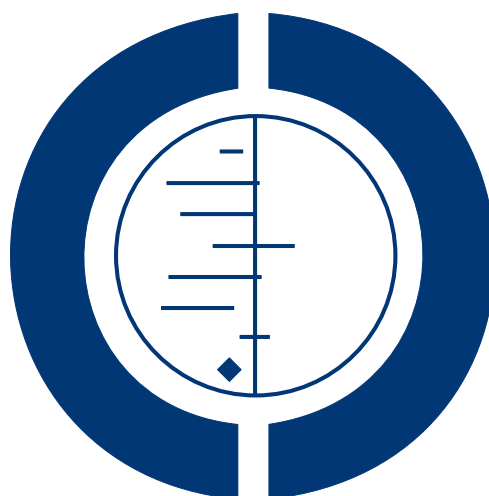


Laparoscopic techniques versus open techniques for inguinal hernia repair (Review)

McCormack K, Scott N, Go PM, Ross SJ, Grant A, Collaboration the EU Hernia Trialists



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TABLE OF CONTENTS

HEADER	1
ABSTRACT	1
PLAIN LANGUAGE SUMMARY	2
BACKGROUND	2
OBJECTIVES	3
METHODS	3
RESULTS	5
DISCUSSION	7
AUTHORS' CONCLUSIONS	7
ACKNOWLEDGEMENTS	8
REFERENCES	9
CHARACTERISTICS OF STUDIES	12
DATA AND ANALYSES	43
Analysis 1.1. Comparison 1 Laparoscopic versus Open, Outcome 1 Duration of operation (minutes).	61
Analysis 1.2. Comparison 1 Laparoscopic versus Open, Outcome 2 "Opposite" method initiated.	63
Analysis 1.3. Comparison 1 Laparoscopic versus Open, Outcome 3 Conversion.	65
Analysis 1.4. Comparison 1 Laparoscopic versus Open, Outcome 4 Haematoma.	67
Analysis 1.5. Comparison 1 Laparoscopic versus Open, Outcome 5 Seroma.	69
Analysis 1.6. Comparison 1 Laparoscopic versus Open, Outcome 6 Wound/superficial infection.	71
Analysis 1.7. Comparison 1 Laparoscopic versus Open, Outcome 7 Mesh/deep infection.	73
Analysis 1.8. Comparison 1 Laparoscopic versus Open, Outcome 8 Vascular injury.	75
Analysis 1.9. Comparison 1 Laparoscopic versus Open, Outcome 9 Visceral injury.	77
Analysis 1.10. Comparison 1 Laparoscopic versus Open, Outcome 10 Port site hernia.	79
Analysis 1.11. Comparison 1 Laparoscopic versus Open, Outcome 11 Length of stay (days).	81
Analysis 1.12. Comparison 1 Laparoscopic versus Open, Outcome 12 Time to return to usual activities (days).	83
Analysis 1.13. Comparison 1 Laparoscopic versus Open, Outcome 13 Persisting pain.	85
Analysis 1.14. Comparison 1 Laparoscopic versus Open, Outcome 14 Persisting numbness.	87
Analysis 1.15. Comparison 1 Laparoscopic versus Open, Outcome 15 Hernia recurrence.	88
Analysis 2.1. Comparison 2 TAPP versus Open, Outcome 1 Duration of operation (minutes).	91
Analysis 2.2. Comparison 2 TAPP versus Open, Outcome 2 "Opposite" method initiated.	93
Analysis 2.3. Comparison 2 TAPP versus Open, Outcome 3 Conversion.	94
Analysis 2.4. Comparison 2 TAPP versus Open, Outcome 4 Haematoma.	96
Analysis 2.5. Comparison 2 TAPP versus Open, Outcome 5 Seroma.	98
Analysis 2.6. Comparison 2 TAPP versus Open, Outcome 6 Wound/superficial infection.	100
Analysis 2.7. Comparison 2 TAPP versus Open, Outcome 7 Mesh/deep infection.	102
Analysis 2.8. Comparison 2 TAPP versus Open, Outcome 8 Vascular injury.	104
Analysis 2.9. Comparison 2 TAPP versus Open, Outcome 9 Visceral injury.	106
Analysis 2.10. Comparison 2 TAPP versus Open, Outcome 10 Port site hernia.	108
Analysis 2.11. Comparison 2 TAPP versus Open, Outcome 11 Length of stay (days).	110
Analysis 2.12. Comparison 2 TAPP versus Open, Outcome 12 Time to return to usual activities (days).	112
Analysis 2.13. Comparison 2 TAPP versus Open, Outcome 13 Persisting pain.	113
Analysis 2.14. Comparison 2 TAPP versus Open, Outcome 14 Persisting numbness.	115
Analysis 2.15. Comparison 2 TAPP versus Open, Outcome 15 Hernia recurrence.	116
Analysis 3.1. Comparison 3 TEP versus Open, Outcome 1 Duration of operation (minutes).	118
Analysis 3.2. Comparison 3 TEP versus Open, Outcome 2 "Opposite" method initiated.	119
Analysis 3.3. Comparison 3 TEP versus Open, Outcome 3 Conversion.	120
Analysis 3.4. Comparison 3 TEP versus Open, Outcome 4 Haematoma.	121
Analysis 3.5. Comparison 3 TEP versus Open, Outcome 5 Seroma.	122
Analysis 3.6. Comparison 3 TEP versus Open, Outcome 6 Wound/superficial infection.	123
Analysis 3.7. Comparison 3 TEP versus Open, Outcome 7 Mesh/deep infection.	124
Analysis 3.8. Comparison 3 TEP versus Open, Outcome 8 Vascular injury.	125

Analysis 3.9. Comparison 3 TEP versus Open, Outcome 9 Visceral injury.	126
Analysis 3.10. Comparison 3 TEP versus Open, Outcome 10 Port site hernia.	127
Analysis 3.11. Comparison 3 TEP versus Open, Outcome 11 Length of stay (days).	128
Analysis 3.12. Comparison 3 TEP versus Open, Outcome 12 Time to return to usual activities (days).	129
Analysis 3.13. Comparison 3 TEP versus Open, Outcome 13 Persisting pain.	130
Analysis 3.14. Comparison 3 TEP versus Open, Outcome 14 Persisting numbness.	131
Analysis 3.15. Comparison 3 TEP versus Open, Outcome 15 Hernia recurrence.	132
Analysis 4.1. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 1 Duration of operation (minutes).	133
Analysis 4.2. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 2 "Opposite" method initiated.	134
Analysis 4.3. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 3 Conversion.	135
Analysis 4.4. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 4 Haematoma.	136
Analysis 4.5. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 5 Seroma.	138
Analysis 4.6. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 6 Wound/superficial infection.	139
Analysis 4.7. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 7 Mesh/deep infection.	140
Analysis 4.8. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 8 Vascular injury.	141
Analysis 4.9. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 9 Visceral injury.	142
Analysis 4.10. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 10 Port site hernia.	144
Analysis 4.11. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 11 Length of stay (days).	145
Analysis 4.12. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 12 Time to return to usual activities (days).	146
Analysis 4.13. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 13 Persisting pain.	147
Analysis 4.14. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 14 Persisting numbness.	148
Analysis 4.15. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 15 Hernia recurrence.	149
Analysis 5.1. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 1 Duration of operation (minutes).	150
Analysis 5.2. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 2 "Opposite" method initiated.	151
Analysis 5.3. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 3 Conversion.	152
Analysis 5.4. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 4 Haematoma.	153
Analysis 5.5. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 5 Seroma.	154
Analysis 5.6. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 6 Wound/superficial infection.	155
Analysis 5.7. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 7 Mesh/deep infection.	156
Analysis 5.8. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 8 Vascular injury.	157
Analysis 5.9. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 9 Visceral injury.	158
Analysis 5.10. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 10 Port site hernia.	159
Analysis 5.11. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 11 Length of stay (days).	160
Analysis 5.12. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 12 Time to return to usual activities (days).	161
Analysis 5.13. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 13 Persisting pain.	162
Analysis 5.14. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 14 Persisting numbness.	163
Analysis 5.15. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 15 Hernia recurrence.	164
Analysis 6.1. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 1 Duration of operation (minutes).	165
Analysis 6.2. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 2 "Opposite" method initiated.	166
Analysis 6.3. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 3 Conversion.	167
Analysis 6.4. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 4 Haematoma.	168
Analysis 6.5. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 5 Seroma.	169
Analysis 6.6. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 6 Wound/superficial infection.	170
Analysis 6.7. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 7 Mesh/deep infection.	171
Analysis 6.8. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 8 Vascular injury.	172
Analysis 6.9. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 9 Visceral injury.	173
Analysis 6.10. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 10 Port site hernia.	174
Analysis 6.11. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 11 Length of stay (days).	175
Analysis 6.12. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 12 Time to return to usual activities (days).	176
Analysis 6.13. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 13 Persisting pain.	177

Analysis 6.14. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 14 Persisting numbness.	178
Analysis 6.15. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 15 Hernia recurrence.	179
Analysis 7.1. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 1 Duration of operation (minutes).	180
Analysis 7.2. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 2 "Opposite" method initiated.	181
Analysis 7.3. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 3 Conversion.	182
Analysis 7.4. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 4 Haematoma.	184
Analysis 7.5. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 5 Seroma.	185
Analysis 7.6. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 6 Wound/superficial infection.	186
Analysis 7.7. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 7 Mesh/deep infection.	187
Analysis 7.8. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 8 Vascular injury.	188
Analysis 7.9. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 9 Visceral injury.	189
Analysis 7.10. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 10 Port site hernia.	190
Analysis 7.11. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 11 Length of stay (days).	192
Analysis 7.12. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 12 Time to return to usual activities (days).	193
Analysis 7.13. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 13 Persisting pain.	194
Analysis 7.14. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 14 Persisting numbness.	195
Analysis 7.15. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 15 Hernia recurrence.	196
Analysis 8.1. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 1 Duration of operation (minutes).	197
Analysis 8.2. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 2 "Opposite" method initiated.	198
Analysis 8.3. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 3 Conversion.	199
Analysis 8.4. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 4 Haematoma.	200
Analysis 8.5. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 5 Seroma.	201
Analysis 8.6. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 6 Wound/superficial infection.	202
Analysis 8.7. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 7 Mesh/deep infection.	203
Analysis 8.8. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 8 Vascular injury.	204
Analysis 8.9. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 9 Visceral injury.	205
Analysis 8.10. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 10 Port site hernia.	206
Analysis 8.11. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 11 Length of stay (days).	207
Analysis 8.12. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 12 Time to return to usual activities (days).	208
Analysis 8.13. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 13 Persisting pain.	209
Analysis 8.14. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 14 Persisting numbness.	210
Analysis 8.15. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 15 Hernia recurrence.	211
Analysis 9.1. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 1 Duration of operation (minutes).	212
Analysis 9.2. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 2 "Opposite" method initiated.	213
Analysis 9.3. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 3 Conversion.	214
Analysis 9.4. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 4 Haematoma.	215
Analysis 9.5. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 5 Seroma.	216
Analysis 9.6. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 6 Wound/superficial infection.	217
Analysis 9.7. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 7 Mesh/deep infection.	218
Analysis 9.8. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 8 Vascular injury.	219
Analysis 9.9. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 9 Visceral injury.	220
Analysis 9.10. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 10 Port site hernia.	221
Analysis 9.11. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 11 Length of stay (days).	222
Analysis 9.12. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 12 Time to return to usual activities (days).	223
Analysis 9.13. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 13 Persisting pain.	224
Analysis 9.14. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 14 Persisting numbness.	225
Analysis 9.15. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 15 Hernia recurrence.	226
Analysis 10.1. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 1 Duration of operation (minutes).	227
Analysis 10.2. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 2 "Opposite" method initiated.	228
Analysis 10.3. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 3 Conversion.	229

Analysis 10.4. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 4 Haematoma.	230
Analysis 10.5. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 5 Seroma.	231
Analysis 10.6. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 6 Wound/superficial infection.	232
Analysis 10.7. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 7 Mesh/deep infection.	233
Analysis 10.8. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 8 Vascular injury.	234
Analysis 10.9. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 9 Visceral injury.	235
Analysis 10.10. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 10 Port site hernia.	236
Analysis 10.11. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 11 Length of stay (days).	237
Analysis 10.12. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 12 Time to return to usual activities (days).	238
Analysis 10.13. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 13 Persisting pain.	239
Analysis 10.14. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 14 Persisting numbness.	240
Analysis 10.15. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 15 Hernia recurrence.	241
Analysis 11.1. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 1 Duration of operation (minutes).	242
Analysis 11.2. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 2 "Opposite" method initiated.	243
Analysis 11.3. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 3 Conversion.	244
Analysis 11.4. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 4 Haematoma.	245
Analysis 11.5. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 5 Seroma.	246
Analysis 11.6. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 6 Wound/superficial infection.	247
Analysis 11.8. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 8 Vascular injury.	248
Analysis 11.9. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 9 Visceral injury.	249
Analysis 11.10. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 10 Port site hernia.	250
Analysis 11.11. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 11 Length of stay (days).	251
Analysis 11.12. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 12 Time to return to usual activities (days).	252
Analysis 11.13. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 13 Persisting pain.	253
Analysis 11.14. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 14 Persisting numbness.	254
Analysis 11.15. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 15 Hernia recurrence.	255
Analysis 12.1. Comparison 12 TEP versus Open (Femoral hernias), Outcome 1 Duration of operation (minutes).	256
Analysis 12.2. Comparison 12 TEP versus Open (Femoral hernias), Outcome 2 "Opposite" method initiated.	257
Analysis 12.3. Comparison 12 TEP versus Open (Femoral hernias), Outcome 3 Conversion.	258
Analysis 12.4. Comparison 12 TEP versus Open (Femoral hernias), Outcome 4 Haematoma.	259
Analysis 12.5. Comparison 12 TEP versus Open (Femoral hernias), Outcome 5 Seroma.	260
Analysis 12.6. Comparison 12 TEP versus Open (Femoral hernias), Outcome 6 Wound/superficial infection.	261
Analysis 12.7. Comparison 12 TEP versus Open (Femoral hernias), Outcome 7 Mesh/deep infection.	262
Analysis 12.8. Comparison 12 TEP versus Open (Femoral hernias), Outcome 8 Vascular injury.	263
Analysis 12.9. Comparison 12 TEP versus Open (Femoral hernias), Outcome 9 Visceral injury.	264
Analysis 12.10. Comparison 12 TEP versus Open (Femoral hernias), Outcome 10 Port site hernia.	265
Analysis 12.11. Comparison 12 TEP versus Open (Femoral hernias), Outcome 11 Length of stay (days).	266
Analysis 12.12. Comparison 12 TEP versus Open (Femoral hernias), Outcome 12 Time to return to usual activities (days).	267
Analysis 12.13. Comparison 12 TEP versus Open (Femoral hernias), Outcome 13 Persisting pain.	268
Analysis 12.14. Comparison 12 TEP versus Open (Femoral hernias), Outcome 14 Persisting numbness.	269
Analysis 12.15. Comparison 12 TEP versus Open (Femoral hernias), Outcome 15 Hernia recurrence.	270
Analysis 13.1. Comparison 13 Laparoscopic versus mesh (published data), Outcome 1 Persisting pain (published data).	271
FEEDBACK	271
WHAT'S NEW	272
HISTORY	272
CONTRIBUTIONS OF AUTHORS	272
DECLARATIONS OF INTEREST	272
SOURCES OF SUPPORT	273
INDEX TERMS	273

Laparoscopic techniques versus open techniques for inguinal hernia repair

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ABSTRACT

Background

Inguinal hernia repair is the most frequently performed operation in general surgery. The standard method for inguinal hernia repair had changed little over a hundred years until the introduction of synthetic mesh. This mesh can be placed by either using an open approach or by using a minimal access laparoscopic technique. Although many studies have explored the relative merits and potential risks of laparoscopic surgery for the repair of inguinal hernia, most individual trials have been too small to show clear benefits of one type of surgical repair over another.

Objectives

To compare minimal access laparoscopic mesh techniques with open techniques.

Search methods

We searched MEDLINE, EMBASE, and The Cochrane Central Controlled Trials Registry for relevant randomised controlled trials. The reference list of identified trials, journal supplements, relevant book chapters and conference proceedings were searched for further relevant trials. Through the EU Hernia Trialists Collaboration (EUHTC) communication took place with authors of identified randomised controlled trials to ask for information on any other recent and ongoing trials known to them.

Selection criteria

All published and unpublished randomised controlled trials and quasi-randomised controlled trials comparing laparoscopic groin hernia repair with open groin hernia repair were eligible for inclusion.

Data collection and analysis

Individual patient data were obtained, where possible, from the responsible trialist for all eligible studies. Where IPD were unavailable additional aggregate data were sought from trialists and published aggregate data checked and verified by the trialists. Where possible, time to event analysis for hernia recurrence and return to usual activities were performed on an intention to treat principle. The main analyses were based on all trials. Sensitivity analyses based on the data source and trial quality were also performed. Pre-defined subgroup analyses based on recurrent hernias, bilateral hernias and femoral hernias were also carried out.

Main results

Forty-one eligible trials of laparoscopic versus open groin hernia repair were identified involving 7161 participants (with individual patient data available for 4165). Meta-analysis was performed, using individual patient data where possible. Operation times for laparoscopic repair were longer and there was a higher risk of rare serious complications. Return to usual activities was faster, and there was less persisting pain and numbness. Hernia recurrence was less common than after open non-mesh repair but not different to open mesh methods.

Authors' conclusions

The review showed that laparoscopic repair takes longer and has a more serious complication rate in respect of visceral (especially bladder) and vascular injuries, but recovery is quicker with less persisting pain and numbness. Reduced hernia recurrence of around 30-50% was related to the use of mesh rather than the method of mesh placement.

PLAIN LANGUAGE SUMMARY

Laparoscopic techniques versus open techniques for repair of a hernia in the groin

Repair of a hernia in the groin (an inguinal hernia) is the most frequently performed operation in general surgery. The hernia is repaired (with suturing or placing a synthetic mesh over the hernia in one of the layers of the abdominal wall) using either open surgery or minimal access laparoscopy. The most common laparoscopic techniques for inguinal hernia repair are transabdominal preperitoneal (TAPP) repair and totally extraperitoneal (TEP) repair. In TAPP the surgeon goes into the peritoneal cavity and places a mesh through a peritoneal incision over possible hernia sites. TEP is different as the peritoneal cavity is not entered and mesh is used to seal the hernia from outside the thin membrane covering the organs in the abdomen (the peritoneum). The mesh, where used, becomes incorporated by fibrous tissue. Minor postoperative problems occur. More serious complications such as damage to the spermatic cord, a blood vessel or nerves, are occasionally reported with open surgery and nerve or major vascular injuries, bowel obstruction, and bladder injury have been reported with laparoscopic repair. Reoccurrence of a hernia is a major drawback.

The review authors identified 41 eligible controlled trials in which a total of 7161 participants were randomized to laparoscopic or open surgery repair. The mean or median duration of follow up of patients ranged from 6 to 36 months.

Return to usual activities was faster for laparoscopic repair, by about seven days, and there was less persisting pain and numbness than with open surgery. However, operation times were some 15 minutes longer (range 14 to 16 minutes) with laparoscopy and there appeared to be a higher number of serious complications of visceral (especially bladder) and vascular injuries. Using a mesh for repair reduced the risk of a recurring hernia rather than the method of placement (open or laparoscopic surgery).

BACKGROUND

Inguinal hernia repair is the most frequently performed operation in general surgery (Rutkow 1993). Approximately 80,000 are performed each year in the UK (Kingsnorth 1992), 100,000 in France (Levard 1996) and 700,000 in the USA (Schumpelick 1994). Because inguinal hernia repair is performed so frequently, relatively modest improvements in clinical outcomes would have a significant medical impact (Simons 1996).

The standard method for inguinal hernia repair had changed little over the hundred years since Bassini introduced the modern era of herniorrhaphy (Bassini 1887). Bassini's method relies on

a musculo-aponeurotic repair to close the abdominal wall defect under tension, eliminate the presence of a lump and relieve the patient's discomfort. Minor postoperative problems are not uncommon, while more serious complications, such as damage to the spermatic cord, the femoral vein or artery, or the genitofemoral or ilioinguinal nerves are occasionally reported. However, its major drawback is recurrence. Annual statistics from various countries show that, despite many modifications introduced by Shouldice, McVay and others, 10-15% of inguinal hernia operations are for recurrent hernias (Liem 1996).

A newer concept of groin hernia repair is to cover the hernia de-

fect with a prosthetic mesh. This mesh is placed on one of the layers of the abdominal wall either using an open approach or a minimal access laparoscopic technique. The two most common types of laparoscopic repair are the transabdominal preperitoneal repair (TAPP) and the totally extraperitoneal repair (TEP). Some surgeons fix the mesh with staples or sutures whereas others now do not. Schrenk et al (Schrenk 1996) claimed that the benefits of laparoscopic inguinal herniorrhaphy included a decrease in post-operative pain, reduced hospital stay and early return to normal activity. However, serious complications have also been reported, such as nerve injuries, major vascular injuries, bowel obstruction, and bladder injury (Kald 1997).

Although many studies have explored the relative merits and potential risks of laparoscopic surgery for the repair of inguinal hernia, most individual trials have been too small to show clear benefits of one type of surgical repair over another and their authors' conclusions have not been consistent. Nevertheless, many of these trials have had important influence on clinical practice and consequently the debate surrounding the optimal treatment for the surgical repair of inguinal hernia has continued.

In 1996 the International Study Group for Laparoscopic Inguinal Hernia Repair (ISLIR) suggested a 'standard' approach to data collection as a basis for an individual patient data (IPD) meta-analysis to combine the results from all available randomised evidence evaluating laparoscopic repair for inguinal hernia. The EU Hernia Trialists Collaboration (EUHTC) was established in 1998, under whose auspices the meta-analysis was conducted. The project secretariat, funded by the EU BIOMED II workprogramme, made contact with the principal investigators of all known relevant randomised controlled trials and invited them to collaborate. The EUHTC first conducted a meta-analysis of published data only and the results of this were published in Issue 4 2000 of the Cochrane Library and the British Journal of Surgery (EUHTC 2000). However, as expected, these analyses showed that there were insufficient published data to provide reliable estimates of some treatment effects. The purpose of this new version of the review is to build on the published meta-analyses by using, where possible, the results of individual patient data analyses to provide a more comprehensive overview of available trial evidence regarding the benefits and harms of laparoscopic inguinal hernia repair. These analyses were completed in January 2001.

OBJECTIVES

The purpose of this review was to compare minimal access laparoscopic mesh techniques with open techniques for inguinal hernia repair. Comparisons of open mesh techniques versus open non-mesh techniques have been considered in a separate review (Scott 2001).

METHODS

Criteria for considering studies for this review

Types of studies

All published and unpublished randomised controlled trials and quasi-randomised controlled trials comparing laparoscopic inguinal hernia repair with open inguinal hernia repair were eligible for inclusion. Trials were included irrespective of the language in which they were reported.

Types of participants

The trials included all patients with a clinical diagnosis of inguinal hernia for whom surgical management was judged appropriate. Where possible, individual patient data from randomised patients were included in the meta-analysis including data obtained for any patients excluded from the original published analyses.

Types of interventions

Methods of surgical repair of inguinal hernia:

- a) Laparoscopic inguinal herniorrhaphy (including the transabdominal preperitoneal technique (TAPP) and the totally extraperitoneal technique (TEP)).
- b) Open repair (including open mesh repair and open non-mesh techniques).

Types of outcome measures

The following data items were sought for all trials:

- 1 Duration of operation (min)
- 2 'Opposite' method initiated
- 3 Conversion (defined as a procedure initiated as laparoscopic but converted to open, or a procedure initiated as open but converted to laparoscopic)
- 4 Haematoma
- 5 Seroma
- 6 Wound/Superficial Infection
- 7 Mesh/Deep Infection
- 8 Port site hernia
- 9 Vascular injury
- 10 Visceral injury
- 11 Length of hospital stay (Days)
- 12 Time to return to usual activities (Days)
- 13 Persisting pain (defined as groin pain of any severity as near 12 months after the operation as possible provided this was at least after 3 months)
- 14 Persisting numbness (defined as groin pain of any severity as near 12 months after the operation as possible provided this was at least after 3 months)

15 Hernia recurrence

16 Known death, within 30 days of surgery

Search methods for identification of studies

1. A database search for randomised controlled trials was conducted using MEDLINE, EMBASE, and The Cochrane Central Controlled Trials Registry.

In MEDLINE, the first two stages of the standard Cochrane search strategy described by Dickersin et al (Dickersin 1994) were used with the following specific search terms:

1. explode inguinal hernia/surgery (MeSH)
 2. inguinal herni\$.tw
 3. shouldice.tw
 4. bassini.tw
 5. mcvay.tw
 6. stoppa.tw
 7. (laparoscop\$ adj25 herni\$).tw
 8. (tension-free adj25 herni\$).tw
 9. (conventional adj25 herni\$).tw
 10. (open adj25 herni\$).tw
 11. (darn adj25 herni\$).tw
 12. (mesh adj25 herni\$).tw
 13. (traditional adj25 herni\$).tw
 14. (plug adj25 herni\$).tw
 15. (lichtenstein adj25 herni\$).tw
 16. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15
2. The reference list of identified trials, journal supplements, and relevant book chapters were searched for further relevant trials.
3. Through the EUHTC, communication took place with authors of identified randomised controlled trials to ask for information on any other completed and ongoing trials known to them
4. Specialists involved in research on the repair of inguinal hernia were contacted to ask for information about any further completed and ongoing trials.
5. Potentially useful sites on the world wide web were checked for references to relevant trials.

Data collection and analysis

This review is based on individual patient data obtained directly from the principal investigator or responsible trialist. The methods used were prespecified in a protocol.

Data were sought for all patients randomised in all eligible published and unpublished randomised controlled trials and follow-up beyond that previously published was requested. When received the IPD were thoroughly checked for internal consistency and consistency with any published reports. Any apparent discrepancies and queries were resolved by discussion with the responsible trialists who also verified the final version of the analyses for each

trial. All analyses were based on the original allocation regardless of the actual method of repair performed ('intention to treat'). If patients had been excluded because they did not receive the allocated procedure, details were sought and included where possible. Where IPD were not available, aggregated data were used; the trialist was asked to verify information abstracted from their publication and supplement this where possible. Any apparent discrepancies and queries were resolved by discussion with the responsible trialists who also verified the final results used for each trial.

Where IPD or additional aggregate data were not available, published data taken from the trial reports were used. All studies were assessed for methodological quality. This was performed by two reviewers independently. Where a difference of opinion existed, the two reviewers consulted an arbiter. The system for classifying methodological quality of trials was based on an assessment of the three principal potential sources of bias. These are: selection bias from insecure random allocation of treatments; attrition bias; and biased ascertainment of outcome where knowledge of the allocation might have influenced the measurement of outcome. The same two reviewers abstracted the outcome data, and other important details of the trial such as the length of follow-up, type of hernia, method of hernia diagnosis, inclusion and exclusion criteria. These data were double checked and any differences of opinion resolved by an arbiter.

For each outcome the results were derived from the best available source: if IPD were not available, information from aggregate data provided by the trialist or data from the trial publications were used. Dichotomous outcome data were combined using the Peto odds ratio method and continuous outcomes were combined using the Mantel-Haenszel weighted mean difference method. Time to return to usual activities was described using IPD by calculating hazard ratios. The interpretation of this outcome is similar to that of other outcomes except that the graph shows estimated hazard ratios instead of odds ratios. By using the IPD the hazard ratio compares the rate of return to usual activities in each group while taking account of the fact that not all trial participants will have returned to usual activities during the follow-up period. The observed minus the expected number of events with its variance were derived for each trial using Kaplan-Meier survival analysis. The results are all reported using a fixed effects model. Chi-squared tests were used to test for heterogeneity across studies and where significant heterogeneity was found possible reasons were explored. The review was conducted using the standard Cochrane software 'RevMan 4.1'. Comparison 1 considers laparoscopic versus open repair. Within this analysis, the trials were ordered by the method of laparoscopic repair (TAPP and TEP). Comparison 2 considers laparoscopic TAPP versus open repair and the trials were ordered by the method of open repair (open mesh or non-mesh). Comparison 3 considers laparoscopic TEP versus open repair and the trials were also ordered by the method of open repair (open mesh or non-mesh). Comparisons 4-6, 7-9, and 10-12 repeat this but include patients with recurrent, bilateral and femoral hernias re-

spectively.

Duration of operation was defined as time from first incision to last suture or time in theatre where this was not available. "Opposite" method was defined as a laparoscopic repair initiated when an open repair was allocated, or an open repair initiated when a laparoscopic repair was allocated. A conversion was defined as a procedure initiated as a laparoscopic but converted to an open repair, or a procedure initiated as an open but converted to a laparoscopic. Haematoma included wound or scrotal haematoma or ecchymosis but not bruising. Seroma included hydrocele. Wound/superficial infection was defined as wound related infections only and included pus from wound, fistula and sinus formation. Length of postoperative stay was defined as time from admission to discharge. Time to return to usual activities was defined as normal social activities or work where this was not available. Persisting pain was defined as groin pain of any severity (including testicular) persisting at one year after the operation, or at the closest timepoint to one year provided this was at least three months after surgery. Persisting numbness included paresthesia, dysesthesia and discomfort persisting at one year after the operation, or at the closest timepoint to one year provided this was at least three months after surgery. Hernia recurrence data were based on the methods of ascertainment used in individual trials.

The main analyses were based on all trials. However, we also planned a priori sensitivity analyses based on: 1) IPD data alone; 2) Trials with adequate allocation concealment. A priori sub-group analyses for recurrent hernia, bilateral hernias and femoral hernias were also planned, as described above.

RESULTS

Description of studies

See: [Characteristics of included studies](#); [Characteristics of excluded studies](#).

The characteristics of the 41 trials are summarised in the 'Characteristics of included studies' table. There were 45 relevant comparisons in 41 eligible trials (7161 participants), because four trials had three-arms. Of the 41 trials included, 34 were reported in full papers and seven as abstracts only. IPD were provided for 25 trials (4165 participants) four of which have a published abstract only, and additional aggregated data for a further seven (2002 participants). Published data only were available for the other nine (994 participants). Two of these were identified too late to approach the authors for individual patient data, with information available for each limited to a conference abstract. All trials were restricted to elective inguinal hernia repair. 19 included recurrent as well as primary hernias, 14 were limited to primary hernias only, one included recurrent hernias only, and these details were not reported for seven. Based on IPD, participants had a mean

age of 54.2 (14.9), 96% were men, 11% had recurrent hernias, 9% bilateral, and 1% femoral. The comparisons in the 41 trials were: TAPP versus open mesh (11 trials, 1206 participants); TAPP versus open non-mesh (12 trials, 1528 participants); TAPP versus mixed open (1 trial, 57 participants); TEP versus open mesh (6 trials, 690 participants); TEP versus non-mesh (5 trials, 1522 participants); TAPP versus TEP versus open non-mesh (one trial, 86 participants); mixture of laparoscopic versus a mixture of open repairs (2 trials, 1051 participants); and TAPP versus open mesh versus open non-mesh (three trials, 1021 participants). Across the trials where reported, all but seven of the patients allocated to laparoscopic repairs received a general anaesthetic (one had a local and six regional). Patients in the open groups received general, regional or local anaesthesia, determined by the trial protocol or surgeon's choice.

Risk of bias in included studies

The method of randomisation used was stated explicitly for 36 of 41 trials: central randomisation service in four, sealed envelopes in 23, computer generated random numbers in two and random number tables in three (although concealment details were not described), by alternation in two, by birthdate in one, and random selection by cards in one. In 5 trials, the allocation was said to be 'randomised' but the method was not specified. The trials ranged in size from 38 to 994 randomised patients. The mean or median duration of follow-up ranged from 6 weeks to 36 months, 25 trials confirmed hernia diagnosis by clinical examination and in 21 trials the operation was reported to have been performed by an 'experienced' surgeon or one who had performed at least 10 laparoscopic hernia repairs.

Effects of interventions

1) Duration of operation

The average length of operation was longer in the laparoscopic groups in 36 of 37 trials with data (Comparison 01.01). Overall the WMD was 14.81 minutes (95% CI 13.98 to 15.64; $p < 0.0001$). The estimated effect size was broadly consistent for the comparisons of TAPP versus open and TEP versus open in all sub-categories (open mesh, open non mesh and mixed open: Comparisons 02.01 and 03.01). There was evidence of statistical heterogeneity but, consistency in direction of effect, even when size and effect estimates varied.

2) "Opposite" method initiated

The 'opposite' method was initiated in 59/2053 (2.9%) allocated laparoscopic repairs and 12/2108 (0.6%) allocated open repairs (Comparison 01.02). Similar patterns were observed after allocation to TAPP (Comparison 02.02) and TEP (Comparison 03.02).

3) Conversions

In total, 85 (2.7%) laparoscopic operations were stated to have been converted to an open procedure amongst 3130 allocated laparoscopic repairs and 5 (0.1%) open procedures were converted to a laparoscopic repair amongst 3541 allocated open repairs (Comparison 01.03: Peto OR 6.73, 95% CI 4.42 to 10.24; $p < 0.0001$). Higher rates observed in TEP trials reflected two studies ([Coala Trial Gp 1997](#); [MRCmulticentre 1999](#)) (Comparisons 02.03 and 03.03).

4) Haematoma

Overall, there appeared to be fewer haematomas in the laparoscopic groups (Comparison 01.04: 238/2747 vs 317/3007: Peto OR 0.72, 95% CI 0.60 to 0.87; $p < 0.01$) but this reflected TEP trials. Stratification by whether TAPP or TEP largely explained the statistical heterogeneity. There were no clear differences when TAPP trials were considered (Comparison 02.04). Eight of the nine TEP trials favoured laparoscopic repair in this respect (Comparison 03.04).

5) Seroma

Overall, there were more seromas in the laparoscopic groups (Comparison 01.05: 139/2408 vs 101/2679: Peto OR 1.58, 95% CI 1.20 to 2.08; $P = 0.001$). The heterogeneity between studies is largely explained by the [MRCmulticentre 1999](#) trial. Excluding this trial, suggests a doubling of the risk of seroma following laparoscopic repair irrespective of method; including it, suggests the differential effect is limited to TAPP repair only (Comparison 02.05 and 03.05).

6) Wound/Superficial infection

Where reported, wound/superficial infection also appeared less frequent in the laparoscopic groups (Comparison 01.06: Peto OR 0.45, 95% CI 0.32 to 0.65; $p < 0.0001$). Although these results were particularly influenced by the [Whipps Cross 1998](#) trial, the difference remained significant when this trial was removed. The estimated effect was similar when comparing TAPP with open and TEP with open, although non-significant in the TEP versus open comparison.

7) Mesh/deep infection

There were only three reported cases of mesh/deep infection: one case of mesh infection in a laparoscopic TAPP group ([Nyborg 1999](#)); one case of mesh infection in an open mesh group ([Bydgoszcz 1998](#)); and one case of deep infection in an open non-mesh group ([SCUR 1999](#)) (Comparisons 01.07; 02.07; and 03.07).

8) Vascular injuries

There were three reported cases of intra-operative vascular injuries all occurring in laparoscopic groups: one unspecified vascular injury ([Adelaide 1994](#)); one trocar injury to the left common iliac artery ([MRCmulticentre 1999](#)); and one artery hit by a port causing a conversion ([Woodville 1996](#)). There were eight post-operative vascular injuries, four in the laparoscopic groups consisting of two cases of post-operative bleeding which required re-operation ([Maastricht 1998](#), [Stuttgart 1995](#)) and two haematomas which required re-operation ([Maastricht 1998](#), [Stuttgart 1995](#)). The re-

maintaining four vascular injuries occurred in the open groups consisting of three haematomas requiring re-operation ([Paris 1994](#), [Stuttgart 1995](#), [Woodville 1996](#)) and one wound haemorrhage ([Whipps Cross 1994](#)).

9) Visceral injuries

There were seven intra-operative visceral injuries, six were in the laparoscopic groups consisting of 4 bladder injuries ([MRCmulticentre 1999](#), [SCUR 1999](#), [Tampere 1998](#)), one re-operation causing small bowel damage ([Adelaide 1994](#)), and one punctured stomach ([Maastricht 1998](#)). One small bowel injury occurred in the open group of the [MRCmulticentre 1999](#) trial. There were also two post-operative bowel obstructions both of which occurred in the laparoscopic groups ([Adelaide 1994](#), [MRCmulticentre 1999](#)).

10) Port-site hernia

There were only 6 cases of port site hernia reported ([Aarberg 1996](#); [Linköping 1997](#); [MRCmulticentre 1999](#); [Whipps Cross 1998](#)).

11) Length of stay (days)

There was marked heterogeneity in length of hospital stay, with greater differences in mean stay between different hospitals than there were between laparoscopic and open repairs in the same hospital (Comparisons 01.11; 02.11; and 03.11). In respect of between trial group differences, the trials tended to show either no difference or a clear difference, sometimes in exact days (e.g. [Coala Trial Gp 1997](#)). This suggests that the overall finding of shorter stay after laparoscopic repair reflects hospital policy rather than a true effect of the repair.

12) Time to return to usual activity (days)

In all trials with data, the time to return to usual activity was shorter in the laparoscopic groups (Comparison 01.12: HR 0.56, 95% CI 0.51 to 0.61; $p < 0.0001$). This is equivalent to an absolute difference of about 7 days. The estimated effect was similar when comparing TAPP with open and TEP with open. However, there was evidence of statistical heterogeneity and this is likely to be due to differences between trials in: post-operative advice; definition of usual activity (e.g. work, walking, sport); existing co-morbidity; and local 'cultures'.

13) Persisting pain

There were fewer cases of persisting pain at one year after the operation in the laparoscopic groups (Comparison 01.13: overall 290/2101 versus 459/2399; Peto OR 0.54, 95% CI 0.46 to 0.64; $p < 0.0001$). The estimated effect was similar when comparing TAPP with open repair and TEP with open repair in all open mesh and open non-mesh sub-categories. The statistical heterogeneity was largely explained by one trial ([MRCmulticentre 1999](#)). This relatively large trial suggests a small difference, but still favoured laparoscopic repair.

14) Persisting numbness

There were fewer cases of persisting numbness in the laparoscopic groups (Comparison 01.14 overall 102/1419 versus 217/1624; Peto OR 0.38, 95% CI 0.28 to 0.49; $p < 0.0001$). The direction of effect was consistent when comparing TAPP with open repairs

and TEP with open repairs. The data suggested a larger difference in TAPP (Comparison 02.14) than TEP trials (Comparison 03.14) but this again reflected the [MRCmulticentre 1999](#) trial which contributed the majority of the TEP data. Overall, there was significant heterogeneity but not when TAPP and TEP were considered separately.

15) Hernia recurrence

Totals of 86 recurrences were reported amongst 3138 allocated laparoscopic repair and 109 amongst 3504 allocated to open repair (Comparison 01.15: Peto OR 0.81, 95% CI 0.61 to 1.08; $p = 0.16$). The comparative performance of both TAPP and TEP was, however, influenced by the nature of the open repair (Comparison 02.15 and 03.15). When the open repair was mesh, the rates of recurrence were similar in the trial groups. In contrast, when the open repair was non-mesh, recurrence was less common after laparoscopic repair, although this was statistically significant only for the TAPP comparison.

16) Known death

Only one death occurred within 30 days of surgery and this was unrelated to operation ([Whipps Cross 1998](#)).

SUBGROUP ANALYSIS

Subgroup analyses were performed for patients with recurrent hernias (Comparison 04.05 and 06), bilateral hernias (Comparison 07.08 and 09), and femoral hernias (Comparison 10, 11 and 12). Data were available from 12 trials for recurrent hernias, 12 trials for bilateral hernias, and 4 trials for femoral hernias. When considering recurrent and bilateral hernias all subgroup analyses were also consistent with or statistically compatible (i.e their confidence intervals did not rule out the effect estimate derived from the overall results) with the overall results. There were too few data to reliably perform subgroup analyses for patients with femoral hernias.

SENSITIVITY ANALYSIS

Analyses restricted to IPD data alone gave similar estimates for recurrence to the overall results (Peto OR 0.79, 95% CI 0.55 to 1.14; $p=0.2$). Trials with adequate allocation concealment also gave similar estimates (Peto OR 0.82, 95% CI 0.60 to 1.13; $p=0.2$).

DISCUSSION

This review was conducted through the formal structure of the EU Hernia Trialists Collaboration which ensured as complete identification of relevant trials as possible. IPD were provided for 25 trials, four of which have a published abstract only, and additional aggregated data for a further seven. This greatly enhanced the amount of data we were able to include in the review compared with the original version based on published data. This particularly applied to 'persisting pain'. The availability of IPD also helped to ensure a better quality of data and randomisation integrity. However, despite maximum effort, published data only were available for nine

trials. Two of these trials were identified too late to approach the authors for individual patient data, with information available for each limited to a conference abstract. The framework of this collaboration means that it is unlikely that we have missed important trials, although we do know that one large trial with long term follow-up is currently unreported and recruitment to another is ongoing.

Our results provide evidence that after a laparoscopic repair return to usual activity is faster and persisting pain is reduced. However, operation times are longer and there appears to be a higher rate of serious complication rate in respect of visceral (especially bladder) and vascular injuries. Our findings relating to hernia recurrence are consistent with those in the review of open mesh versus open non-mesh repair of groin hernia ([Scott 2001](#)). That review provides evidence that the use of mesh in open repair is associated with a substantial reduction in the risk of hernia recurrence. In this review both of the sub-group comparisons of laparoscopic groups (which use mesh) with non-mesh open methods favour the laparoscopic method (although not statistically significantly so for the TEP versus non-mesh comparison). This is equivalent to around a 30-50% reduction in the risk of hernia recurrence. However, when comparing laparoscopic methods with open mesh methods of hernia repair there is no apparent difference. Therefore results of the two reviews taken together provide evidence that the use of mesh is associated with a reduction in the risk of hernia recurrence rather than the method of placement and that the two methods of mesh placement appear equally effective in this respect.

The results for many of the outcomes in this review displayed significant heterogeneity. With the exception of recurrence there was generally consistency in direction of effect, even when size and effect estimates varied. Much of the variation was explained by differences in the methods of repair, both laparoscopic (TAPP or TEP) and open (mesh or non-mesh). Sensitivity analyses suggested that the type of data (IPD or not) and adequacy of allocation concealment did not influence the estimates of effect, at least in respect of recurrence. Other likely sources of heterogeneity, however, are differences in the way the outcomes were defined or measured; in operator experience; in the types of people studied; and in length of follow-up.

AUTHORS' CONCLUSIONS

Implications for practice

The use of mesh during laparoscopic hernia repair is associated with a reduction in the risk of hernia recurrence in comparison with non-mesh methods of hernia repair. However, there is no apparent difference when laparoscopic methods are compared with open mesh methods of hernia repair. The data available show less persisting pain and numbness following a laparoscopic repair and return to usual activities is faster. However, operation times are

longer and there appears to be a higher serious complication rate in respect of visceral (especially bladder) and vascular injuries. An economic evaluation (not reported here) suggests that laparoscopic repair is more costly than an open mesh repair, and that this is not sufficiently offset by benefits to make it cost-effective.

Implications for research

To our knowledge, this is the first time that general surgeons have collaborated in this way and contributed their raw trial data for the purposes of a systematic review. We have demonstrated that, although costly, the collection of IPD can greatly enhance the data available for a Cochrane systematic review compared with using published data only. We used a liberal definition of 'persisting pain' with the consequence of widely varying prevalence rates across trials. Ideally, the issue of chronic pain should now be addressed prospectively using standard definitions and allowing assessment of the degree of pain.

Rare, serious complications are an important consideration in the context of minor surgery. Even considering trials involving over 7000 participants gives imprecise estimates; prospective population-based registries of new surgical procedures may be the best way to address this. (The advantage of randomised trials, however, is formal entry prior to surgery and this ideal is unlikely to be accomplished in observational studies).

Questions remain about the relative merits and risks of TAPP and TEP. Further research is also required about the optimal mesh type (e.g. size) and placement (e.g. sutured, unsutured or stapled) procedure for both laparoscopic and open mesh repair.

Laparoscopic groin hernia repair like most other surgical procedures is technically challenging and performance is likely to improve with experience. In this review, the consistency of the trials (involving surgeons at varying stages of learning) provided reassurance that learning is not a major confounder. Nevertheless, the general issue is important and further methodological research is warranted in the context of both trials and meta-analyses of trials.

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REFERENCES

References to studies included in this review

Aarberg 1996 {published and unpublished data}

Tschudi J, Wagner M, Klaiber C, Brugger J-J, Frei E, Krahenbuhl L, Inderbitzi R, Husler J, Hsu Schmitz S. Controlled multicenter trial of laparoscopic transabdominal preperitoneal hernioplasty vs Shouldice herniorrhaphy. *Surgical Endoscopy* 1996;**10**:845–847. [MEDLINE: 1996351006]

Adelaide 1994 {published and unpublished data}

Maddern GJ, Devitt P, Malycha P, Rudkin G. Laparoscopic versus open inguinal hernia repair. *British Journal of Surgery* 1993;**80** Suppl:38–39.

* Maddern GJ, Rudkin G, Bessell JR, Devitt P, Ponte L. A comparison of laparoscopic and inguinal hernia repair as a day surgical procedure. *Surgical Endoscopy* 1994;**8**:1404–1408. [MEDLINE: 1996270205]

Ancona 1998 {published and unpublished data}

Paganini AM, Lezoche E, Carle F, Carlei F, Favretti F, Feliciotti F, Gesuita R, Guerrieri M, Lomanto D, Nardovino M, Panti M, Ribichini P, Sarli L, Sottili M, Tamburini A, Taschieri A. A randomised, controlled, clinical study of laparoscopic vs open tension-free inguinal hernia repair. *Surgical Endoscopy* 1998;**12**:979–986.

Bangkok 1998 {published data only}

Tanphiphat C, Tanprayonn T, Sangsubhan C, Chatamra K. Laparoscopic vs open inguinal hernia repair. *Surgical Endoscopy* 1998;**12**:846–851.

Barcelona 2 1998 {published data only}

Ramon JM, Carulla X, Hidalgo JM, Navarro S, Ferrer M, Sanchez Ortego JM. Study of quality of life in relation with the health after the surgery of the endoscopic inguinal hernia versus conventional.. *British Journal of Surgery* 1998;**85** supplement II:18.

Berlin 1996 {published data only}

* J Zieren, HU Zieren, CA Jacobi, FA Wenger, JM Muller. Prospective randomised study comparing laparoscopic and open tension-free inguinal hernia repair with Shouldice.. *The American Journal of Surgery* 1998;**175**:331–333. Zieren I, Zieren HU, Said S, Muller M. Laparoscopic or Conventional inguinal hernia repair with or without implant. A prospective randomised trial. *Langenbecks Archiv fur Chirurgie* 1996;**Supplement II**:609–10.

Bietigheim 1998 {published data only}

* Koninger JS, Oster M, Butters M. Management of inguinal hernia: a comparison of current methods. *Chirurg* 1998;**69**:1340–4.

Brisbane 1996 {published data only}

Nathanson L, Adib R. Randomised trial of open & Laparoscopic inguinal hernia repair. Proceedings of the Society of American Gastrointestinal Endoscopic Surgeons, Philadelphia. 1996.

Bydgoszcz 1998 {published data only}

Gontarz W, Wolanski L, Leksowski K. A comparison of two 'tension free' inguinal hernia repair methods - laparoscopic hernioplasty vs anterior mesh technique.. *British Journal of Surgery* 1998;**85** Supplement II:101.

Caen 1998 {published data only}

* Damamme A, Samama G, D'Alche-Gautier MJ, Chanavel N, Brefour JL, Le Roux Y. Medico-economic evaluation of treatment of inguinal hernia: Shouldice vs laparoscopy. *Annales de Chirurgie* 1998;**52**:11–16.

Coala Trial Gp 1997 {published data only}

Liem MSL, Halsema JAM, van der Graaf Y, Schrijvers AJP, van Vroonhoven TJMV. Cost-effectiveness of extraperitoneal laparoscopic inguinal hernia repair: A randomised comparison with conventional herniorrhaphy. *Annals of Surgery* 1997;**226**(6):668–676. [MEDLINE: 1998072224]

* Liem MSL, van der Graaf Y, van Steensel CJ, Boelhouwer RU, Clevers G-J, Meijer WS, Stassen LPS, Vente JP, Weidema WF, Schrijvers AJP, van Vroonhoven TJMV. Comparison of conventional anterior surgery and laparoscopic surgery for inguinal hernia repair. *The New England Journal of Medicine* 1997;**336**(22):1541–1547. [MEDLINE: 1997291359]

Liem MSL, van der Graaf Y, van Steensel CJ, Boelhouwer RU, Clevers G-J, Meijer WS, Stassen LPS, Vente JP, Weidema WF, Schrijvers AJP, van Vroonhoven TJMV. Faster recovery and fewer recurrences after laparoscopic than after conventional inguinal hernia surgery; a prospective randomized study.. *Nederlands Tijdschrift Voor Geneeskunde* 1997;**141**(29):1430–1436.

Liem MSL, van der Graaf Y, Zwart RC, Geurts I, van Vroonhoven TJMV. A randomised comparison of physical performance following laparoscopic and open inguinal hernia repair. *British Journal of Surgery* 1997;**84**:64–67. [MEDLINE: 1997196274]

Liem MSL, van Steensel CJ, Boelhouwer RU, Weidema WF, Clevers G-J, Meijer WS, Vente JP, de Vries LS, van Vroonhoven TJMV. The learning curve for totally extraperitoneal laparoscopic inguinal hernia repair. *The American Journal of Surgery* 1996;**171**:281–285. [MEDLINE: 1996177201]

Denizli 1998 {published data only}

Bostanci BE, Tetik C, Ozer S, Ozden A. Posterior approaches in groin hernia repair with prosthesis: open or closed. *Acta Chirurgie Belgique* 1998;**98**:241–244.

Hawaii 1994 {published and unpublished data}

Payne JH, Grininger LM, Izawa MD, Podoll EF, Lindahl PJ, Balfour J. Laparoscopic or open inguinal herniorrhaphy. *Archives of Surgery* 1994;**129**:973–981.

Hawaii 1996 {published and unpublished data}

Payne J, Izawa M, Glen P, Grininger L, Podoll E, Balfour J. Laparoscopic or tension-free inguinal hernia repair? A cost/benefit analysis of 200 prospectively randomised patients.

- Proceedings of the Society of American Gastrointestinal Endoscopic Surgeons, Philadelphia. 1996.
- Kokkola 1997** *{published and unpublished data}*
Heikkinen T, Haukipuro K, Leppala J, Hulkko A. Total costs of laparoscopic and Lichtenstein inguinal hernia repairs: A randomised prospective study. *Surgical Laparoscopy & Endoscopy* 1997;**7**(1):1–5. [MEDLINE: 1997187864]
- Linköping 1997** *{published and unpublished data}*
Kald A, Anderberg B, Carlsson P, Park PO, Smedh K. Surgical outcome and cost-minimisation analyses of laparoscopic and open hernia repair: A randomised prospective trial with one year follow up. *European Journal of Surgery* 1997;**163**:505–510. [MEDLINE: 1997390045]
- Linz 1996** *{published data only}*
Schrenk P, Bettelheim P, Woisetschlager R, Reiger R, Wayand WU. Metabolic responses after laparoscopic or open hernia repair. *Surgical Endoscopy* 1996;**10**:628–632. [MEDLINE: 1996270223]
* Schrenk P, Woisetschlager R, Reiger R, Wayand W. Prospective randomised trial comparing postoperative pain and return to physical activity after transabdominal preperitoneal, total preperitoneal or Shouldice technique for inguinal hernia repair. *British Journal of Surgery* 1996;**83**:1563–1566. [MEDLINE: 1997166986]
- Maastricht 1998** *{published and unpublished data}*
Dirksen CD, Beets GL, Go PM, Geisler FE, Baeten CG, Kootstra G. Bassini repair compared with laparoscopic repair for primary inguinal hernia. *European Journal of Surgery* 1998;**164**:439–47.
- Maastricht 1999** *{published and unpublished data}*
Beets GL, Dirksen CD, Go PM, Geisler FE, Baeten CG, Kootstra G. Open or laparoscopic preperitoneal mesh repair for recurrent inguinal hernia?: a randomized controlled trial.. *Surgical Endoscopy* 1999;**13**:323–7.
- Madrid 1997** *{published and unpublished data}*
Merello J, G Guerra A, Madriz J, G Guerra G. Laparoscopic TEP versus open Lichtenstein hernia repair. Randomised trial. *Surgical Endoscopy* 1997;**11**:545.
- Michigan 1997** *{published and unpublished data}*
Kozol R, Lange PM, Kosir M, Beleski K, Mason K, Tennenberg S, Kubinec SM, Wilson RF. A prospective, randomised study of open vs laparoscopic inguinal hernia repair. An assessment of postoperative pain. *Archives of Surgery* 1997;**132**:292–295. [MEDLINE: 1997236042]
- Montreal 1995** *{published and unpublished data}*
Barkun JS, Wexler MJ, Hinchey EJ, Thibeault D, Meakins JL. Laparoscopic versus open inguinal herniorrhaphy: Preliminary results of a randomised controlled trial. *Surgery* 1995;**118**:703–710. [MEDLINE: 1996006375]
- MRCmulticentre 1999** *{published and unpublished data}*
* MRC Laparoscopic groin Hernia Trial Group. Laparoscopic versus open repair of groin hernia: a randomised comparison. *Lancet* 1999;**354**:185–190.
Wright DM, Kennedy A, Baxter J, Fullarton GM, Fife LM, Sunderland GT, O'Dwyer PJ. Early outcome after open versus extraperitoneal endoscopic tension-free hernioplasty: A randomised clinical trial. *Surgery* 1996;**119**:552–227. [MEDLINE: 1996204557]
- Nyborg 1999** *{published data only}*
* Juul P, Christensen K. Randomised clinical trial of laparoscopic versus open inguinal hernia repair. *British Journal of Surgery* 1999;**86**:316–319.
- Omaha 1996** *{published and unpublished data}*
Filipi CJ, Gaston-Johansson F, McBride PJ, Murayama K, Gerhardt J, Cornet DA, Lund RJ, Hirai D, Graham R, Patil K, Fitzgibbons R, Gaines RD. An assessment of pain and return to normal activity. Laparoscopic herniorrhaphy vs open tension-free Lichtenstein repair. *Surgical Endoscopy* 1996;**10**:983–986. [MEDLINE: 1997020135]
- Oulu 1 1998** *{published and unpublished data}*
Heikkinen TJ, Haukipuro K, Hulkko A. A cost and outcome comparison between laparoscopic and Lichtenstein hernia operations in a day-case unit.. *Surgical Endoscopy* 1998;**12**:1199–1203.
- Oulu 2 1998** *{published and unpublished data}*
Heikkinen TJ, Haukipuro K, Koivukangas P, Hulkko A. A prospective randomised outcome and cost comparison of totally extraperitoneal endoscopic hernioplasty versus Lichtenstein hernia operation among employed patients.. *Surgical Laparoscopy and Endoscopy* 1998;**8**(5):338–344.
- Oxford 1995** *{published data only}*
Jenkinson C, Lawrence K, McWhinnie D, Gordon J. Sensitivity to change of health status measures in a randomised controlled trial: comparison of the COOP charts and the SF-36. *Quality of life research* 1995;**4**:47–52. [MEDLINE: 1995227134]
* Lawrence K, McWhinnie D, Goodwin A, Doll H, Gordon A, Gray A, Britton J, Collin J. Randomised controlled trial of laparoscopic versus open repair of inguinal hernia: early results. *British Medical Journal* 1995;**311**:981–985. [MEDLINE: 1996022007]
Lawrence K, McWhinnie D, Goodwin A, Gray A, Gordon J, Storie J, Britton J, Collin J. An economic evaluation of laparoscopic versus open inguinal hernia repair. *Journal of Public Health Medicine* 1996;**18**(1):41–48. [MEDLINE: 1996260816]
Lawrence K, McWhinnie D, Jenkinson C, Coulter A. Quality of life in patients undergoing inguinal hernia repair. *Annals of the Royal College of Surgeons in England* 1997;**79**:40–45. [MEDLINE: 1997190534]
- Paris 1994** *{published data only}*
Benoit J, Champault G, Lauroy J, Rizk N, Boutelier P. Traitement laparoscopique des hernies de l'aîne. Evaluation de la douleur postopératoire. Voie pre-peritoneale pure vs operation de Shouldice (124 cases). *Chirurgie* 1994;**120**:455–459.
* Champault G, Benoit J, Lauroy J, Rizk, Boutelier P. Inguinal hernia in adults. Laparoscopic surgery versus the Shouldice method. Controlled randomized study in 181 patients. Preliminary results.. *Annales de Chirurgie* 1994;**48**(11):1003–1008.

Paris 1997 {published data only}

Champault GG, Rizk N, Catheline J-M, Riskalla H, Boutelier P. Hernies de l'aîne. Traitement laparoscopique pre-peritoneal versus operation de Stoppa. Etude randomisee: 100. *Journal de Chirurgie* 1996;**133**(6): 274–280.

* Champault GG, Rizk N, Catheline J-M, Turner R, Boutelier P. Inguinal hernia repair. Totally preperitoneal laparoscopic approach versus Stoppa operation: randomised trial of 100 cases. *Surgical Laparoscopy & Endoscopy* 1997;**7**(6):445–450.

Parma 1997 {published data only}

Sarli L, Pietra N, Choua O, Costi R, Thenasseril B, Giunta A. Prospective randomised comparative study of laparoscopic hernioplasty and Lichtenstein tension-free hernioplasty. *Acta Bio-Medica de l'Ateneo Parmense* 1997;**68**(1-2):5–10.

Quebec 1998 {published and unpublished data}

Khoury NA. A randomised prospective controlled trial of laparoscopic extraperitoneal hernia repair and mesh-plug hernioplasty: a study of 315 cases.. *Journal of Laparoendoscopic and Advanced Surgical Techniques* 1998;**8**: 367–372.

Riga 1999 {published data only}

Picchio M, Lombardi A, Zolovkins A, Mihelsons M, La Torre G. Tension-free laparoscopic and open hernia repair: randomised controlled trial of early results.. *World Journal of Surgery* 1999;**23**:1004–1009.

SCUR 1999 {published and unpublished data}

Johansson B, Hallerback B, Gilse H, Anesten B, Melen K, Holm J, Bergman B. Laparoscopic mesh repair vs open repair W/WO mesh graft for inguinal hernia (SCUR groin hernia repair study)-Preliminary results. *Surgical Endoscopy* 1997;**11**:170.

* Johansson B, Hallerback B, Gilse H, Anesten B, Smedberg S, Roman J. Laparoscopic mesh versus open preperitoneal mesh versus conventional technique for inguinal hernia repair: a randomised multicenter trial (SCUR Hernia Repair Study). *Annals of Surgery* 1999;**230**(2):225–231.

Stuttgart 1995 {published and unpublished data}

Leibl B, Daubler P, Schwarz J, Ulrich M, Bittner R. Standardisierte laparoskopische Hernioplastik vs Shouldice-Reparation. *Chirurg* 1995;**66**:895–898.

Tampere 1998 {published and unpublished data}

Aitola P, Airo I, Matikainen M. Laparoscopic versus open preperitoneal inguinal hernia repair: A prospective randomised trial. *Annales Chirurgiae et Gynaecologiae* 1998;**87**:22–25.

Tournai 1996 {published and unpublished data}

Hauters P, Meunier D, Urgan S, Jouret JC, Janssen P, Nys JM. Etude prospective controlee comparant laparoscopie et Shouldice dans la traitement de la hernie inguinale unilaterale. *Annales de Chirurgie* 1996;**50**(9):776–781.

Ulm 1993 {published and unpublished data}

Kunz R, Schwarz A, Beger HG. Laparoscopic transperitoneal hernia repair vs. Shouldice herniorrhaphy - Preliminary

results of a prospectively randomised trial. *Chirurgie Endoscopique* 1993;**Numero Hors Serie**:12.

Whipps Cross 1994 {published and unpublished data}

Stoker DL, Spiegelhalter DJ, Singh R, Wellwood JM. Laparoscopic versus open inguinal hernia repair: randomised prospective trial. *The Lancet* 1994;**343**: 1243–1245.

Whipps Cross 1998 {published and unpublished data}

Wellwood J, Sculpher MJ, Stoker D, Nicholls GJ, Geddes C, Whitehead A, Singh R, Spiegelhalter. Randomised trial of laparoscopic versus open mesh repair for inguinal hernia: outcome and cost. *BMJ* 1998;**317**:103–109.

Woodville 1996 {published and unpublished data}

* Bessell JR, Baxter P, Riddell P, Watkin S, Maddern GJ. A randomised controlled trial of laparoscopic extraperitoneal hernia repair as a day surgical procedure. *Surgical Endoscopy* 1996;**10**:495–500.

References to studies excluded from this review

Amid 1995 {published data only}

Amid PK, Shulman AG, Lichtenstein IL. An analytical comparison of Laparoscopic Hernia Repair with Open Tension-free Hernioplasty.. *International Surgery* 1995;**80**: 9–17.

Brooks 1994 {published data only}

Brooks DC. A prospective Comparison of Laparoscopic and Tension-Free Open Herniorrhaphy.. *Archives of Surgery* 1994;**129**:361–366.

Ferzli 1993 {published data only}

Ferzli G, Massaad A, Albert P, Worth MH. Endoscopic Extraperitoneal Herniorrhaphy versus Conventional Hernia Repair: A Comparative Study.. *Current Surgery* 1993;**50**(4): 291–294.

Goodwin 1995 {published data only}

Goodwin 2nd JS, Traverso LW. A prospective cost and outcome comparison of inguinal hernia repairs. Laparoscopic transabdominal preperitoneal versus open tension-free preperitoneal.. *Surgical Endoscopy* 1995;**9**(9): 981–983.

Haug-Gebhard 1996 {published data only}

Haug-Gebhard S, Becker HP, Ehlich R, Thiede P, Gerngrob H. Comparison of Endoscopic Extraperitoneal and Conventional Hernia Repair.. *Lagenbecks Arch Chir Suppl II (Kongreßbericht)* 1996;**113**:611–613.

Lukaszczuk 1996 {published data only}

Lukaszczuk JJ, Preletz RJ, Morrow GJ, Lange MK, Tachovsky TJ, Krall JM. Laparoscopic Herniorrhaphy versus traditional open repair at a community hospital.. *Journal of Laparoendoscopic Surgery* 1996;**6**(4):203–208.

Millikan 1994 {published data only}

Millikan KW, Kosik ML, Doolas A. A Prospective Comparison of Transabdominal Preperitoneal Laparoscopic Hernia Repair versus Traditional Open Hernia Repair in a University Setting.. *Surgical Laparoscopy and Endoscopy* 1994;**4**(4):247–253.

Schultz 1998 {published data only}

Schultz LS. Laparoscopic versus inguinal hernia repairs. Outcome and costs. *Surgical Endoscopy* 1998;**9**(12): 1307–1311.

Sheppard 1993 {published data only}

Sheppard BC. Minimal Access versus Open Herniorrhaphy. *World Journal of Medicine* 1993;**159**(6):685–686.

Wilson 1995 {published data only}

Wilson MS. Prospective trial comparing Lichtenstein with laparoscopic tension-free mesh repair of inguinal hernia. *British Journal of Surgery* 1995;**82**:274–277.

Additional references**Bassini 1887**

Bassini E. Nuovo metodo sulla cura radicale dell'ernia inguinale. *Arch Soc Ital Chir* 1887;**4**:380.

Dickersin 1994

Dickersin K, Scherer R, Lefebvre C. Identifying relevant studies for systematic reviews. *BMJ* 1994;**309**:1286.

Kald 1997

Kald A, Anderberg B, Carlsson P, Park PO, Smedh K. Surgical Outcome and Cost-Minimisation-Analyses of Laparoscopic and Open Hernia Repair: A Randomised Prospective Trial with One Year Follow Up. *Eur J Surg* 1997;**163**:505–510.

Kingsnorth 1992

Kingsnorth AN, Gray MR, Nott DM. Prospective randomised trial comparing the Shouldice technique and plication darn for inguinal hernia. *Br J Surg* 1992;**79**: 1068–1070.

Levard 1996

Levard H, Boudet MJ, Hennen H, Hay JM. Inguinal hernia repair: a prospective multicentre trial on 1706 hernias. *Br J Surg* 1996;**83** suppl 2:72.

Liem 1996

Liem MS, van Vroonhoven TJ. Laparoscopic inguinal hernia repair. *Br J Surg* 1996;**83**(9):1197–1204. [MEDLINE: 1997105427]

Rutkow 1993

Rutkow IM, Robbins AW. Demographic, classificatory, and socioeconomic aspects of hernia repair in the United States.

Surg Clin Nth Am 1993;**73**(3):413–26. [MEDLINE: 1993269157]

Schrenk 1996

Schrenk P, Bettelheim P, Woisetschlager R, Rieger R, Wayand WU. Metabolic responses after laparoscopic or open hernia repair. *Surg Endosc* 1996;**10**(6):628–32. [MEDLINE: 1996270223]

Schumpelick 1994

Schumpelick V, Treutner KH, Arlt G. Inguinal hernia repair in adults. *Lancet* 1994;**344**(8919):375–79. [MEDLINE: 1994328814]

Scott 2001

Scott NW, Webb K, Go PMNYH, Ross SJ, Grant AM on behalf of the EU Hernia Trialists Collaboration. Open Mesh versus Non-Mesh Repair of Inguinal Hernia (Cochrane Review). *Cochrane Database of Systematic Reviews* 2001, Issue 2. [DOI: 10.1002/14651858.CD002197]

Simons 1996

Simons MP, Kleijnen J, van Geldere D, Hoitsma HF, Obertop H. Role of the Shouldice technique in inguinal hernia repair: a systematic review of controlled trials and a meta-analysis. *Br J Surg* 1996;**83**(6):734–38. [MEDLINE: 1996334821]

References to other published versions of this review**EUHTC 2000**

EU Hernia Trialists Collaboration. Laparoscopic compared with open methods of groin hernia repair - Systematic review of randomised controlled trials. *British Journal of Surgery* 2000;**87**:860–867.

EUHTC 2002(1)

The EU Hernia Trialists Collaboration. Laparoscopic versus open groin hernia repair: meta-analysis of randomised trials based on individual patient data. *Hernia* 2002;**6**(1):2–10.

EUHTC 2002(2)

The EU Hernia Trialists Collaboration. Repair of groin hernia with synthetic mesh. Meta-analysis of randomized controlled trials. *Annals of Surgery* 2002;**235**(3):322–332.

* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Aarberg 1996

Methods	Randomisation by a blind envelope system; the seal was broken the day before surgery	
Participants	87 patients aged 50 years or more referred for elective inguinal hernia repair. Patients were excluded if they were unfit for general anaesthesia and pneumoperitoneum (ASA III and IV) were excluded, as were those who had irreducible hernia	
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=44) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=43) repair performed by the Shouldice technique. All patients were given a local anaesthesia	
Outcomes	Included data items: Time of operation (min) Total inpatient time (days) Complications (inpatient) Time to return to normal activity (days) Hernia recurrence Other data items: Post-operative pain (day 1) Use of analgesia Time to return to work (days) Patient satisfaction	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Adelaide 1994

Methods	Randomised Trial. No information available regarding method of randomisation.	
Participants	86 patients scheduled for elective inguinal hernia repair. Patients were excluded if there was contraindication to general anaesthesia or any other medical condition precluding surgery	
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=42) repair performed by the TAPP technique. All patients were given general anaesthesia.	

Adelaide 1994 (Continued)

	Open group: (n=44) Excision of the hernial sac in the case of indirect hernias and invagination in direct hernias. The posterior inguinal wall was repaired with a continuous 0 prolene suture overlain by a loose double darn of 0 prolene between the conjoint tendon and inguinal ligament. All patients were given local anaesthesia	
Outcomes	Included data items: Operation time (minutes) Conversions Postoperative discharge time (minutes) Return to work or normal activity (days) Complications Hernia recurrence Other data items: Use of analgesia Patient satisfaction	
Notes	Published abstract and full text available.	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Ancona 1998

Methods	Patients were randomised by fax. Each centre participating in the study sent a randomisation form by fax to the co-ordinating centre containing the information required for the patient to be randomised, according to a random number generator table	
Participants	108 low-risk patients classified as either ASA I or II. Patients were entered into the study with a diagnosis of primary or recurrent hernia. Patients with unilateral were included as well as patients with bilateral hernias. High-risk patients (ASA III and IV) were not included, nor were pregnant patients or patients younger than 18 years of age. Patients with incarcerated hernias, congenital hernias, massive scrotal or sliding hernias, or with a history of multiple recurrent hernias were also excluded. Additional exclusion criteria were the presence of previous pelvic surgery, coagulation disorders and the presence of other abdominal diseases amenable to surgical treatment that could be performed laparoscopically during the same operation. Patients with a personal preference for one of the two procedures and those who had been referred from their general practitioner to receive a specific type of procedure were not included in the study	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=52) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=56) primary inguinal hernias were repaired according to the technique described by Amid et al. Recurrent inguinal hernia repairs were repaired according to the technique described by Lichtenstein. 53 patients were given local anaesthesia, 1 patient was given general anaesthesia and 2 patients were given epidural anaesthesia	

Ancona 1998 (Continued)

Outcomes	Included data items: Operation time (minutes) Intraoperative complications Conversions Postoperative pain (day 1) Postoperative complications Mortality Length of hospital stay (hours) Time to return to work (days) Hernia recurrence Other data items: Use of analgesia Time to return to sport (days) Theatre costs	
Notes	There may be a 30 patient overlap with this trial and Parma 1997	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Bangkok 1998

Methods	Eligible patients were randomised by drawing sealed envelopes arranged in blocks of 10	
Participants	120 patients with inguinal hernia and requiring elective surgery were considered for enrolment into the trial. Patients whose hernias were successfully reduced in the emergency room and could undergo surgery on the next routine operating schedule were also included. Exclusion criteria consisted of the following: high risk for general anaesthesia, pregnancy, previous complicated or multiple lower abdominal or pelvic operations, large or irreducible hernias, second recurrence, and no fixed address in Bangkok or its nearby provinces	
Interventions	Laparoscopic versus open non-mesh inguinal hernia repair. Laparoscopic group: (n=60) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=60) the modified Bassini repair was the standard technique used. 7 patients were given general anaesthesia, 51 patients were given spinal anaesthesia, and 2 patients were given were given epidural anaesthesia	
Outcomes	Included data items: Operation time (minutes) Conversions Postoperative pain (day 1) Postoperative hospital stay (days) Return to activities (stratified data) Postoperative complications	

Bangkok 1998 (Continued)

	Hernia recurrence Other data items: Use of analgesia Postoperative disability	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Barcelona 2 1998

Methods	Abstract Randomised Trial. No information	
Participants	59 patients.	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=31) repair performed by the TAPP technique. Open group: (n=28) repair performed by the Nyhus (O) technique. All patients were operated on under regional anaesthesia	
Outcomes	Included data items: Return to work Other data items: Perceived health Pain (day 7 & day 30) Patient satisfaction	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Berlin 1996

Methods	Eligible patients were randomised by computer randomisation.
Participants	240 patients who were operated on for primary inguinal hernia were entered into the study. Patients with contraindications for general anaesthesia, cardiac insufficiency, age under 18 years , and coagulation disorders as well as incarcerated hernia were excluded from the study
Interventions	Laparoscopic versus open mesh versus open non-mesh inguinal hernia repair. Laparoscopic group: (n=80) repair performed by the TAPP technique. All patients were given general anaesthesia. Open mesh group: (n=80) repair performed by the plug and patch repair. Patients chose between general or local anaesthesia. Open non-mesh: (n=80) repair performed using the Shouldice technique. Patients chose between general or local anaesthesia
Outcomes	Included data items: Operating time (minutes) Intraoperative complications Postoperative pain (day 1) Postoperative complications Hospital stay (days) Limitation of daily activities (days) Hernia recurrence Other data items: Use of analgesia (days) Return to work (days) Costs
Notes	There are 2 publications for this trial (one in English and one in German)

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Bietigheim 1998

Methods	Patients were allocated strictly at random.
Participants	280 male patients with primary inguinal hernia.
Interventions	Laparoscopic versus open mesh versus open non-mesh inguinal hernia repair. Laparoscopic group: (n=93) repair performed by the TAPP technique. All patients were given general anaesthesia. Open mesh group: (n=93) repair performed by the Lichtenstein repair. All patients were given general anaesthesia. Open non mesh group: (n=94) repair performed by the Shouldice repair. All patients were given general anaesthesia

Bietigheim 1998 (Continued)

Outcomes	Included data items: Operation time (minutes) Postoperative complications Return to work (days) Hernia recurrence Other data items: Use of analgesia Return to sport (days)	
Notes	Published in German.	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Brisbane 1996

Methods	Abstract Randomised Trial. No information available regarding method of randomisation.	
Participants	184 patients.	
Interventions	Laparoscopic versus modified Shouldice repair.	
Outcomes	Included data items: Operation time (data not reported) Conversions Postoperative complications (data not reported) Return to normal activities Hernia recurrence Other data items: Postoperative pain (day 1: data not reported) Return to work (days)	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Bydgoszcz 1998

Methods	Abstract Randomised Trial. No information	
Participants	112 patients.	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: repair performed by the TAPP technique. Open group: repair performed by the Lichtenstein technique.	
Outcomes	Included data items: Mesh infection Hernia recurrence Other data items: Post -operaive pain	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Caen 1998

Methods	Patients were randomised by an envelope system.	
Participants	64 male patients aged over 35 years old with a unilateral or bilateral inguinal hernia. Patients were excluded if they were less than 35 years old, had a crurale hernia, complicated or recurrent hernia, previous abdominal surgery, contraindications for laparoscopic surgery, if patients refused one or the other technique	
Interventions	Laparoscopic versus open non-mesh inguinal hernia repair. Laparoscopic group: (n=32) repair performed by the TAPP technique. Open group: (n=32) the Shouldice repair was the standard technique used. All patients were given general anaesthesia.	
Outcomes	Included data items: Postoperative complications Length of hospital stay (days) Return to work (days) Hernia recurrence Mortality Other data items: Postoperative pain (day 1) Use of analgesia Costs	
Notes	Published in French.	

<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Coala Trial Gp 1997

Methods	Randomisation by telephone, according to a computer-generated list, in groups of 25 or 50 patients; within each of these groups, the maximal allowable difference in the number of patients assigned to the two treatments was 4. They were stratified according to the hospital and the type of hernia. Analysis by 'intention to treat'
Participants	994 patients over 20 years old, who presented with clinically diagnosed unilateral inguinal hernias (primary hernias or first recurrence) and were scheduled to undergo surgical repair with general anaesthesia were eligible. Exclusion criteria were an additional surgical intervention planned during the hernia repair; a history of extensive lower abdominal surgery, severe local inflammation, or radiotherapy; advanced pregnancy (>12 weeks' gestation); and previous participation in the study (contralateral hernia). Patients who were mentally incompetent or not able to speak Dutch were also excluded
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy Laparoscopic group (n=487) A TEP repair was performed. 481 patients had general while 6 had spinal anaesthesia. Open group: (n=507) Conventional anterior repair consisted of a reduction of the hernia, ligation of the hernial sac, if necessary and a reconstruction of the inguinal floor with nonabsorbable sutures, if necessary. A mesh prosthesis was not used unless adequate repair was otherwise not possible. 201 patients had general while 306 had spinal anaesthesia
Outcomes	Included data items: Operation time (minutes) Conversions Intraoperative complications Length of hospital stay (days) Time to return to normal activity (days) Complications Hernia recurrence Mortality Other data items: Postoperative pain (day 1) Use of analgesia Time to return to work (days) Time to resumption of athletic activities (days) Activities of daily living score
Notes	There are multiple publications for this trial including a formal economic evaluation and learning curve assessment

Coala Trial Gp 1997 (Continued)

<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Denizli 1998

Methods	Randomised Trial. No information
Participants	64 patients.
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=32) repair performed by the TEP technique. Open group: (n=32) repair performed by the preperitoneal mesh technique
Outcomes	Included data items: Operation time (mins) Conversions Intraoperative complications Post-operative complications Hernia recurrence Mortality Other data items: Use of analgesia
Notes	

<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Hawaii 1994

Methods	Randomisation was provided by an independent computer consultant using a table of random numbers. The nurse co-ordinator prepared sequentially numbered, sealed envelopes containing the operation to be performed. The surgeon was unaware of the sequence of procedures. An envelope was opened by the patient during the clinic visit prior to surgery
Participants	100 patients between 20 and 70 years of age who were referred with symptomatic inguinal hernias and were suitable for general anaesthesia and able to tolerate a pneumoperitoneum. Direct, indirect, recurrent and bilateral hernias were acceptable for inclusion. Patients with paediatric, femoral or incarcerated hernias were excluded.

Hawaii 1994 (Continued)

	The prior removal of a non perforated appendix was acceptable, but any other lower abdominal surgery excluded the patient from participation	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=48) repair performed by the TAPP technique. Open group: (n=52) repairs performed in a tension-free manner similar to that described by Lichtenstein. Most of the procedures were performed using local anaesthetic with sedation. Spinal anaesthesia used in two cases and general anaesthesia in 3 cases	
Outcomes	Included data items: Operation time (minutes) Conversions Discharge time (hours) Time to return to work (days) Complications Pain persisting longer than 3 months Hernia recurrence Time to return to work (days: stratified data) Other data items: 'Straight leg raises' performance Hospital costs	
Notes	Published abstract and full text available.	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Hawaii 1996

Methods	Abstract Randomised Trial. No information available regarding method of randomisation.	
Participants	200 patients.	
Interventions	Laparoscopic TAPP (n=48) versus Laparoscopic TEP (n=50) versus open mesh (n=102) inguinal herniorrhaphy	
Outcomes	Included data items: Operation time (minutes) Discharge time (hours) Time to return to work (days) Complications Hernia recurrence Other data items:	

Hawaii 1996 (Continued)

	Hospital costs Disability costs Exercises (data not reported)	
Notes	Pooled open group with Hawaii 1994.	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Kokkola 1997

Methods	Randomised trial. No information available regarding randomisation method.	
Participants	38 consecutive patients. Exclusion criteria included high anaesthetic risk, pregnancy, irreducible hernia, infection or the patient's reluctance to give informed consent	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=20) repair performed by the TAPP technique. Open group: (n=18) repair performed by the Lichtenstein technique. All patients were given general anaesthesia	
Outcomes	Included data items: Operation time (minutes) Conversions Hospital stay (days) Return to work (days) Complications Hernia recurrence Other data items: Postoperative pain (day 1) Satisfaction scale score (1-4) Use of analgesia Costs	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Linköping 1997

Methods	An unblocked randomisation was carried out by a clinical assistant using randomisation tables
Participants	200 men aged 25-75 years who were assessed as fit for general anaesthesia. Patients with a history of major lower abdominal surgery or previous abdominal radiotherapy were excluded
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=122) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=89) repair performed by the Shouldice technique with a four-layer suture (n=54) or with a modified technique using a two-layer continuous suture line (n=35). 2 patients had their operations under local anaesthesia, 25 had spinal anaesthesia, and the remaining 62 patients had general anaesthesia
Outcomes	Included data items: Operating time (minutes) Hospital stay (hours) Time off work (days: stratified data) Complications Hernia recurrence Other data items: Time to complete recovery (days: stratified data) Direct costs
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Linz 1996

Methods	Randomisation was done immediately before surgery in the anaesthetic room by use of sealed envelopes
Participants	86 consecutive patients having elective unilateral inguinal hernia repair. Patients with recurrent or incarcerated hernia were excluded
Interventions	Laparoscopic TAPP versus Laparoscopic TEP versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=28) repairs performed by the TAPP technique and (n=24) repairs performed by the TEP technique. All patients were given general anaesthesia. Open group: (n=24) repair performed by the Shouldice technique with continuous 0 polypropylene sutures. 13 patients were given general anaesthesia and 21 were given spinal anaesthesia
Outcomes	Included data items: Duration of surgery (minutes) Postoperative complications Length of hospital stay (days) Return to work (days) Hernia recurrence

Linz 1996 (Continued)

	Other data items: Postoperative pain (day 1) Use of analgesia Return to stratified activities Patient satisfaction	
Notes	There are 2 publications for this trial.	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Maastricht 1998

Methods	Randomisation using sealed envelopes.
Participants	210 patients eligible for general anaesthesia (ASA I-III) between 20 and 80 years of age, with a primary inguinal hernia were included. Exclusion criteria included pregnant women, patients with coagulation disorders, advanced carcinoma, history of lower abdominal or other pelvic surgery (except appendectomy) , and patients needing other operations simultaneously
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=88) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=87) repair performed by the Bassini technique. All patients were given general anaesthesia
Outcomes	Included data items: Operating time (minutes) Conversions Postoperative complications Postoperative hospital stay (stratified data) Return to work (stratified data) Chronic pain Chronic inguinal hypaesthesia Hernia recurrence Other data items: Postoperative pain (day 1) (stratified data) Use of analgesia Return to physical activities (stratified data) Abdominal muscle tests
Notes	
<i>Risk of bias</i>	

Maastricht 1998 (Continued)

Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Maastricht 1999

Methods	Randomisation by sealed envelopes.	
Participants	79 patients eligible for general anaesthesia (ASA I-III), between 20 and 80 years of age, with a recurrent inguinal hernia. Exclusion criteria included pregnant women, patients with coagulation disorders, advanced carcinoma, history of lower abdominal or other pelvic surgery (except appendectomy) patients requiring concomitant surgery, patients with giant scrotal recurrent hernias and patients with recurrence after a preperitoneal repair	
Interventions	Laparoscopic versus open mesh repair. Laparoscopic group: (n=42) repair performed by the TAPP technique. All patients were given a general anaesthetic. Open repair: (n=37) repair performed by the GPRVS technique. All patients were given a general anaesthetic	
Outcomes	Included data items: Operating time (minutes) Conversions Postoperative complications Postoperative hospital stay (% discharged) Return to work (stratified data) Chronic pain Chronic inguinal hypaesthesia Hernia recurrence Mortality Other data items: Postoperative pain (Day 1-7) Use of analgesia Return to physical activities (stratified data) Abdominal muscle tests Costs	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Madrid 1997

Methods	Abstract Randomised trial. No information available regarding randomisation method.
Participants	120 patients.
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=60) repair performed by the TEP technique. Open group: (n=60) repair performed by the Lichtenstein technique. General anaesthesia was administered to all patients.
Outcomes	Included data items: Operation time (minutes) Hospital stay (hours) Return to work (days) Hernia recurrence Other data items: Use of analgesia Hospital costs (data not reported)
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Michigan 1997

Methods	Randomised, blinded trial. On arrival in the operating room, an envelope was drawn and the card inside indicated which procedure would be used
Participants	62 male patients aged between 19 and 81 scheduled for elective inguinal hernia repair. Pre-existing medical problems were present in 21 patients, including hypertension, cardiac disease, and cerebrovascular disease. 9 patients reported a history of substance abuse.
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=30) repair performed by the TAPP technique. Open group: (n=32) repair performed using Bassini repairs for small indirect hernias, McVay repairs for small direct hernias and a tension-free mesh technique for large direct hernias. General anaesthesia was administered to all patients.
Outcomes	Included data items: Operation time (minutes) Conversions

Michigan 1997 (Continued)

	Postoperative complications Hernia recurrence Other data items: Postoperative pain (day 1) Use of analgesia	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Montreal 1995

Methods	Randomisation was carried out within blocks of 20, by use of computer generated randomised numbers. A separate randomisation box was given to each of the four surgeons to ensure an equal proportion of patients in each group
Participants	Interim analysis of 92 patients. All patients 16 to 85 years of age and referred to participating surgeons for elective hernia repair were eligible for entry into the study. Exclusion included patients unfit for general anaesthesia, pregnant women and refusal of random group allocation. Exclusion included patients unfit
Interventions	Laparoscopic versus mixed open inguinal herniorrhaphy. Laparoscopic group: (n=43) repair performed by the TAPP technique under general anaesthesia. Open group : (n=49) The open repair was left to each surgeon's preference, which was usually based on the operative findings, type of hernia and strength of the floor. These varied from classic Bassini, McVay, modified Shouldice techniques to tension-free repairs with Marlex patch and/or plugs. 35.7 % had general anaesthesia and 64.3 % had local-regional anaesthetic
Outcomes	Included data items: Operation time (minutes) Conversions Hospital stay (days) Postoperative complications Convalescence Hernia recurrence Other data items: Postoperative pain (day 1) Use of analgesia Quality of life Patient satisfaction
Notes	

<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

MRCmulticentre 1999

Methods	Randomisation was performed by using a computer generated series of random numbers. The trial coordinator prepared sealed envelopes containing the operation to be performed. The envelopes were opened in the clinical centres	
Participants	Interim analysis of 120 patients aged between 46 and 77. Criteria for exclusion from randomisation included patient refused randomisation, surgeon had not completed 10 laparoscopic hernia repairs, patient medically unfit for general anaesthesia, had a previous mid-line or lower paramedian incision, an incarcerated hernia, an uncorrected coagulation disorder or is pregnant	
Interventions	Laparoscopic versus mixed open inguinal herniorrhaphy. Laparoscopic group: (n=60) A TEP technique was used. Open group: (n=60) Patients with unilateral primary hernias had a Lichtenstein whereas those with recurrent or bilateral hernias had an open preperitoneal mesh repair through a transverse lower abdominal incision. General anaesthesia was administered to all patients.	
Outcomes	Included data items: Operation time (minutes) Conversions Intraoperative complications Return to usual activities (stratified data) Sever groin pain (1 year) Numbness (1 year) Hernia recurrence Other data items: Return to work (days) Costs	
Notes	There are 2 publications for this trial.	

<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Nyborg 1999

Methods	The patients were randomised by a blind envelope system. The allocation was provided by an independent consultant using computer-generated random numbers
Participants	All male patients between 18 and 75 years of age with a primary unilateral hernia referred for elective surgery were eligible for entry into the study. Patients with irreducible hernias and those who were unfit for general anaesthesia were excluded
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=138) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=130) repair performed by a modified Shouldice technique. Patients were given either spinal or general anaesthesia
Outcomes	Included data items: Operation time (minutes) Conversions Postoperative complications Hospital stay (days) Time to return to normal activities (days) Hernia recurrence Other data items: Use of analgesia

Notes

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Omaha 1996

Methods	Randomisation schedules were developed using the PLAN procedure from the Statistical Analysis Systems software. This schedule incorporated a balanced allotment every 20 patients
Participants	53 male patients with unilateral inguinal hernia on clinical examination. All patients were required to have the ability to read English and sign informed consent. Exclusion criteria included bilateral inguinal hernias, inability to tolerate a general anaesthesia, patients requiring additional major surgery under the same anaesthetic, previous preperitoneal pelvic or extensive lower abdominal surgery, drug addiction and the presence of either an incarcerated or strangulated hernia
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=24) repair performed by the transabdominal preperitoneal (TAPP) technique. All patients were given general anaesthesia. Open group: (n=29) repair performed by the Lichtenstein technique. Patients were given general, regional, or local anaesthesia

Omaha 1996 (Continued)

Outcomes	Included data items: Operation time (minutes) Postoperative complications Hospital stay (days) Hernia recurrence Other data items: Postoperative pain (day 1) Use of analgesia Activity assessment	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Oulu 1 1998

Methods	The patients were randomised via sealed envelope.	
Participants	42 patients with a primary unilateral hernia considered suitable for day-case surgery. Exclusion criteria included bilateral and recurrent hernia, prefnancy, irreducible hernia, infection, patient's reluctance to give informed consent	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=20) repair performed by the transabdominal preperitoneal (TAPP) technique. Open group: (n=20) repair performed by the Lichtenstein technique. Patients were given local anaesthesia	
Outcomes	Included data items: Operation time (mins) Post-operative stay Return to normal life Intraoperative complications Postoperative complications Hernia recurrence Other data items: Patient satisfaction Return to work Postoperative pain (day 1-14) Hospital costs	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description

Oulu 1 1998 (Continued)

Allocation concealment?	Yes	A - Adequate
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Oulu 2 1998

Methods	Randomisation was carried out at the preoperative visit by opening a sealed envelope defining the method
Participants	45 employed men with primary unilateral hernias. Exclusion criteria included previous major lower abdominal surgery, retirement from work, pregnancy, irreducible hernia, and infection
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=22) repair performed by the TEP technique. All patients were given general anaesthetic. Open group: (n=23) repair performed by the Lichtenstein technique. Patients were given local, spinal or general anaesthesia
Outcomes	Included data items: Operation time (mins) Post-operative stay intraoperative complications Postoperative complications Return to normal life Hernia recurrence Other data items: Physical fitness at one week Return to work Patient satisfaction Postoperative pain (day 1-14) Hospital costs
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Oxford 1995

Methods	Allocated by unrestricted randomisation in 1:1 ratio.
Participants	125 male patients with primary or unilateral inguinal hernia on examination. Required to meet the local criteria for day surgery (American Society of Anaesthesia grade 1 or 2, age < 70 years). Exclusion criteria included patients who had had previous major abdominal surgery or needed overnight admission

Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy Laparoscopic group : (n=58) A TAPP prosthetic mesh repair was performed. Open group : (n=66) A modified, two layer Maloney darn, comprising polypropylene plication of transversalis fascia and a tension-free nylon darn between the inguinal ligament and conjoint tendon. General anaesthesia was administered to all patients.	
Outcomes	Included data items: Postoperative complications Return to work or normal activities (days) Hernia recurrence Other data items: Postoperative pain (day 1) use of analgesia SF36 Costs	
Notes	There are three published reports for this trial including a formal economic evaluation	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Paris 1994

Methods	Randomisation was performed using random number tables	
Participants	181 male or female patients with unilateral or bilateral, direct or indirect, primary or recurrent inguinal hernia aged 40 years or over. Exclusion criteria included irreducible or strangulated hernia, recurrent hernias following mesh repair, large inguinoscrotal hernias, contraindications for general anaesthesia, contraindications for video endoscopy, cardio pulmonary problems, advanced physiological age, coagulation disorders, glaucoma, pelvic irradiation, local sepsis, midline sub-umbilical laparotomy, obesity, patients susceptible to urological or vascular problems	
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=92) repair performed by the TEP technique. Open group: (n=89) repair performed by the Shouldice technique	
Outcomes	Included data items: Operation time (minutes) Postoperative complications Length of hospital stay (days) Return to work (days) Hernia recurrence Mortality Other data items:	

Paris 1994 (Continued)

	Postoperative pain (ratios) Use of analgesia Costs	
Notes	There are two published reports for this trial. One paper reports on 181 patients and the second reports on 124 cases (both in French)	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Paris 1997

Methods	Randomisation was performed using random number tables	
Participants	100 male patients aged 40 years or over with inguinal hernia. Exclusion criteria included irreducible or strangulated hernia, femoral hernia, large inguinoscrotal hernias, recurrent hernias following mesh repair, contraindications for general anaesthesia, contraindications for video endoscopy, cardio pulmonary problems, age>75, cirrhosis, coagulation disorders, glaucoma, pelvic irradiation, abdominal wall or groin infections, midline sub-umbilical laparotomy (excluding appendectomy), obesity BM1>30, patient refusal	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=51) repair performed by the TEP technique. Open group: (n=49) repair performed by the Stoppa technique. All patients were given general anaesthesia.	
Outcomes	Included data items: Duration of operation (minutes) Conversions Intraoperative complications Postoperative complications Length of hospital stay (days) Return to work (days) Hernia recurrence Other data items: Postoperative pain (day 1-3; ratios)	
Notes	There are two published reports for this trial (one in French and one in English)	
Risk of bias		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Parma 1997

Methods	Randomisation performed using sealed envelope
Participants	108 patients with inguinal hernia were included in the study without any other complications. Exclusion criteria included no previous lower abdominal surgery for inguinal hernia i.e. recurrent hernia
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=52) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=56) repair performed by the Lichtenstein technique. Patients were given local or spinal anaesthesia
Outcomes	Included data items: Operation time (minutes) Postoperative complications Hospital stay (days) Return to normal activities (days) Other data items: Postoperative pain (day 1)
Notes	There may be a 30 patient overlap with this trial and Ancona 1998. Clarification is being sought

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Quebec 1998

Methods	Random selection by cards.
Participants	292 patients over 18 years old with groin hernias (inguinal or femoral; primary, recurrent and bilateral) were eligible. Exclusion criteria included a history of multiple lower abdominal surgery, pregnancy and contraindication to general anaesthesia
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=150) repair performed by the TEP technique. All patients were given general anaesthesia. Open group: (n=142) repair performed by using an open mesh-plug under local anaesthesia with light sedation. 7 patients had general anaesthesia, 4 patients had a spinal anaesthesia, and the remaining 131 patients were given a local anaesthesia
Outcomes	Included data items: Operation time (minutes) Return to work (days) Postoperative morbidity Hernia recurrence Other data items:

Quebec 1998 (Continued)

	Postoperative pain (day 1-7) Use of analgesia	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Riga 1999

Methods	Randomisation was provided by an independent computer consultant using a teable of random numbers. The envelopes, containing the operation to be performed, were opened at admission	
Participants	117 patients with symptomatic primary inguinal hernia. Exclusion criteria included patients unsuitable for general anaesthesia and pneumoperitoneum, with previous lower abdominal surgery, and complicated hernias	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=53) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=52) repair performed by the Lichtenstein technique. All patients were given a local anaesthesia	
Outcomes	Included data items: Operation time (mins) Postoperative hospital stay Intraoperative complications Postoperative complications Return to normal activities and work Other data items: Use of analgesia Postoperative pain (day 1&2)	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

SCUR 1999

Methods	Randomisation was computer-generated in blocks of six and distributed to each centre. Patients were randomised at each centre by opening consecutively numbered sealed envelopes
Participants	613 male patients aged 40-75 years, healthy, with a unilateral or first-recurrence inguinal hernia. Exclusion criteria included irreducible hernias or those requiring emergency surgery, bilateral hernias, more than one recurrence, earlier surgery with mesh in the same groin, patients with complications resulting in ASA 3 or 4, contraindications to laparoscopic hernia repair and giant hernia
Interventions	Laparoscopic versus open mesh versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=unclear) repair performed by the TAPP technique. Open non-mesh: (n=unclear). repair performed by the techniques preferred by the surgeon. Open mesh: (n=unclear). repair performed using the preperitoneal approach
Outcomes	Included data items: Operation time (minutes) Conversions Postoperative complications Hernia recurrence Time to return to full recovery (days) Other data items: Postoperative pain (day 7) Restriction of physical activities Sick leave (days) Cost estimation
Notes	Published abstract and full text available. The total numbers randomised to each group is unclear in the full text publication

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Stuttgart 1995

Methods	Randomisation performed using randomisation plan
Participants	102 patients with unilateral inguinal hernia. Exclusion criteria included inguino-scrotal hernias, post laparotomy and ASA>2
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=54) repair performed by the TAPP technique. Open group: (n=48) repair performed by the Shouldice technique. All patients were given general anaesthesia.
Outcomes	Included data items: Operation time (minutes)

Stuttgart 1995 (Continued)

	Return to work (days) Postoperative complications Other data items: Postoperative pain (day 1)	
Notes	Published in German.	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Tampere 1998

Methods	Randomised trial. No information available regarding randomisation method.	
Participants	60 consecutive elective inguinal hernia patients.	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=24) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=25) repair performed by the open preperitoneal technique as described by Horten and Florence. 14 patients were given general anaesthesia and 11 patients were given regional anaesthesia	
Outcomes	Included data items: Operation time (minutes) Intraoperative complications Postoperative complications Postoperative hospital stay (days) Return to work or normal activity (days) Hernia recurrence Other data items: Postoperative symptom questionnaire	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Tournai 1996

Methods	Simple randomisation using envelopes.
Participants	70 patients aged 20 years or over with simple unilateral inguinal hernia. Exclusion criteria included contra-indication to general anaesthesia, previous surgery under umbilical region, strangulated, recurrent, inguino-scrotal, bilateral and crurale hernias
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=35) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=35) repair performed by the Shouldice technique. 19 patients were given general and 16 patients were given 'rachidiene' anaesthesia
Outcomes	Included data items: Operation time (minutes) Conversions Postoperative complication Hospital stay (days) Return to home activities (days) Other data items: Postoperative pain (day 1) Return to work (days)
Notes	Published in French. Laparoscopic group received prophylactic antibiotics but Shouldice group did not

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Ulm 1993

Methods	Abstract Randomised Trial. No information available regarding method of randomisation.
Participants	70 patients
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=35) repair performed by the TAPP technique. All patients were given general anaesthesia. Open group: (n=35) repair performed by the Shouldice technique
Outcomes	Included data items: Postoperative morbidity Mortality

Ulm 1993 (Continued)

Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Whipps Cross 1994

Methods	Randomisation by a blind envelope system. The seal was broken in the anaesthetic room before surgery. Analysis by 'intention to treat'.	
Participants	150 patients aged between 18 and 85 years referred for elective inguinal hernia repair. Exclusion criteria were patients in whom pneumoperitoneum could not be established; those who were unfit for general anaesthesia; were pregnant; or who had irreducible hernia; systemic or local infection; or psychiatric conditions precluding consent	
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: (n=75) A transabdominal preperitoneal (TAPP) repair was performed. Open group: (n=75) Repair was undertaken with a tension-free interlocking nylon darn between the conjoint tendon and the inguinal ligament. General anaesthesia was administered to all patients.	
Outcomes	Included data items: Operation time (minutes) Conversions Return to normal activity (days) Postoperative complications Hernia recurrence Other data items: Postoperative pain (day 1) Use of analgesia	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Whipps Cross 1998

Methods	A randomisation schedule in balanced blocks randomly chosen to be of length 4 or 6. Allocations were placed in consecutive opaque envelopes and the seal broken in the anaesthetic room immediately before surgery	
Participants	403 patients with an inguinal hernia. Exclusion criteria included patients who were unfit for general anaesthesia, had psychological complaints, were under 18 years of age or had a poor understanding of English	
Interventions	Laparoscopic versus open mesh inguinal herniorrhaphy. Laparoscopic group: (n=200) repair performed by the TAPP technique. All patients were given a general anaesthesia, Open group: (n=200) repair performed by the Lichtenstein technique. All patients were given a local anaesthesia	
Outcomes	Included data items: Duration of surgery (minutes) Intraoperative complications Length of hospital stay (% discharged) Postoperative complications Persistent Numbness (1 and 3 months) Persistent pain (1 and 3 months) Hernia recurrence Mortality Other data items: Postoperative pain (day 1) SF36 Costs	
Notes		
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Woodville 1996

Methods	Randomly assigned by the clinical trials officer.	
Participants	104 Patients scheduled for elective inguinal hernia repair.	
Interventions	Laparoscopic versus open non-mesh inguinal herniorrhaphy. Laparoscopic group: repair performed by the TEP technique. All patients were given a general anaesthesia. Open group: repair performed by the Shouldice technique. All patients were given a local anaesthesia	
Outcomes	Included data items: Operation time (mins)	

Woodville 1996 (Continued)

	Postoperative morbidity Postoperative stay (mins) Return to normal activity or work Hernia recurrence Other data items: Activity levels Postoperative pain (day 30, 180, 360, and 540) Use of analgesia	
Notes	Trial excluded from a previous version of this review due to major deviation from intention to treat analysis	
<i>Risk of bias</i>		
Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

TAPP - Transabdominal Preperitoneal

TEP - Totally Extraperitoneal

GPRVS - Giant Prosthetic Reinforcement of the Visceral Sac

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Amid 1995	Patients were not randomised to different treatments arms.
Brooks 1994	Patients were not randomised to different treatments arms.
Ferzli 1993	Patients were not randomised to different treatments arms.
Goodwin 1995	Patients were not randomised to different treatments arms.
Haug-Gebhard 1996	Patients were not randomised to different treatments arms.
Lukaszcyket 1996	Patients were not randomised to different treatments arms.
Millikan 1994	Patients were not randomised to different treatments arms.
Schultz 1998	Patients were not randomised to different treatments arms.
Sheppard 1993	Patients were not randomised to different treatments arms.
Wilson 1995	Patients were not randomised to different treatments arms.

DATA AND ANALYSES

Comparison 1. Laparoscopic versus Open

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	35	6482	Mean Difference (IV, Fixed, 95% CI)	14.81 [13.98, 15.64]
1.1 TAPP versus Open	27	3978	Mean Difference (IV, Fixed, 95% CI)	17.49 [16.45, 18.53]
1.2 TEP versus Open	9	2384	Mean Difference (IV, Fixed, 95% CI)	9.94 [8.54, 11.34]
1.3 Miscellaneous Laparoscopic versus Open	1	120	Mean Difference (IV, Fixed, 95% CI)	14.93 [3.99, 25.87]
2 "Opposite" method initiated	22	4161	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.11 [2.55, 6.62]
2.1 TAPP versus Open	16	1859	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.96 [2.20, 16.18]
2.2 TEP versus Open	7	2302	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.67 [2.13, 6.33]
2.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3 Conversion	35	6671	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.73 [4.42, 10.24]
3.1 TAPP versus Open	26	3999	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.85 [2.29, 10.29]
3.2 TEP versus Open	11	2672	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.80 [4.71, 12.95]
3.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4 Haematoma	31	5754	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.72 [0.60, 0.87]
4.1 TAPP versus Open	24	3407	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.84 [0.66, 1.06]
4.2 TEP versus Open	9	2347	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.55 [0.41, 0.75]
4.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5 Seroma	27	5087	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.58 [1.20, 2.08]
5.1 TAPP versus Open	20	2800	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.03 [1.45, 2.82]
5.2 TEP versus Open	8	2287	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.92 [0.57, 1.50]
5.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6 Wound/superficial infection	28	5565	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.45 [0.32, 0.65]
6.1 TAPP versus Open	21	3358	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.43 [0.29, 0.65]
6.2 TEP versus Open	8	2207	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.53 [0.26, 1.11]
6.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7 Mesh/deep infection	22	4654	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.65 [0.07, 6.58]
7.1 TAPP versus Open	17	2662	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.65 [0.07, 6.58]
7.2 TEP versus Open	6	1992	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	25	5256	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.38 [0.44, 4.29]
8.1 TAPP versus Open	19	2980	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.61 [0.65, 10.53]
8.2 TEP versus Open	7	2276	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.38 [0.05, 2.74]
8.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	21	4914	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.76 [1.53, 21.68]
9.1 TAPP versus Open	17	2844	Peto Odds Ratio (Peto, Fixed, 95% CI)	9.36 [2.29, 38.26]
9.2 TEP versus Open	5	2070	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.13 [0.00, 6.78]

9.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
10 Port site hernia	22	4822	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.97 [1.40, 34.77]
10.1 TAPP versus Open	18	2870	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.97 [1.40, 34.77]
10.2 TEP versus Open	5	1952	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
11 Length of stay (days)	35	6249	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.1 TAPP versus Open	26	3564	Mean Difference (IV, Fixed, 95% CI)	0.07 [0.02, 0.11]
11.2 TEP versus Open	10	2563	Mean Difference (IV, Fixed, 95% CI)	-0.33 [-0.40, -0.25]
11.3 Miscellaneous	1	122	Mean Difference (IV, Fixed, 95% CI)	-0.09 [-0.41, 0.23]
Laparoscopic versus Open				
12 Time to return to usual activities (days)	19	2608	Peto Odds Ratio (95% CI)	0.56 [0.51, 0.61]
12.1 TAPP versus Open	14	1678	Peto Odds Ratio (95% CI)	0.58 [0.53, 0.65]
12.2 TEP versus Open	6	930	Peto Odds Ratio (95% CI)	0.51 [0.45, 0.59]
12.3 Miscellaneous	0	0	Peto Odds Ratio (95% CI)	Not estimable
Laparoscopic versus Open				
13 Persisting pain	20	4500	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.54 [0.46, 0.64]
13.1 TAPP versus Open	15	2494	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.62 [0.49, 0.79]
13.2 TEP versus Open	6	2006	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.47 [0.36, 0.60]
13.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
14 Persisting numbness	15	3043	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.38 [0.29, 0.49]
14.1 TAPP versus Open	12	2137	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.23 [0.16, 0.33]
14.2 TEP versus Open	4	906	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.57 [0.41, 0.80]
14.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
15 Hernia recurrence	37	6642	Peto Odds Ratio (95% CI)	0.81 [0.61, 1.08]
15.1 TAPP versus Open	27	3889	Peto Odds Ratio (95% CI)	0.76 [0.52, 1.09]
15.2 TEP versus Open	12	2753	Peto Odds Ratio (95% CI)	0.91 [0.57, 1.46]
15.3 Miscellaneous	0	0	Peto Odds Ratio (95% CI)	Not estimable
Laparoscopic versus Open				

Comparison 2. TAPP versus Open

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	27	4611	Mean Difference (IV, Fixed, 95% CI)	16.20 [15.26, 17.15]
1.1 TAPP versus Mesh	13	1841	Mean Difference (IV, Fixed, 95% CI)	14.42 [13.09, 15.75]
1.2 TAPP versus Non-Mesh	15	2514	Mean Difference (IV, Fixed, 95% CI)	18.52 [17.12, 19.92]
1.3 TAPP versus Mixed Open	2	256	Mean Difference (IV, Fixed, 95% CI)	11.69 [6.64, 16.74]
2 "Opposite" method initiated	16	1939	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.96 [2.20, 16.18]
2.1 TAPP versus Mesh	7	680	Peto Odds Ratio (Peto, Fixed, 95% CI)	8.44 [1.88, 37.84]
2.2 TAPP versus Non-Mesh	9	1062	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.3 TAPP versus Mixed Open	1	197	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.53 [1.19, 17.22]
3 Conversion	26	4326	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.53 [2.23, 9.21]
3.1 TAPP versus Mesh	12	1847	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.77 [2.37, 25.47]

3.2 TAPP versus Non-Mesh	15	2232	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.40 [0.84, 6.89]
3.3 TAPP versus Mixed Open	2	247	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.48 [1.48, 37.87]
4 Haematoma	24	3695	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.84 [0.67, 1.06]
4.1 TAPP versus Mesh	10	1503	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.69 [0.51, 0.93]
4.2 TAPP versus Non-Mesh	15	2061	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.18 [0.81, 1.73]
4.3 TAPP versus Mixed Open	1	131	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.82 [0.28, 2.39]
5 Seroma	20	3087	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.02 [1.46, 2.81]
5.1 TAPP versus Mesh	10	1499	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.47 [1.44, 4.24]
5.2 TAPP versus Non-Mesh	10	1424	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.93 [1.25, 2.99]
5.3 TAPP versus Mixed Open	2	164	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.97 [0.27, 3.50]
6 Wound/superficial infection	21	3739	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.41 [0.27, 0.61]
6.1 TAPP versus Mesh	10	1583	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.36 [0.23, 0.59]
6.2 TAPP versus Non-Mesh	12	1992	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.47 [0.21, 1.04]
6.3 TAPP versus Mixed Open	2	164	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.91 [0.19, 18.68]
7 Mesh/deep infection	17	2949	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.54 [0.06, 5.16]
7.1 TAPP versus Mesh	10	1537	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.16 [0.00, 8.03]
7.2 TAPP versus Non-Mesh	7	1248	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.98 [0.06, 15.71]
7.3 TAPP versus Mixed Open	2	164	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	19	3267	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.61 [0.65, 10.53]
8.1 TAPP versus Mesh	8	1322	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TAPP versus Non-Mesh	11	1711	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.27 [0.51, 10.07]
8.3 TAPP versus Mixed Open	2	234	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.97 [0.14, 351.93]
9 Visceral injury	17	3131	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.42 [2.14, 25.72]
9.1 TAPP versus Mesh	8	1322	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.39 [0.77, 71.25]
9.2 TAPP versus Non-Mesh	10	1609	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.60 [1.31, 44.10]
9.3 TAPP versus Mixed Open	1	200	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.04 [0.44, 113.48]
10 Port site hernia	18	3157	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.97 [1.40, 34.77]
10.1 TAPP versus Mesh	8	1339	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.39 [0.15, 372.38]
10.2 TAPP versus Non-Mesh	10	1633	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.46 [0.66, 62.92]
10.3 TAPP versus Mixed Open	2	185	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.59 [0.47, 122.49]
11 Length of stay (days)	26	3438	Mean Difference (IV, Fixed, 95% CI)	0.06 [0.01, 0.10]
11.1 TAPP versus Mesh	12	1657	Mean Difference (IV, Fixed, 95% CI)	0.15 [0.09, 0.21]
11.2 TAPP versus Non-Mesh	13	1586	Mean Difference (IV, Fixed, 95% CI)	-0.10 [-0.17, -0.02]
11.3 TAPP versus Mixed Open	2	195	Mean Difference (IV, Fixed, 95% CI)	0.11 [-0.16, 0.38]
12 Time to return to usual activities (days)	14	1753	Peto Odds Ratio (95% CI)	0.59 [0.54, 0.65]
12.1 TAPP versus Mesh	7	876	Peto Odds Ratio (95% CI)	0.63 [0.55, 0.72]
12.2 TAPP versus Non-Mesh	7	728	Peto Odds Ratio (95% CI)	0.50 [0.43, 0.58]
12.3 TAPP versus Mixed Open	1	149	Peto Odds Ratio (95% CI)	0.86 [0.62, 1.19]
13 Persisting pain	15	2844	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.51 [0.40, 0.63]
13.1 TAPP versus Mesh	7	1348	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.59 [0.43, 0.83]
13.2 TAPP versus Non-Mesh	8	1235	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.35 [0.24, 0.50]
13.3 TAPP versus Mixed Open	3	261	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.69 [0.41, 1.16]
14 Persisting numbness	12	2387	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.22 [0.15, 0.32]
14.1 TAPP versus Mesh	7	1292	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.18 [0.10, 0.33]
14.2 TAPP versus Non-Mesh	5	871	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.20 [0.09, 0.43]
14.3 TAPP versus Mixed Open	2	224	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.27 [0.15, 0.49]

15 Hernia recurrence	27	4270	Peto Odds Ratio (95% CI)	0.67 [0.47, 0.96]
15.1 TAPP versus Mesh	12	1830	Peto Odds Ratio (95% CI)	1.01 [0.56, 1.85]
15.2 TAPP versus Non-Mesh	16	2259	Peto Odds Ratio (95% CI)	0.45 [0.28, 0.72]
15.3 TAPP versus Mixed Open	2	181	Peto Odds Ratio (95% CI)	2.72 [0.62, 11.86]

Comparison 3. TEP versus Open

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	9	2384	Mean Difference (IV, Fixed, 95% CI)	9.94 [8.54, 11.34]
1.1 TEP versus Mesh	5	566	Mean Difference (IV, Fixed, 95% CI)	5.29 [2.84, 7.73]
1.2 TEP versus Non-Mesh	3	1156	Mean Difference (IV, Fixed, 95% CI)	10.30 [8.20, 12.40]
1.3 TEP versus Mixed Open	1	662	Mean Difference (IV, Fixed, 95% CI)	15.91 [12.98, 18.84]
2 "Opposite" method initiated	7	2302	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.67 [2.13, 6.33]
2.1 TEP versus Mesh	4	526	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.2 TEP versus Non-Mesh	2	1098	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.11 [2.46, 15.15]
2.3 TEP versus Mixed Open	1	678	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.76 [1.40, 5.45]
3 Conversion	11	2672	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.80 [4.71, 12.95]
3.1 TEP versus Mesh	6	681	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.36 [1.47, 36.94]
3.2 TEP versus Non-Mesh	4	1340	Peto Odds Ratio (Peto, Fixed, 95% CI)	8.31 [4.02, 17.17]
3.3 TEP versus Mixed Open	1	651	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.36 [3.36, 16.13]
4 Haematoma	9	2347	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.55 [0.41, 0.75]
4.1 TEP versus Mesh	4	426	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.26 [0.14, 0.48]
4.2 TEP versus Non-Mesh	4	1337	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.27 [0.70, 2.33]
4.3 TEP versus Mixed Open	1	584	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.53 [0.34, 0.83]
5 Seroma	8	2287	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.92 [0.57, 1.50]
5.1 TEP versus Mesh	4	426	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.12 [0.24, 5.09]
5.2 TEP versus Non-Mesh	3	1279	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.65 [2.33, 25.09]
5.3 TEP versus Mixed Open	1	582	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.55 [0.31, 0.98]
6 Wound/superficial infection	8	2288	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.56 [0.27, 1.19]
6.1 TEP versus Mesh	4	426	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.03 [0.21, 19.85]
6.2 TEP versus Non-Mesh	3	1279	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.14 [0.03, 0.61]
6.3 TEP versus Mixed Open	1	583	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.79 [0.31, 2.02]
7 Mesh/deep infection	6	1992	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.1 TEP versus Mesh	3	311	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TEP versus Non-Mesh	2	1098	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 TEP versus Mixed Open	1	583	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	7	2276	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.55 [0.06, 5.30]
8.1 TEP versus Mesh	3	323	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TEP versus Non-Mesh	3	1279	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.55 [0.06, 5.30]
8.3 TEP versus Mixed Open	1	674	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	5	2070	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.13 [0.00, 6.78]
9.1 TEP versus Mesh	2	298	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.2 TEP versus Non-Mesh	2	1098	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 TEP versus Mixed Open	1	674	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.13 [0.00, 6.78]
10 Port site hernia	5	1952	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.1 TEP versus Mesh	2	298	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TEP versus Non-Mesh	2	1098	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable

10.3 TEP versus Mixed Open	1	556	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
11 Length of stay (days)	10	2563	Mean Difference (IV, Fixed, 95% CI)	-0.33 [-0.40, -0.25]
11.1 TEP versus Mesh	5	622	Mean Difference (IV, Fixed, 95% CI)	-0.34 [-0.45, -0.23]
11.2 TEP versus Non-Mesh	4	1338	Mean Difference (IV, Fixed, 95% CI)	-0.34 [-0.45, -0.22]
11.3 TEP versus Mixed Open	1	603	Mean Difference (IV, Fixed, 95% CI)	-0.15 [-0.48, 0.18]
12 Time to return to usual activities (days)	6	930	Peto Odds Ratio (95% CI)	0.51 [0.45, 0.59]
12.1 TEP versus Mesh	4	409	Peto Odds Ratio (95% CI)	0.26 [0.21, 0.33]
12.2 TEP versus Non-Mesh	1	94	Peto Odds Ratio (95% CI)	0.78 [0.52, 1.17]
12.3 TEP versus Mixed Open	1	427	Peto Odds Ratio (95% CI)	0.80 [0.66, 0.97]
13 Persisting pain	6	2006	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.47 [0.36, 0.60]
13.1 TEP versus Mesh	3	350	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.13 [0.05, 0.34]
13.2 TEP versus Non-Mesh	2	1015	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.22 [0.14, 0.35]
13.3 TEP versus Mixed Open	1	641	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.77 [0.57, 1.06]
14 Persisting numbness	4	906	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.57 [0.41, 0.80]
14.1 TEP versus Mesh	3	302	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.21 [0.04, 1.12]
14.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.3 TEP versus Mixed Open	1	604	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.60 [0.42, 0.85]
15 Hernia recurrence	12	2753	Peto Odds Ratio (95% CI)	0.91 [0.57, 1.46]
15.1 TEP versus Mesh	6	678	Peto Odds Ratio (95% CI)	0.97 [0.34, 2.77]
15.2 TEP versus Non-Mesh	5	1519	Peto Odds Ratio (95% CI)	0.67 [0.38, 1.18]
15.3 TEP versus Mixed Open	1	556	Peto Odds Ratio (95% CI)	7.10 [1.61, 31.24]

Comparison 4. Laparoscopic versus Open (Recurrent hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	13	448	Mean Difference (IV, Fixed, 95% CI)	14.31 [10.77, 17.85]
1.1 TAPP versus Open	10	280	Mean Difference (IV, Fixed, 95% CI)	14.24 [9.48, 18.99]
1.2 TEP versus Open	4	168	Mean Difference (IV, Fixed, 95% CI)	14.40 [9.10, 19.70]
1.3 Miscellaneous Laparoscopic versus Open	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
2 "Opposite" method initiated	8	268	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.50 [0.64, 9.81]
2.1 TAPP versus Open	6	139	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.86 [0.85, 55.10]
2.2 TEP versus Open	3	129	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.17 [0.19, 7.15]
2.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3 Conversion	11	328	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.91 [1.19, 12.82]
3.1 TAPP versus Open	9	203	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.48 [0.24, 25.38]
3.2 TEP versus Open	3	125	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.59 [1.15, 18.27]
3.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4 Haematoma	10	383	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.60 [0.34, 1.06]
4.1 TAPP versus Open	9	266	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.24 [0.58, 2.62]
4.2 TEP versus Open	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.22 [0.09, 0.54]
4.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5 Seroma	10	379	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.39 [0.67, 2.90]

5.1 TAPP versus Open	9	262	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.80 [0.79, 4.12]
5.2 TEP versus Open	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.57 [0.12, 2.70]
5.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
6 Wound/superficial infection	10	383	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.50 [0.17, 1.46]
6.1 TAPP versus Open	9	266	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.50 [0.17, 1.46]
6.2 TEP versus Open	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
7 Mesh/deep infection	8	358	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.22 [0.00, 13.53]
7.1 TAPP versus Open	7	241	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.22 [0.00, 13.53]
7.2 TEP versus Open	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
8 Vascular injury	9	312	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TAPP versus Open	8	189	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TEP versus Open	2	123	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
9 Visceral injury	8	306	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.47 [0.10, 293.66]
9.1 TAPP versus Open	7	183	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.47 [0.10, 293.66]
9.2 TEP versus Open	2	123	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
10 Port site hernia	9	361	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.1 TAPP versus Open	8	250	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TEP versus Open	2	111	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
11 Length of stay (days)	11	367	Mean Difference (IV, Fixed, 95% CI)	0.01 [-0.13, 0.15]
11.1 TAPP versus Open	10	279	Mean Difference (IV, Fixed, 95% CI)	-0.00 [-0.14, 0.14]
11.2 TEP versus Open	2	88	Mean Difference (IV, Fixed, 95% CI)	0.24 [-0.45, 0.93]
11.3 Miscellaneous	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
12 Time to return to usual activities (days)	10	262	Peto Odds Ratio (95% CI)	0.60 [0.46, 0.78]
12.1 TAPP versus Open	8	165	Peto Odds Ratio (95% CI)	0.62 [0.45, 0.87]
12.2 TEP versus Open	3	97	Peto Odds Ratio (95% CI)	0.55 [0.35, 0.89]
12.3 Miscellaneous	0	0	Peto Odds Ratio (95% CI)	Not estimable
Laparoscopic versus Open				
13 Persisting pain	8	331	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.90 [0.50, 1.59]
13.1 TAPP versus Open	7	209	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.00 [0.44, 2.25]
13.2 TEP versus Open	2	122	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.80 [0.36, 1.81]
13.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
14 Persisting numbness	8	332	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.79 [0.39, 1.61]
14.1 TAPP versus Open	7	215	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.39 [0.13, 1.17]
14.2 TEP versus Open	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.33 [0.52, 3.38]
14.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
15 Hernia recurrence	11	387	Peto Odds Ratio (95% CI)	1.04 [0.45, 2.43]
15.1 TAPP versus Open	10	276	Peto Odds Ratio (95% CI)	0.99 [0.39, 2.51]

15.2 TEP versus Open	2	111	Peto Odds Ratio (95% CI)	1.33 [0.18, 10.06]
15.3 Miscellaneous	0	0	Peto Odds Ratio (95% CI)	Not estimable
Laparoscopic versus Open				

Comparison 5. TAPP versus Open (Recurrent hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	10	303	Mean Difference (IV, Fixed, 95% CI)	15.55 [10.99, 20.11]
1.1 TAPP versus Mesh	5	188	Mean Difference (IV, Fixed, 95% CI)	12.32 [6.64, 18.00]
1.2 TAPP versus Non-Mesh	4	93	Mean Difference (IV, Fixed, 95% CI)	23.79 [13.67, 33.91]
1.3 TAPP versus Mixed Open	2	22	Mean Difference (IV, Fixed, 95% CI)	18.22 [6.52, 29.92]
2 "Opposite" method initiated	6	139	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.86 [0.85, 55.10]
2.1 TAPP versus Mesh	3	104	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.86 [0.85, 55.10]
2.2 TAPP versus Non-Mesh	2	25	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.3 TAPP versus Mixed Open	1	10	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3 Conversion	9	226	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.66 [0.37, 19.24]
3.1 TAPP versus Mesh	4	111	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.71 [0.35, 94.25]
3.2 TAPP versus Non-Mesh	4	93	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.25 [0.08, 20.37]
3.3 TAPP versus Mixed Open	2	22	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4 Haematoma	9	289	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.26 [0.60, 2.63]
4.1 TAPP versus Mesh	4	182	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.04 [0.43, 2.54]
4.2 TAPP versus Non-Mesh	4	93	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.70 [0.42, 6.84]
4.3 TAPP versus Mixed Open	2	14	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.95 [0.09, 283.86]
5 Seroma	9	285	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.80 [0.79, 4.12]
5.1 TAPP versus Mesh	4	178	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.06 [0.83, 5.11]
5.2 TAPP versus Non-Mesh	4	93	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.14 [0.21, 22.16]
5.3 TAPP versus Mixed Open	2	14	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.07 [0.00, 3.98]
6 Wound/superficial infection	9	289	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.50 [0.17, 1.46]
6.1 TAPP versus Mesh	4	182	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.45 [0.14, 1.44]
6.2 TAPP versus Non-Mesh	4	93	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.18 [0.00, 9.42]
6.3 TAPP versus Mixed Open	2	14	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.95 [0.09, 283.86]
7 Mesh/deep infection	7	264	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.15 [0.00, 7.71]
7.1 TAPP versus Mesh	4	182	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TAPP versus Non-Mesh	2	68	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.15 [0.00, 7.71]
7.3 TAPP versus Mixed Open	2	14	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	8	212	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TAPP versus Mesh	3	103	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TAPP versus Non-Mesh	4	93	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 TAPP versus Mixed Open	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	7	206	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.47 [0.10, 293.66]
9.1 TAPP versus Mesh	3	103	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.47 [0.10, 293.66]
9.2 TAPP versus Non-Mesh	4	93	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 TAPP versus Mixed Open	1	10	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10 Port site hernia	8	273	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.1 TAPP versus Mesh	3	165	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TAPP versus Non-Mesh	4	93	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 TAPP versus Mixed Open	2	15	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Open				

11 Length of stay (days)	10	302	Mean Difference (IV, Fixed, 95% CI)	0.04 [-0.10, 0.17]
11.1 TAPP versus Mesh	5	190	Mean Difference (IV, Fixed, 95% CI)	0.02 [-0.13, 0.17]
11.2 TAPP versus Non-Mesh	4	92	Mean Difference (IV, Fixed, 95% CI)	0.08 [-0.25, 0.41]
11.3 TAPP versus Mixed Open	2	20	Mean Difference (IV, Fixed, 95% CI)	0.5 [-0.85, 1.85]
12 Time to return to usual activities (days)	8	178	Peto Odds Ratio (95% CI)	0.63 [0.47, 0.86]
12.1 TAPP versus Mesh	5	114	Peto Odds Ratio (95% CI)	0.55 [0.37, 0.80]
12.2 TAPP versus Non-Mesh	3	57	Peto Odds Ratio (95% CI)	0.70 [0.41, 1.20]
12.3 TAPP versus Mixed Open	1	7	Peto Odds Ratio (95% CI)	7.98 [1.02, 62.27]
13 Persisting pain	6	223	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.99 [0.44, 2.25]
13.1 TAPP versus Mesh	3	153	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.22 [0.49, 3.03]
13.2 TAPP versus Non-Mesh	2	53	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.18 [0.00, 9.42]
13.3 TAPP versus Mixed Open	2	17	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.48 [0.05, 4.40]
14 Persisting numbness	7	231	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.31 [0.11, 0.89]
14.1 TAPP versus Mesh	4	162	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.18 [0.05, 0.69]
14.2 TAPP versus Non-Mesh	2	53	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.16 [0.02, 1.70]
14.3 TAPP versus Mixed Open	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.79 [0.38, 60.76]
15 Hernia recurrence	10	299	Peto Odds Ratio (95% CI)	0.91 [0.37, 2.24]
15.1 TAPP versus Mesh	5	190	Peto Odds Ratio (95% CI)	1.20 [0.43, 3.32]
15.2 TAPP versus Non-Mesh	4	93	Peto Odds Ratio (95% CI)	0.31 [0.04, 2.26]
15.3 TAPP versus Mixed Open	2	16	Peto Odds Ratio (95% CI)	Not estimable

Comparison 6. TEP versus Open (Recurrent hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	4	168	Mean Difference (IV, Fixed, 95% CI)	14.40 [9.10, 19.70]
1.1 TEP versus Mesh	3	85	Mean Difference (IV, Fixed, 95% CI)	13.02 [6.47, 19.57]
1.2 TEP versus Non-Mesh	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
1.3 TEP versus Mixed Open	1	83	Mean Difference (IV, Fixed, 95% CI)	17.01 [8.00, 26.02]
2 "Opposite" method initiated	3	129	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.17 [0.19, 7.15]
2.1 TEP versus Mesh	2	42	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.3 TEP versus Mixed Open	1	87	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.17 [0.19, 7.15]
3 Conversion	3	125	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.59 [1.15, 18.27]
3.1 TEP versus Mesh	2	41	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.3 TEP versus Mixed Open	1	84	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.59 [1.15, 18.27]
4 Haematoma	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.22 [0.09, 0.54]
4.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.15 [0.03, 0.87]
4.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4.3 TEP versus Mixed Open	1	81	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.26 [0.09, 0.71]
5 Seroma	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.57 [0.12, 2.70]

5.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5.3 TEP versus Mixed Open	1	81	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.57 [0.12, 2.70]
6 Wound/superficial infection	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.3 TEP versus Mixed Open	1	81	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7 Mesh/deep infection	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 TEP versus Mixed Open	1	81	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	2	123	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 TEP versus Mixed Open	1	87	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	2	123	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 TEP versus Mixed Open	1	87	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10 Port site hernia	2	111	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 TEP versus Mixed Open	1	75	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
11 Length of stay (days)	2	88	Mean Difference (IV, Fixed, 95% CI)	0.24 [-0.45, 0.93]
11.1 TEP versus Mesh	1	5	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.2 TEP versus Non-Mesh	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.3 TEP versus Mixed Open	1	83	Mean Difference (IV, Fixed, 95% CI)	0.24 [-0.45, 0.93]
12 Time to return to usual activities (days)	3	97	Peto Odds Ratio (95% CI)	0.55 [0.35, 0.89]
12.1 TEP versus Mesh	2	40	Peto Odds Ratio (95% CI)	0.14 [0.05, 0.36]
12.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
12.3 TEP versus Mixed Open	1	57	Peto Odds Ratio (95% CI)	0.87 [0.50, 1.49]
13 Persisting pain	2	122	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.80 [0.36, 1.81]
13.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.19 [0.01, 3.32]
13.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
13.3 TEP versus Mixed Open	1	86	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.91 [0.39, 2.13]
14 Persisting numbness	2	117	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.33 [0.52, 3.38]
14.1 TEP versus Mesh	1	36	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.3 TEP versus Mixed Open	1	81	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.33 [0.52, 3.38]
15 Hernia recurrence	2	111	Peto Odds Ratio (95% CI)	1.33 [0.18, 10.06]
15.1 TEP versus Mesh	1	36	Peto Odds Ratio (95% CI)	0.23 [0.01, 4.48]
15.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
15.3 TEP versus Mixed Open	1	75	Peto Odds Ratio (95% CI)	6.17 [0.39, 98.67]

Comparison 7. Laparoscopic versus Open (Bilateral hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	13	341	Mean Difference (IV, Fixed, 95% CI)	12.12 [7.98, 16.26]
1.1 TAPP versus Open	10	208	Mean Difference (IV, Fixed, 95% CI)	8.12 [3.06, 13.19]
1.2 TEP versus Open	4	133	Mean Difference (IV, Fixed, 95% CI)	20.19 [13.00, 27.38]
1.3 Miscellaneous Laparoscopic versus Open	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
2 "Opposite" method initiated	10	235	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.13 [0.59, 63.42]
2.1 TAPP versus Open	8	144	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.42 [0.30, 99.54]
2.2 TEP versus Open	3	91	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.66 [0.15, 386.16]
2.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3 Conversion	11	270	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.34 [0.90, 59.47]
3.1 TAPP versus Open	9	181	Peto Odds Ratio (Peto, Fixed, 95% CI)	9.03 [0.18, 462.31]
3.2 TEP versus Open	3	89	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.76 [0.57, 80.00]
3.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4 Haematoma	10	266	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.38 [0.67, 2.83]
4.1 TAPP versus Open	9	194	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.09 [0.48, 2.48]
4.2 TEP versus Open	2	72	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.03 [0.67, 13.75]
4.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5 Seroma	9	250	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.24 [0.56, 2.75]
5.1 TAPP versus Open	8	179	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.55 [0.63, 3.83]
5.2 TEP versus Open	2	71	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.56 [0.10, 3.06]
5.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6 Wound/superficial infection	10	265	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.27 [0.10, 0.75]
6.1 TAPP versus Open	9	194	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.28 [0.10, 0.81]
6.2 TEP versus Open	2	71	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.16 [0.00, 7.96]
6.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7 Mesh/deep infection	7	185	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.1 TAPP versus Open	6	114	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TEP versus Open	2	71	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	7	191	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TAPP versus Open	6	116	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TEP versus Open	2	75	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	8	232	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.16 [0.09, 286.55]
9.1 TAPP versus Open	7	157	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.16 [0.09, 286.55]
9.2 TEP versus Open	2	75	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10 Port site hernia	8	212	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.49 [0.03, 468.68]

10.1 TAPP versus Open	7	141	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.49 [0.03, 468.68]
10.2 TEP versus Open	2	71	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
11 Length of stay (days)	12	292	Mean Difference (IV, Fixed, 95% CI)	-0.09 [-0.19, 0.01]
11.1 TAPP versus Open	10	204	Mean Difference (IV, Fixed, 95% CI)	-0.09 [-0.19, 0.02]
11.2 TEP versus Open	3	88	Mean Difference (IV, Fixed, 95% CI)	-0.15 [-0.62, 0.32]
11.3 Miscellaneous	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
12 Time to return to usual activities (days)	10	217	Peto Odds Ratio (95% CI)	0.59 [0.44, 0.79]
12.1 TAPP versus Open	8	144	Peto Odds Ratio (95% CI)	0.51 [0.36, 0.73]
12.2 TEP versus Open	3	73	Peto Odds Ratio (95% CI)	0.79 [0.47, 1.32]
12.3 Miscellaneous	0	0	Peto Odds Ratio (95% CI)	Not estimable
Laparoscopic versus Open				
13 Persisting pain	6	223	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.70 [0.38, 1.30]
13.1 TAPP versus Open	5	149	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.58 [0.27, 1.24]
13.2 TEP versus Open	2	74	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.01 [0.36, 2.86]
13.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
14 Persisting numbness	7	228	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.56 [0.24, 1.31]
14.1 TAPP versus Open	6	158	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.23 [0.06, 0.80]
14.2 TEP versus Open	2	70	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.18 [0.38, 3.66]
14.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
15 Hernia recurrence	11	277	Peto Odds Ratio (95% CI)	1.36 [0.55, 3.37]
15.1 TAPP versus Open	10	206	Peto Odds Ratio (95% CI)	1.09 [0.42, 2.84]
15.2 TEP versus Open	2	71	Peto Odds Ratio (95% CI)	8.85 [0.55, 141.43]
15.3 Miscellaneous	0	0	Peto Odds Ratio (95% CI)	Not estimable
Laparoscopic versus Open				

Comparison 8. TAPP versus Open (Bilateral hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	10	208	Mean Difference (IV, Fixed, 95% CI)	8.12 [3.06, 13.19]
1.1 TAPP versus Mesh	5	99	Mean Difference (IV, Fixed, 95% CI)	-0.80 [-6.52, 4.91]
1.2 TAPP versus Non-Mesh	4	97	Mean Difference (IV, Fixed, 95% CI)	41.17 [29.72, 52.61]
1.3 TAPP versus Mixed Open	1	12	Mean Difference (IV, Fixed, 95% CI)	36.63 [-0.21, 73.47]
2 "Opposite" method initiated	8	144	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.42 [0.30, 99.54]
2.1 TAPP versus Mesh	4	53	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.42 [0.30, 99.54]
2.2 TAPP versus Non-Mesh	3	80	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.3 TAPP versus Mixed Open	1	11	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3 Conversion	9	181	Peto Odds Ratio (Peto, Fixed, 95% CI)	9.03 [0.18, 462.31]
3.1 TAPP versus Mesh	4	73	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.2 TAPP versus Non-Mesh	4	97	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.3 TAPP versus Mixed Open	1	11	Peto Odds Ratio (Peto, Fixed, 95% CI)	9.03 [0.18, 462.31]
4 Haematoma	9	194	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.09 [0.48, 2.48]

4.1 TAPP versus Mesh	4	90	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.84 [0.27, 2.64]
4.2 TAPP versus Non-Mesh	4	97	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.26 [0.37, 4.29]
4.3 TAPP versus Mixed Open	1	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.75 [0.11, 302.04]
5 Seroma	8	179	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.55 [0.63, 3.83]
5.1 TAPP versus Mesh	4	90	Peto Odds Ratio (Peto, Fixed, 95% CI)	2.86 [0.79, 10.35]
5.2 TAPP versus Non-Mesh	3	82	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.85 [0.24, 3.04]
5.3 TAPP versus Mixed Open	1	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6 Wound/superficial infection	9	194	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.28 [0.10, 0.81]
6.1 TAPP versus Mesh	4	90	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.22 [0.07, 0.69]
6.2 TAPP versus Non-Mesh	4	97	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.97 [0.08, 11.59]
6.3 TAPP versus Mixed Open	1	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7 Mesh/deep infection	6	114	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.1 TAPP versus Mesh	4	90	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TAPP versus Non-Mesh	1	17	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 TAPP versus Mixed Open	1	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	6	116	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TAPP versus Mesh	3	63	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TAPP versus Non-Mesh	2	41	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 TAPP versus Mixed Open	1	12	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	7	157	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.16 [0.09, 286.55]
9.1 TAPP versus Mesh	3	63	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.2 TAPP versus Non-Mesh	3	82	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.16 [0.09, 286.55]
9.3 TAPP versus Mixed Open	1	12	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10 Port site hernia	7	141	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.49 [0.03, 468.68]
10.1 TAPP versus Mesh	3	76	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TAPP versus Non-Mesh	3	56	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.49 [0.03, 468.68]
10.3 TAPP versus Mixed Open	1	9	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
11 Length of stay (days)	10	204	Mean Difference (IV, Fixed, 95% CI)	-0.09 [-0.19, 0.02]
11.1 TAPP versus Mesh	5	100	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.2 TAPP versus Non-Mesh	4	97	Mean Difference (IV, Fixed, 95% CI)	-0.05 [-0.17, 0.07]
11.3 TAPP versus Mixed Open	1	7	Mean Difference (IV, Fixed, 95% CI)	0.42 [-0.73, 1.57]
12 Time to return to usual activities (days)	9	146	Peto Odds Ratio (95% CI)	0.51 [0.36, 0.73]
12.1 TAPP versus Mesh	5	79	Peto Odds Ratio (95% CI)	0.44 [0.27, 0.73]
12.2 TAPP versus Non-Mesh	3	59	Peto Odds Ratio (95% CI)	0.52 [0.31, 0.88]
12.3 TAPP versus Mixed Open	1	8	Peto Odds Ratio (95% CI)	1.56 [0.37, 6.67]
13 Persisting pain	5	149	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.58 [0.27, 1.24]
13.1 TAPP versus Mesh	2	74	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.80 [0.29, 2.22]
13.2 TAPP versus Non-Mesh	2	63	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.38 [0.10, 1.43]
13.3 TAPP versus Mixed Open	1	12	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.39 [0.04, 4.01]
14 Persisting numbness	6	158	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.23 [0.06, 0.80]
14.1 TAPP versus Mesh	3	84	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.18 [0.04, 0.81]
14.2 TAPP versus Non-Mesh	2	62	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.3 TAPP versus Mixed Open	1	12	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.39 [0.04, 4.01]
15 Hernia recurrence	10	206	Peto Odds Ratio (95% CI)	1.09 [0.42, 2.84]
15.2 TAPP versus Mesh	5	100	Peto Odds Ratio (95% CI)	4.16 [0.84, 20.63]
15.3 TAPP versus Non-Mesh	4	97	Peto Odds Ratio (95% CI)	0.51 [0.15, 1.70]

15.4 TAPP versus Mixed Open	1	9	Peto Odds Ratio (95% CI)	Not estimable
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Comparison 9. TEP versus Open (Bilateral hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	4	133	Mean Difference (IV, Fixed, 95% CI)	20.19 [13.00, 27.38]
1.1 TEP versus Mesh	3	78	Mean Difference (IV, Fixed, 95% CI)	17.99 [8.86, 27.12]
1.2 TEP versus Non-Mesh	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
1.3 TEP versus Mixed Open	1	55	Mean Difference (IV, Fixed, 95% CI)	23.79 [12.12, 35.46]
2 "Opposite" method initiated	3	91	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.66 [0.15, 386.16]
2.1 TEP versus Mesh	2	34	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.3 TEP versus Mixed Open	1	57	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.66 [0.15, 386.16]
3 Conversion	3	89	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.76 [0.57, 80.00]
3.1 TEP versus Mesh	2	33	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.32 [0.02, 638.51]
3.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.3 TEP versus Mixed Open	1	56	Peto Odds Ratio (Peto, Fixed, 95% CI)	8.27 [0.50, 135.86]
4 Haematoma	2	72	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.03 [0.67, 13.75]
4.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.28 [0.02, 708.06]
4.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4.3 TEP versus Mixed Open	1	53	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.01 [0.62, 14.56]
5 Seroma	2	71	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.56 [0.10, 3.06]
5.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5.3 TEP versus Mixed Open	1	52	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.56 [0.10, 3.06]
6 Wound/superficial infection	2	71	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.16 [0.00, 7.96]
6.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.3 TEP versus Mixed Open	1	52	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.16 [0.00, 7.96]
7 Mesh/deep infection	2	71	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 TEP versus Mixed Open	1	52	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	2	75	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 TEP versus Mixed Open	1	56	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	2	75	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 TEP versus Mixed Open	1	56	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10 Port site hernia	2	71	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 TEP versus Mixed Open	1	52	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
11 Length of stay (days)	3	88	Mean Difference (IV, Fixed, 95% CI)	-0.15 [-0.62, 0.32]
11.1 TEP versus Mesh	2	34	Mean Difference (IV, Fixed, 95% CI)	Not estimable

11.2 TEP versus Non-Mesh	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.3 TEP versus Mixed Open	1	54	Mean Difference (IV, Fixed, 95% CI)	-0.15 [-0.62, 0.32]
12 Time to return to usual activities (days)	3	73	Peto Odds Ratio (95% CI)	0.79 [0.47, 1.32]
12.1 TEP versus Mesh	2	34	Peto Odds Ratio (95% CI)	0.68 [0.32, 1.45]
12.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
12.3 TEP versus Mixed Open	1	39	Peto Odds Ratio (95% CI)	0.89 [0.44, 1.81]
13 Persisting pain	2	74	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.01 [0.36, 2.86]
13.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.28 [0.02, 708.06]
13.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
13.3 TEP versus Mixed Open	1	55	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.96 [0.33, 2.79]
14 Persisting numbness	2	70	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.18 [0.38, 3.66]
14.1 TEP versus Mesh	1	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.28 [0.02, 708.06]
14.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.3 TEP versus Mixed Open	1	51	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.12 [0.35, 3.58]
15 Hernia recurrence	2	71	Peto Odds Ratio (95% CI)	8.85 [0.55, 141.43]
15.1 TEP versus Mesh	1	19	Peto Odds Ratio (95% CI)	Not estimable
15.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
15.3 TEP versus Mixed Open	1	52	Peto Odds Ratio (95% CI)	8.85 [0.55, 141.43]

Comparison 10. Laparoscopic versus Open (Femoral hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	4	27	Mean Difference (IV, Fixed, 95% CI)	23.33 [1.51, 45.14]
1.1 TAPP versus Open	2	7	Mean Difference (IV, Fixed, 95% CI)	0.83 [-39.61, 41.27]
1.2 TEP versus Open	2	20	Mean Difference (IV, Fixed, 95% CI)	32.56 [6.65, 58.47]
1.3 Miscellaneous Laparoscopic versus Open	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
2 "Opposite" method initiated	4	27	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.24 [0.06, 296.20]
2.1 TAPP versus Open	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.2 TEP versus Open	2	20	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.24 [0.06, 296.20]
2.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3 Conversion	4	26	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.25 [0.44, 88.87]
3.1 TAPP versus Open	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.2 TEP versus Open	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.25 [0.44, 88.87]
3.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4 Haematoma	4	24	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.06 [0.30, 54.29]
4.1 TAPP versus Open	2	8	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.48 [0.07, 286.49]
4.2 TEP versus Open	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.81 [0.14, 105.19]
4.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5 Seroma	4	23	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.29 [0.10, 289.29]
5.1 TAPP versus Open	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.29 [0.10, 289.29]
5.2 TEP versus Open	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable

5.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
6 Wound/superficial infection	4	23	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.17 [0.06, 300.53]
6.1 TAPP versus Open	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.2 TEP versus Open	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.17 [0.06, 300.53]
6.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
7 Mesh/deep infection	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.1 TAPP versus Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TEP versus Open	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
8 Vascular injury	3	24	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TAPP versus Open	1	5	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TEP versus Open	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
9 Visceral injury	4	26	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.1 TAPP versus Open	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.2 TEP versus Open	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
10 Port site hernia	3	23	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.1 TAPP versus Open	1	5	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TEP versus Open	2	18	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
11 Length of stay (days)	4	23	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.1 TAPP versus Open	2	7	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.2 TEP versus Open	2	16	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.3 Miscellaneous	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
12 Time to return to usual activities (days)	2	13	Peto Odds Ratio (95% CI)	0.46 [0.14, 1.44]
12.1 TAPP versus Open	1	5	Peto Odds Ratio (95% CI)	0.14 [0.02, 1.11]
12.2 TEP versus Open	1	8	Peto Odds Ratio (95% CI)	0.78 [0.19, 3.15]
12.3 Miscellaneous	0	0	Peto Odds Ratio (95% CI)	Not estimable
Laparoscopic versus Open				
13 Persisting pain	4	26	Peto Odds Ratio (Peto, Fixed, 95% CI)	1.19 [0.16, 8.82]
13.1 TAPP versus Open	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.39 [0.15, 372.38]
13.2 TEP versus Open	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.62 [0.06, 6.42]
13.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
14 Persisting numbness	4	26	Peto Odds Ratio (Peto, Fixed, 95% CI)	10.56 [1.03, 108.64]
14.1 TAPP versus Open	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.2 TEP versus Open	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	10.56 [1.03, 108.64]
14.3 Miscellaneous	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Laparoscopic versus Open				
15 Hernia recurrence	4	26	Peto Odds Ratio (95% CI)	5.29 [0.10, 289.29]
15.1 TAPP versus Open	2	7	Peto Odds Ratio (95% CI)	5.29 [0.10, 289.29]
15.2 TEP versus Open	2	19	Peto Odds Ratio (95% CI)	Not estimable

15.3 Miscellaneous Laparoscopic versus Open	0	0	Peto Odds Ratio (95% CI)	Not estimable
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Comparison 11. TAPP versus Open (Femoral hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	2	7	Mean Difference (IV, Fixed, 95% CI)	0.83 [-39.61, 41.27]
1.1 TAPP versus Mesh	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
1.2 TAPP versus Non-Mesh	2	7	Mean Difference (IV, Fixed, 95% CI)	0.83 [-39.61, 41.27]
1.3 TAPP versus Mixed Open	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
2 "Opposite" method initiated	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.2 TAPP versus Non-Mesh	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3 Conversion	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.2 TAPP versus Non-Mesh	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4 Haematoma	2	8	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.48 [0.07, 286.49]
4.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4.2 TAPP versus Non-Mesh	2	8	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.48 [0.07, 286.49]
4.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5 Seroma	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.29 [0.10, 289.29]
5.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5.2 TAPP versus Non-Mesh	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	5.29 [0.10, 289.29]
5.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6 Wound/superficial infection	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.2 TAPP versus Non-Mesh	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7 Mesh/deep infection	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TAPP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	1	5	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TAPP versus Non-Mesh	1	5	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.2 TAPP versus Non-Mesh	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10 Port site hernia	1	5	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TAPP versus Non-Mesh	1	5	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 TAPP versus Mixed Open	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Open				
11 Length of stay (days)	2	7	Mean Difference (IV, Fixed, 95% CI)	Not estimable

11.1 TAPP versus Mesh	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.2 TAPP versus Non-Mesh	2	7	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.3 TAPP versus Mixed	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
Open				
12 Time to return to usual activities (days)	1	5	Peto Odds Ratio (95% CI)	0.14 [0.02, 1.11]
12.1 TAPP versus Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
12.2 TAPP versus Non-Mesh	1	5	Peto Odds Ratio (95% CI)	0.14 [0.02, 1.11]
12.3 TAPP versus Mixed	0	0	Peto Odds Ratio (95% CI)	Not estimable
Open				
13 Persisting pain	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.39 [0.15, 372.38]
13.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
13.2 TAPP versus Non-Mesh	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	7.39 [0.15, 372.38]
13.3 TAPP versus Mixed	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Open				
14 Persisting numbness	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.1 TAPP versus Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.2 TAPP versus Non-Mesh	2	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.3 TAPP versus Mixed	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
Open				
15 Hernia recurrence	2	7	Peto Odds Ratio (95% CI)	5.29 [0.10, 289.29]
15.1 TAPP versus Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
15.2 TAPP versus Non-Mesh	2	7	Peto Odds Ratio (95% CI)	5.29 [0.10, 289.29]
15.3 TAPP versus Mixed	0	0	Peto Odds Ratio (95% CI)	Not estimable
Open				

Comparison 12. TEP versus Open (Femoral hernias)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Duration of operation (minutes)	2	20	Mean Difference (IV, Fixed, 95% CI)	32.56 [6.65, 58.47]
1.1 TEP versus Mesh	1	7	Mean Difference (IV, Fixed, 95% CI)	Not estimable
1.2 TEP versus Non-Mesh	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
1.3 TEP versus Mixed Open	1	13	Mean Difference (IV, Fixed, 95% CI)	32.56 [6.65, 58.47]
2 "Opposite" method initiated	2	20	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.24 [0.06, 296.20]
2.1 TEP versus Mesh	1	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
2.3 TEP versus Mixed Open	1	13	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.24 [0.06, 296.20]
3 Conversion	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.25 [0.44, 88.87]
3.1 TEP versus Mesh	1	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
3.3 TEP versus Mixed Open	1	12	Peto Odds Ratio (Peto, Fixed, 95% CI)	6.25 [0.44, 88.87]
4 Haematoma	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.81 [0.14, 105.19]
4.1 TEP versus Mesh	1	6	Peto Odds Ratio (Peto, Fixed, 95% CI)	3.32 [0.02, 638.51]
4.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
4.3 TEP versus Mixed Open	1	10	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.17 [0.06, 300.53]
5 Seroma	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5.1 TEP versus Mesh	1	6	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable

5.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
5.3 TEP versus Mixed Open	1	10	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6 Wound/superficial infection	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.17 [0.06, 300.53]
6.1 TEP versus Mesh	1	6	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
6.3 TEP versus Mixed Open	1	10	Peto Odds Ratio (Peto, Fixed, 95% CI)	4.17 [0.06, 300.53]
7 Mesh/deep infection	2	16	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.1 TEP versus Mesh	1	6	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
7.3 TEP versus Mixed Open	1	10	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8 Vascular injury	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.1 TEP versus Mesh	1	6	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
8.3 TEP versus Mixed Open	1	13	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9 Visceral injury	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.1 TEP versus Mesh	1	6	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
9.3 TEP versus Mixed Open	1	13	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10 Port site hernia	2	18	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.1 TEP versus Mesh	1	6	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
10.3 TEP versus Mixed Open	1	12	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
11 Length of stay (days)	2	16	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.1 TEP versus Mesh	1	6	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.2 TEP versus Non-Mesh	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
11.3 TEP versus Mixed Open	1	10	Mean Difference (IV, Fixed, 95% CI)	Not estimable
12 Time to return to usual activities (days)	1	8	Peto Odds Ratio (95% CI)	0.78 [0.19, 3.15]
12.1 TEP versus Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
12.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
12.3 TEP versus Mixed Open	1	8	Peto Odds Ratio (95% CI)	0.78 [0.19, 3.15]
13 Persisting pain	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.62 [0.06, 6.42]
13.1 TEP versus Mesh	1	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
13.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
13.3 TEP versus Mixed Open	1	12	Peto Odds Ratio (Peto, Fixed, 95% CI)	0.62 [0.06, 6.42]
14 Persisting numbness	2	19	Peto Odds Ratio (Peto, Fixed, 95% CI)	10.56 [1.03, 108.64]
14.1 TEP versus Mesh	1	7	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (Peto, Fixed, 95% CI)	Not estimable
14.3 TEP versus Mixed Open	1	12	Peto Odds Ratio (Peto, Fixed, 95% CI)	10.56 [1.03, 108.64]
15 Hernia recurrence	2	19	Peto Odds Ratio (95% CI)	Not estimable
15.1 TEP versus Mesh	1	7	Peto Odds Ratio (95% CI)	Not estimable
15.2 TEP versus Non-Mesh	0	0	Peto Odds Ratio (95% CI)	Not estimable
15.3 TEP versus Mixed Open	1	12	Peto Odds Ratio (95% CI)	Not estimable

Comparison 13. Laparoscopic versus mesh (published data)

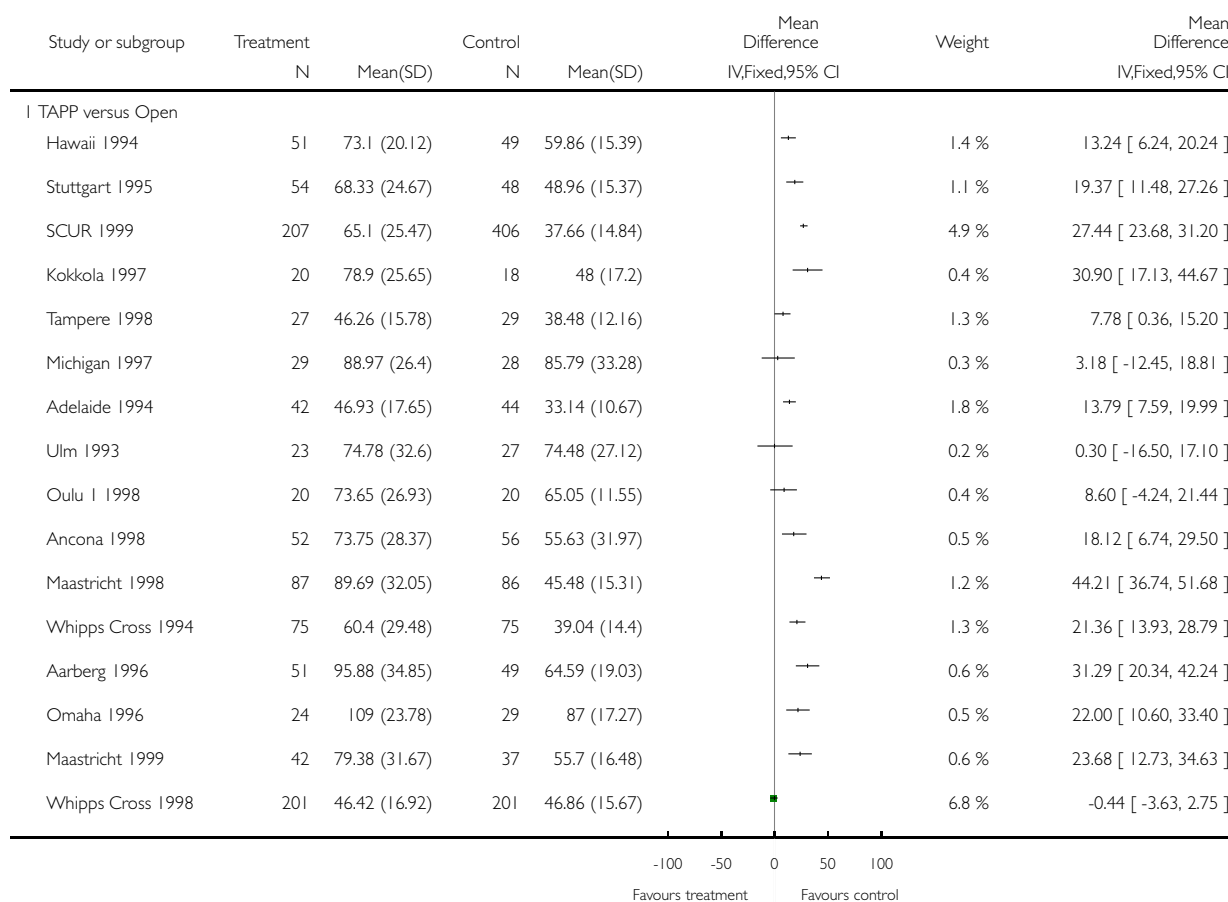
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Persisting pain (published data)	2	488	Odds Ratio (M-H, Fixed, 95% CI)	2.28 [0.58, 8.92]
1.1 TAPP versus Open Mesh	2	488	Odds Ratio (M-H, Fixed, 95% CI)	2.28 [0.58, 8.92]
1.2 TEP versus Open Mesh	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable

Analysis 1.1. Comparison 1 Laparoscopic versus Open, Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

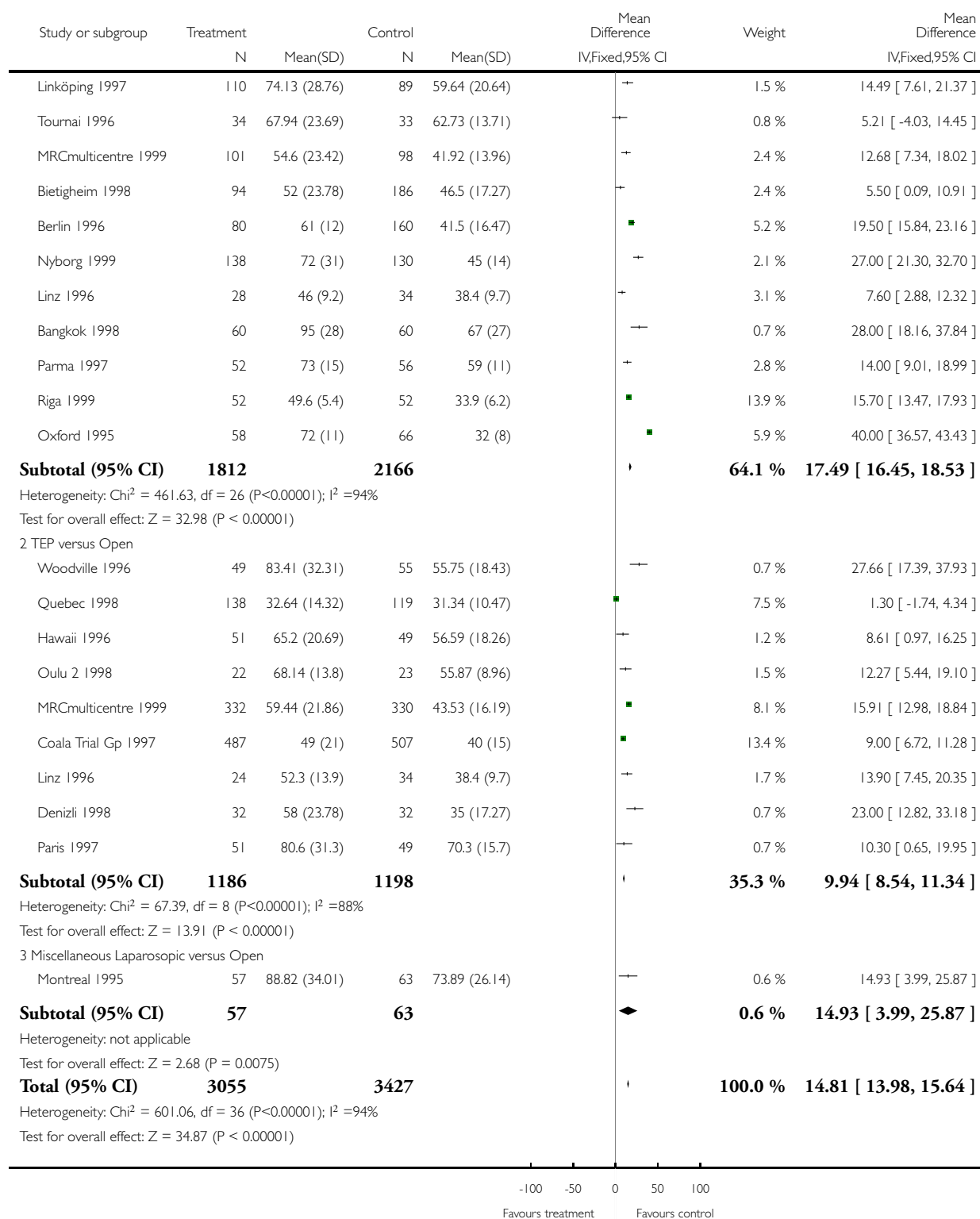
Comparison: 1 Laparoscopic versus Open

Outcome: 1 Duration of operation (minutes)



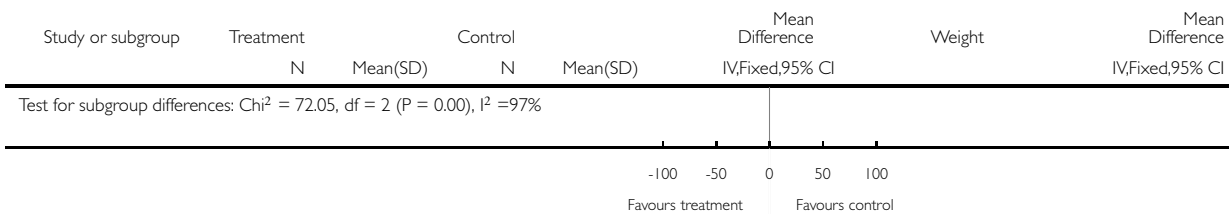
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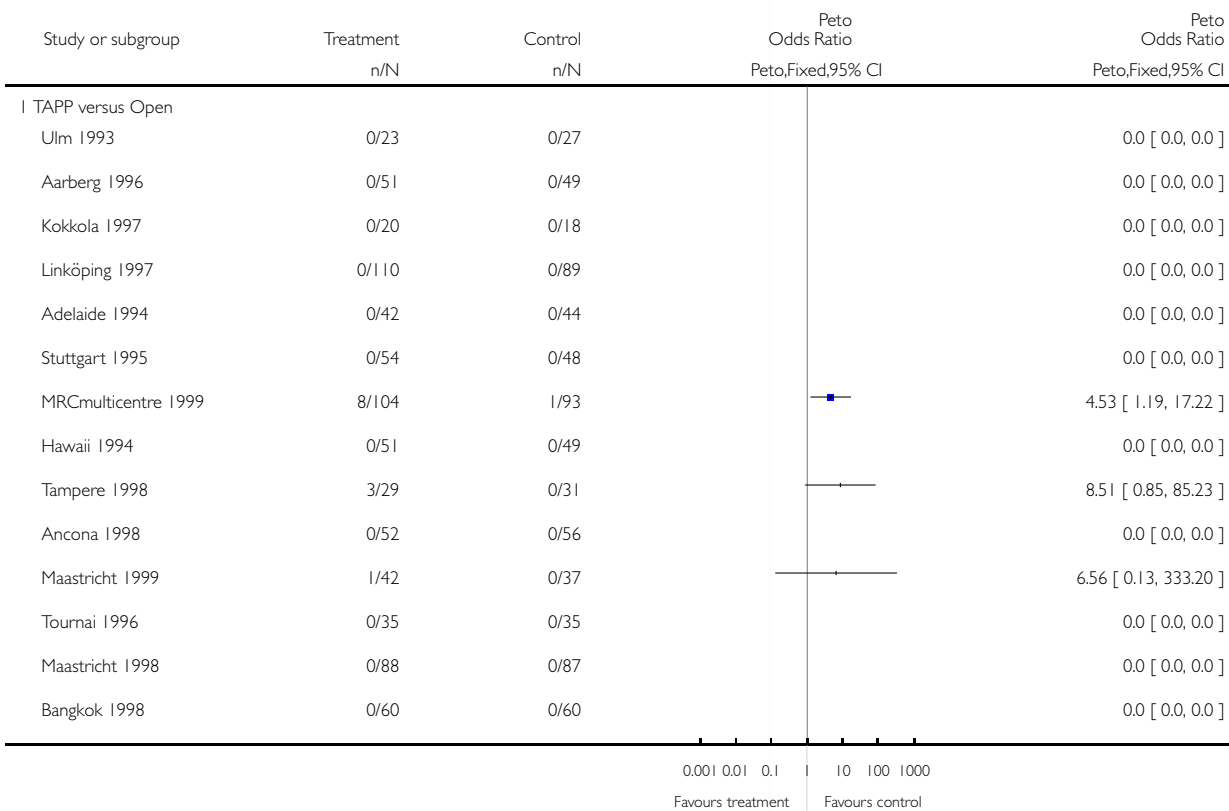


Analysis 1.2. Comparison 1 Laparoscopic versus Open, Outcome 2 "Opposite" method initiated.

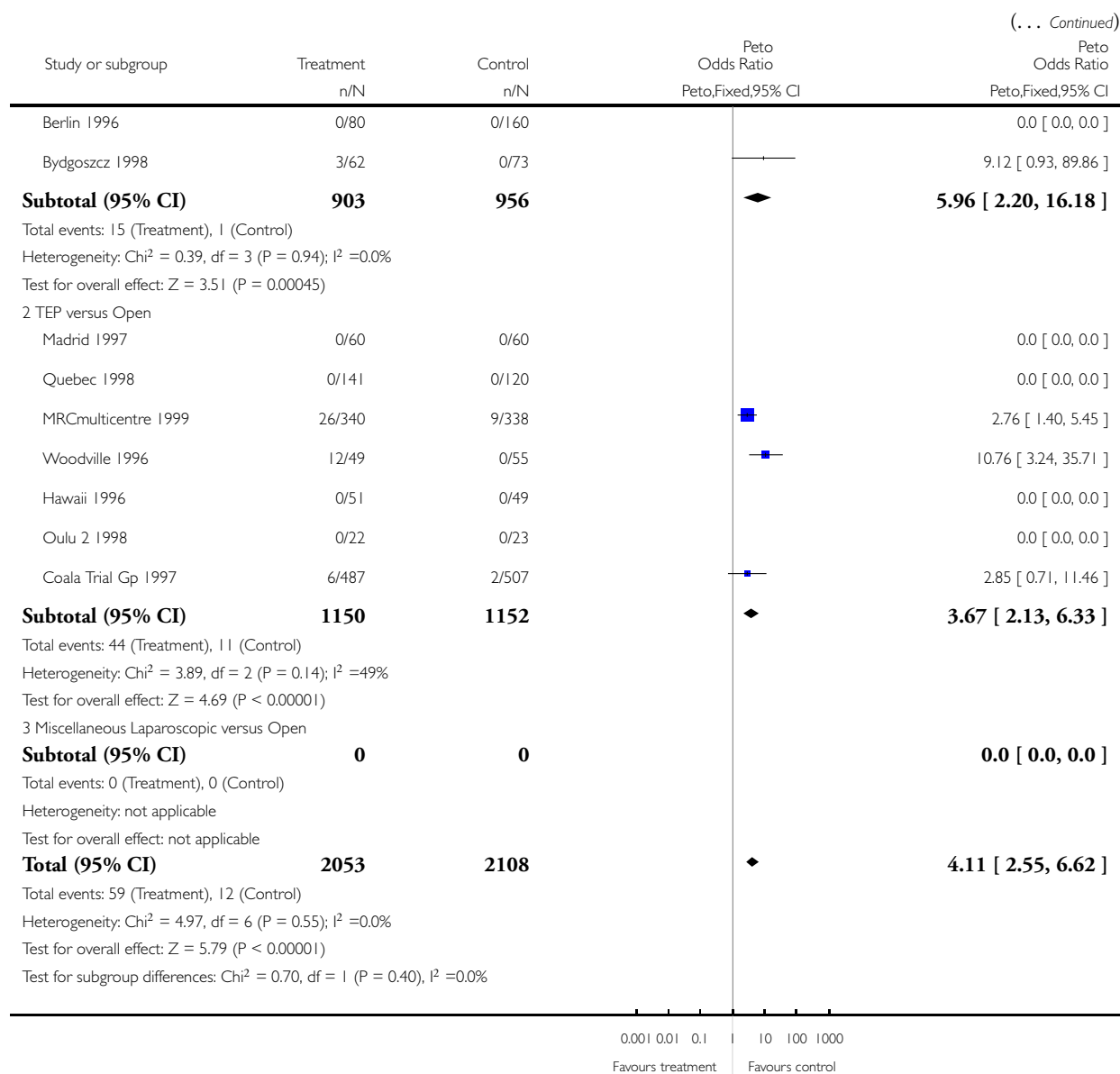
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 1 Laparoscopic versus Open

Outcome: 2 "Opposite" method initiated



(Continued ...)

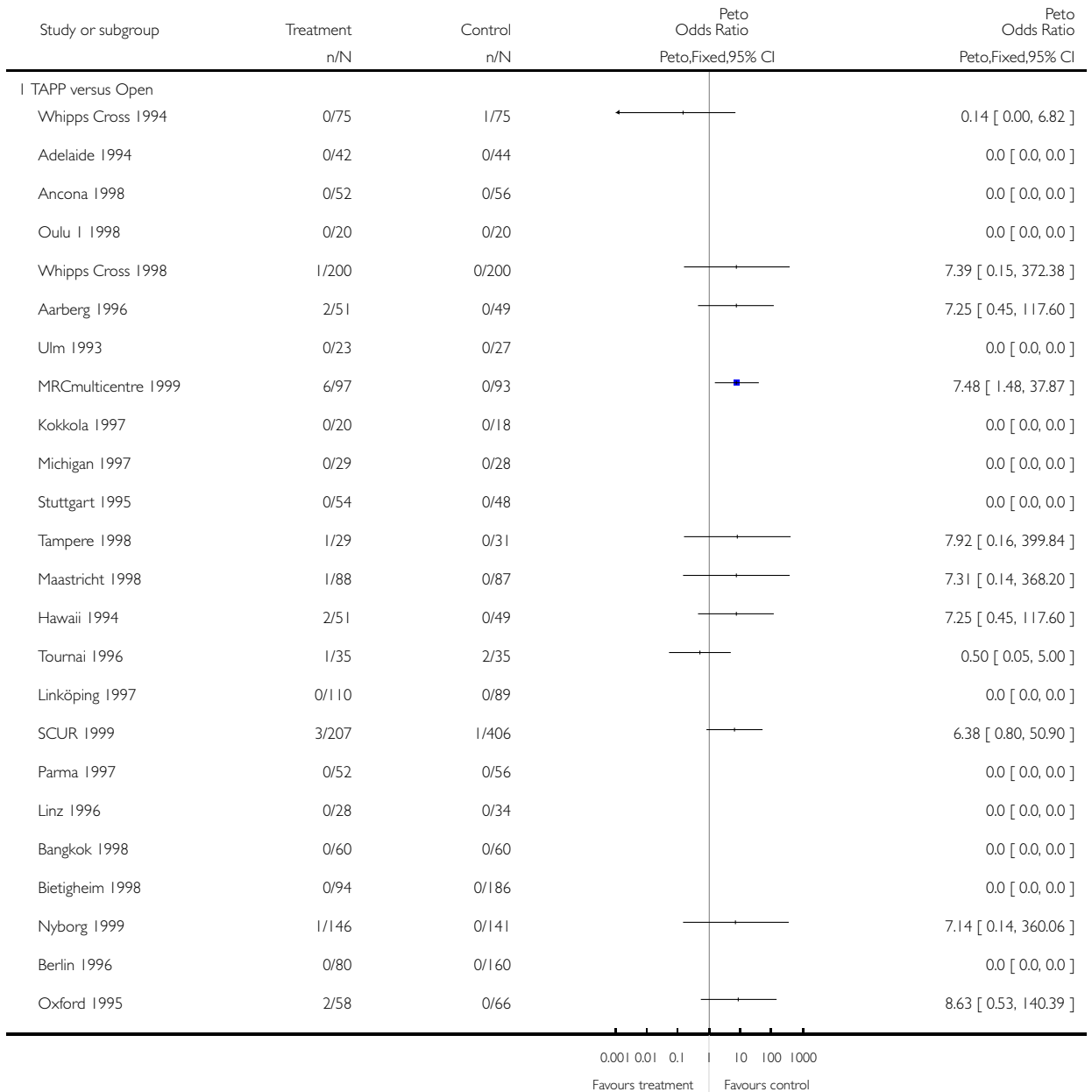


Analysis 1.3. Comparison 1 Laparoscopic versus Open, Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

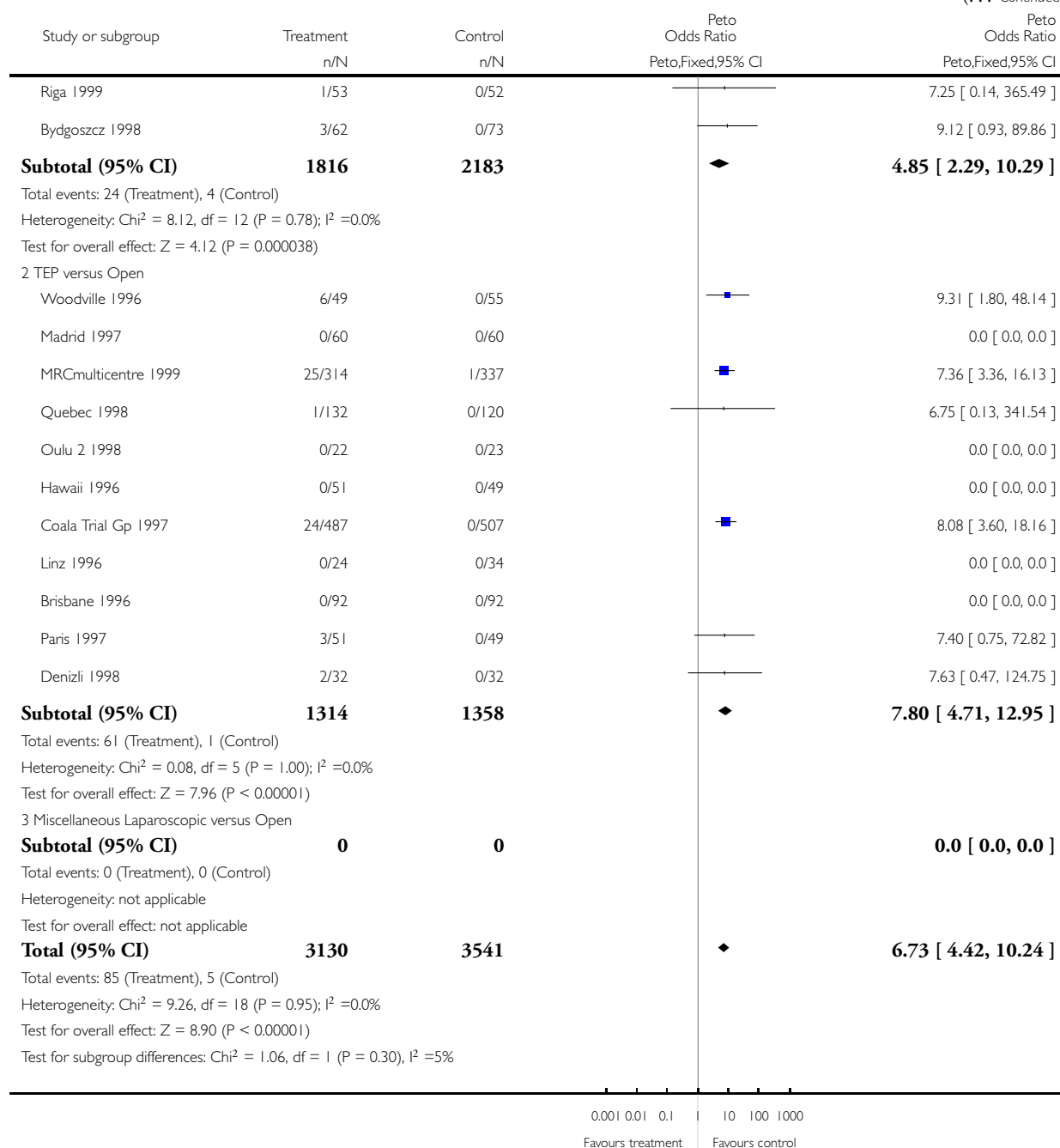
Comparison: 1 Laparoscopic versus Open

Outcome: 3 Conversion



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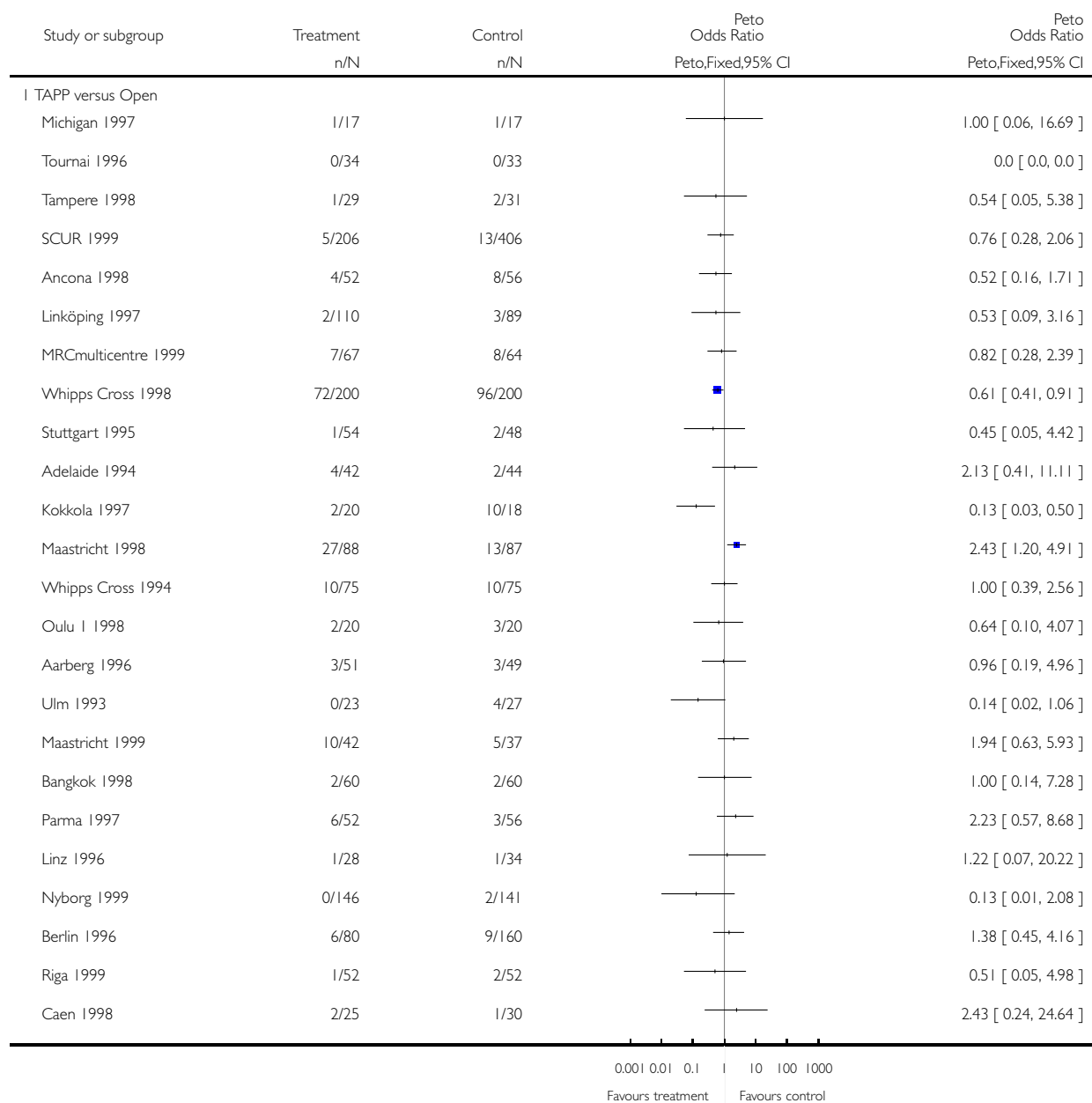


Analysis I.4. Comparison I Laparoscopic versus Open, Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

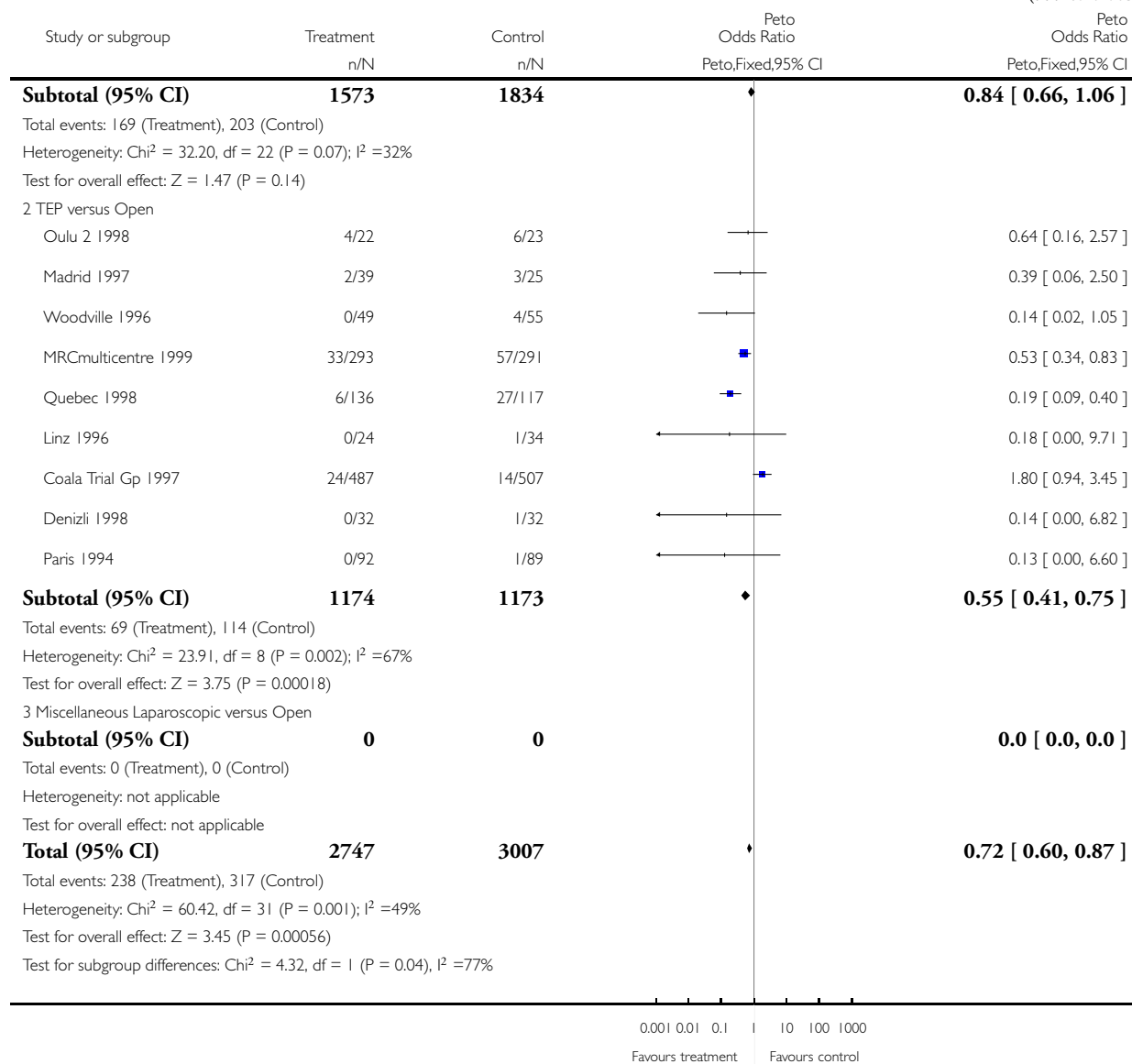
Comparison: I Laparoscopic versus Open

Outcome: 4 Haematoma



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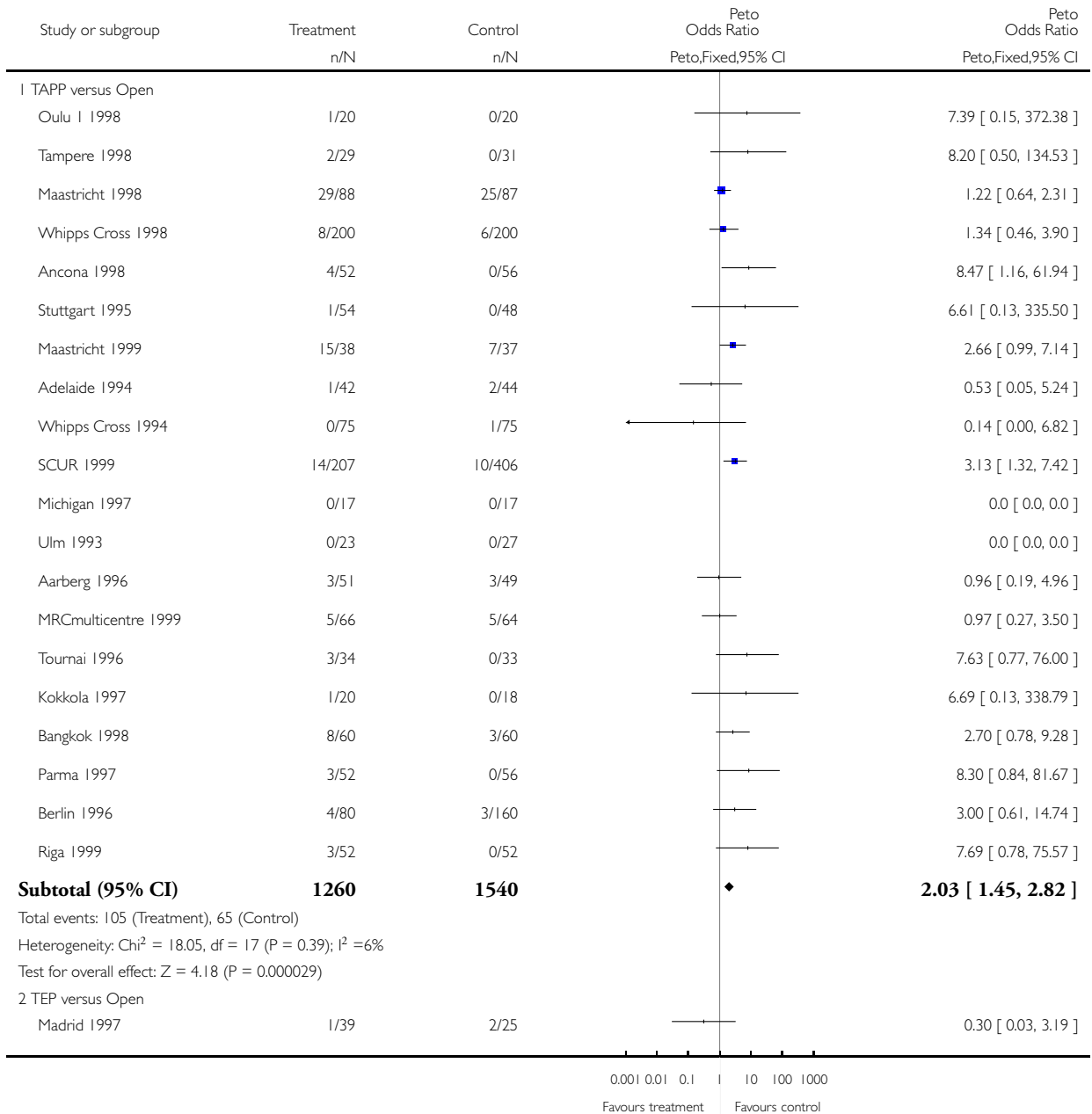


Analysis 1.5. Comparison 1 Laparoscopic versus Open, Outcome 5 Seroma.

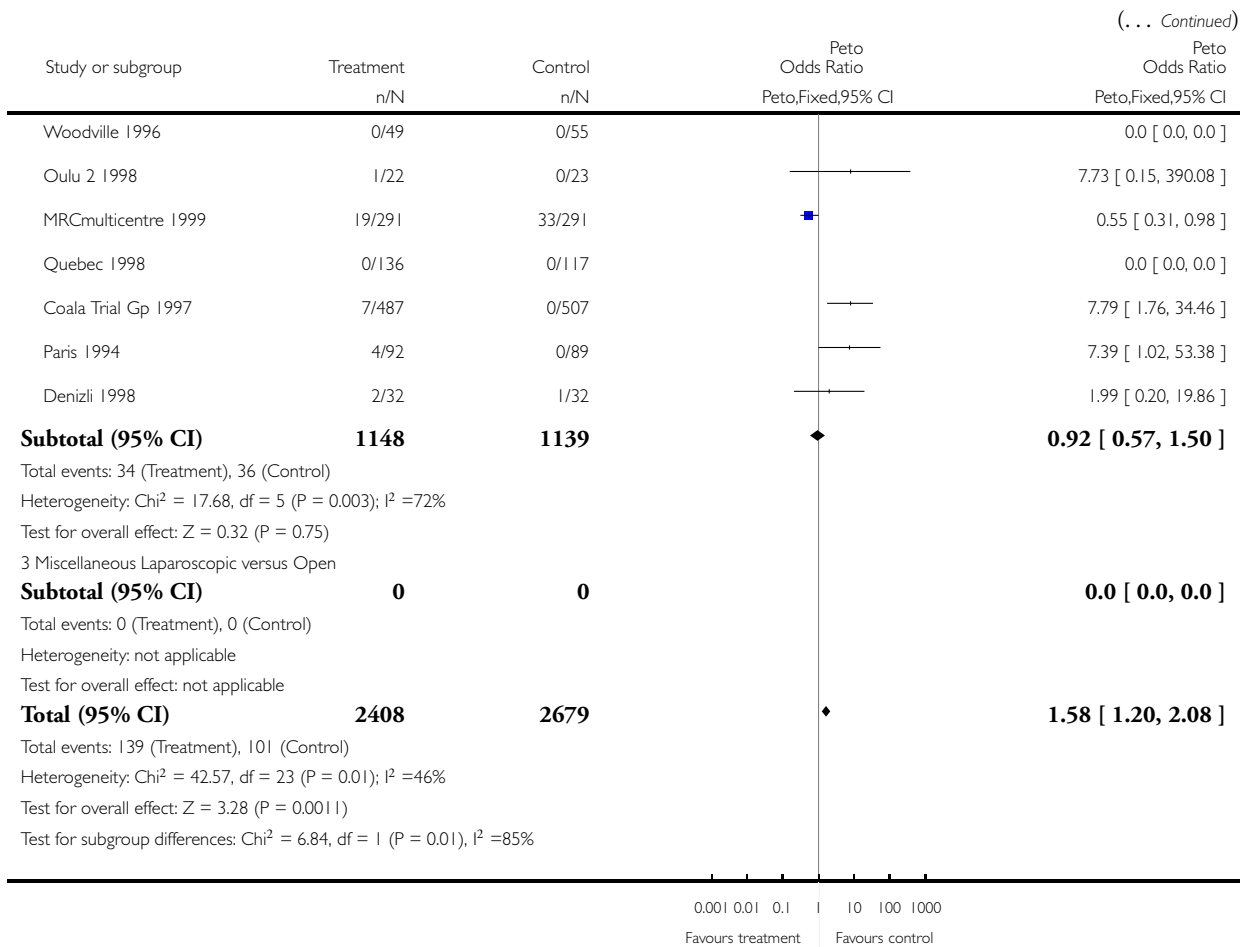
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 1 Laparoscopic versus Open

Outcome: 5 Seroma



(Continued ...)

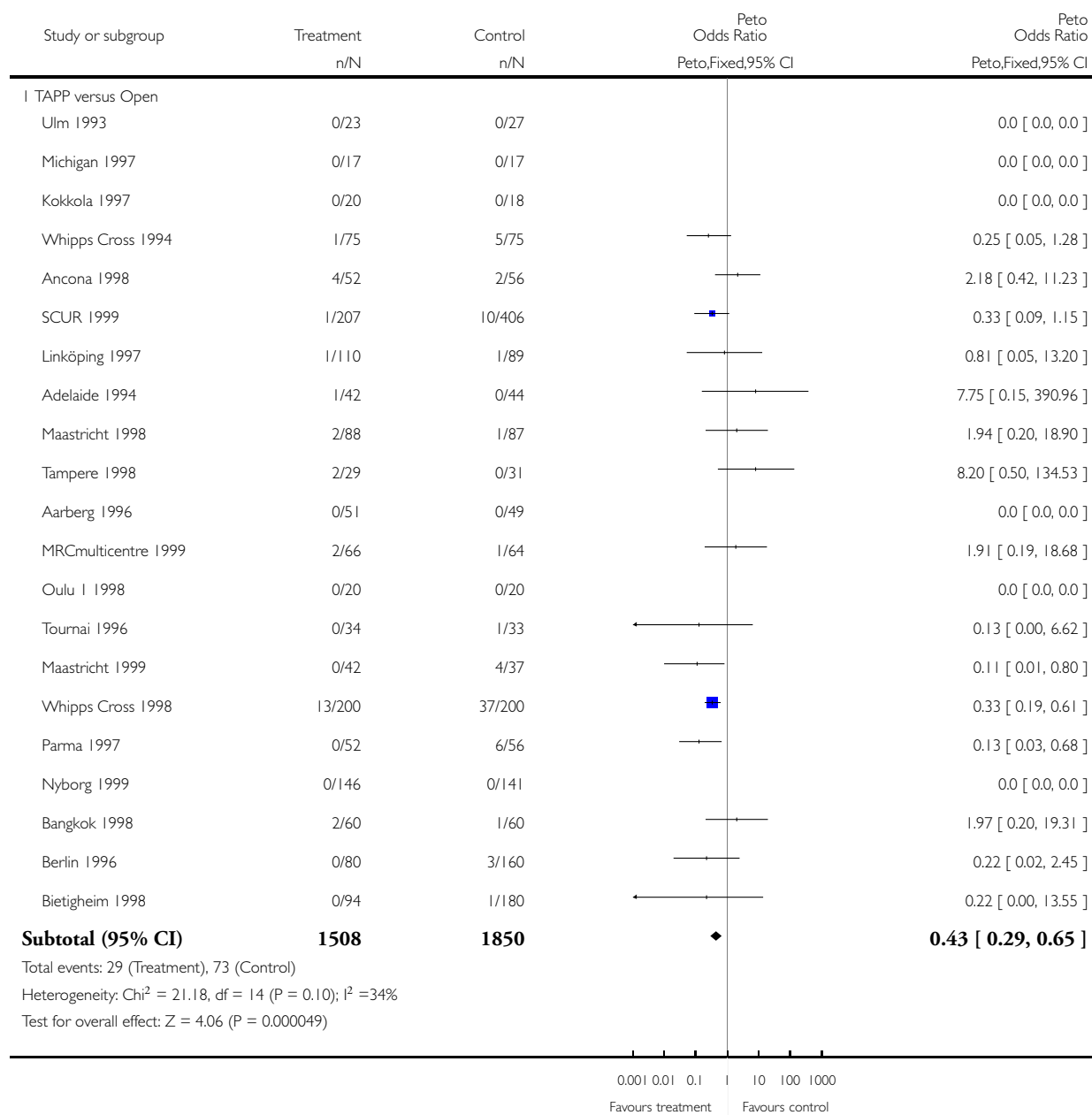


Analysis 1.6. Comparison 1 Laparoscopic versus Open, Outcome 6 Wound/superficial infection.

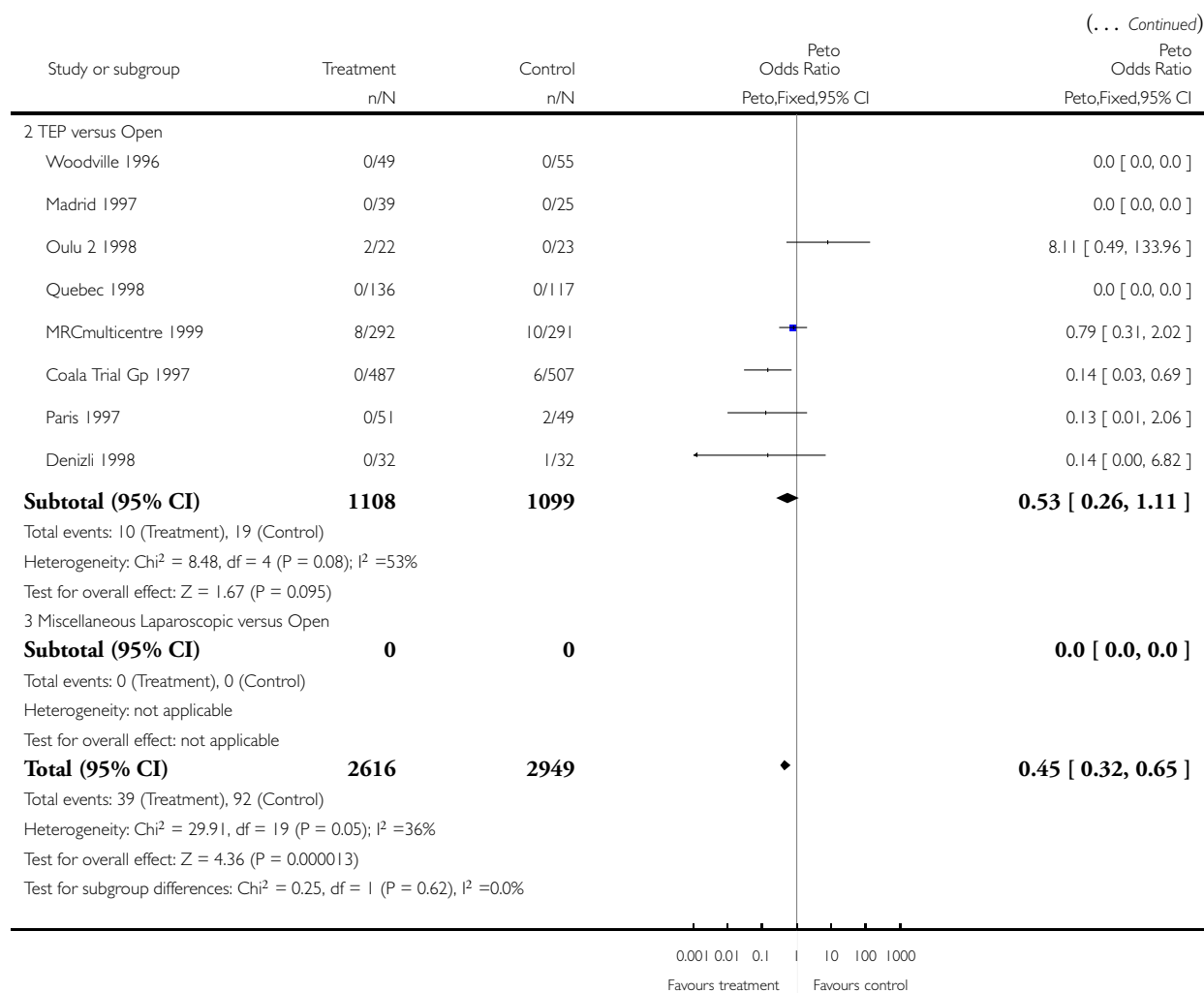
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 1 Laparoscopic versus Open

Outcome: 6 Wound/superficial infection



(Continued ...)

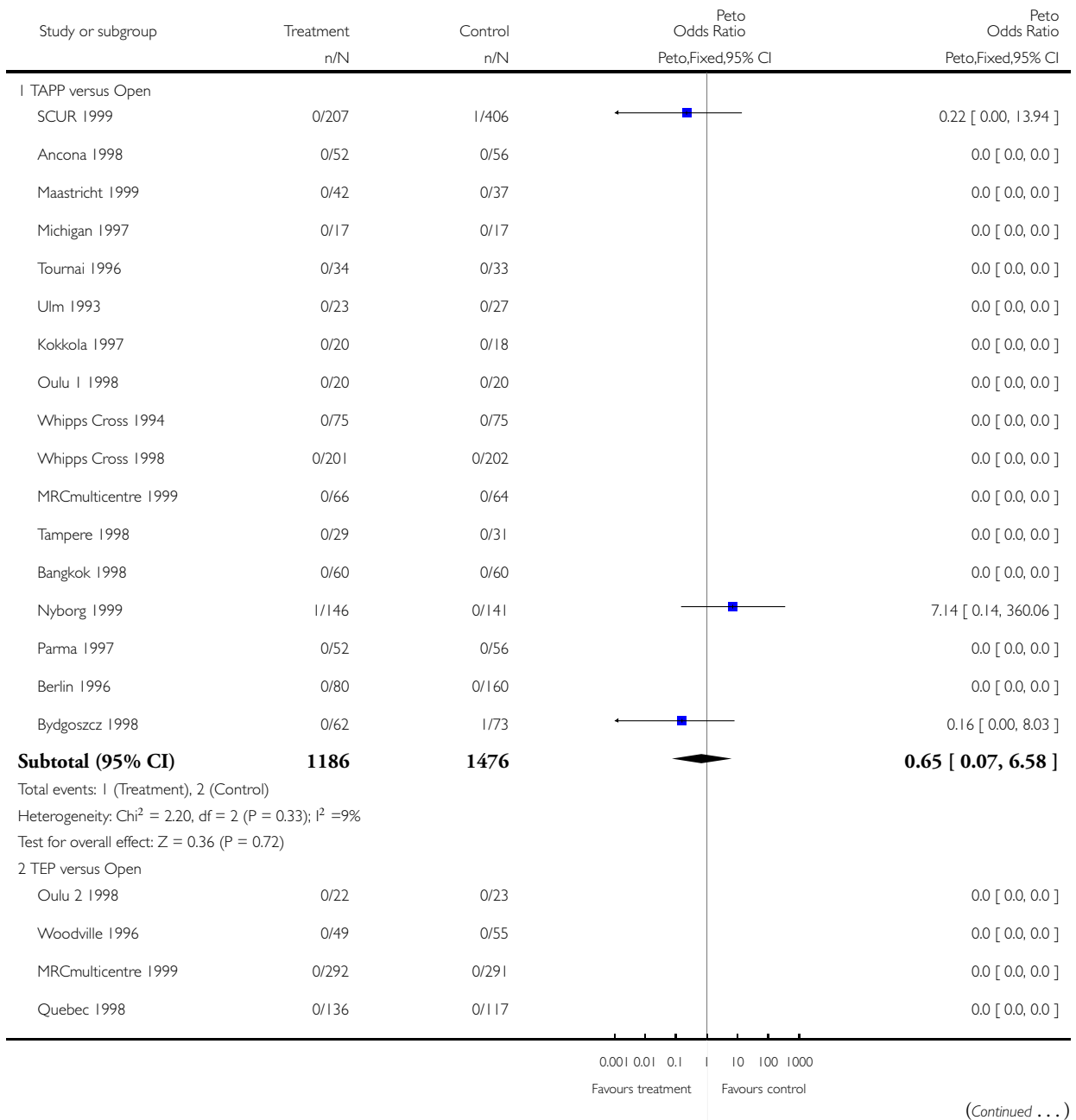


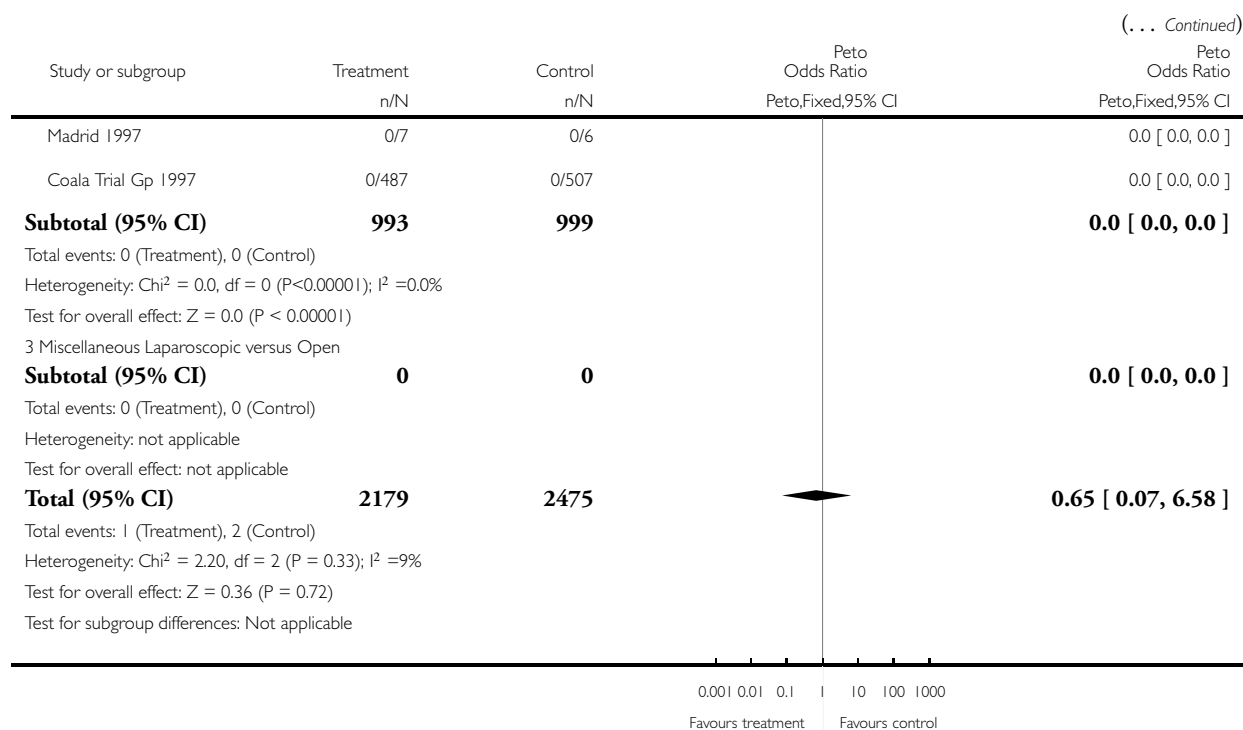
Analysis 1.7. Comparison 1 Laparoscopic versus Open, Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 1 Laparoscopic versus Open

Outcome: 7 Mesh/deep infection



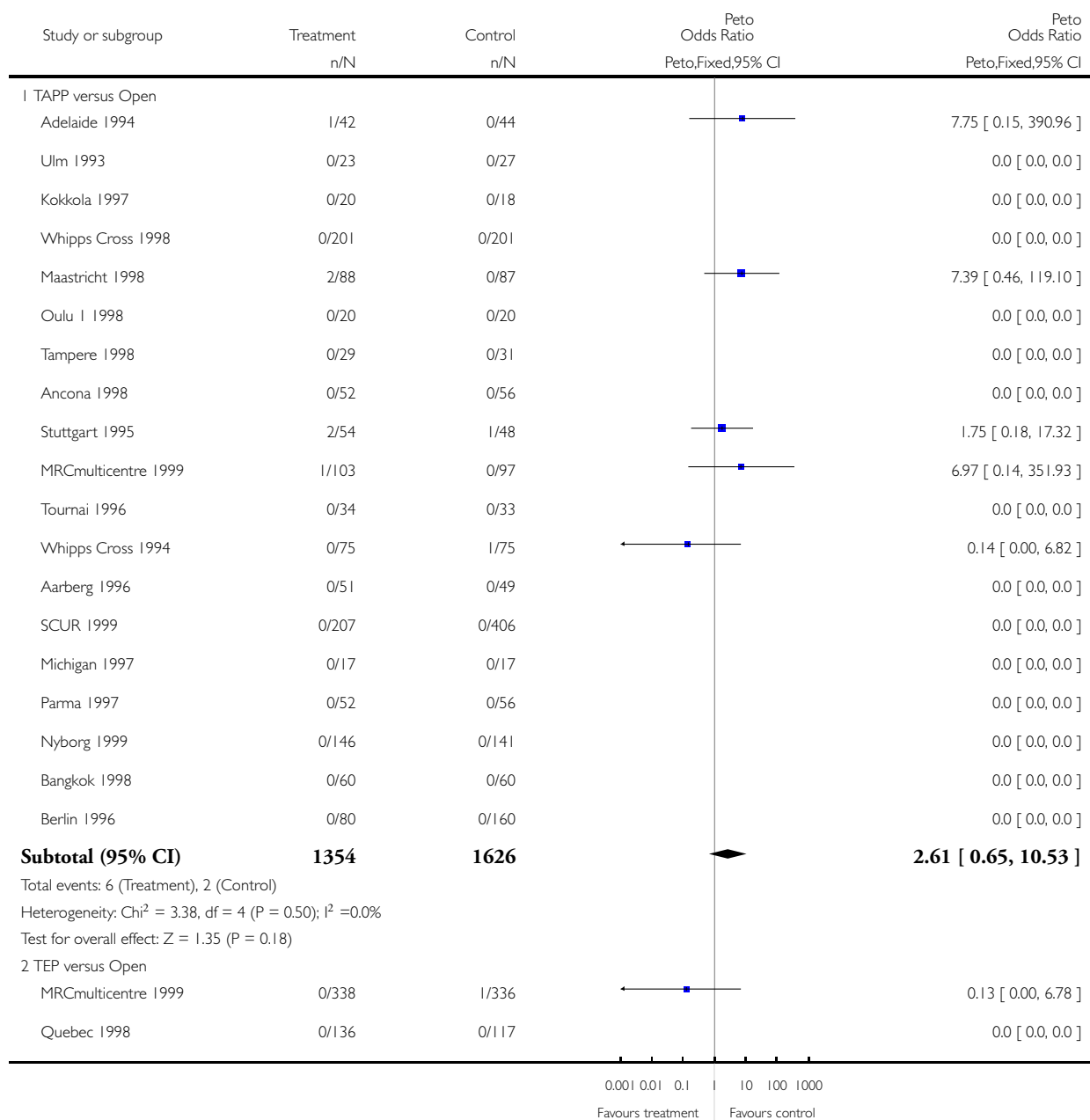


Analysis 1.8. Comparison 1 Laparoscopic versus Open, Outcome 8 Vascular injury.

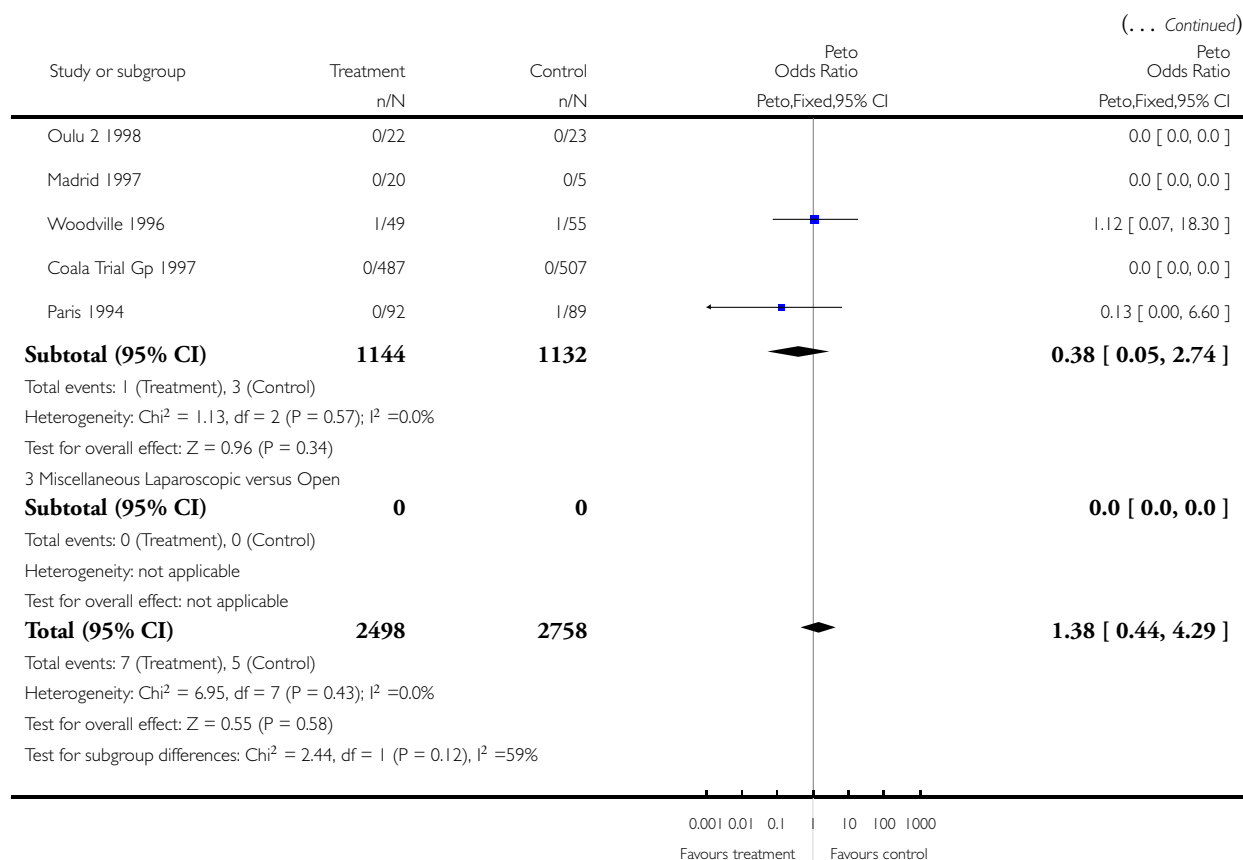
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 1 Laparoscopic versus Open

Outcome: 8 Vascular injury



(Continued ...)

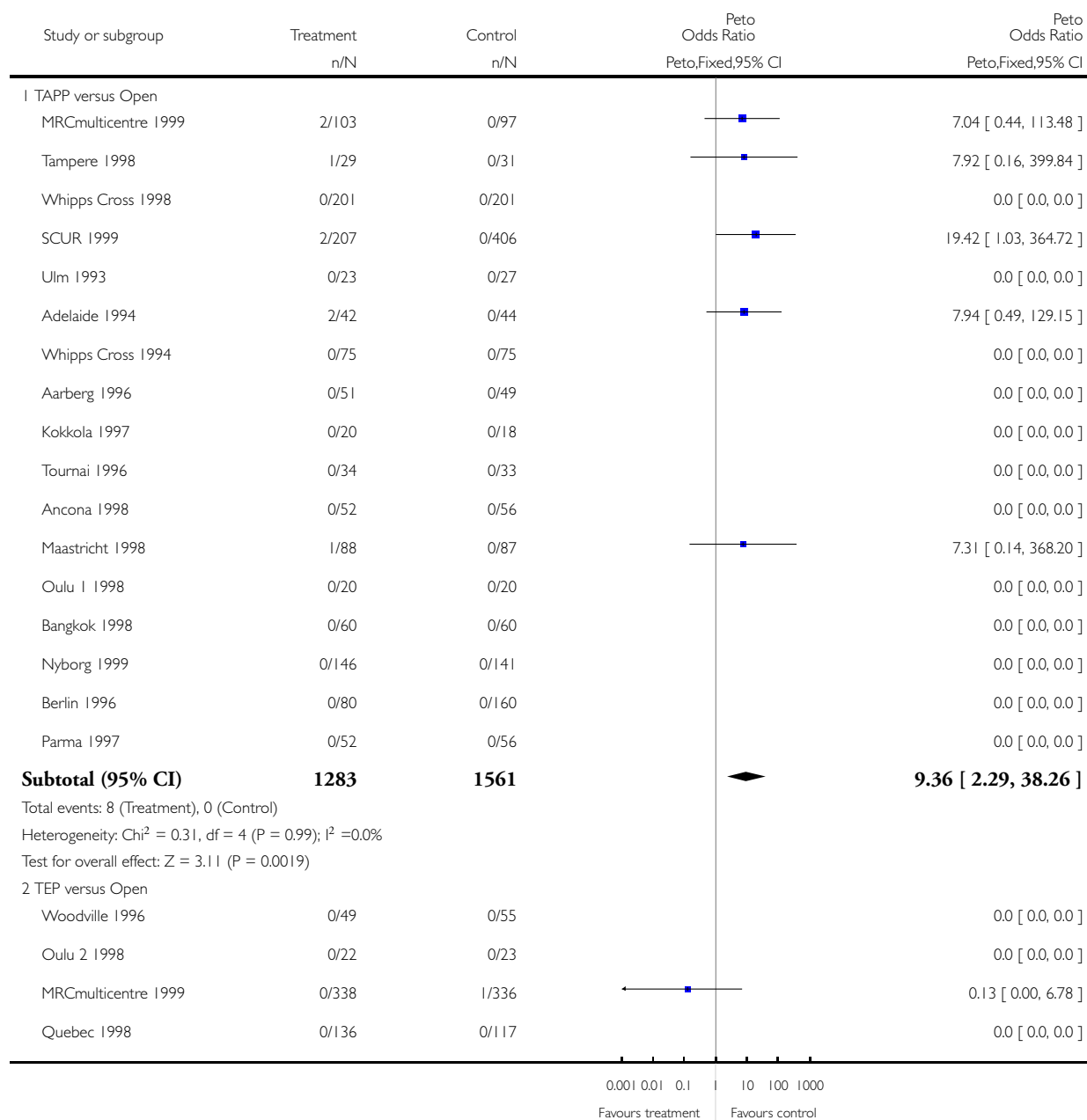


Analysis 1.9. Comparison 1 Laparoscopic versus Open, Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

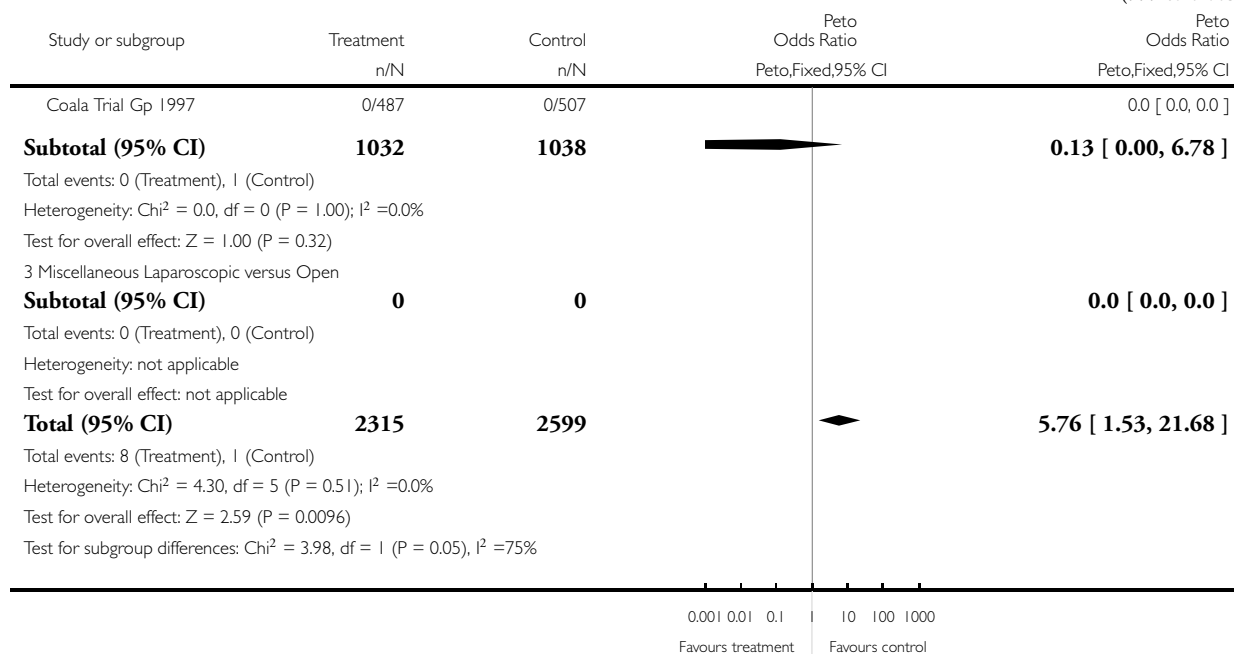
Comparison: 1 Laparoscopic versus Open

Outcome: 9 Visceral injury



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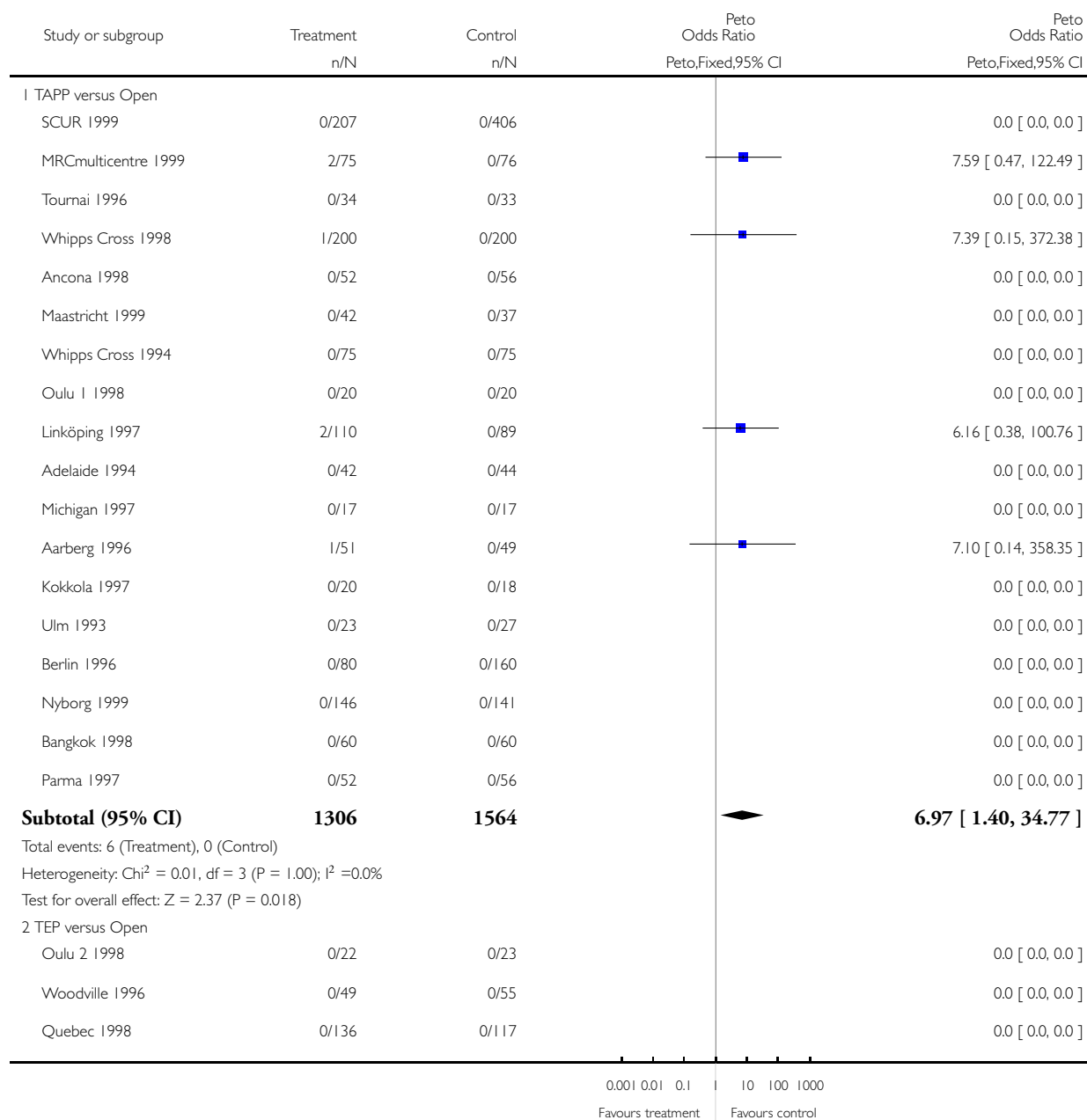


Analysis I.10. Comparison I Laparoscopic versus Open, Outcome 10 Port site hernia.

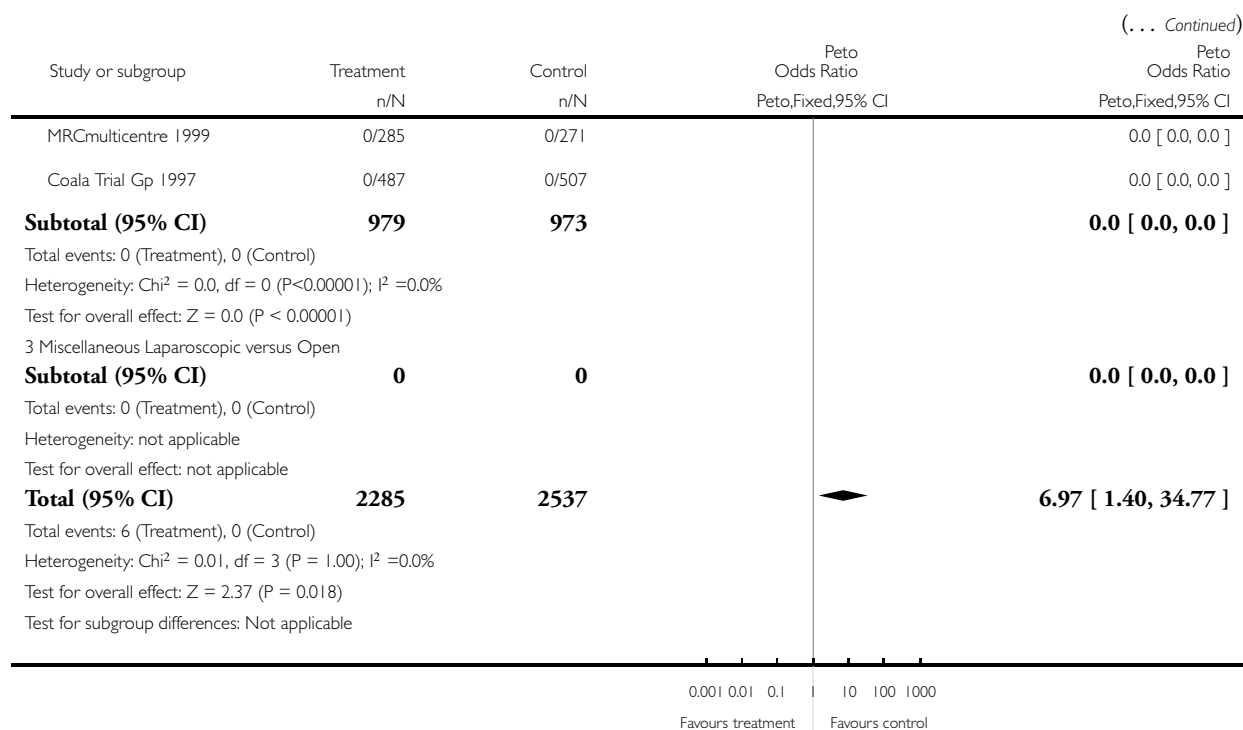
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: I Laparoscopic versus Open

Outcome: 10 Port site hernia



(Continued ...)

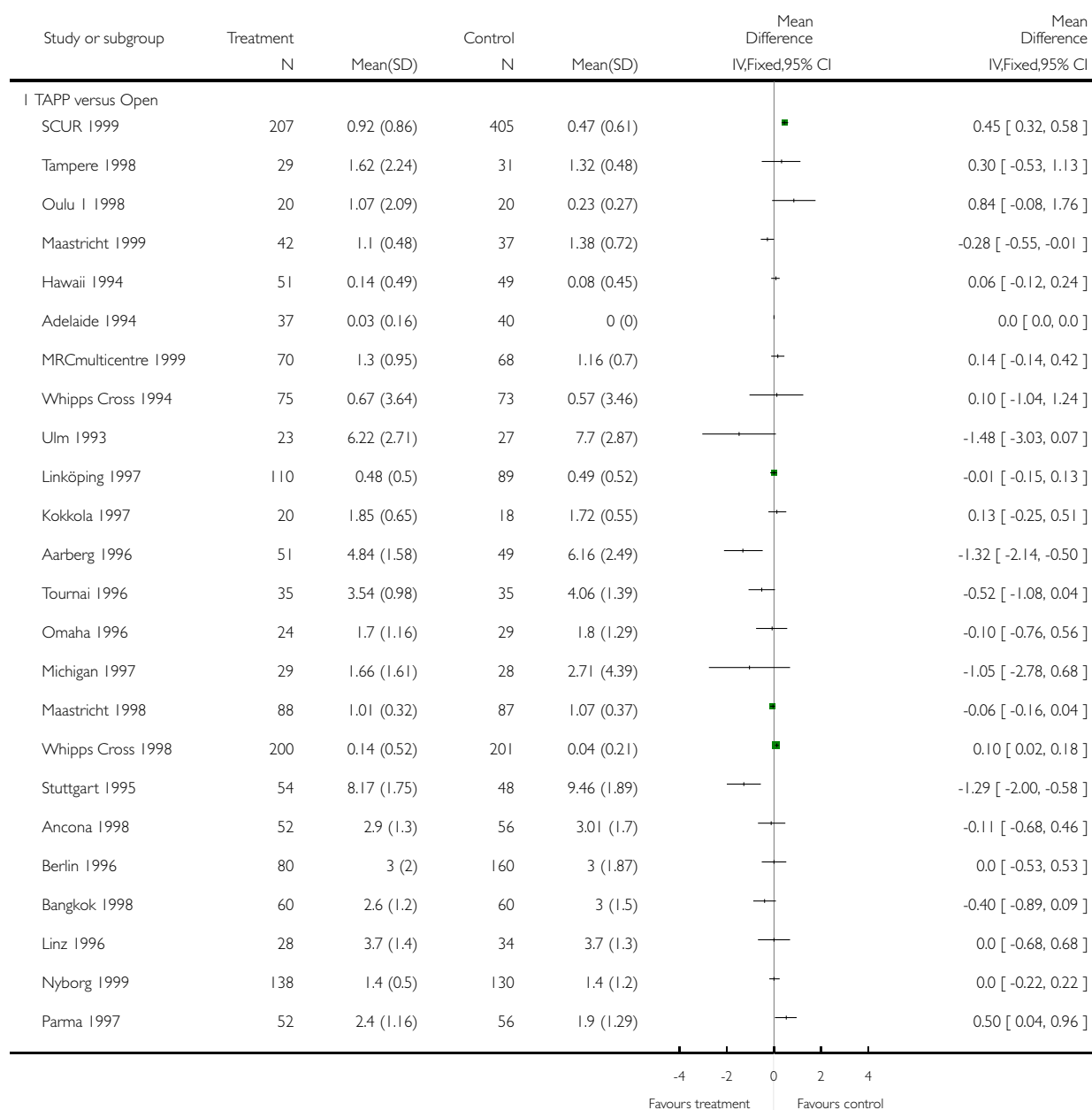


Analysis 1.11. Comparison 1 Laparoscopic versus Open, Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

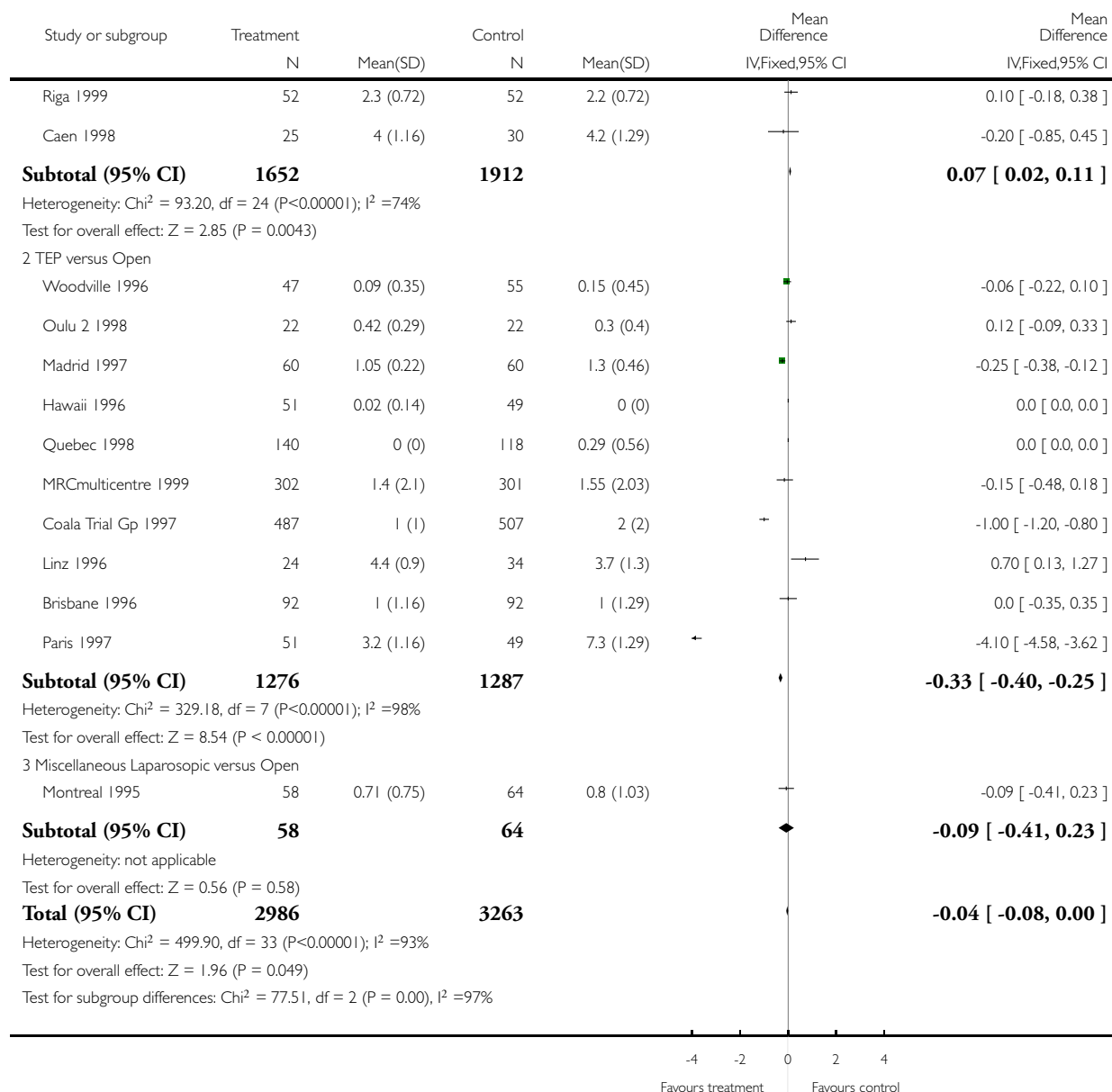
Comparison: 1 Laparoscopic versus Open

Outcome: 11 Length of stay (days)



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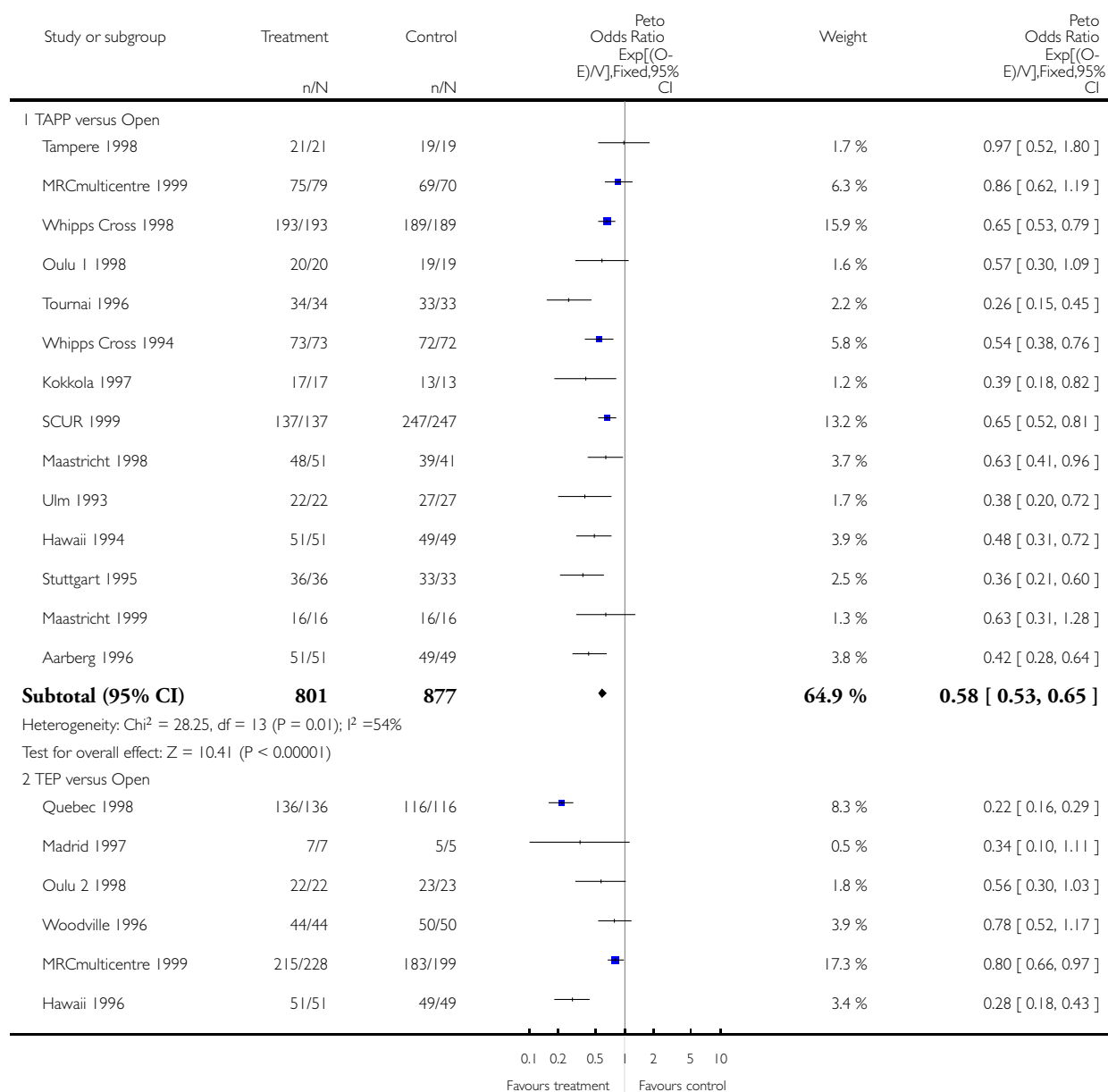


Analysis 1.12. Comparison 1 Laparoscopic versus Open, Outcome 12 Time to return to usual activities (days).

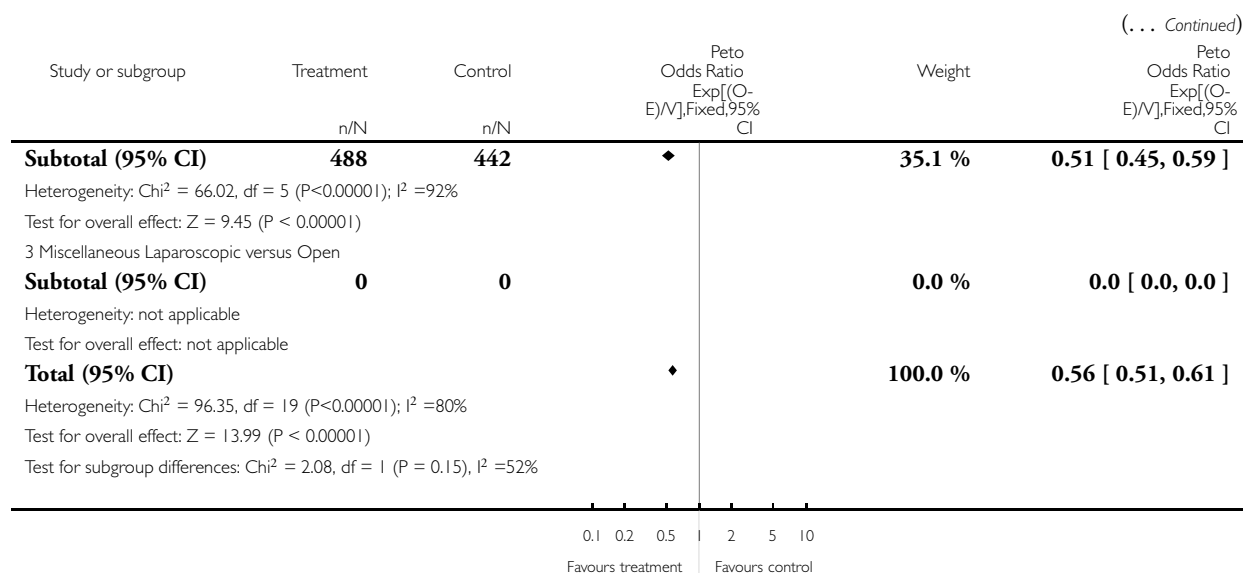
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 1 Laparoscopic versus Open

Outcome: 12 Time to return to usual activities (days)



(Continued ...)

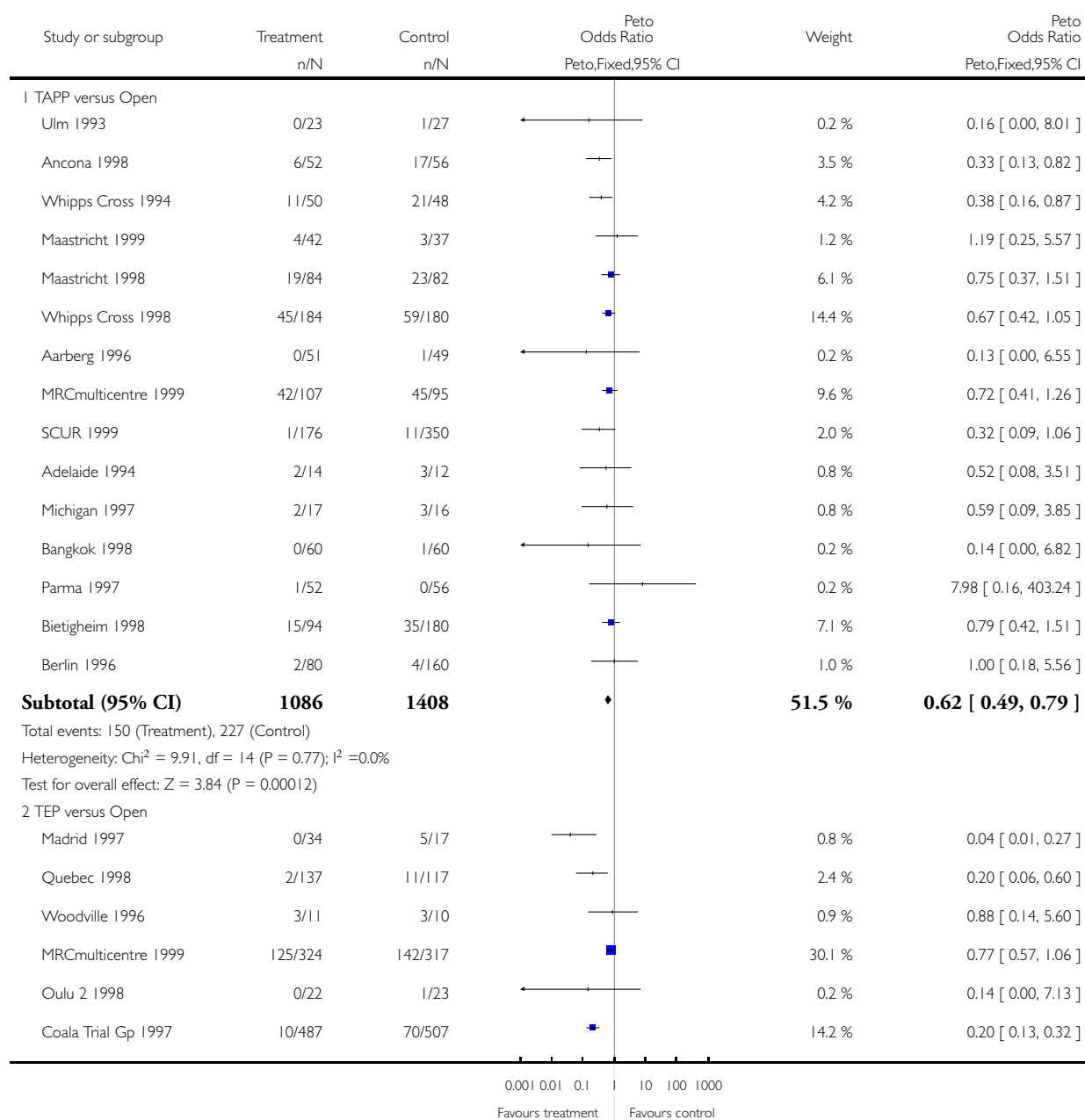


Analysis 1.13. Comparison 1 Laparoscopic versus Open, Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 1 Laparoscopic versus Open

Outcome: 13 Persisting pain



(Continued ...)

(... Continued)

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Weight	Peto Odds Ratio Peto,Fixed,95% CI
Subtotal (95% CI)	1015	991	♦	48.5 %	0.47 [0.36, 0.60]
Total events: 140 (Treatment), 232 (Control)					
Heterogeneity: $\text{Chi}^2 = 32.03$, $\text{df} = 5$ ($P < 0.00001$); $I^2 = 84\%$					
Test for overall effect: $Z = 6.07$ ($P < 0.00001$)					
3 Miscellaneous Laparoscopic versus Open					
Subtotal (95% CI)	0	0		0.0 %	0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)					
Heterogeneity: not applicable					
Test for overall effect: not applicable					
Total (95% CI)	2101	2399	♦	100.0 %	0.54 [0.46, 0.64]
Total events: 290 (Treatment), 459 (Control)					
Heterogeneity: $\text{Chi}^2 = 44.76$, $\text{df} = 20$ ($P = 0.001$); $I^2 = 55\%$					
Test for overall effect: $Z = 6.98$ ($P < 0.00001$)					
Test for subgroup differences: $\text{Chi}^2 = 2.83$, $\text{df} = 1$ ($P = 0.09$), $I^2 = 65\%$					

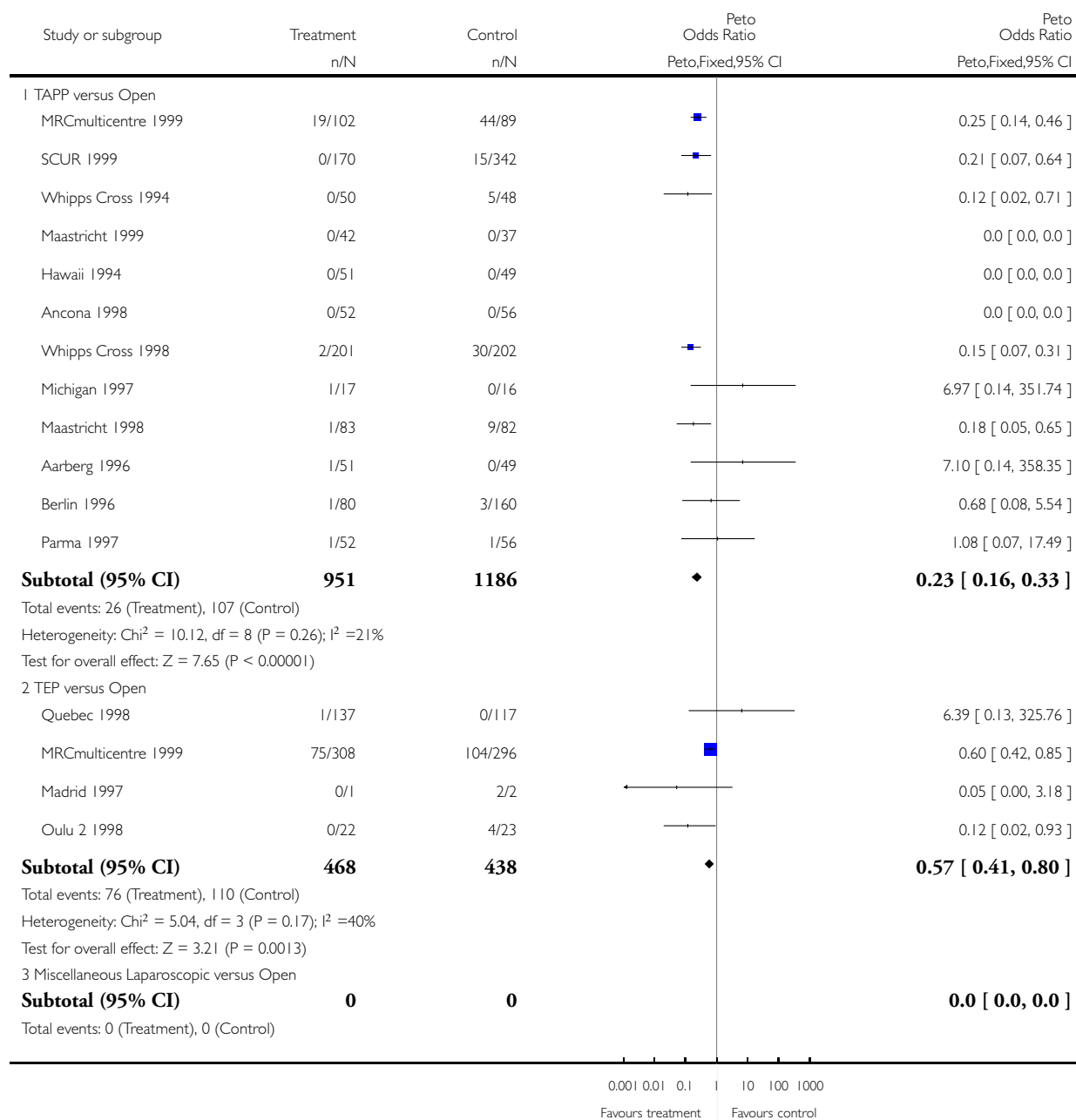
0.001 0.01 0.1 | 10 100 1000
Favours treatment Favours control

Analysis 1.14. Comparison 1 Laparoscopic versus Open, Outcome 14 Persisting numbness.

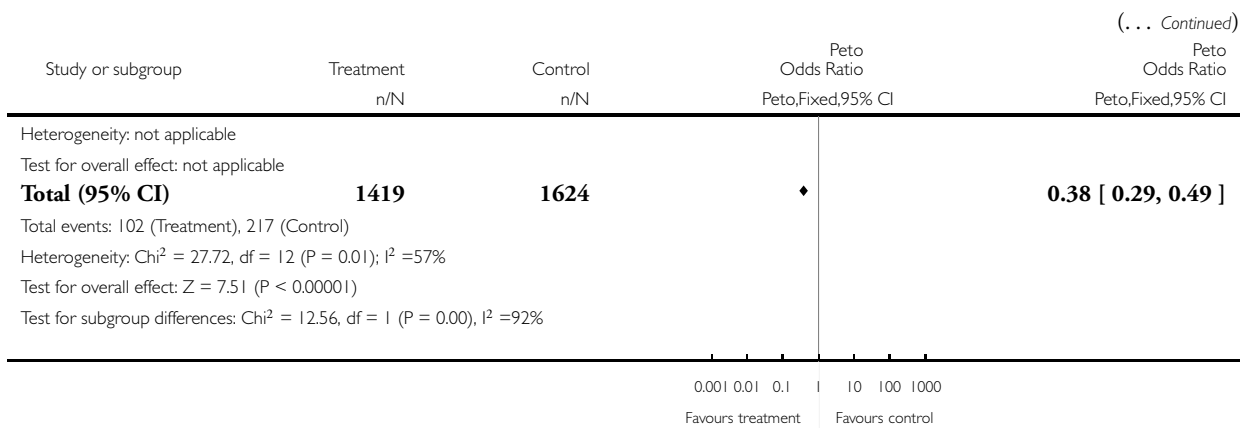
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 1 Laparoscopic versus Open

Outcome: 14 Persisting numbness



(Continued ...)

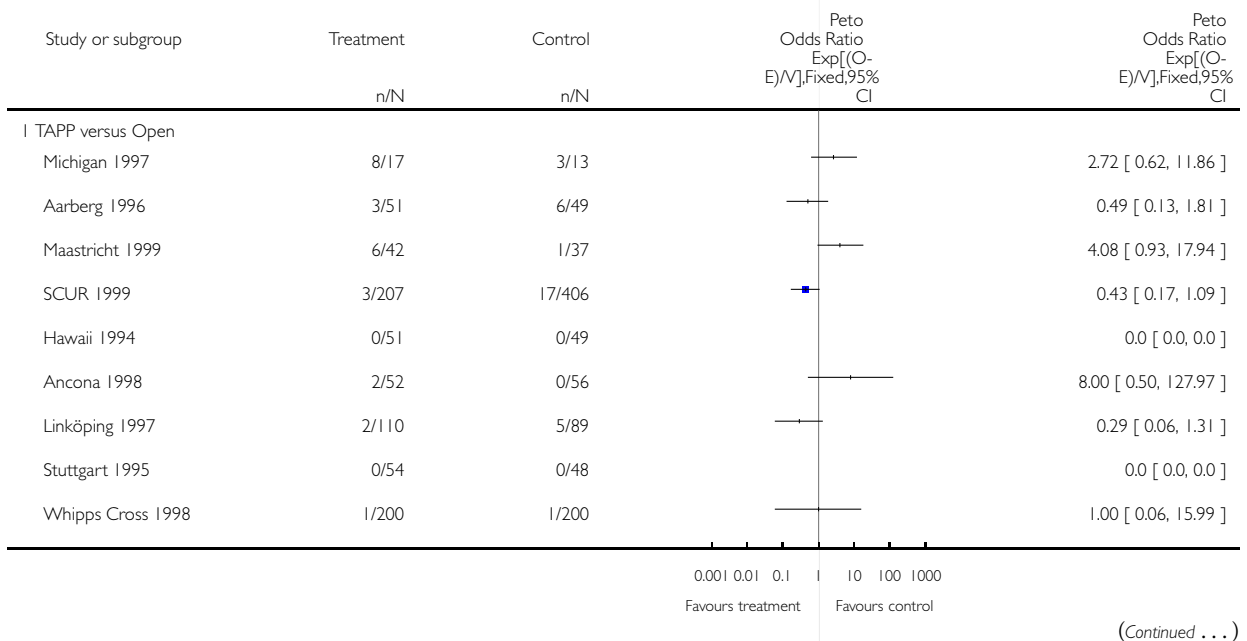


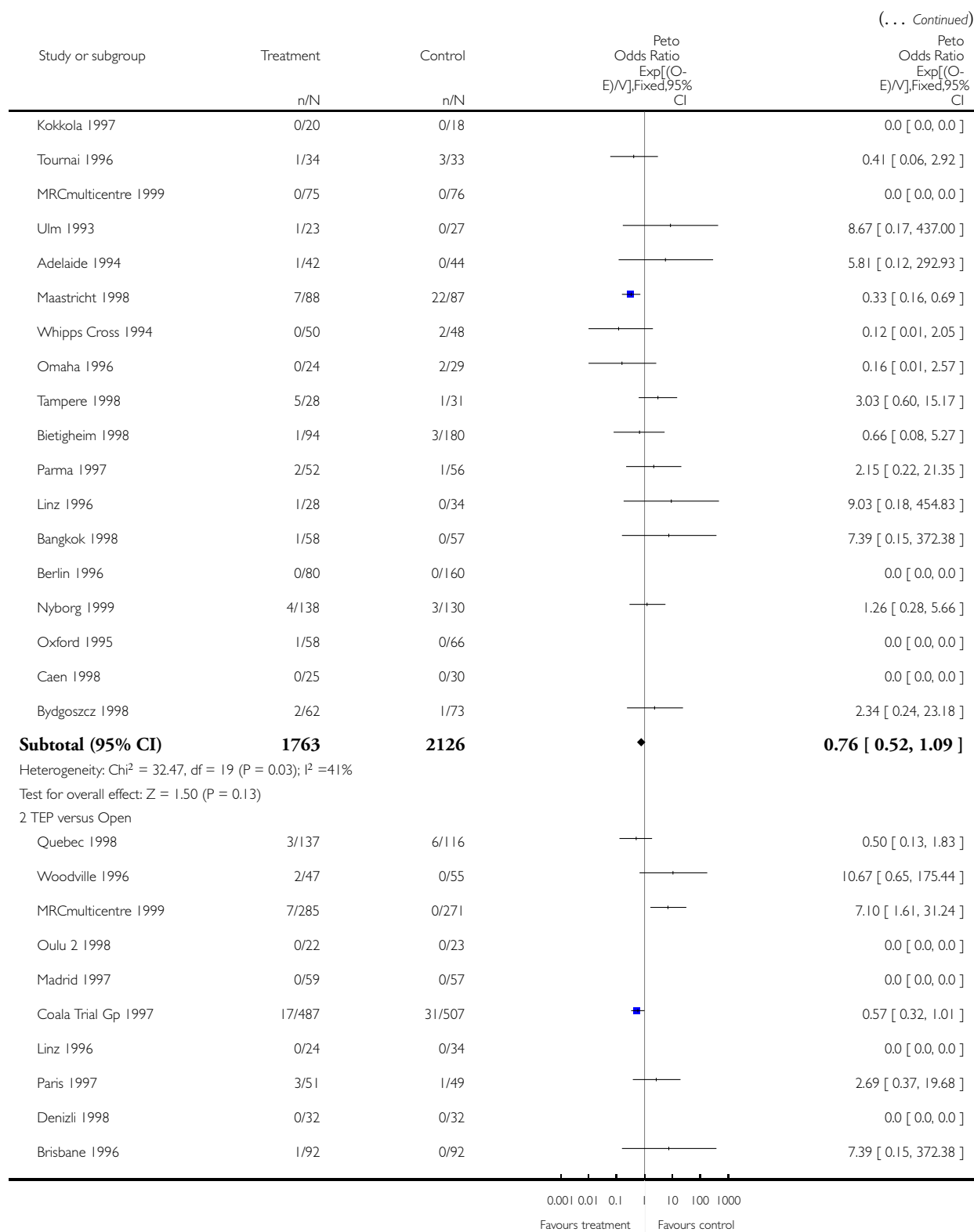
Analysis I.15. Comparison I Laparoscopic versus Open, Outcome 15 Hernia recurrence.

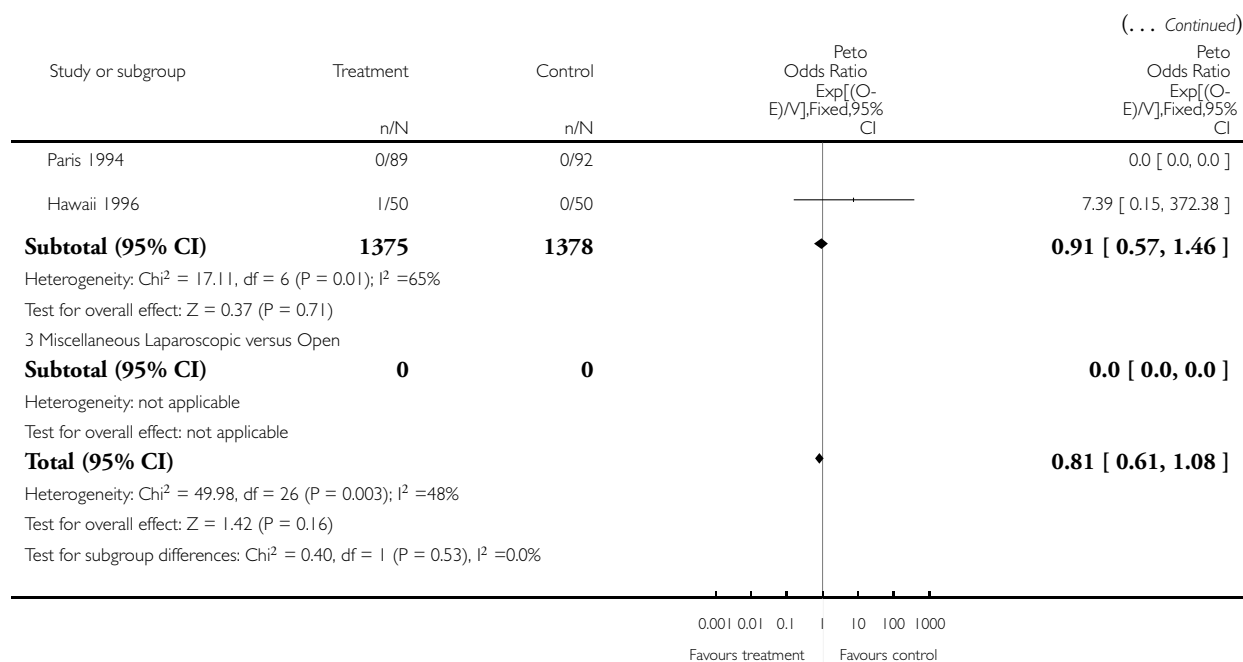
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: I Laparoscopic versus Open

Outcome: 15 Hernia recurrence





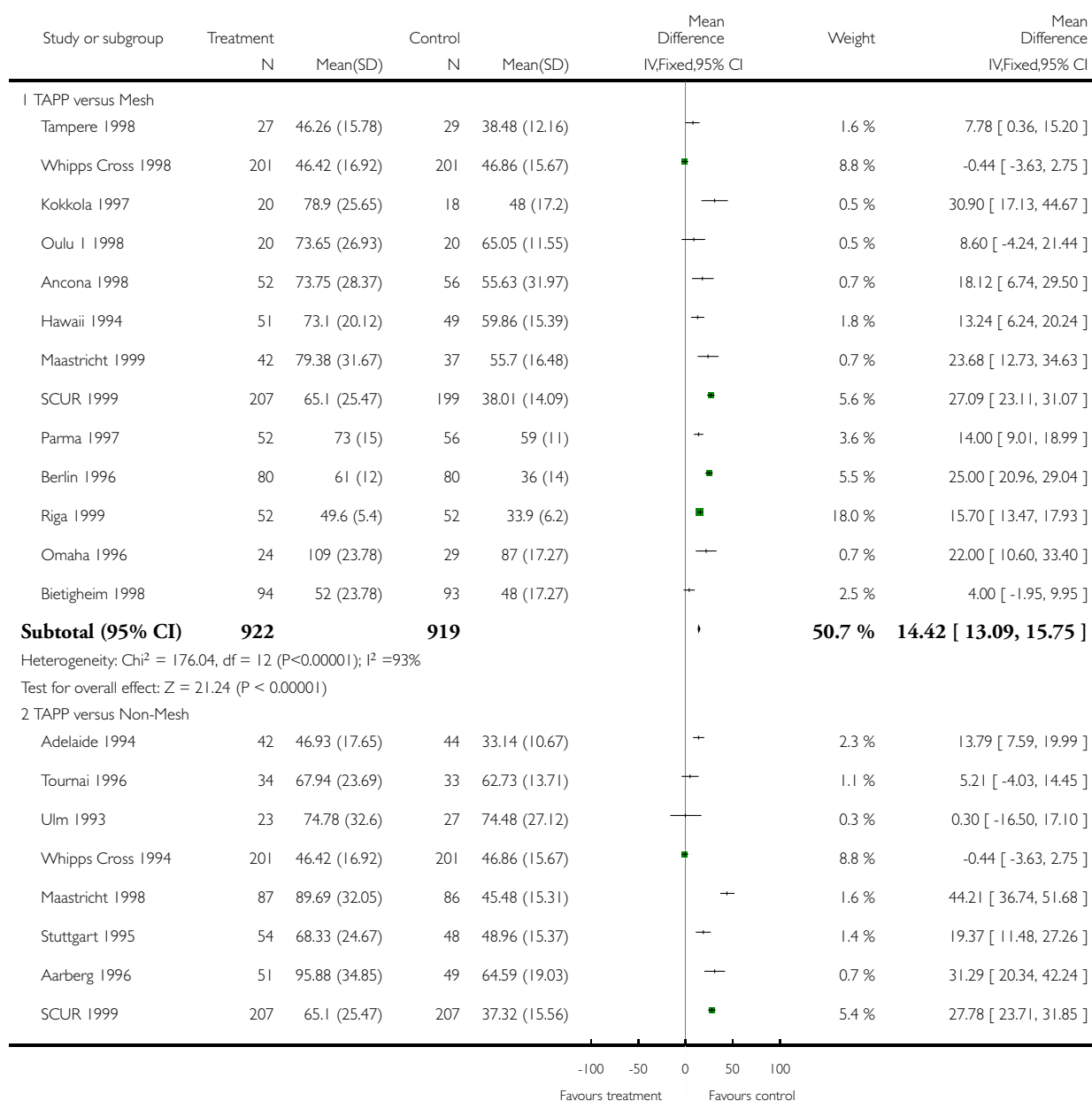


Analysis 2.1. Comparison 2 TAPP versus Open, Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

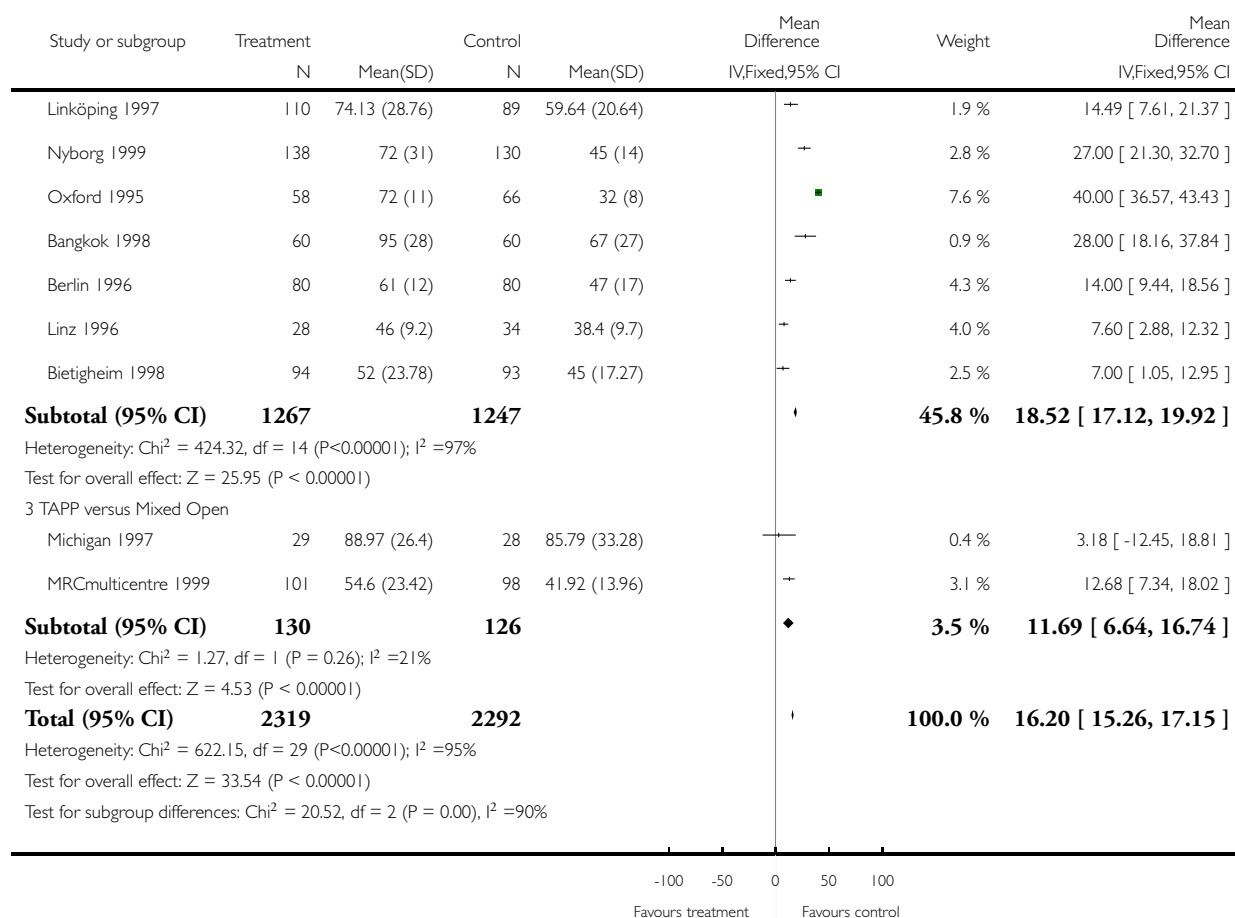
Comparison: 2 TAPP versus Open

Outcome: 1 Duration of operation (minutes)



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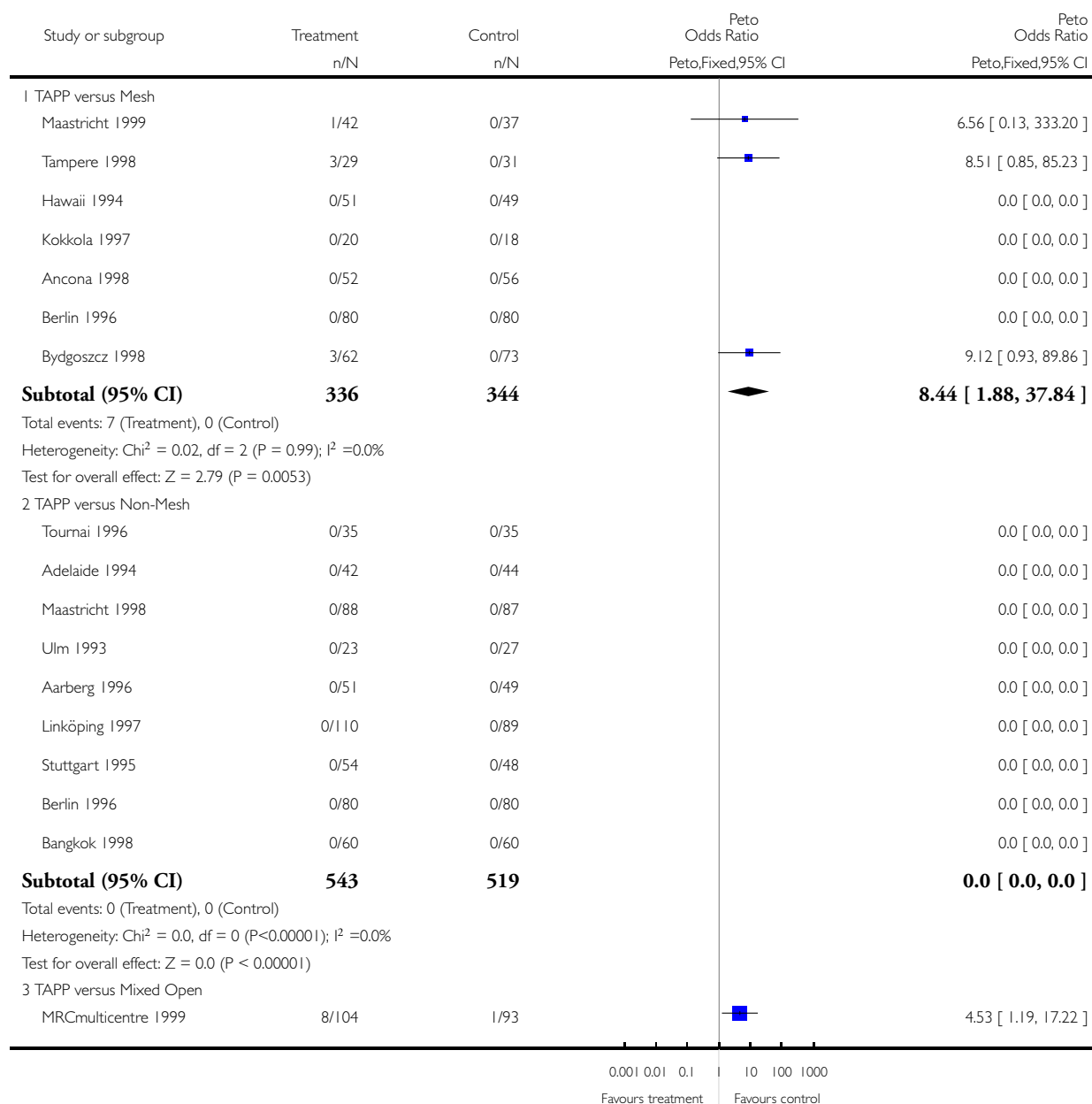


Analysis 2.2. Comparison 2 TAPP versus Open, Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

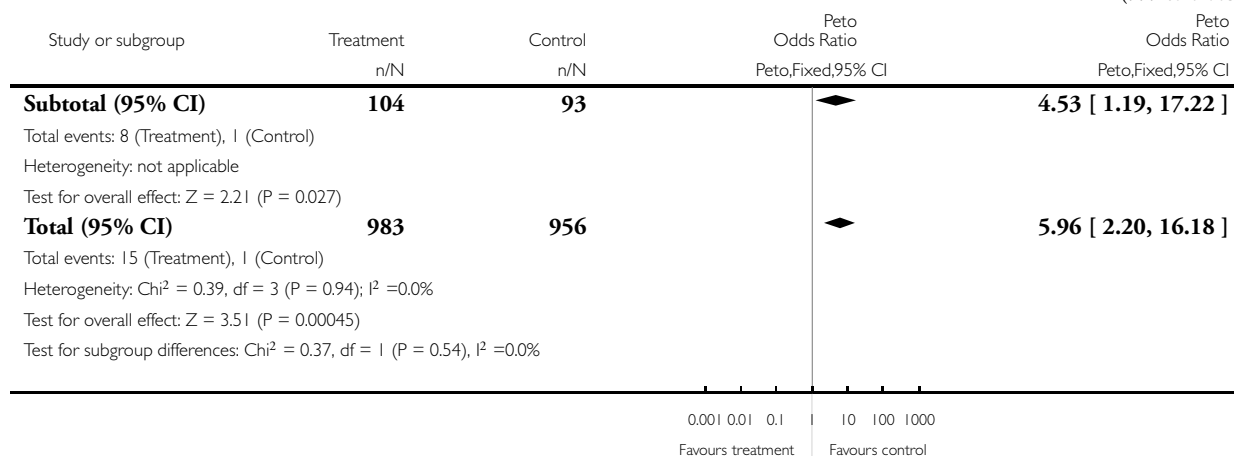
Comparison: 2 TAPP versus Open

Outcome: 2 "Opposite" method initiated



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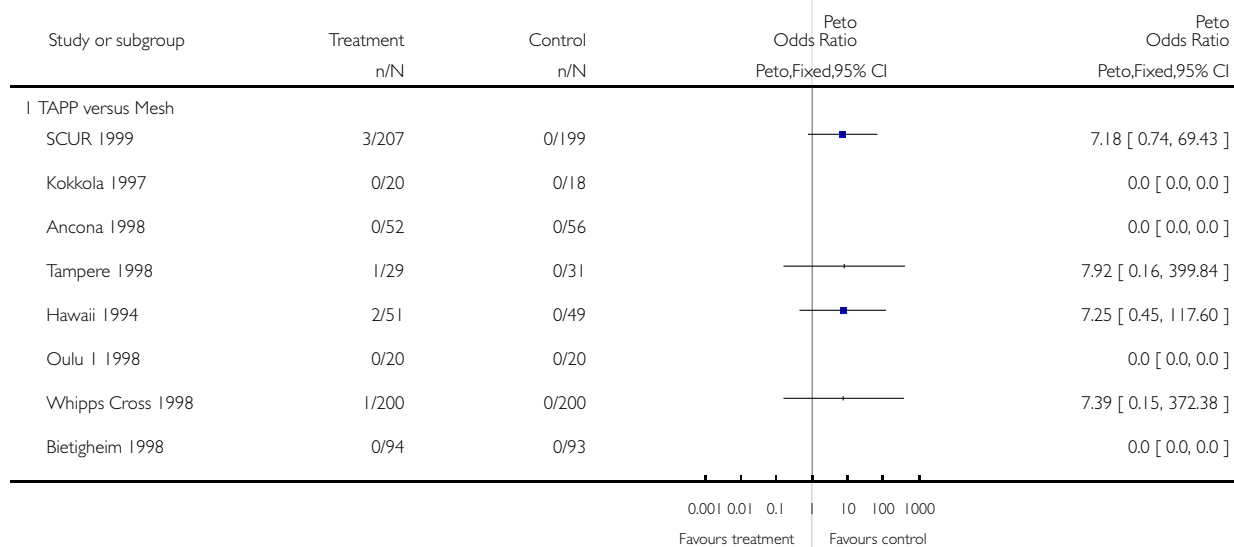


Analysis 2.3. Comparison 2 TAPP versus Open, Outcome 3 Conversion.

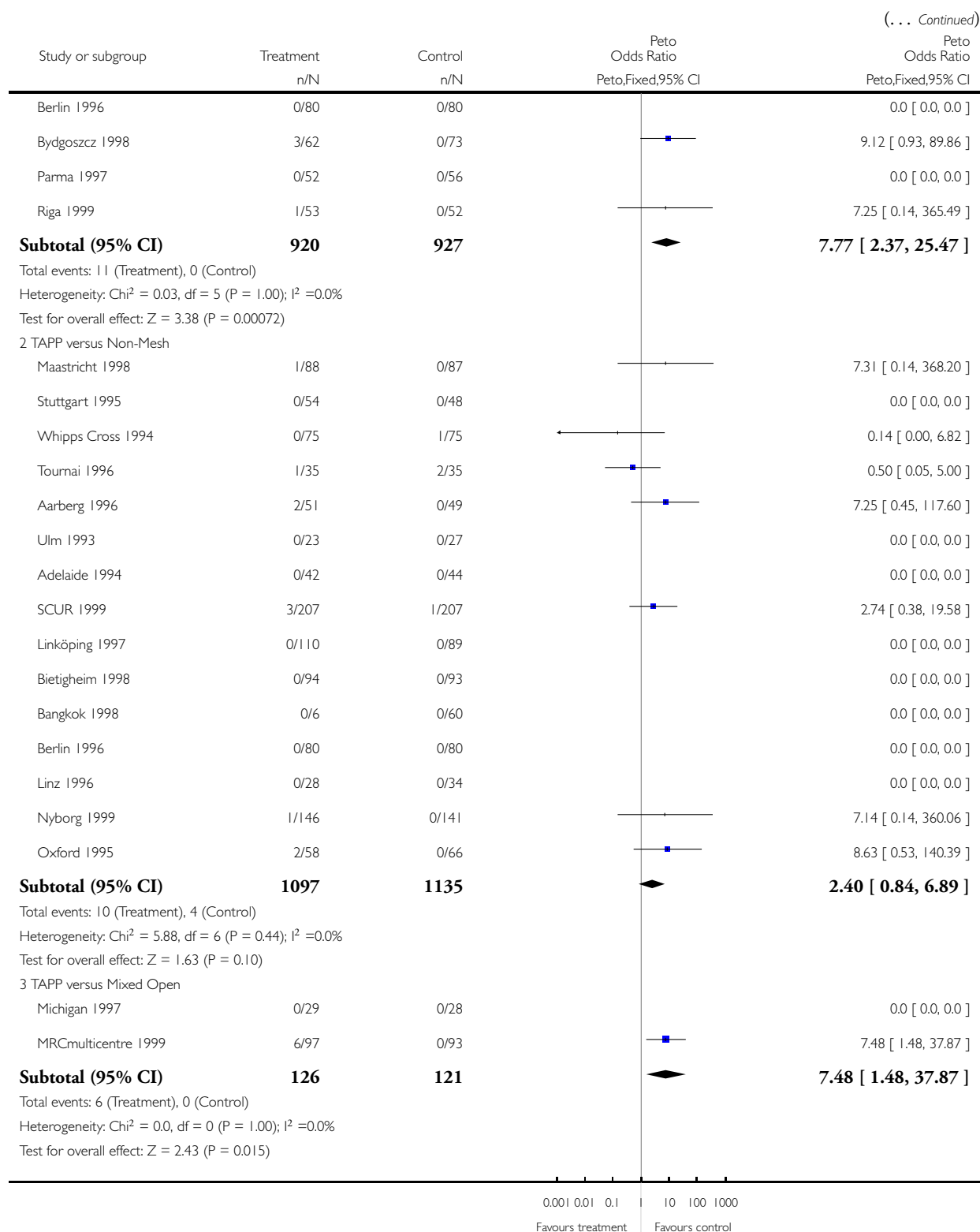
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 2 TAPP versus Open

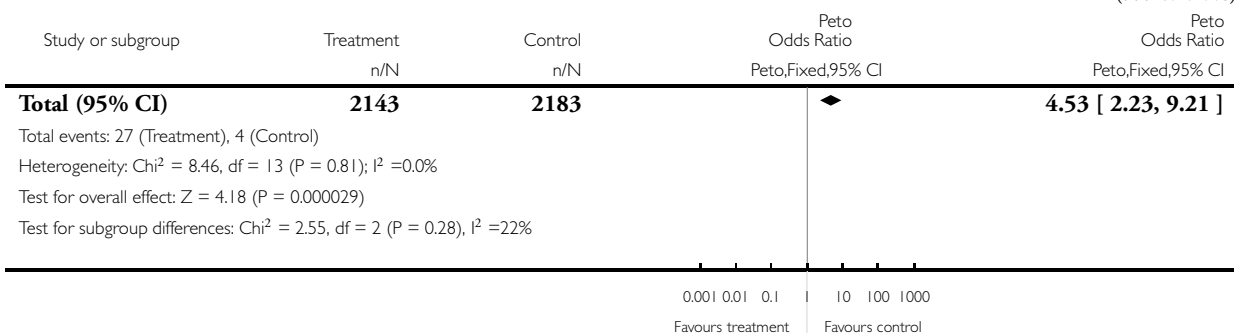
Outcome: 3 Conversion



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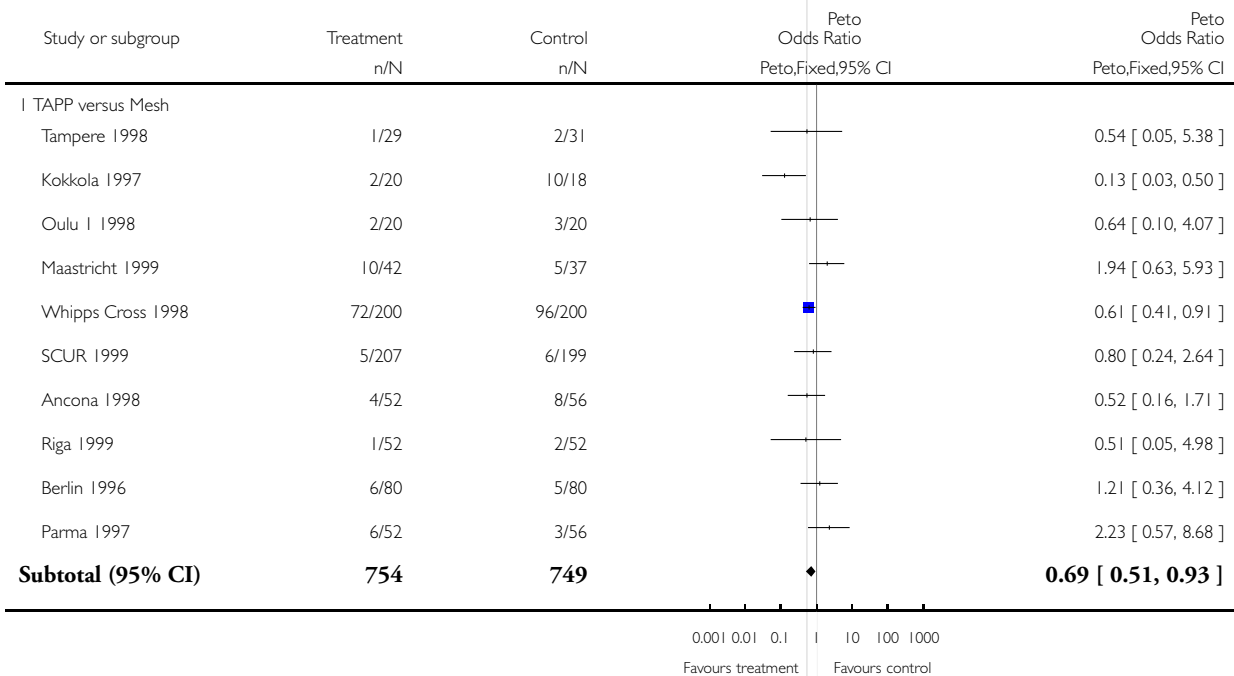


Analysis 2.4. Comparison 2 TAPP versus Open, Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

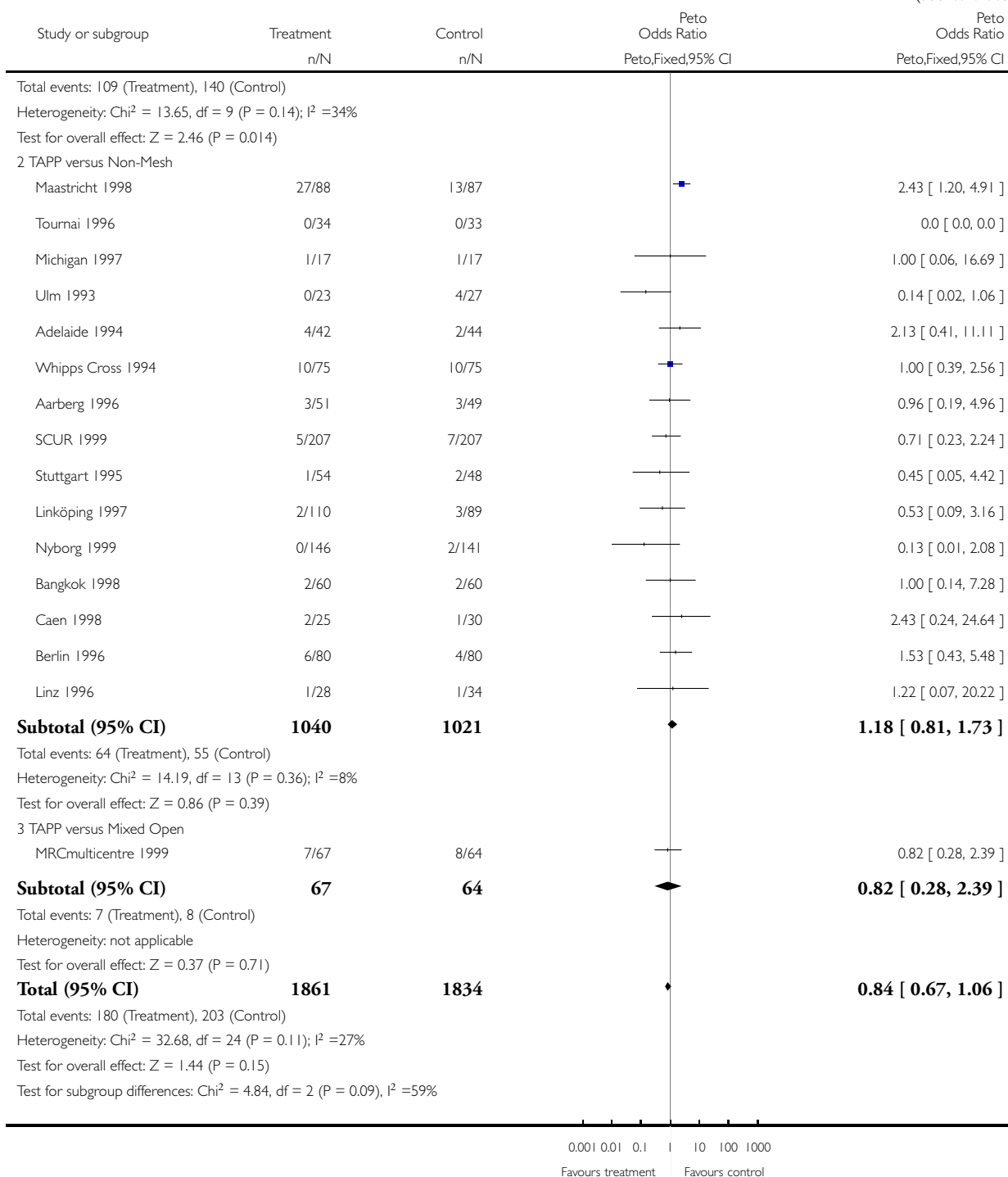
Comparison: 2 TAPP versus Open

Outcome: 4 Haematoma



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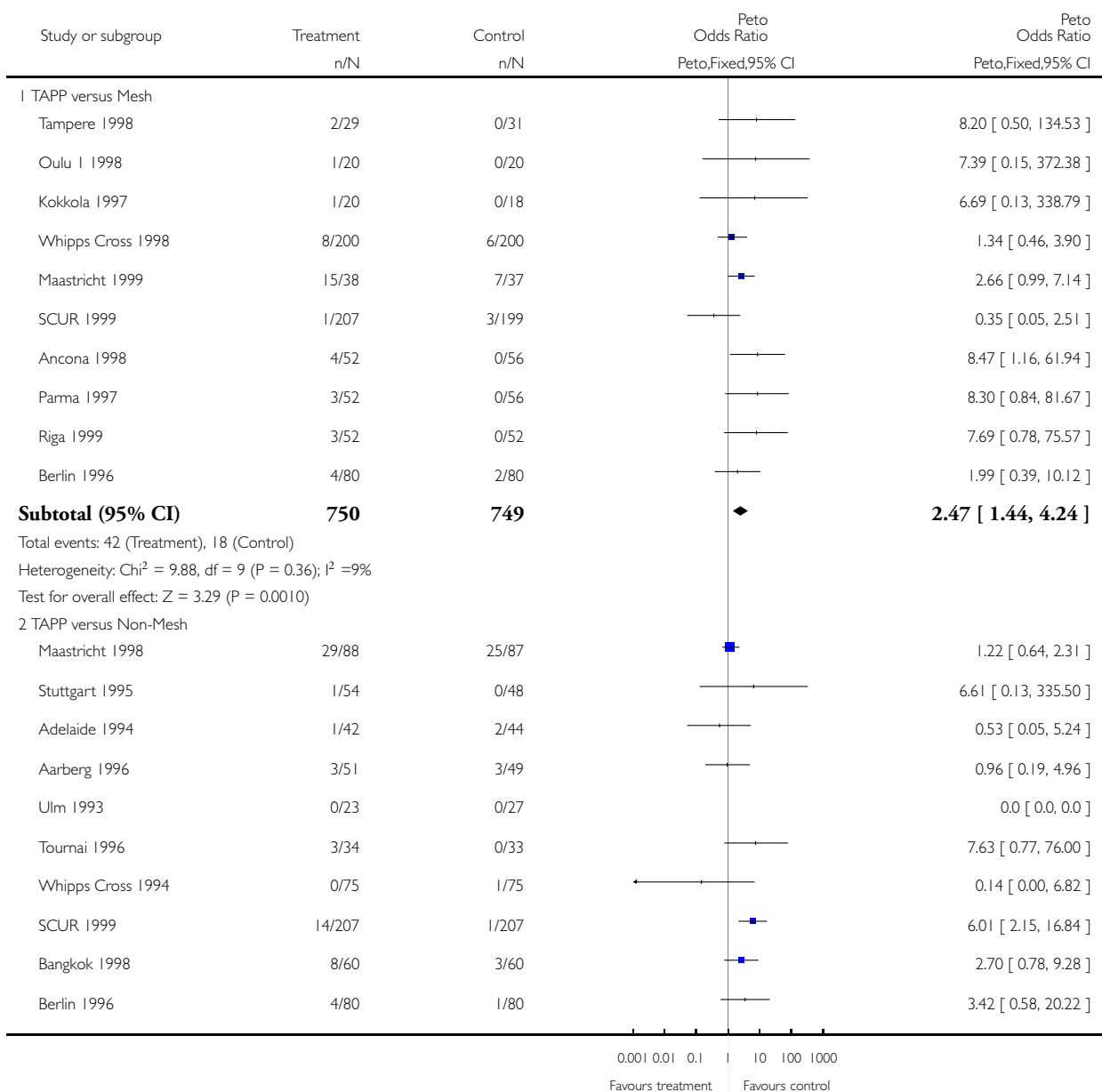


Analysis 2.5. Comparison 2 TAPP versus Open, Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

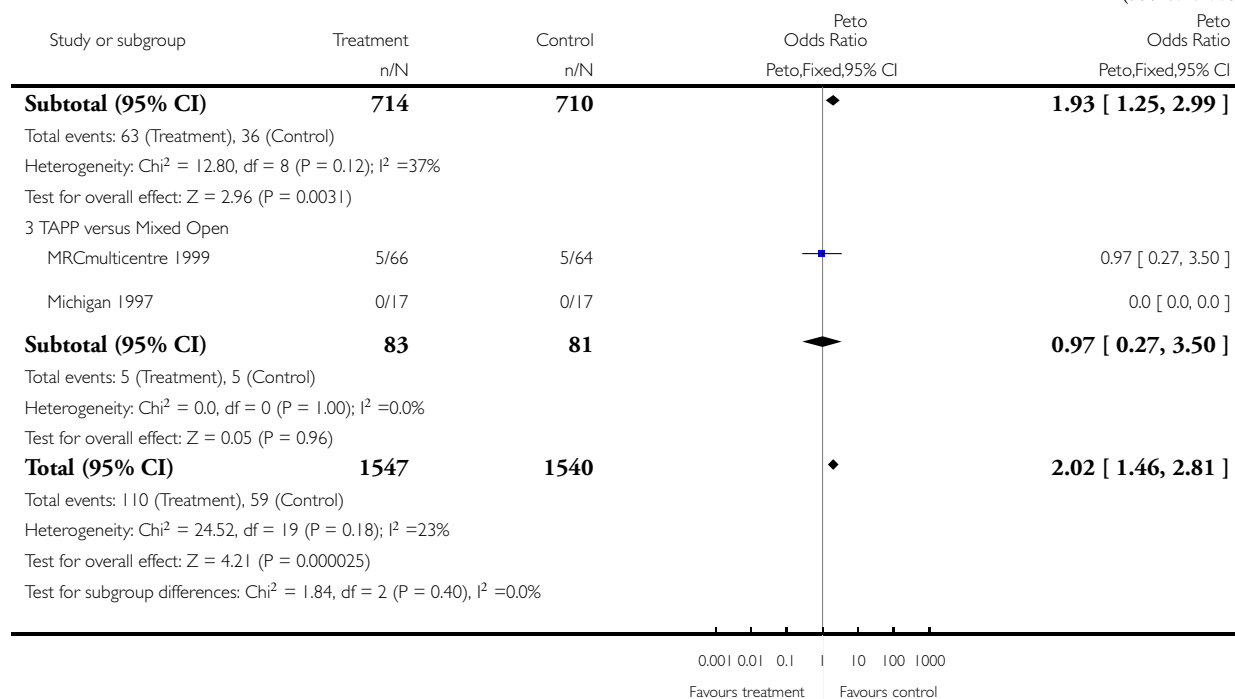
Comparison: 2 TAPP versus Open

Outcome: 5 Seroma



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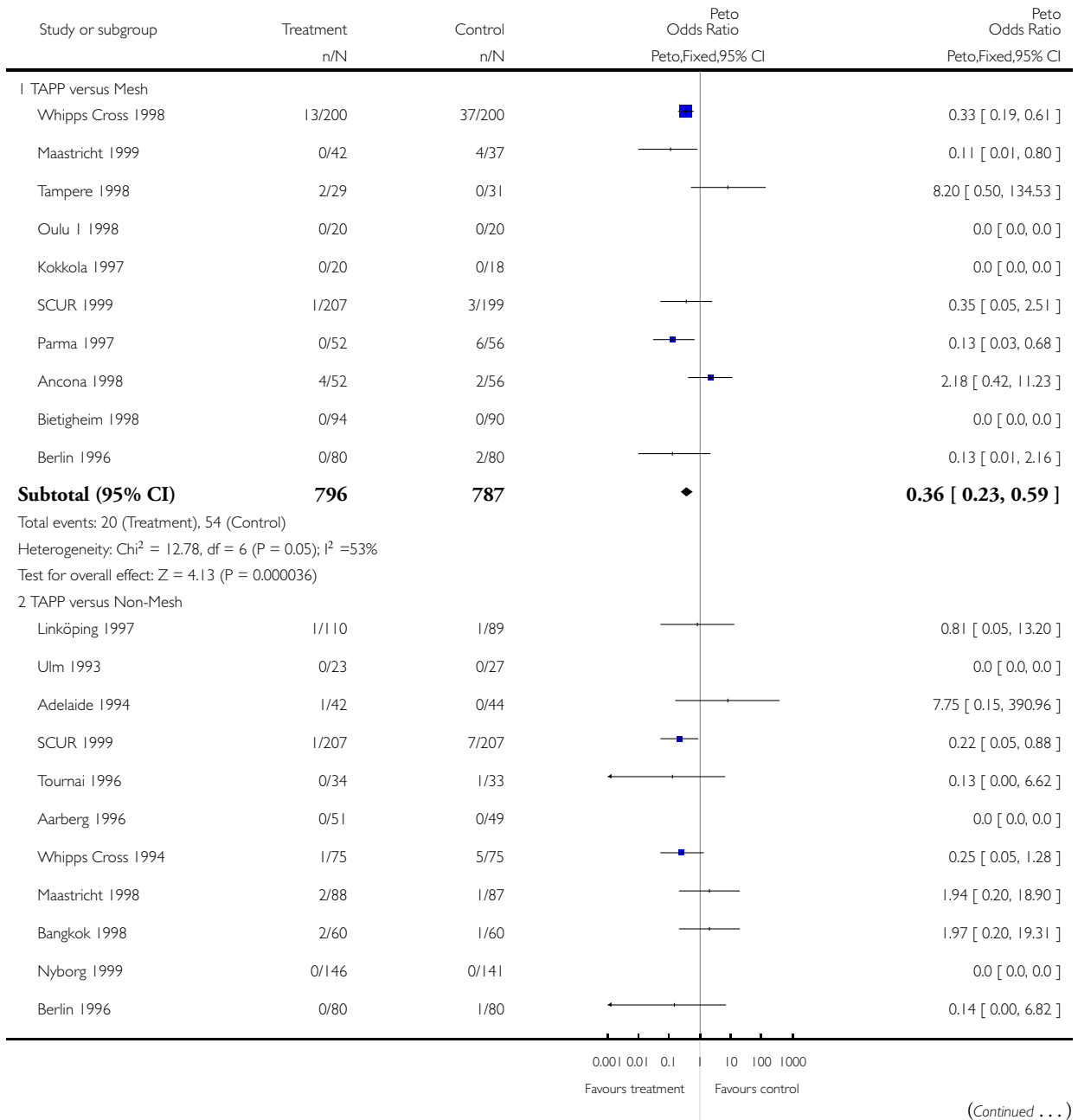


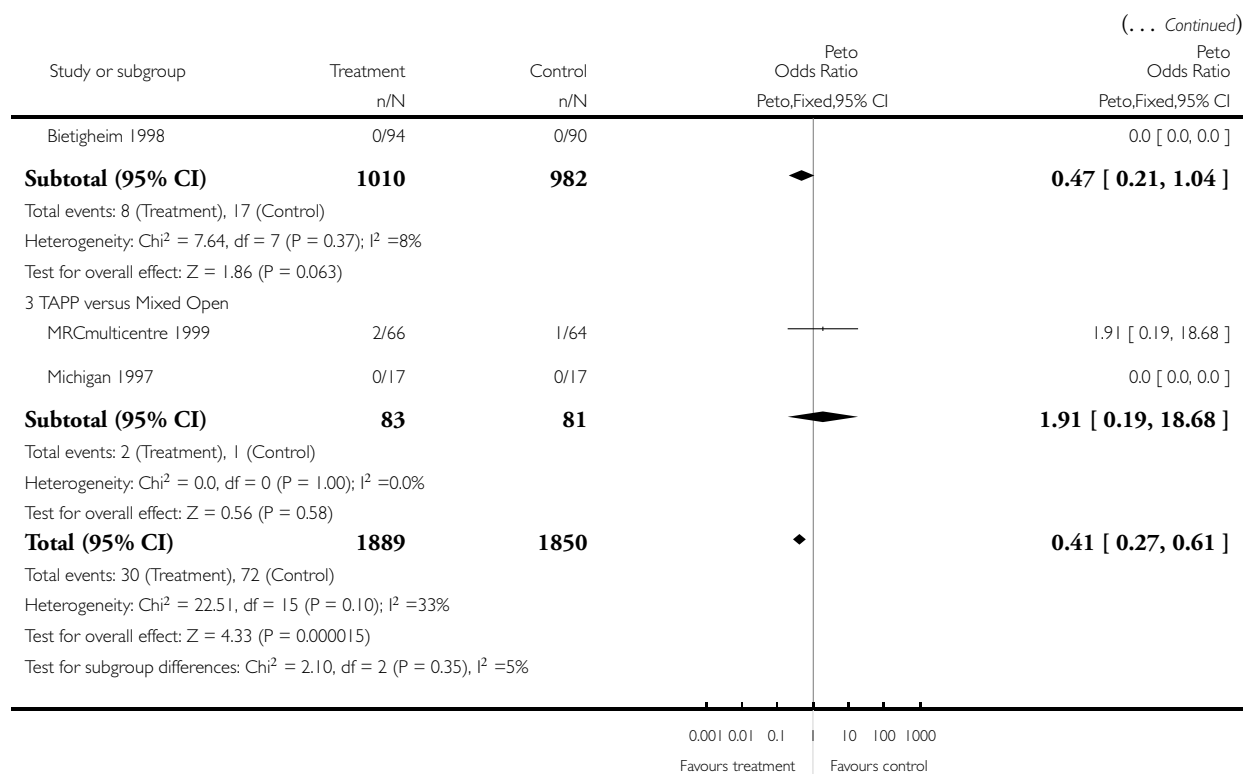
Analysis 2.6. Comparison 2 TAPP versus Open, Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 2 TAPP versus Open

Outcome: 6 Wound/superficial infection



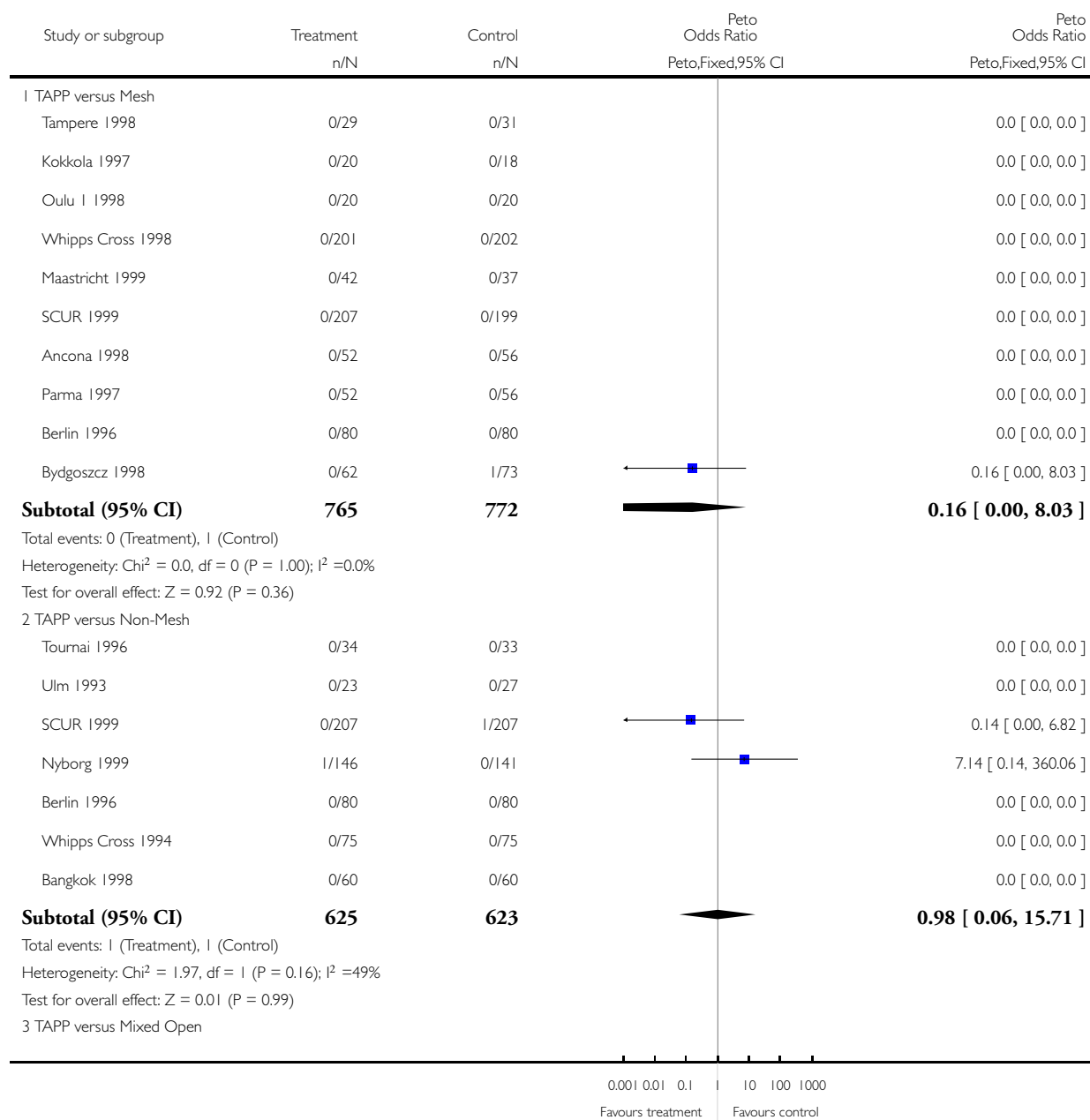


Analysis 2.7. Comparison 2 TAPP versus Open, Outcome 7 Mesh/deep infection.

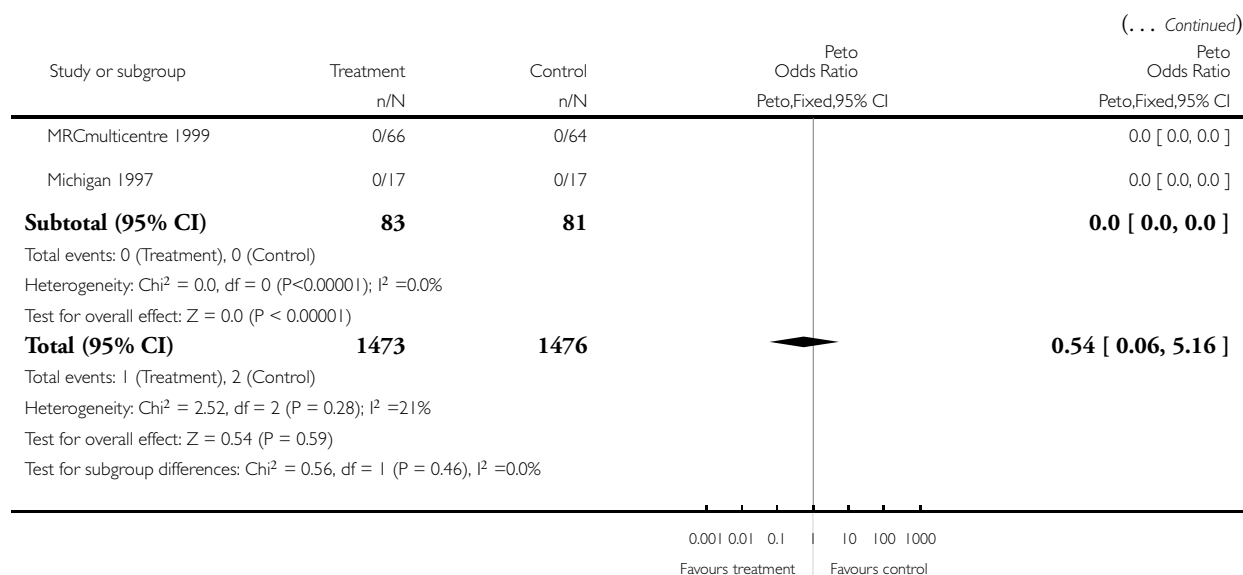
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 2 TAPP versus Open

Outcome: 7 Mesh/deep infection



(Continued ...)

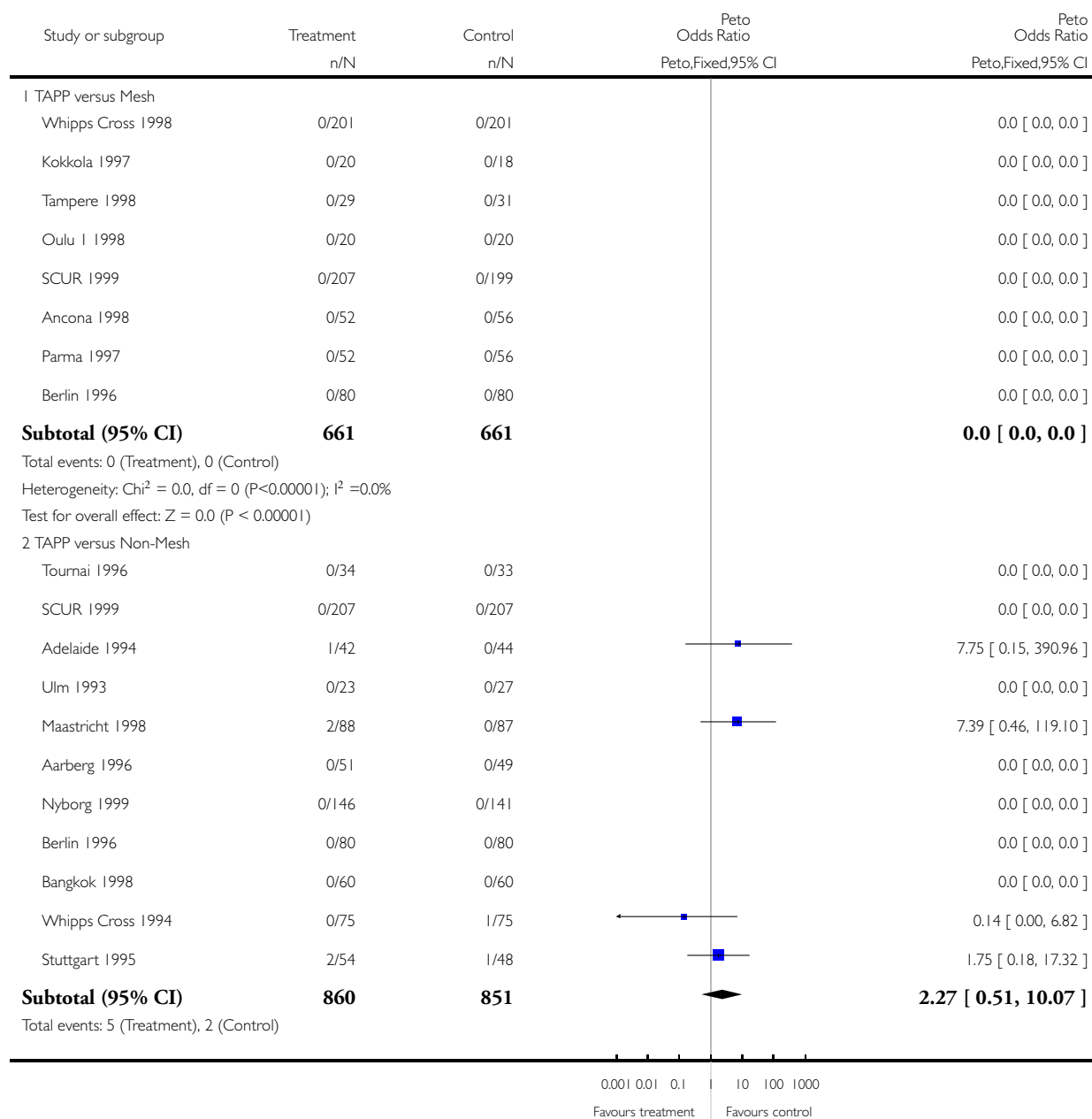


Analysis 2.8. Comparison 2 TAPP versus Open, Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

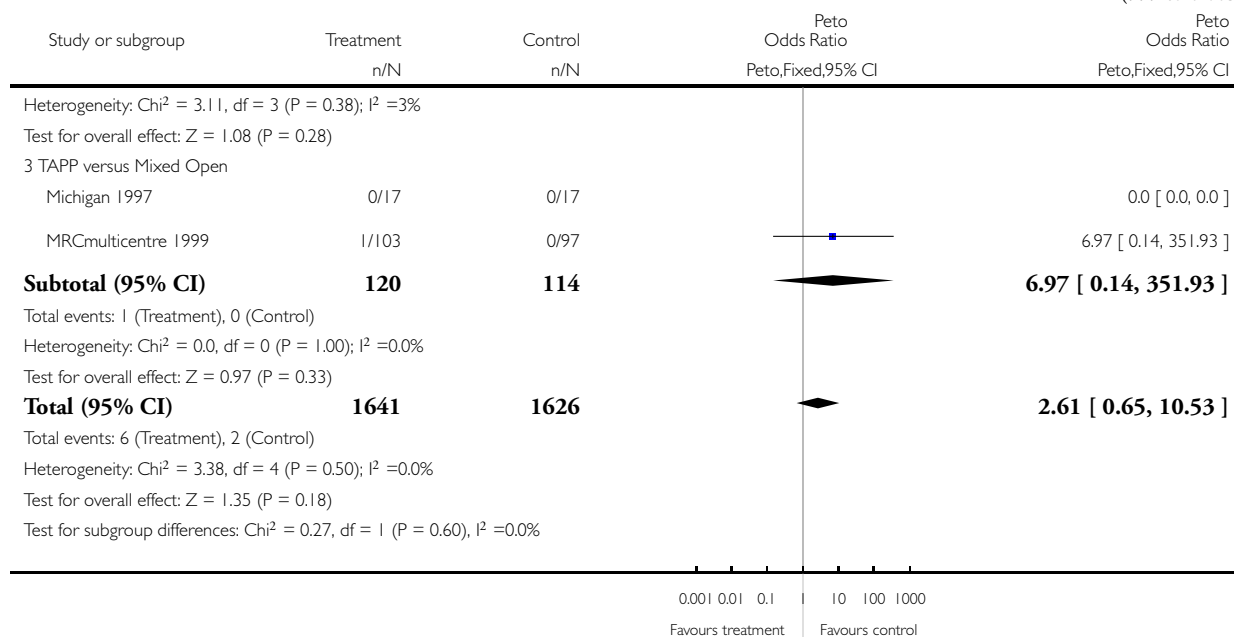
Comparison: 2 TAPP versus Open

Outcome: 8 Vascular injury



(Continued ...)

(... Continued)

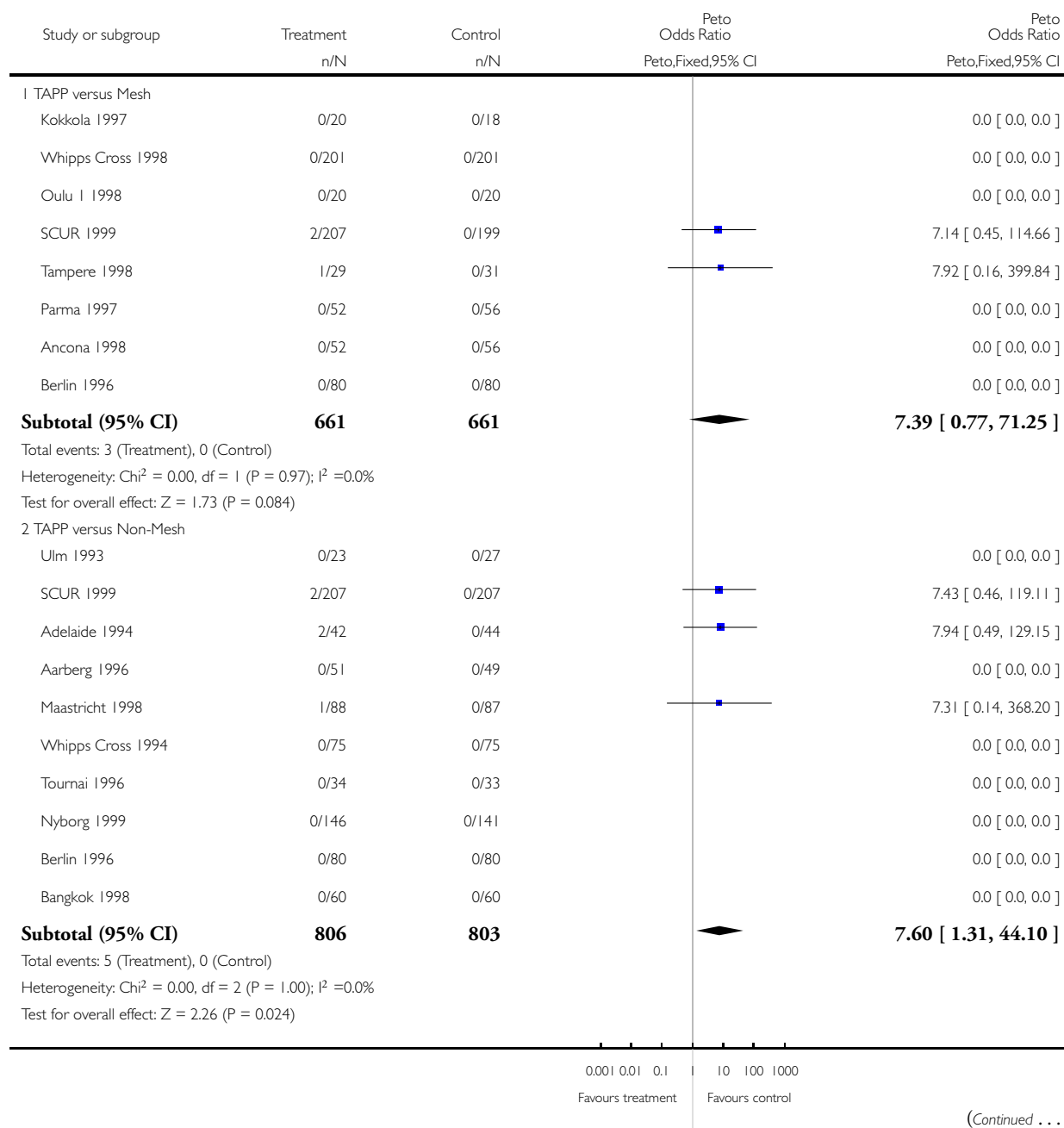


Analysis 2.9. Comparison 2 TAPP versus Open, Outcome 9 Visceral injury.

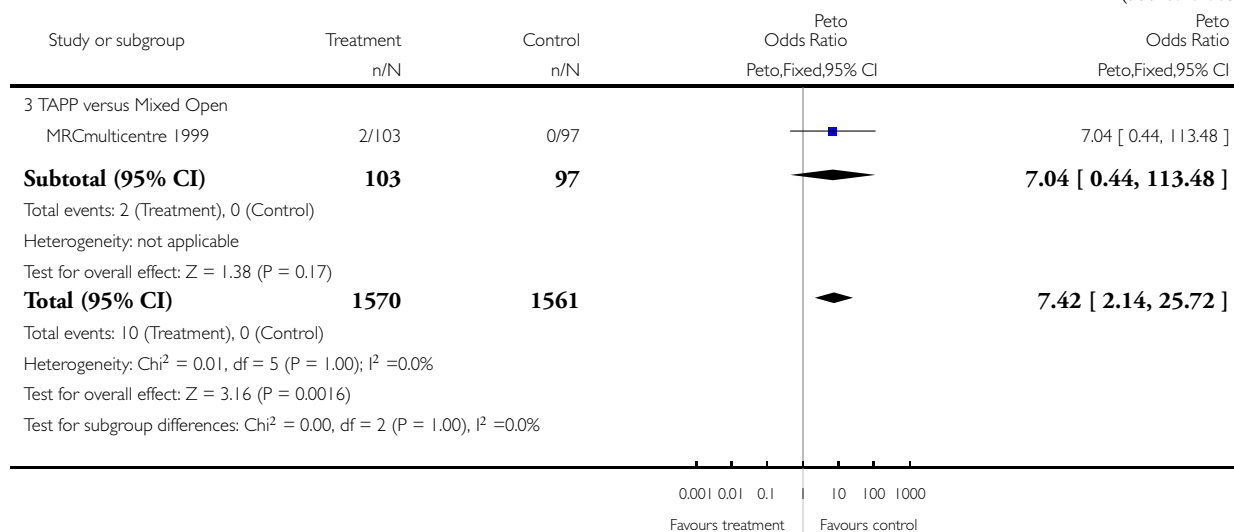
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 2 TAPP versus Open

Outcome: 9 Visceral injury



(... Continued)

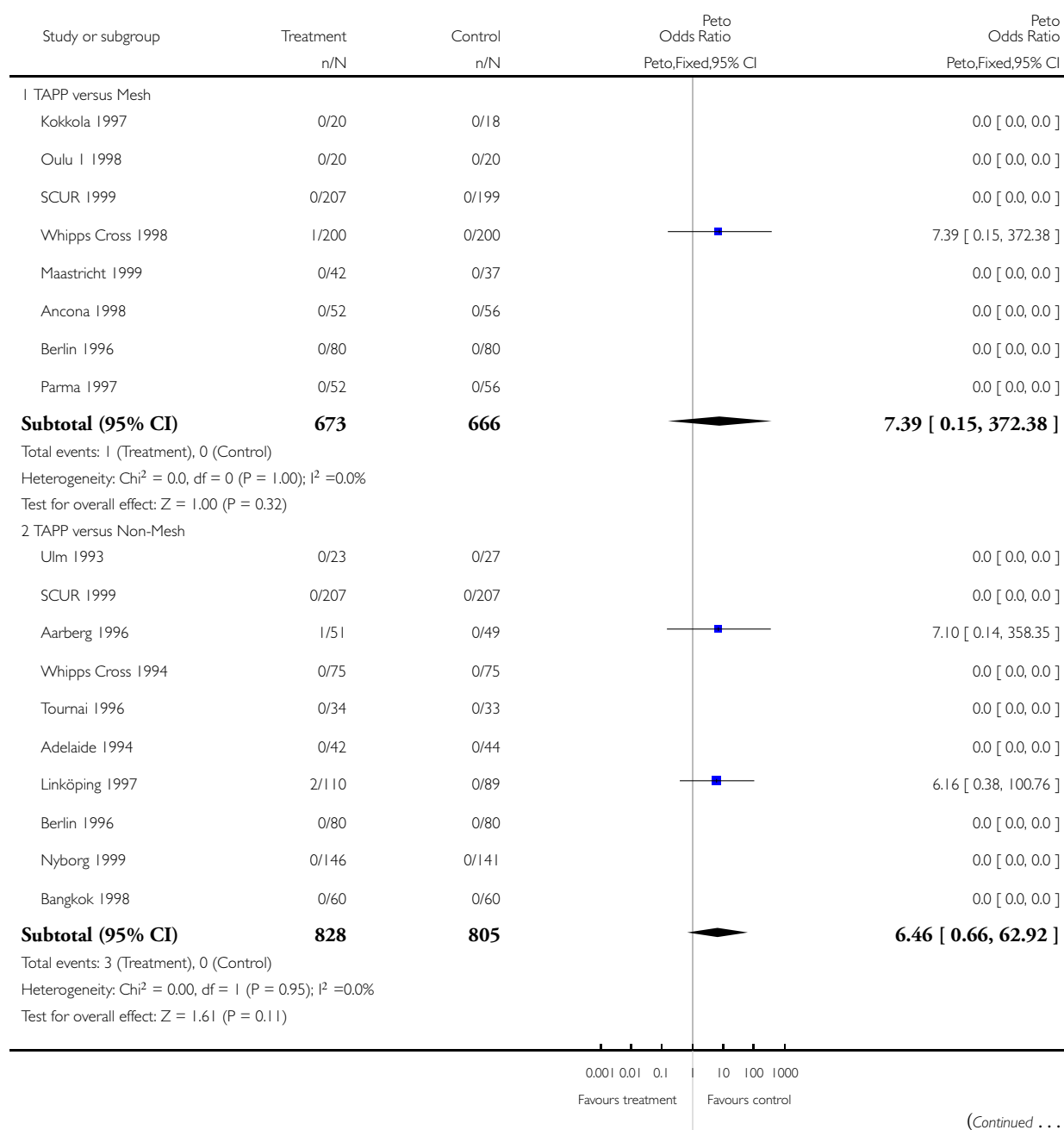


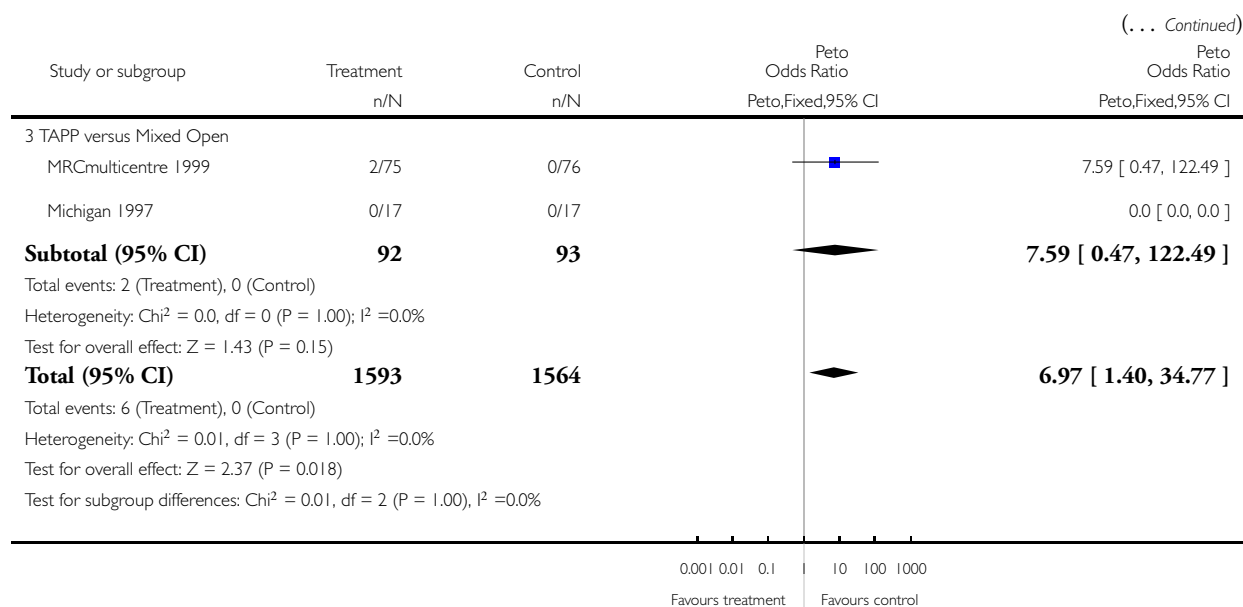
Analysis 2.10. Comparison 2 TAPP versus Open, Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 2 TAPP versus Open

Outcome: 10 Port site hernia



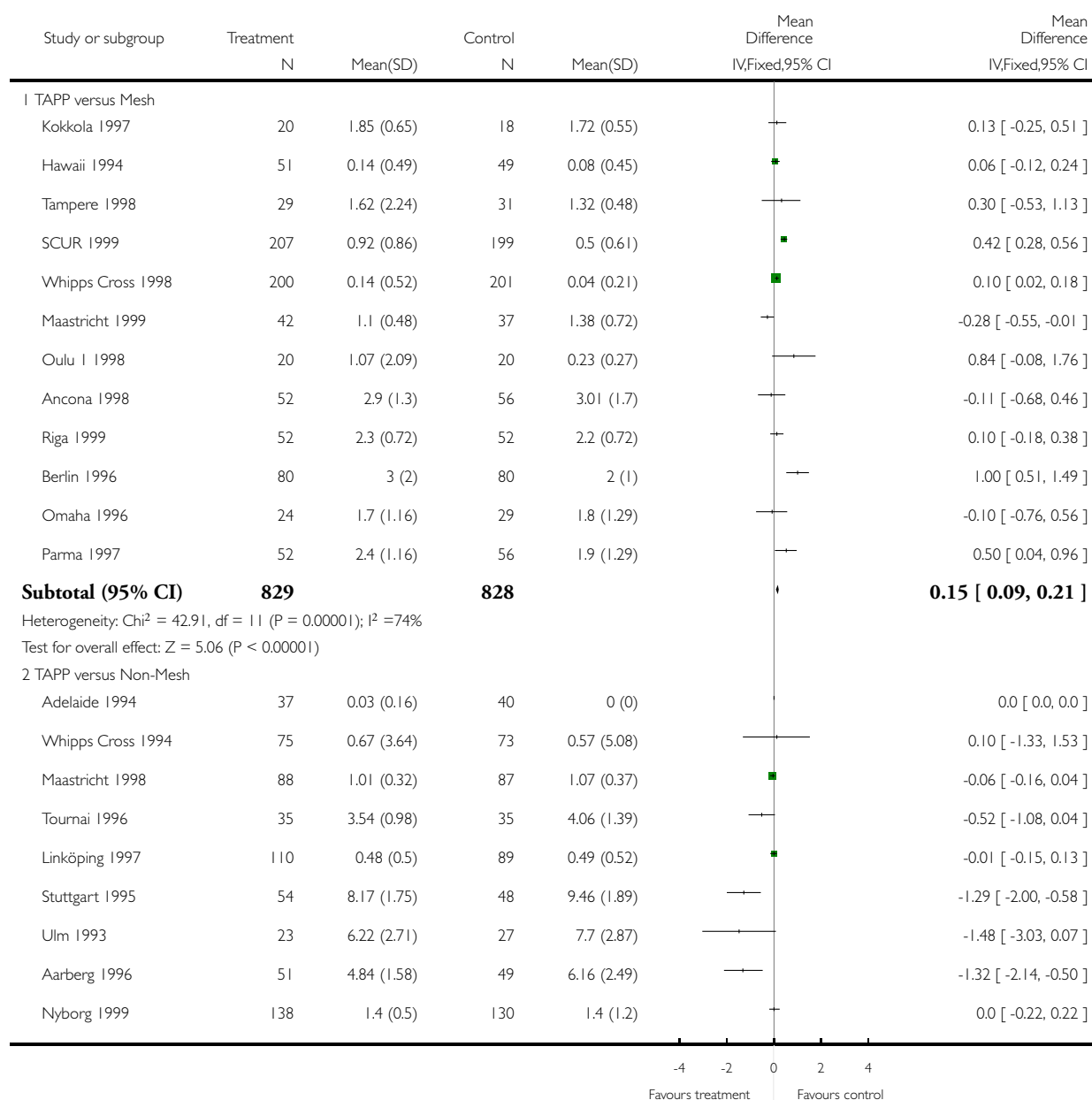


Analysis 2.11. Comparison 2 TAPP versus Open, Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

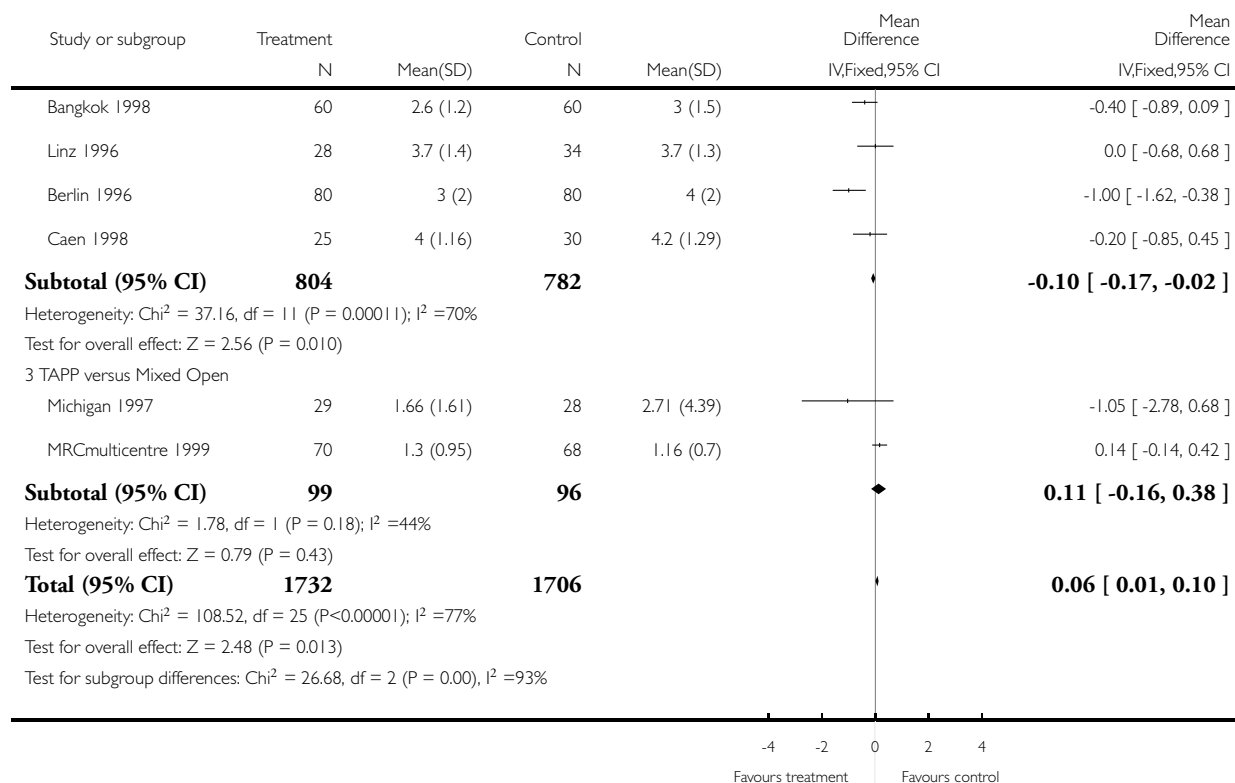
Comparison: 2 TAPP versus Open

Outcome: 11 Length of stay (days)



(Continued ...)

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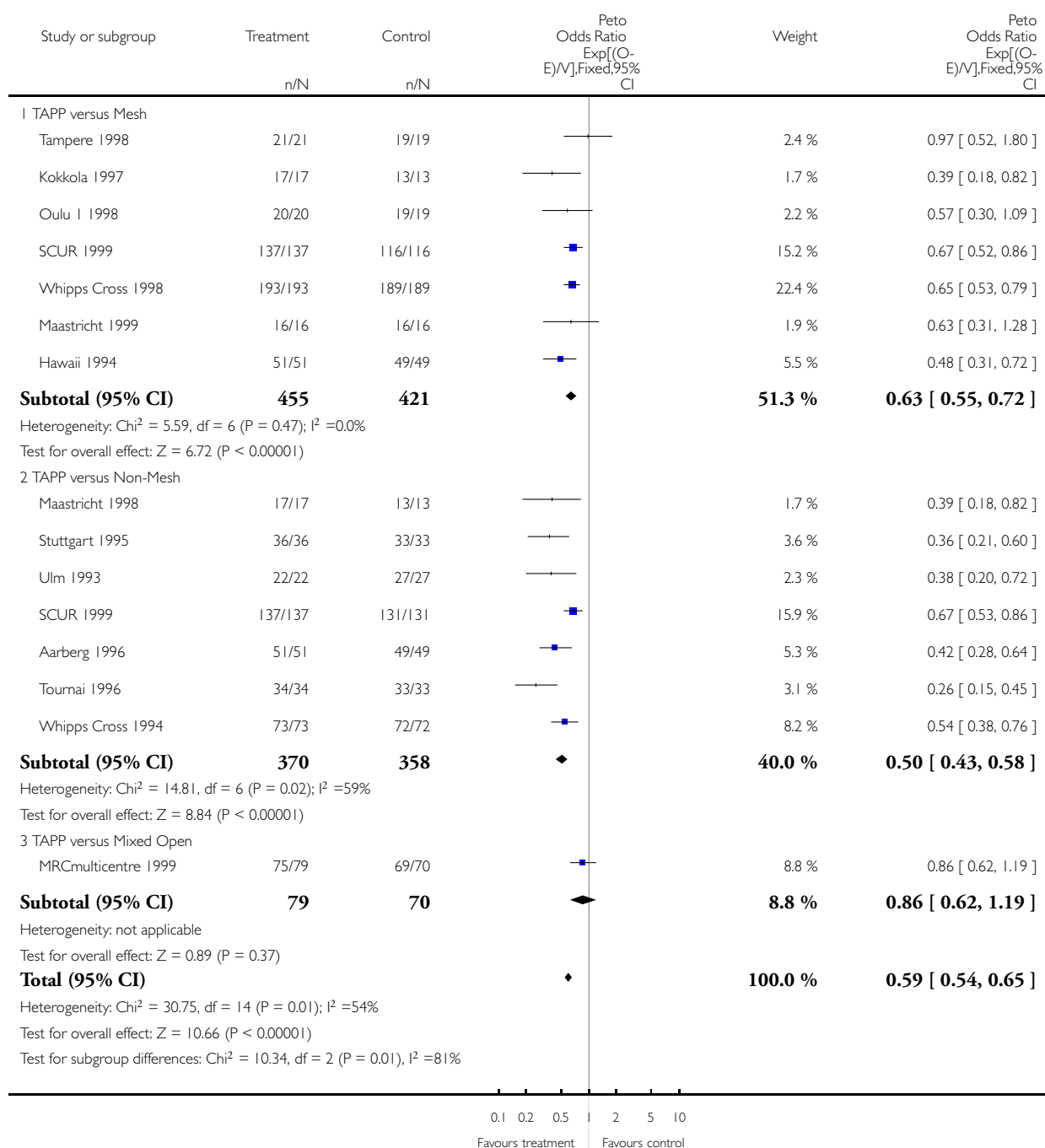


Analysis 2.12. Comparison 2 TAPP versus Open, Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 2 TAPP versus Open

Outcome: 12 Time to return to usual activities (days)

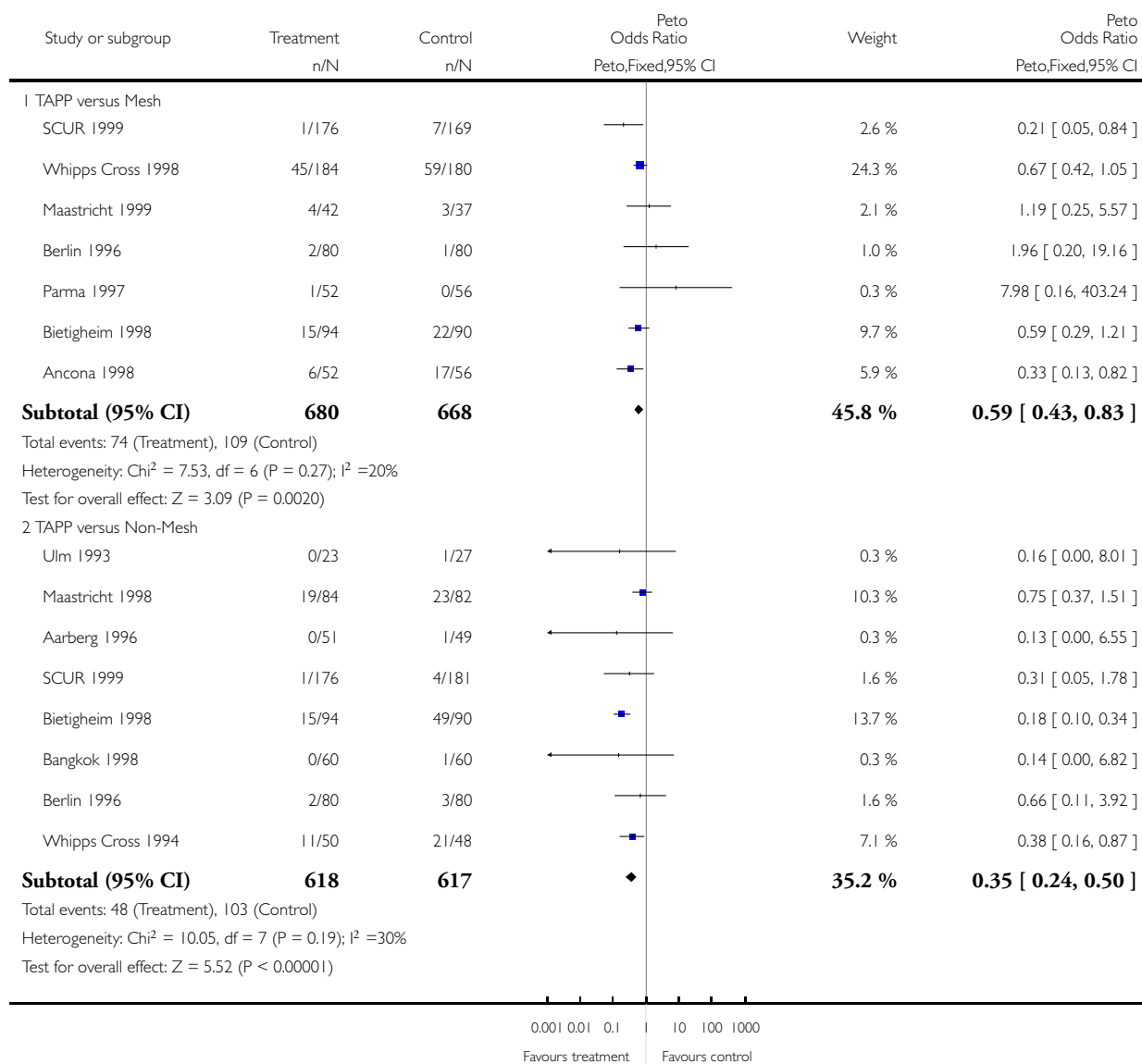


Analysis 2.13. Comparison 2 TAPP versus Open, Outcome 13 Persisting pain.

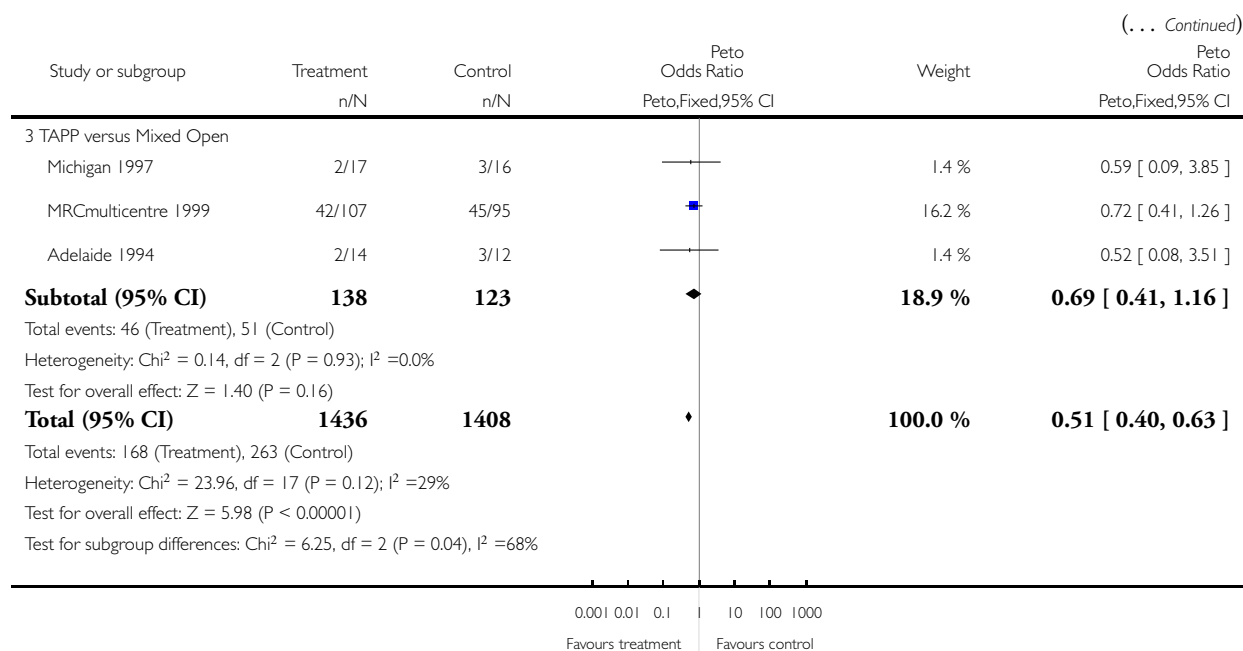
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 2 TAPP versus Open

Outcome: 13 Persisting pain



(Continued ...)

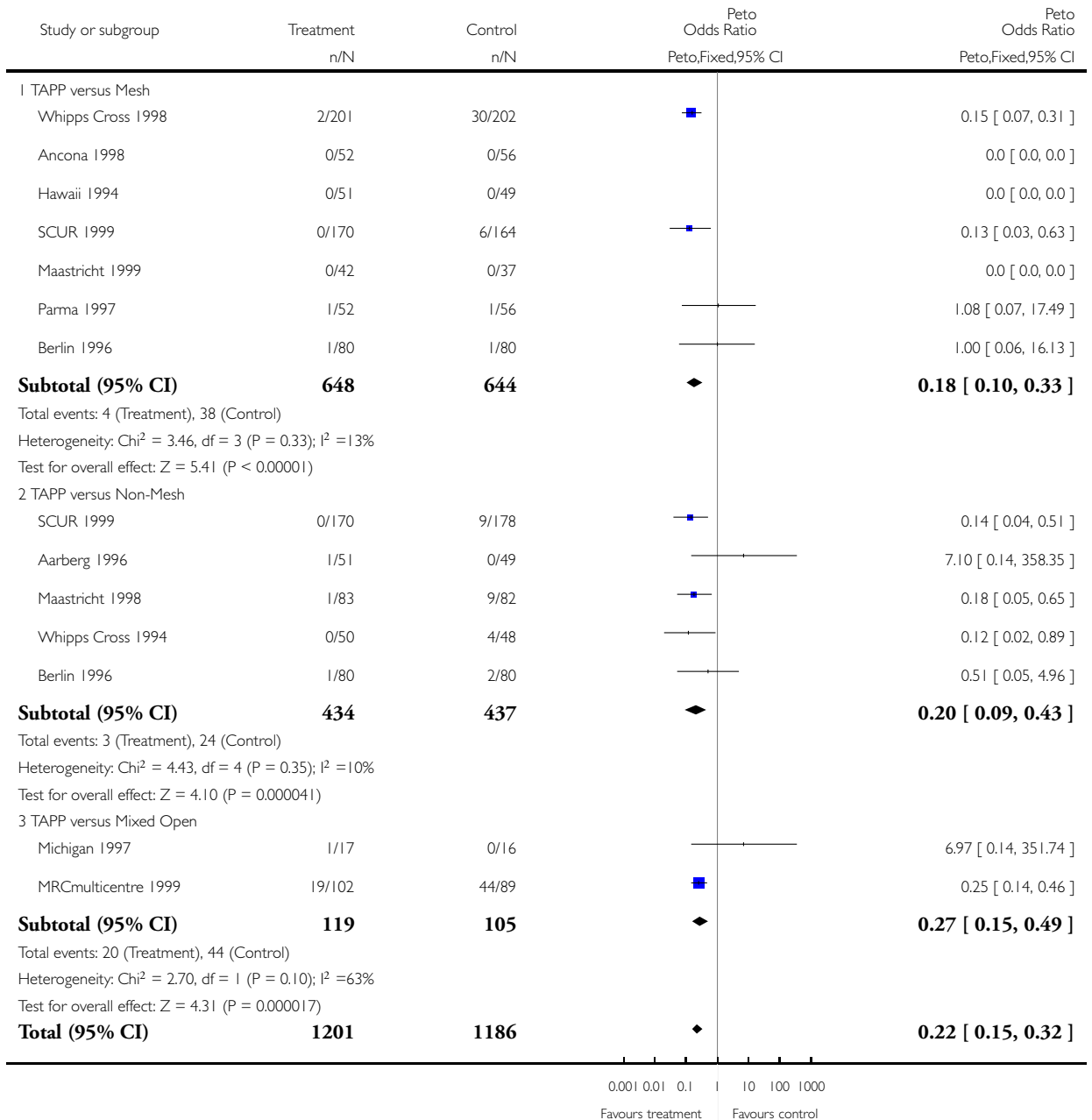


Analysis 2.14. Comparison 2 TAPP versus Open, Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

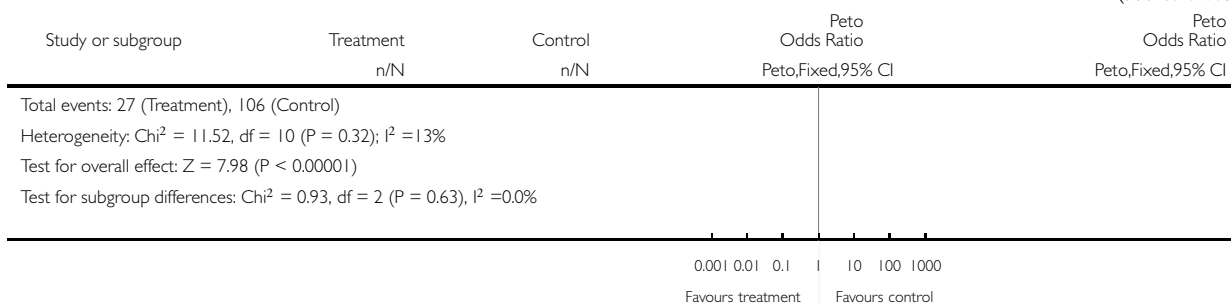
Comparison: 2 TAPP versus Open

Outcome: 14 Persisting numbness



(Continued ...)

(... Continued)

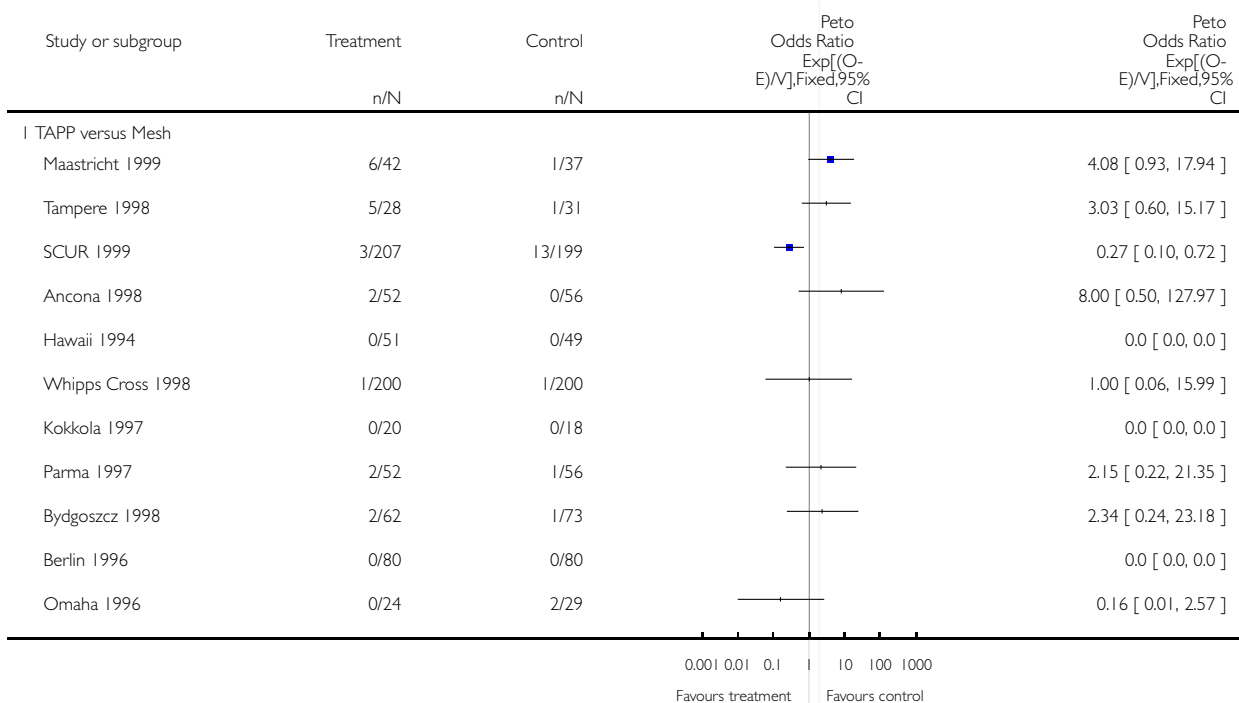


Analysis 2.15. Comparison 2 TAPP versus Open, Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

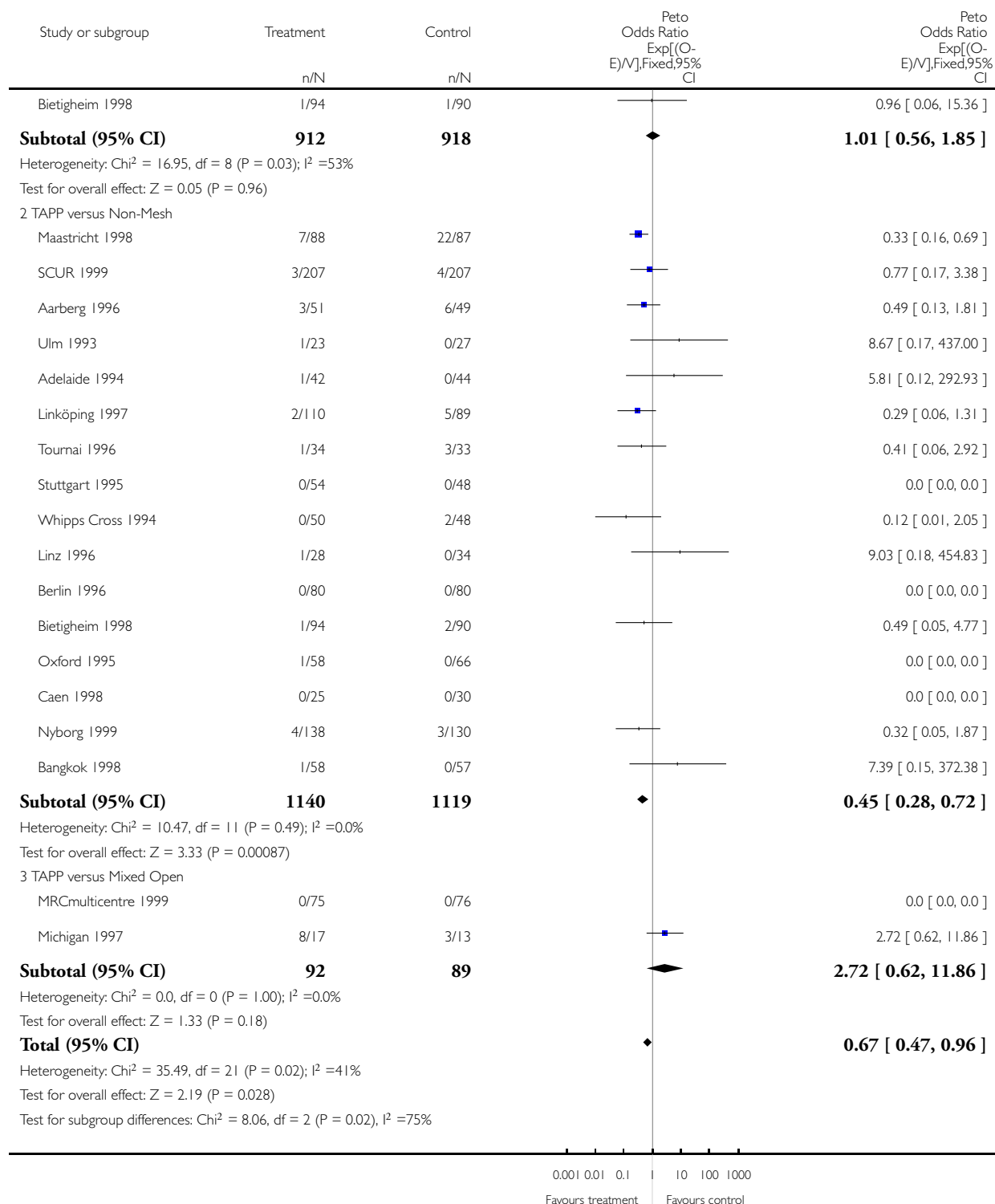
Comparison: 2 TAPP versus Open

Outcome: 15 Hernia recurrence



(Continued ...)

(... Continued)

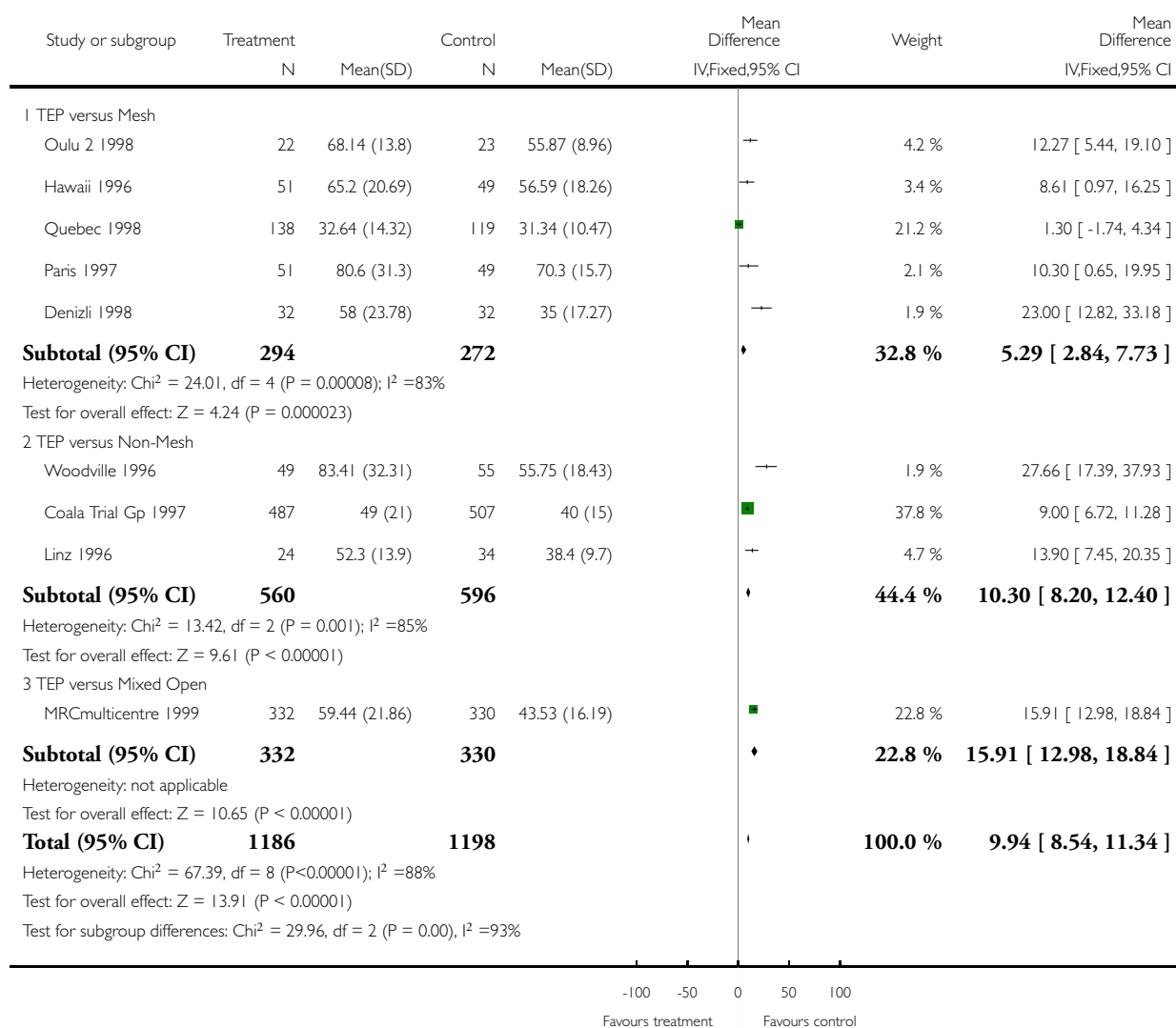


Analysis 3.1. Comparison 3 TEP versus Open, Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 1 Duration of operation (minutes)

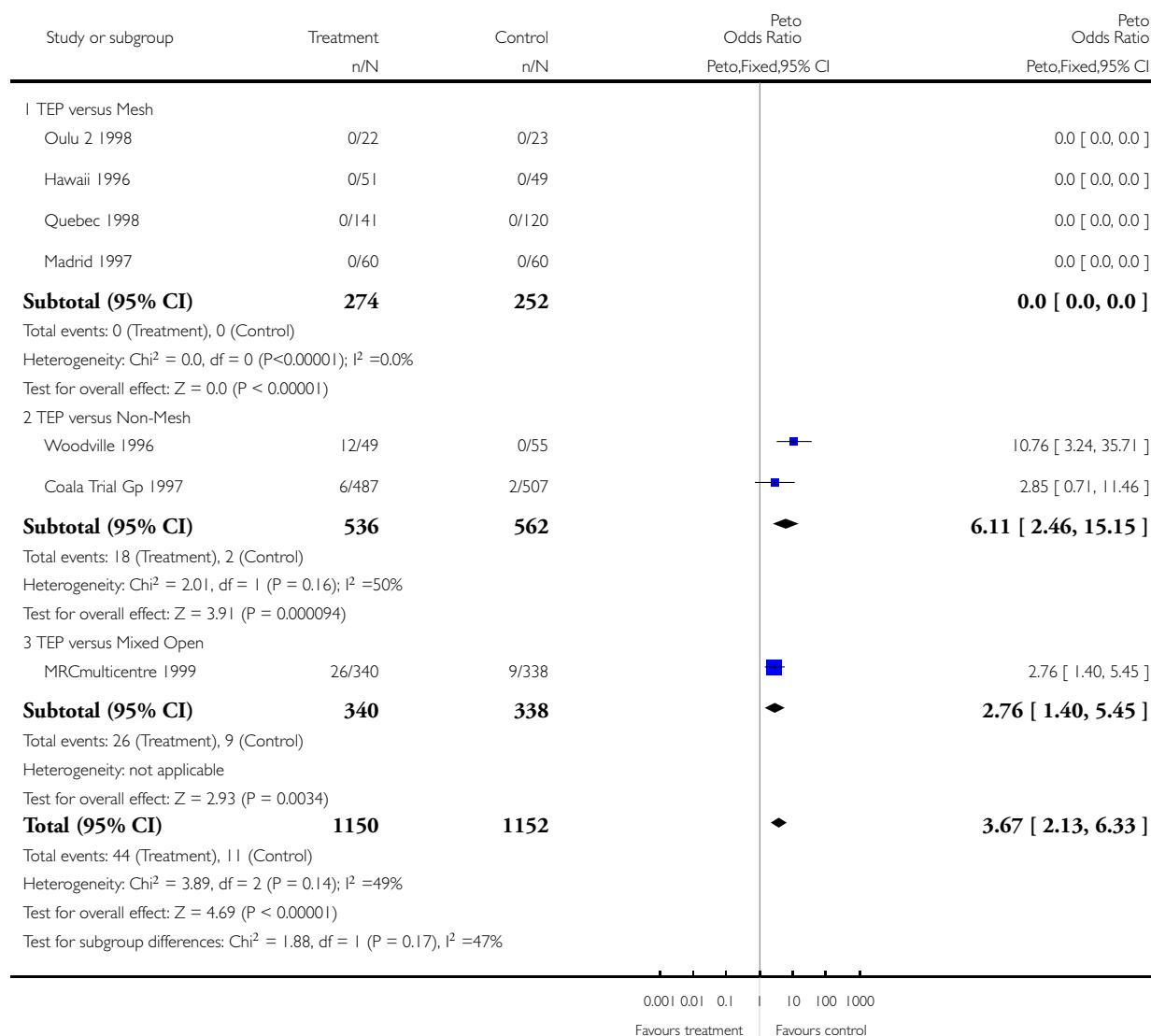


Analysis 3.2. Comparison 3 TEP versus Open, Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 2 "Opposite" method initiated

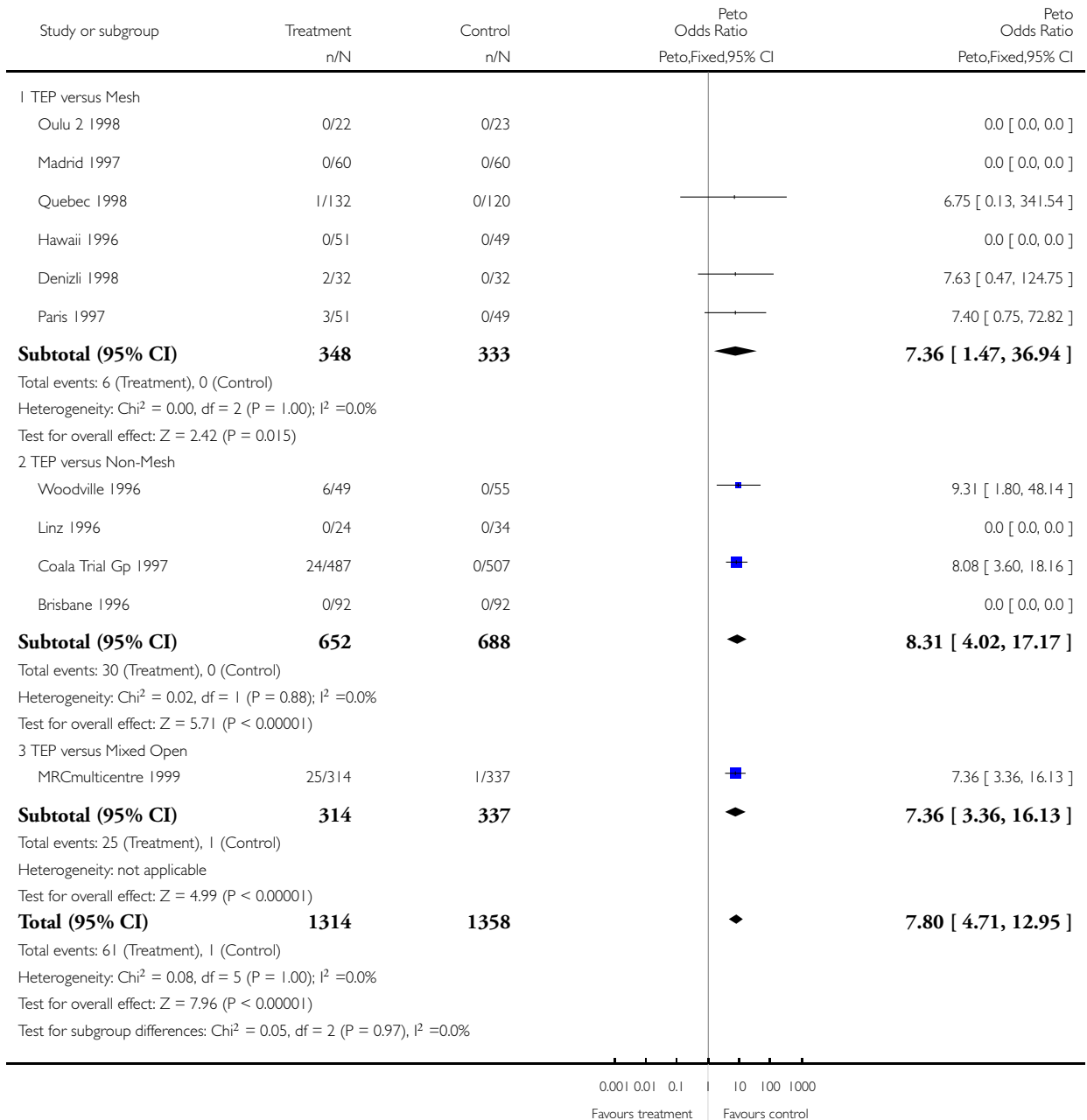


Analysis 3.3. Comparison 3 TEP versus Open, Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 3 Conversion

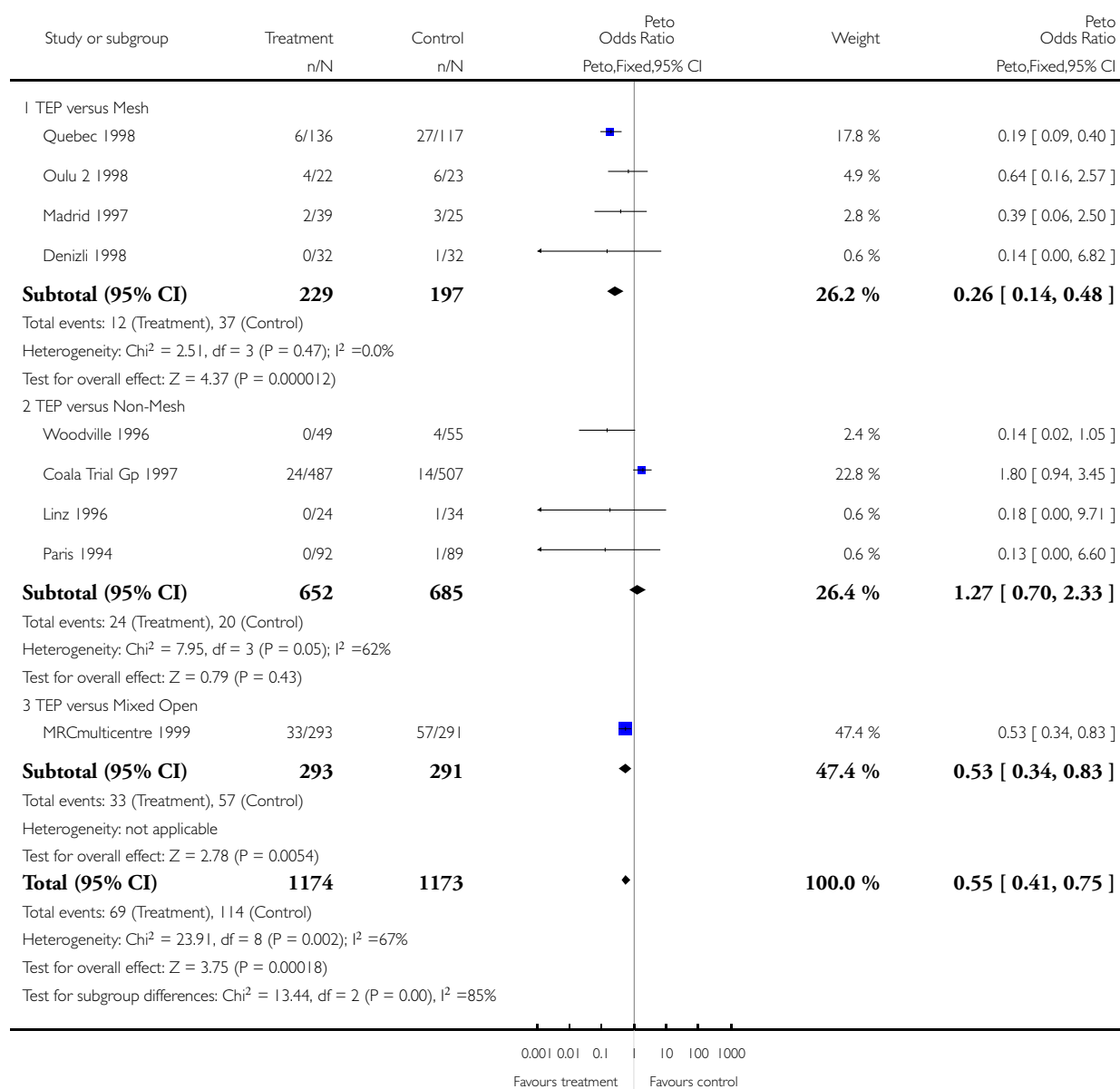


Analysis 3.4. Comparison 3 TEP versus Open, Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 4 Haematoma

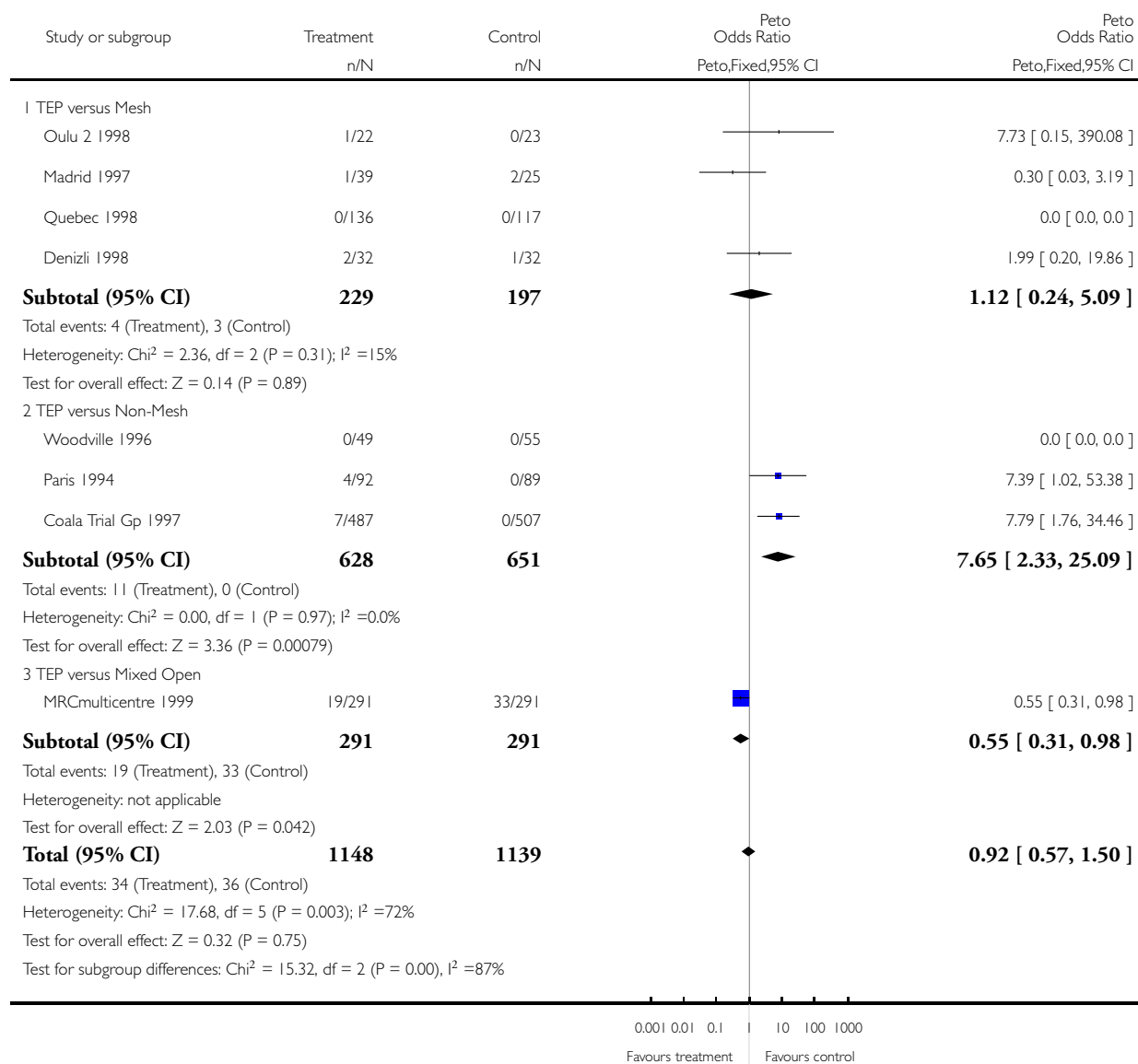


Analysis 3.5. Comparison 3 TEP versus Open, Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 5 Seroma

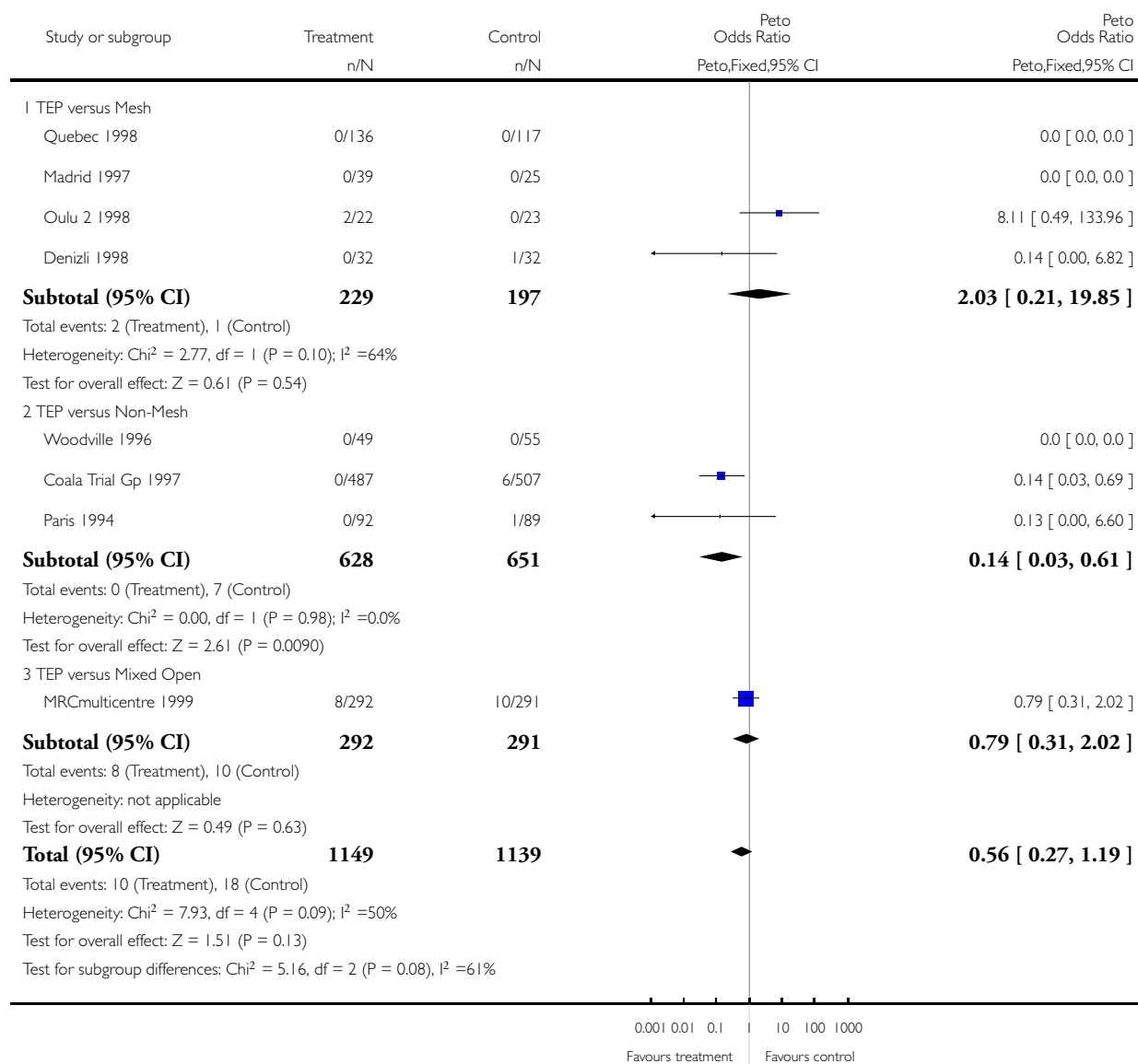


Analysis 3.6. Comparison 3 TEP versus Open, Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 6 Wound/superficial infection



Analysis 3.7. Comparison 3 TEP versus Open, Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 7 Mesh/deep infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh				
Oulu 2 1998	0/22	0/23		0.0 [0.0, 0.0]
Quebec 1998	0/136	0/117		0.0 [0.0, 0.0]
Madrid 1997	0/7	0/6		0.0 [0.0, 0.0]
Subtotal (95% CI)	165	146		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Woodville 1996	0/49	0/55		0.0 [0.0, 0.0]
Coala Trial Gp 1997	0/487	0/507		0.0 [0.0, 0.0]
Subtotal (95% CI)	536	562		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TEP versus Mixed Open				
MRCmulticentre 1999	0/292	0/291		0.0 [0.0, 0.0]
Subtotal (95% CI)	292	291		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	993	999		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				

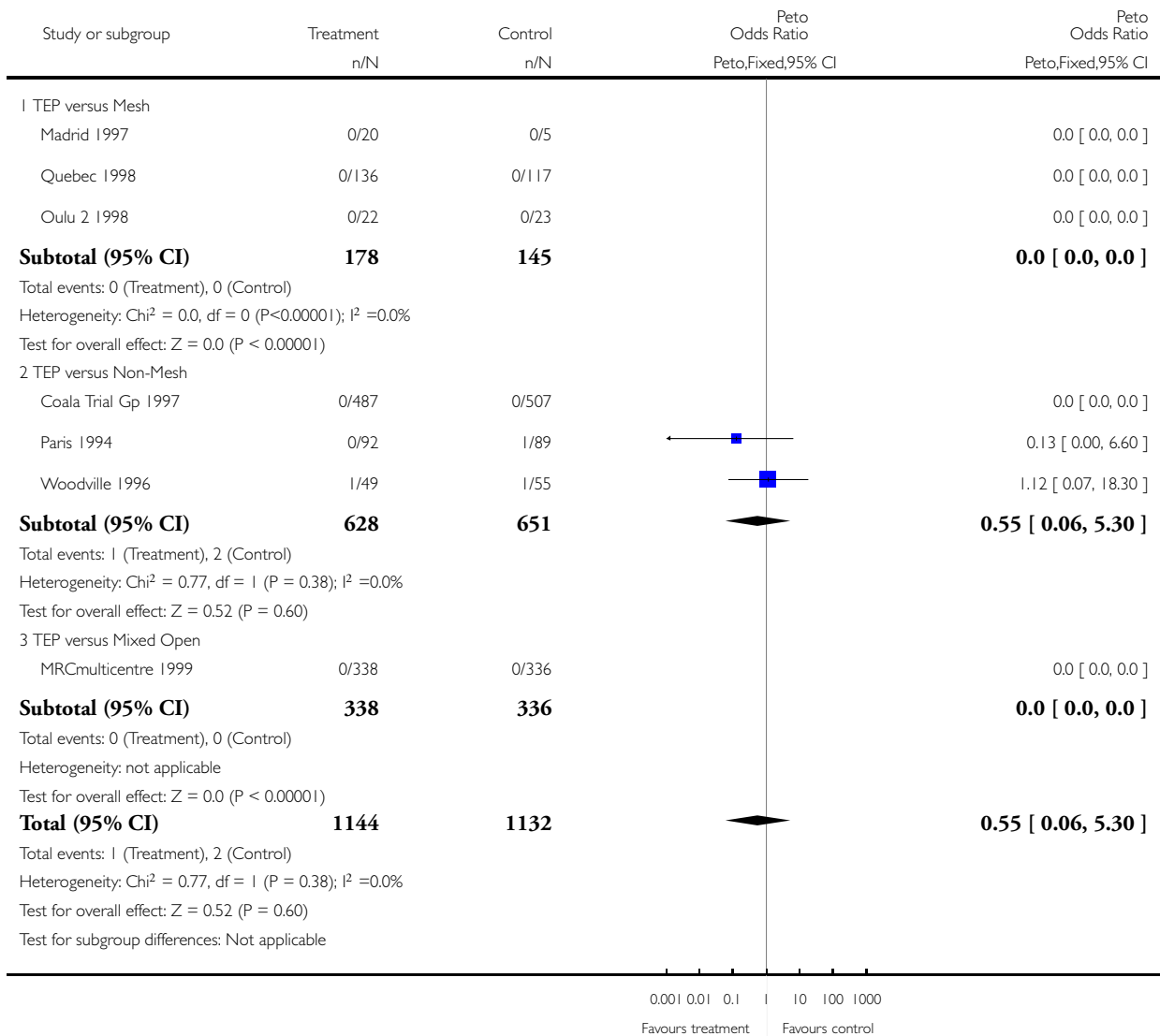
0.001 0.01 0.1 10 100 1000
Favours treatment Favours control

Analysis 3.8. Comparison 3 TEP versus Open, Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 8 Vascular injury

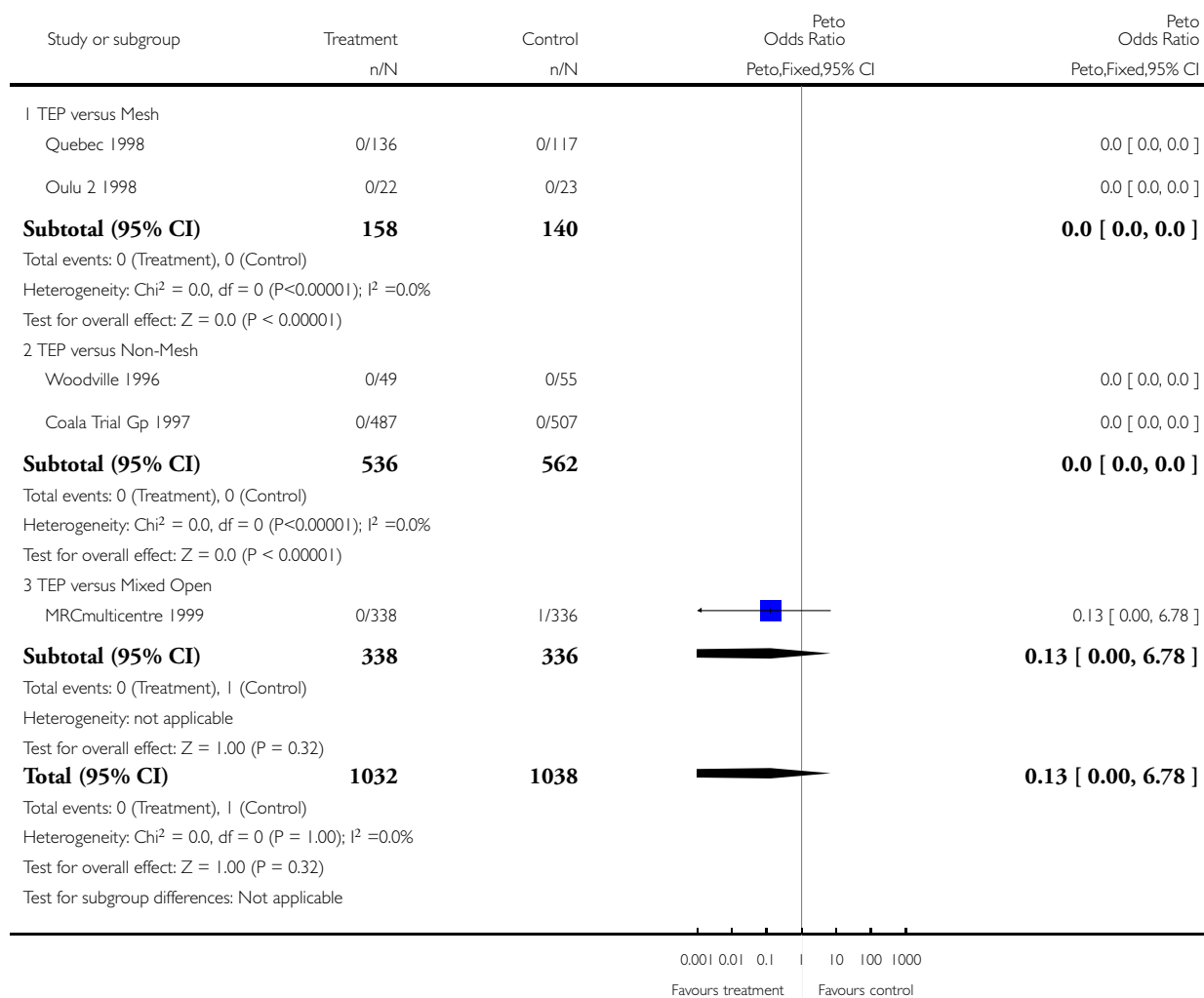


Analysis 3.9. Comparison 3 TEP versus Open, Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 9 Visceral injury



Analysis 3.10. Comparison 3 TEP versus Open, Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 10 Port site hernia

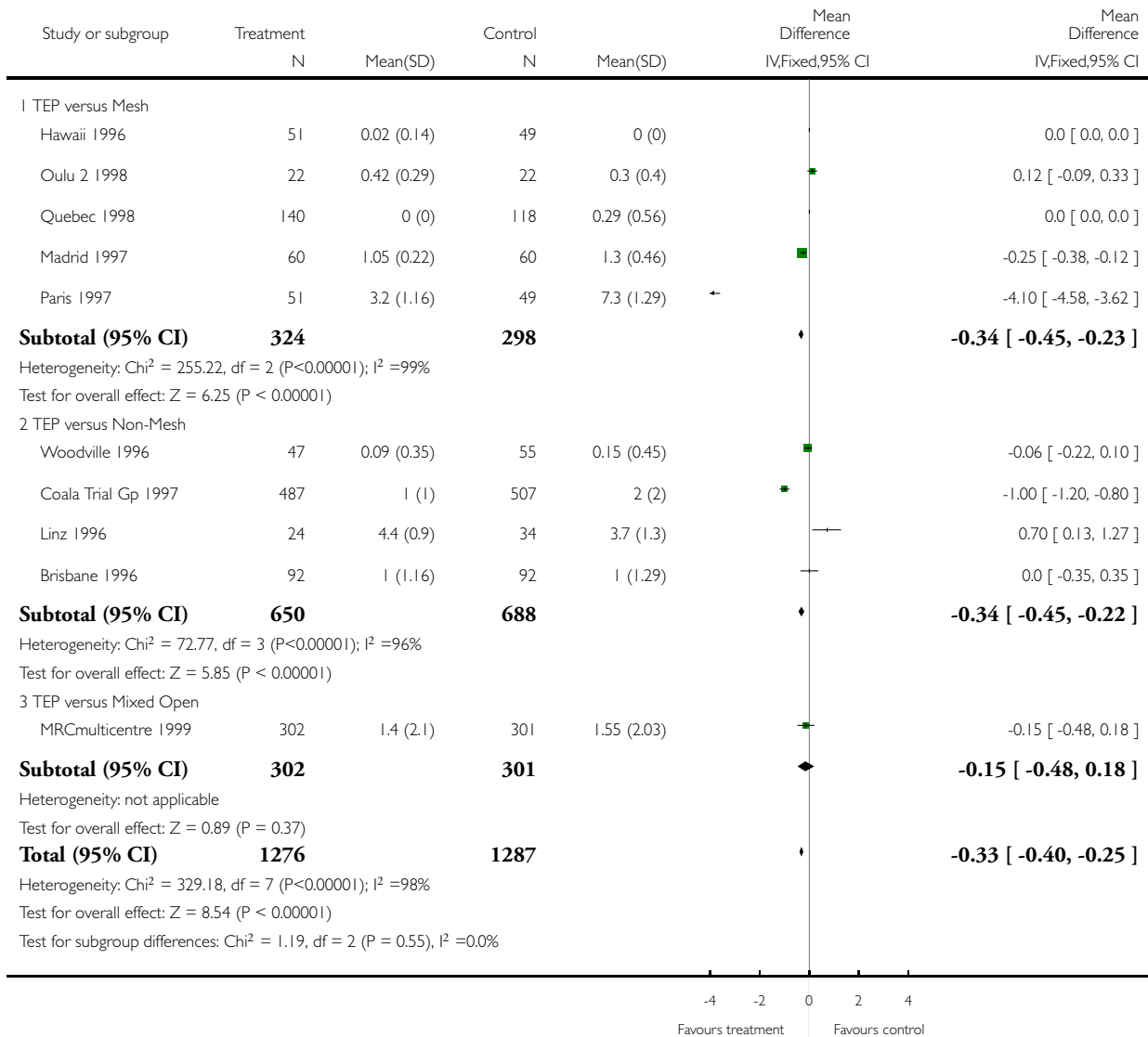
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh				
Quebec 1998	0/136	0/117		0.0 [0.0, 0.0]
Oulu 2 1998	0/22	0/23		0.0 [0.0, 0.0]
Subtotal (95% CI)	158	140		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² = 0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
2 TEP versus Non-Mesh				
Woodville 1996	0/49	0/55		0.0 [0.0, 0.0]
Coala Trial Gp 1997	0/487	0/507		0.0 [0.0, 0.0]
Subtotal (95% CI)	536	562		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² = 0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
3 TEP versus Mixed Open				
MRCmulticentre 1999	0/285	0/271		0.0 [0.0, 0.0]
Subtotal (95% CI)	285	271		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Total (95% CI)	979	973		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² = 0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Test for subgroup differences: Chi ² = 0.0, df = -1 (P = 0.0), I ² = 0.0%				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 3.11. Comparison 3 TEP versus Open, Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 11 Length of stay (days)

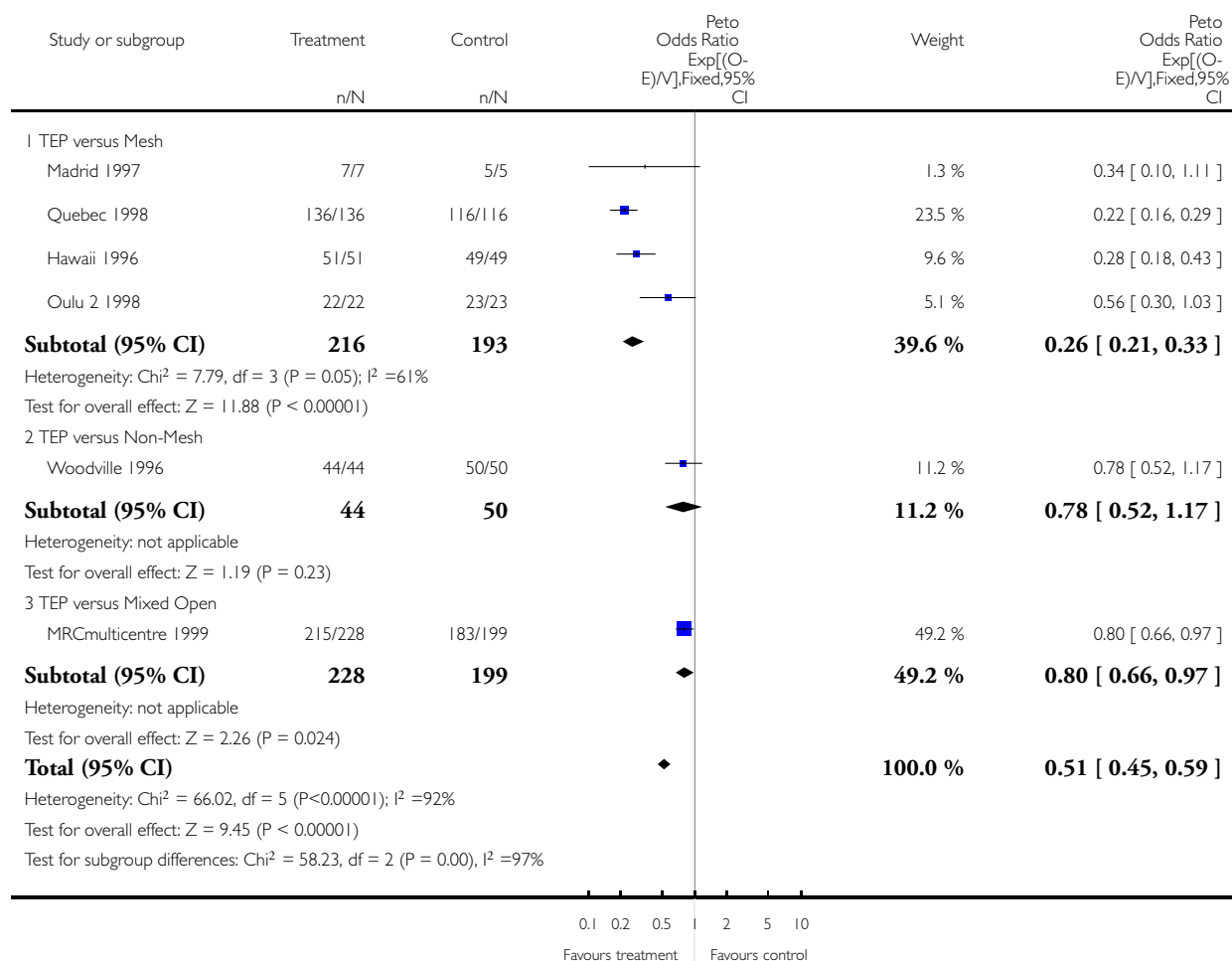


Analysis 3.12. Comparison 3 TEP versus Open, Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 12 Time to return to usual activities (days)

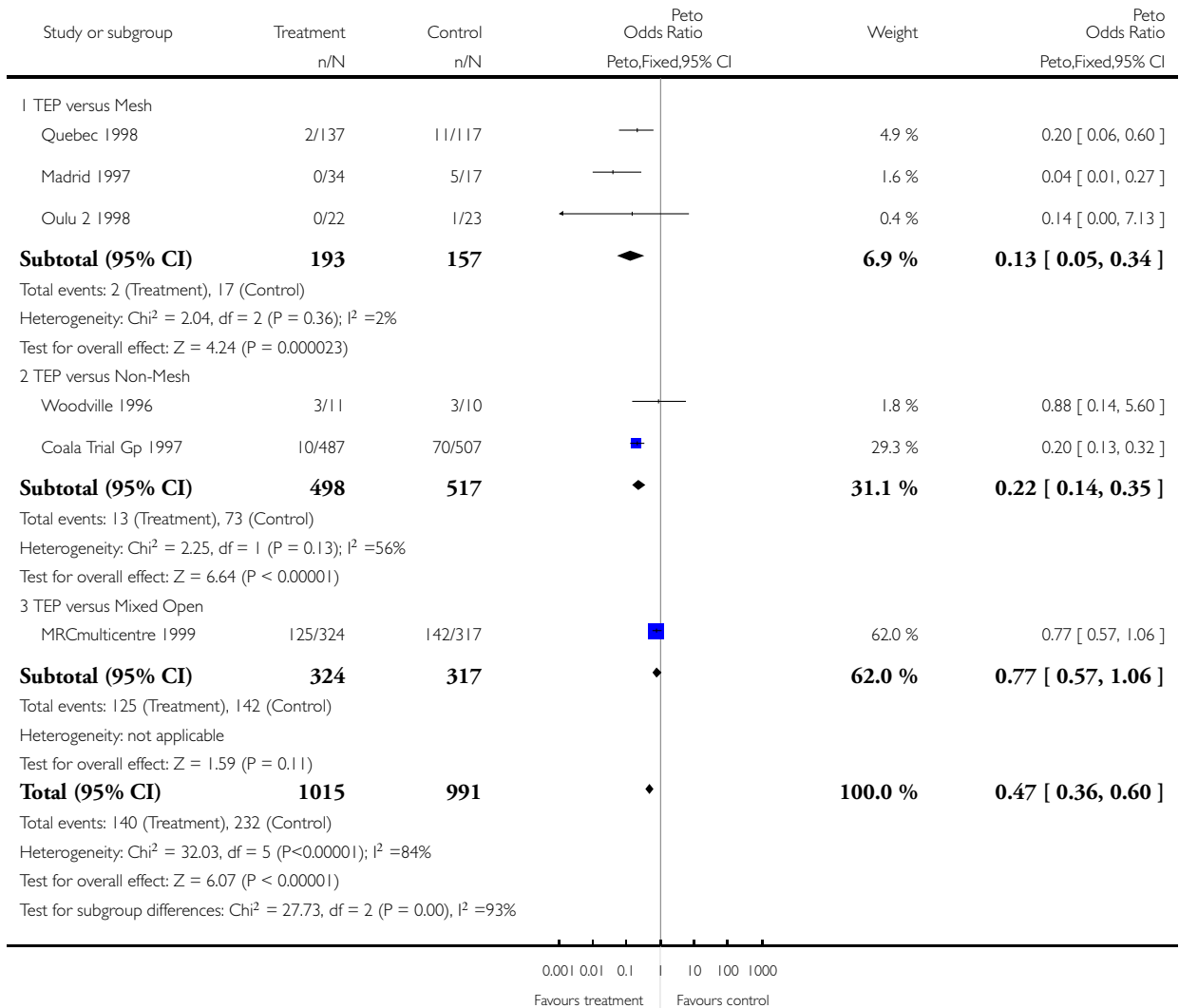


Analysis 3.13. Comparison 3 TEP versus Open, Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 13 Persisting pain

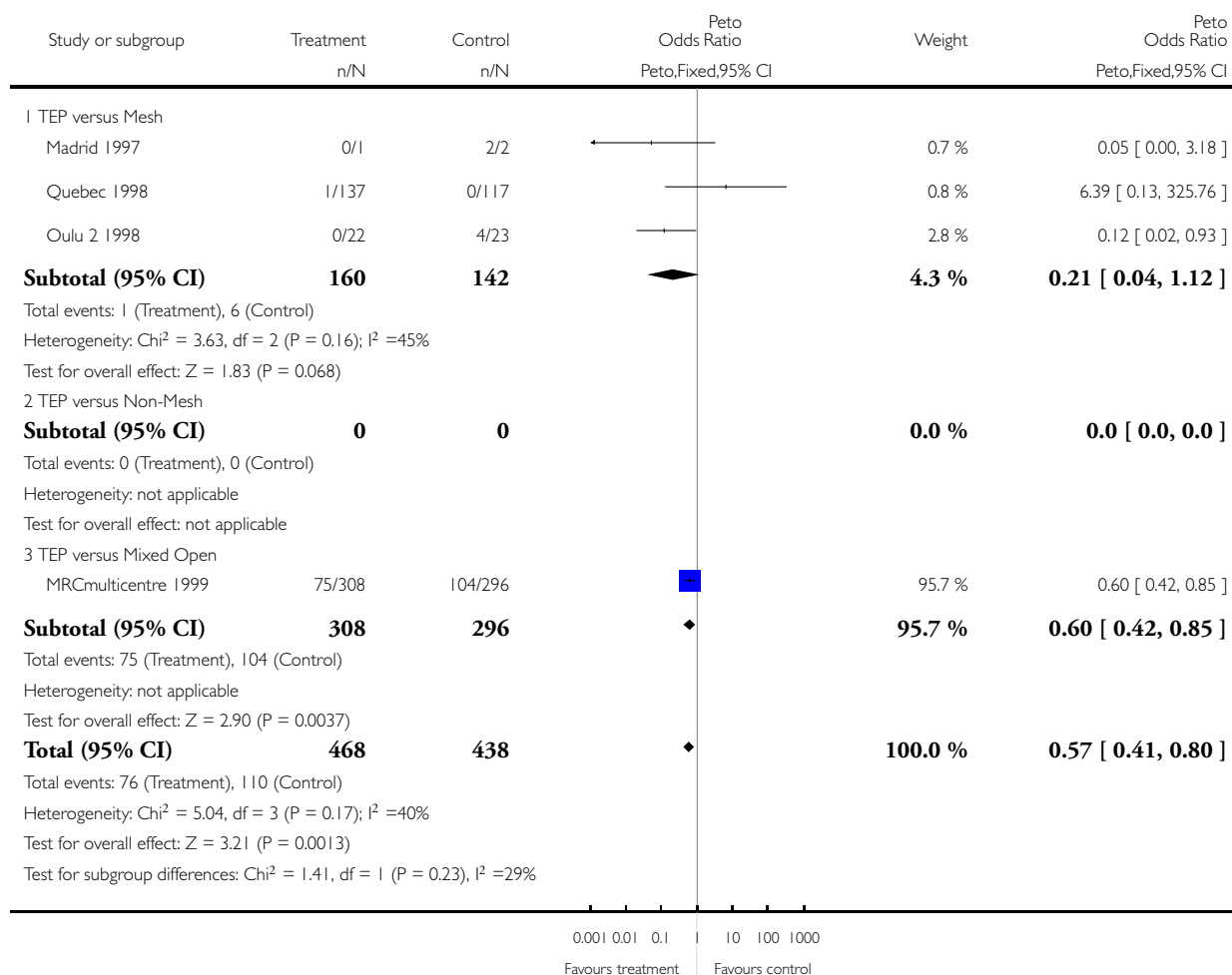


Analysis 3.14. Comparison 3 TEP versus Open, Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 14 Persisting numbness

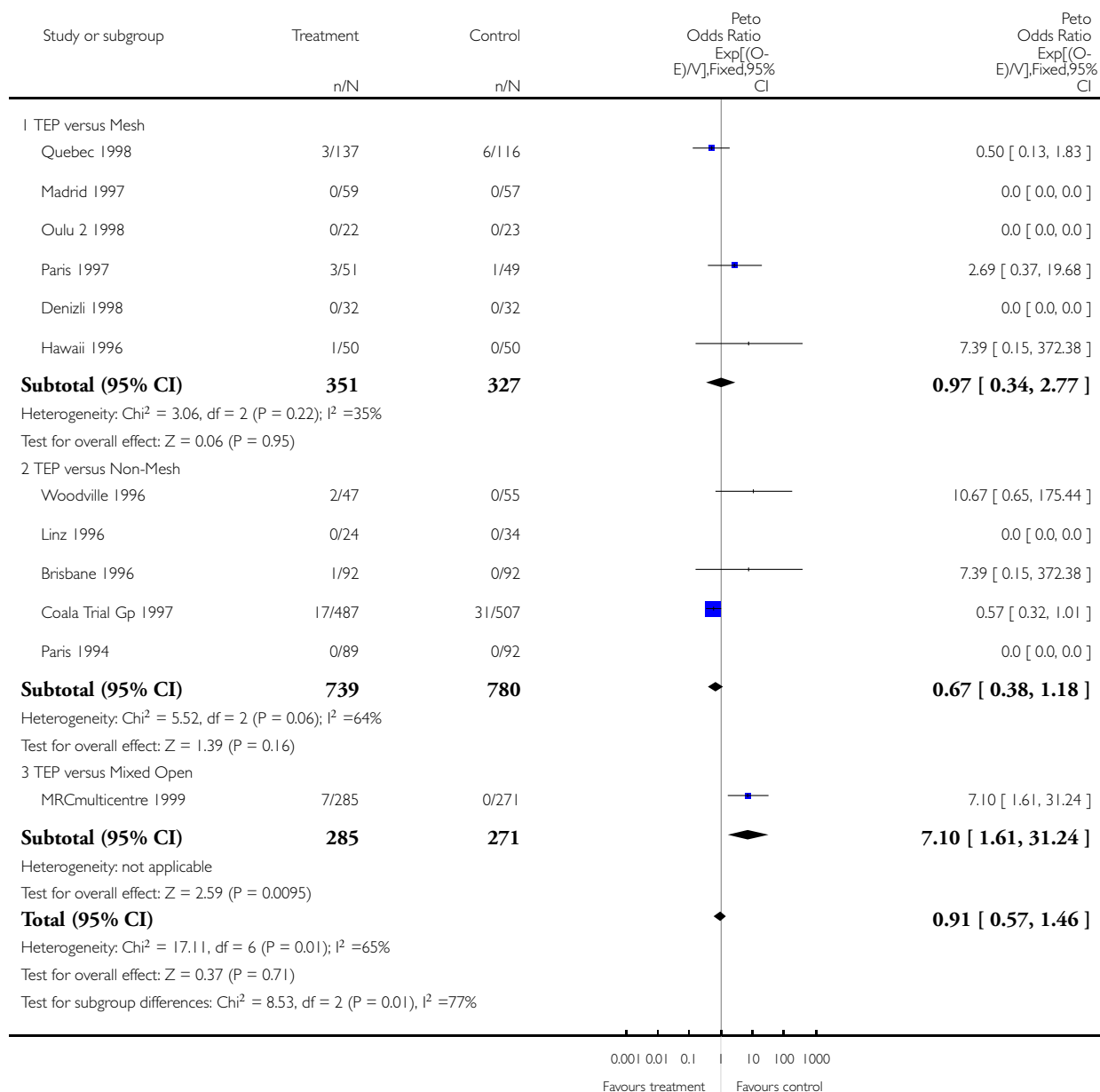


Analysis 3.15. Comparison 3 TEP versus Open, Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 3 TEP versus Open

Outcome: 15 Hernia recurrence

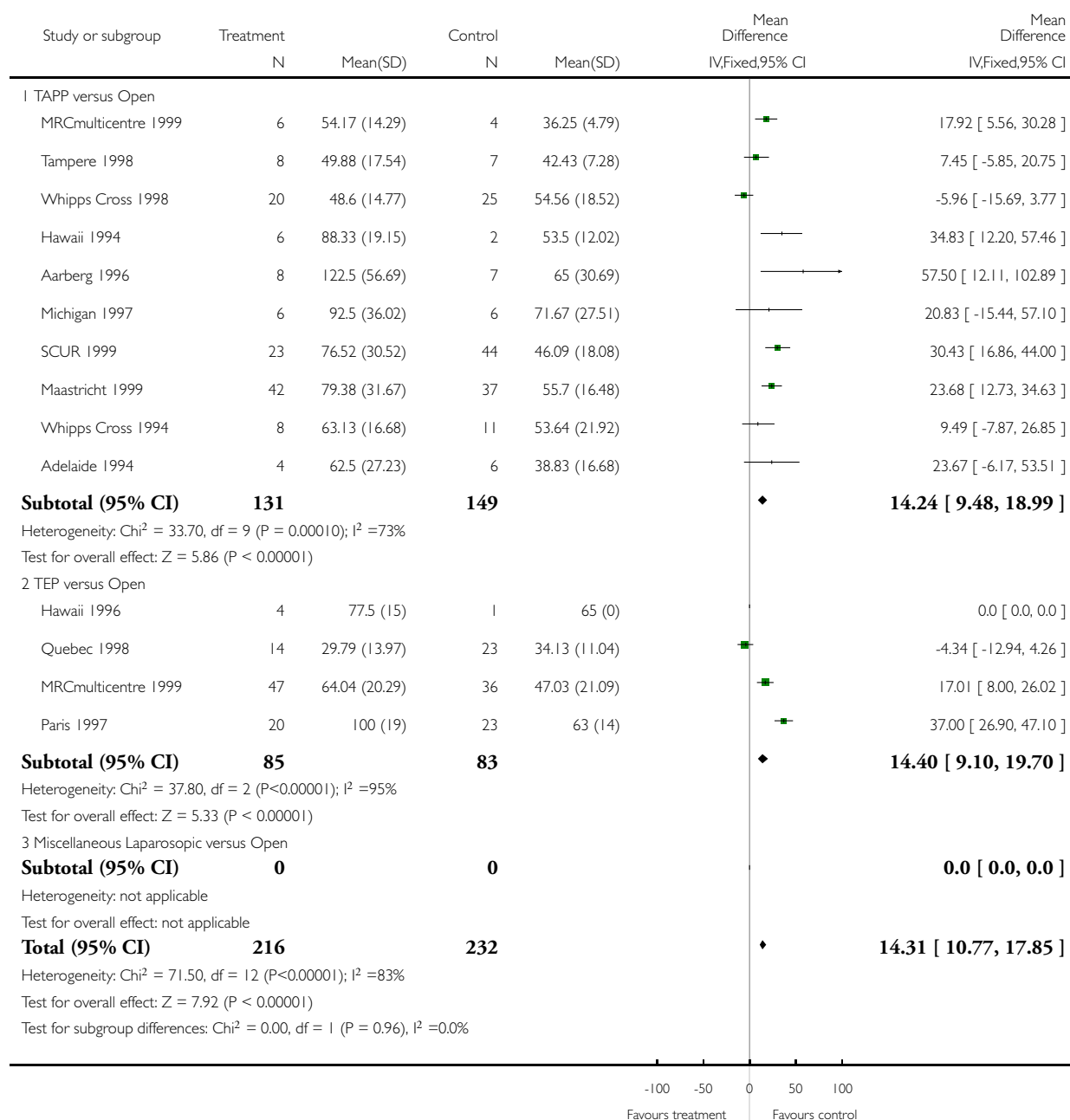


Analysis 4.1. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 1 Duration of operation (minutes)

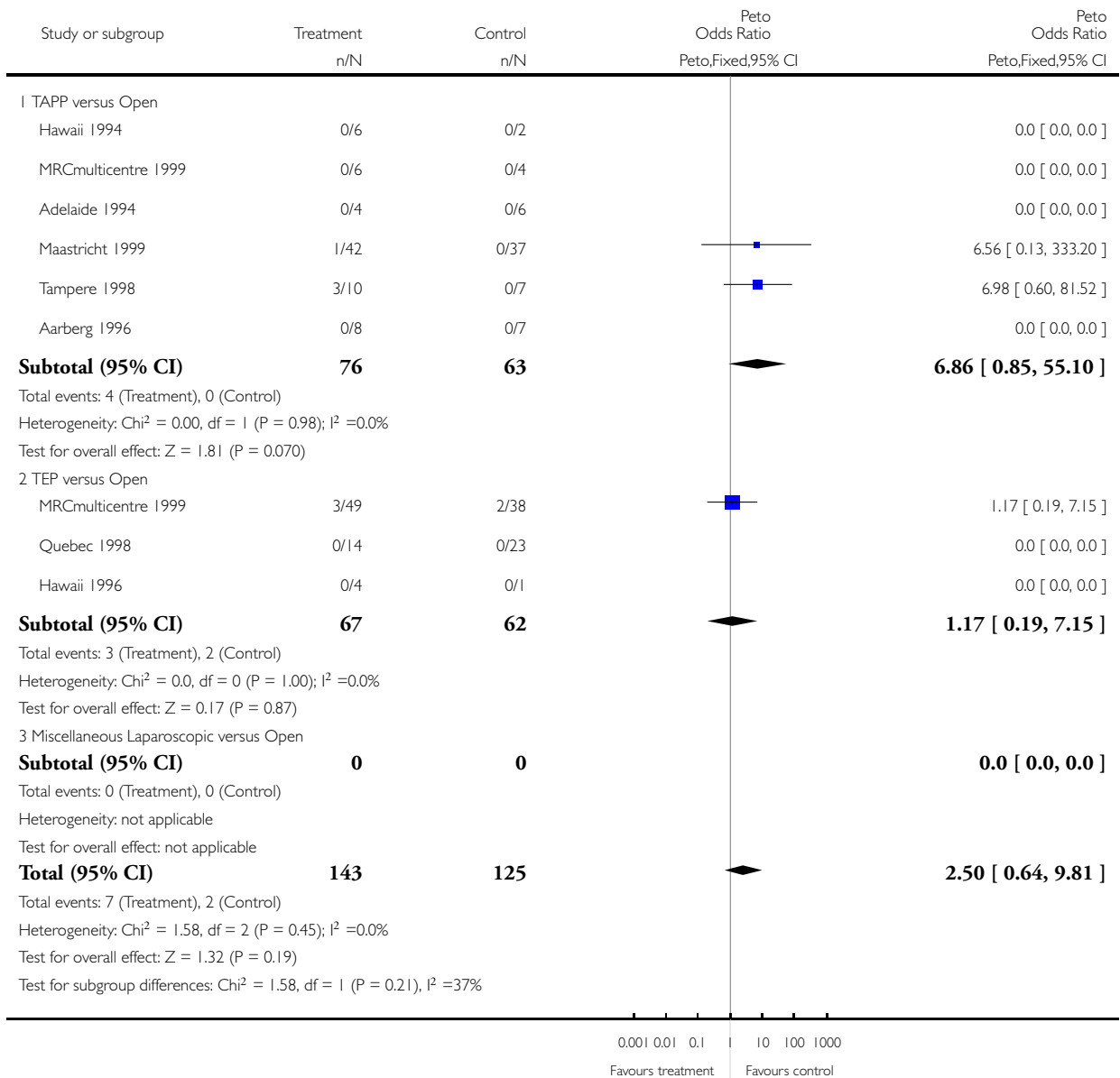


Analysis 4.2. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 2 "Opposite" method initiated

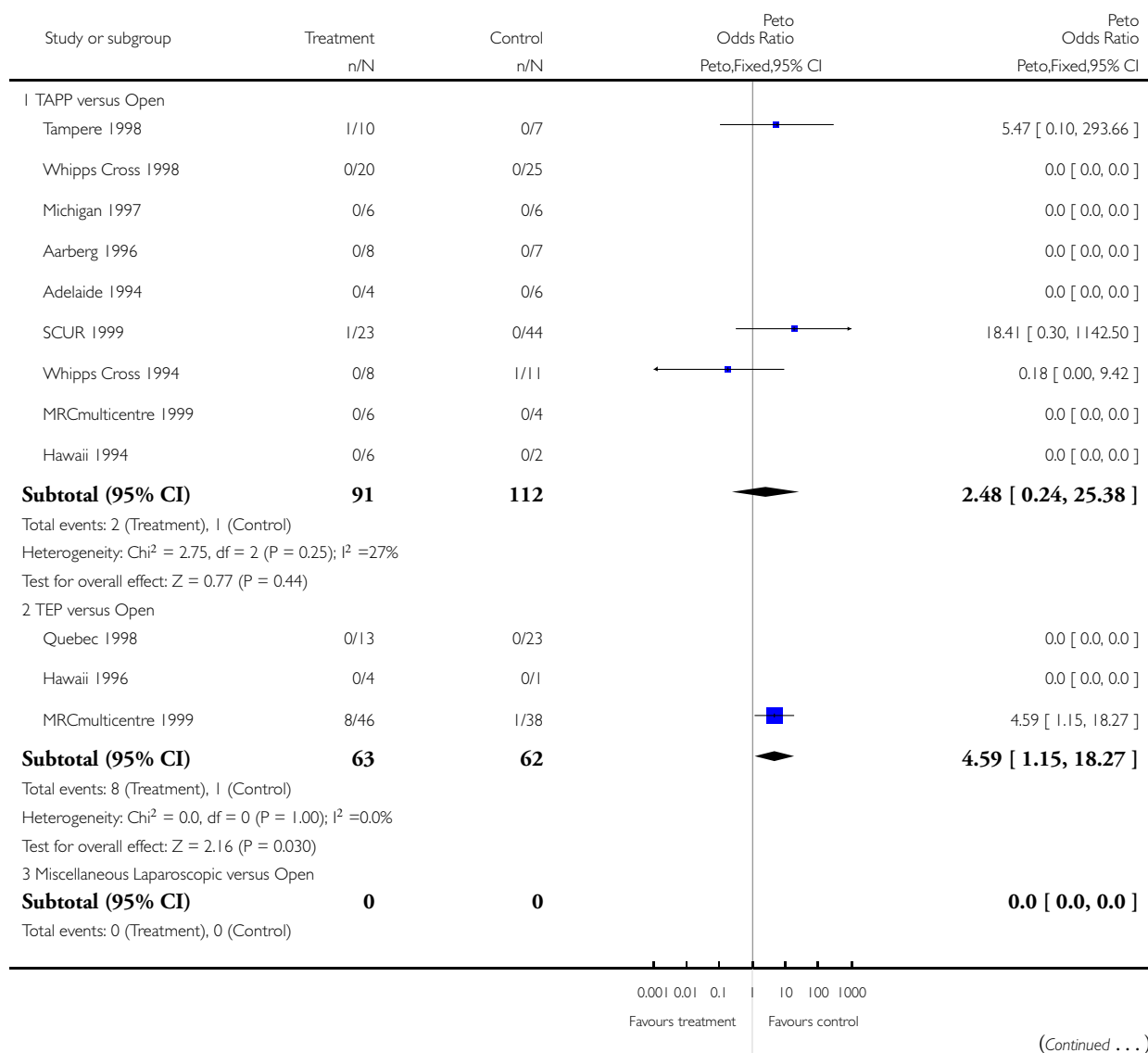


Analysis 4.3. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 3 Conversion.

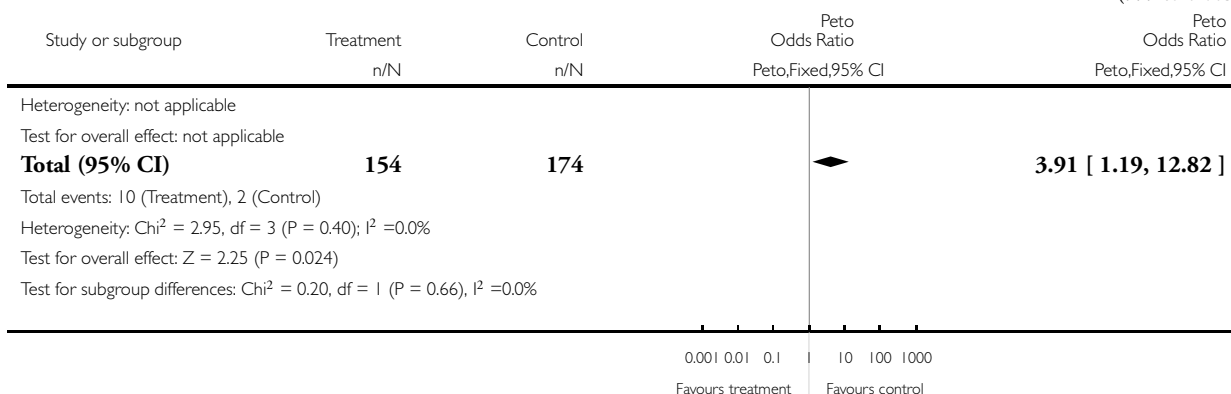
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 3 Conversion



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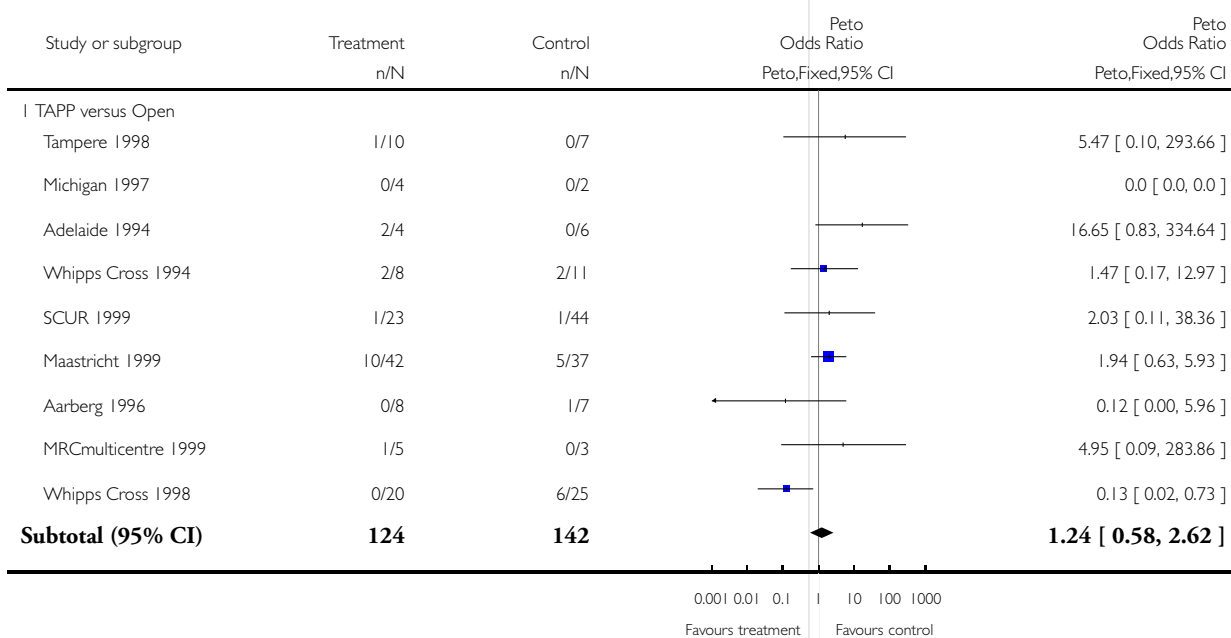


Analysis 4.4. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

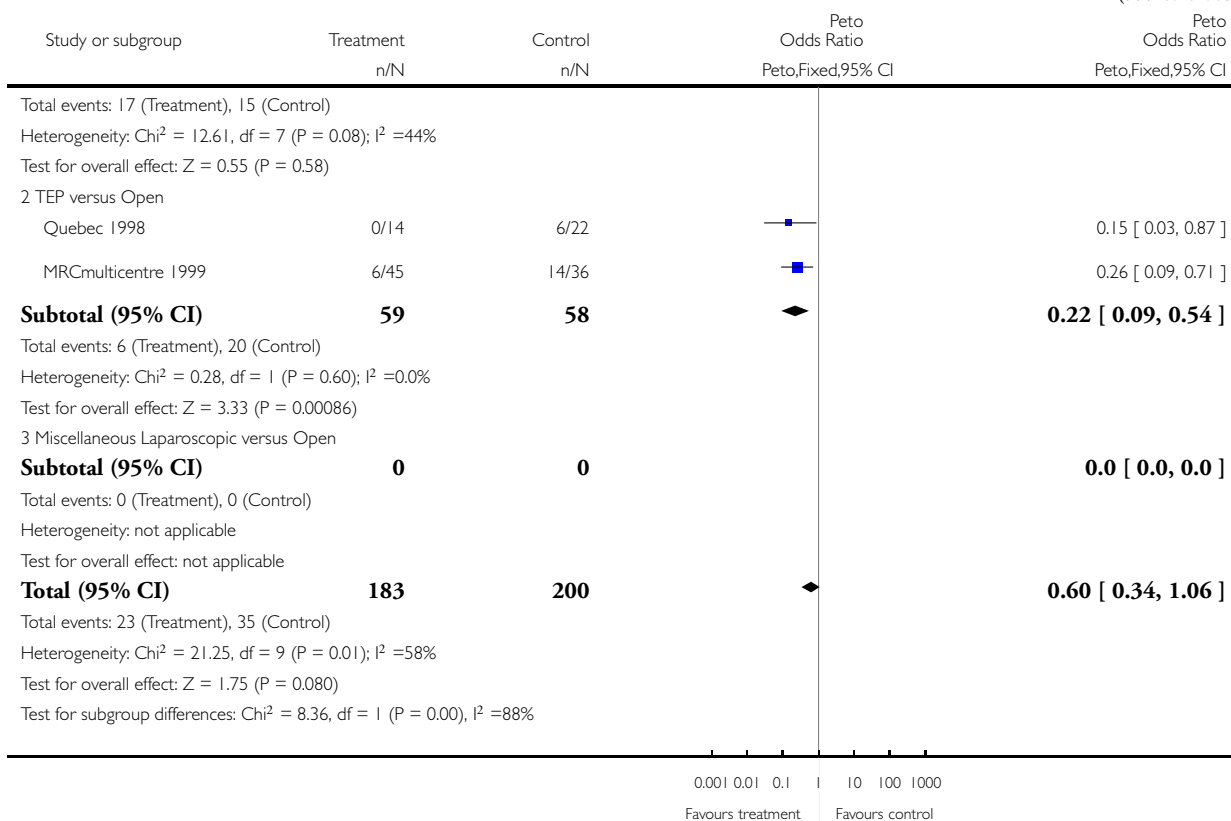
Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 4 Haematoma



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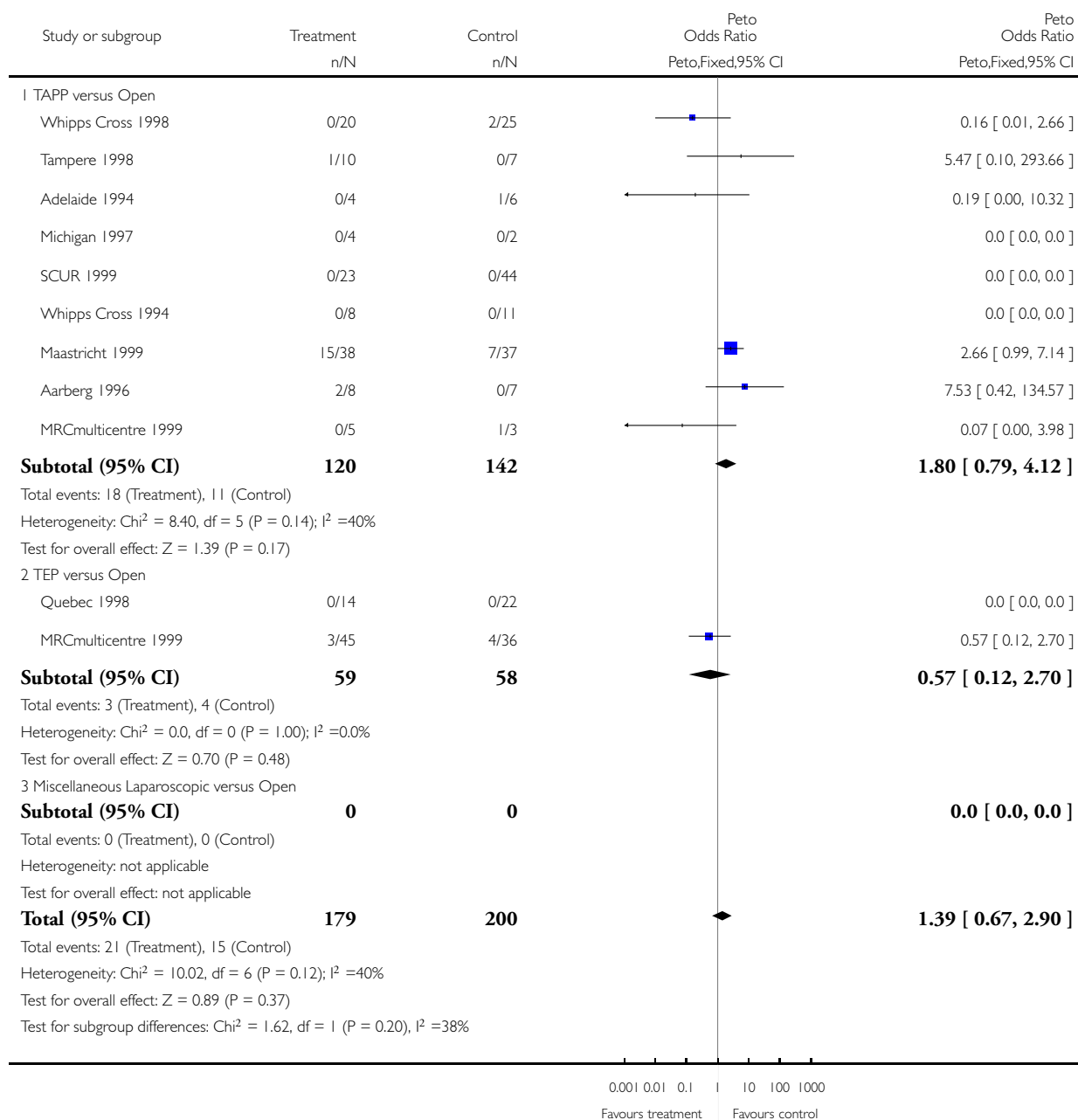


Analysis 4.5. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 5 Seroma

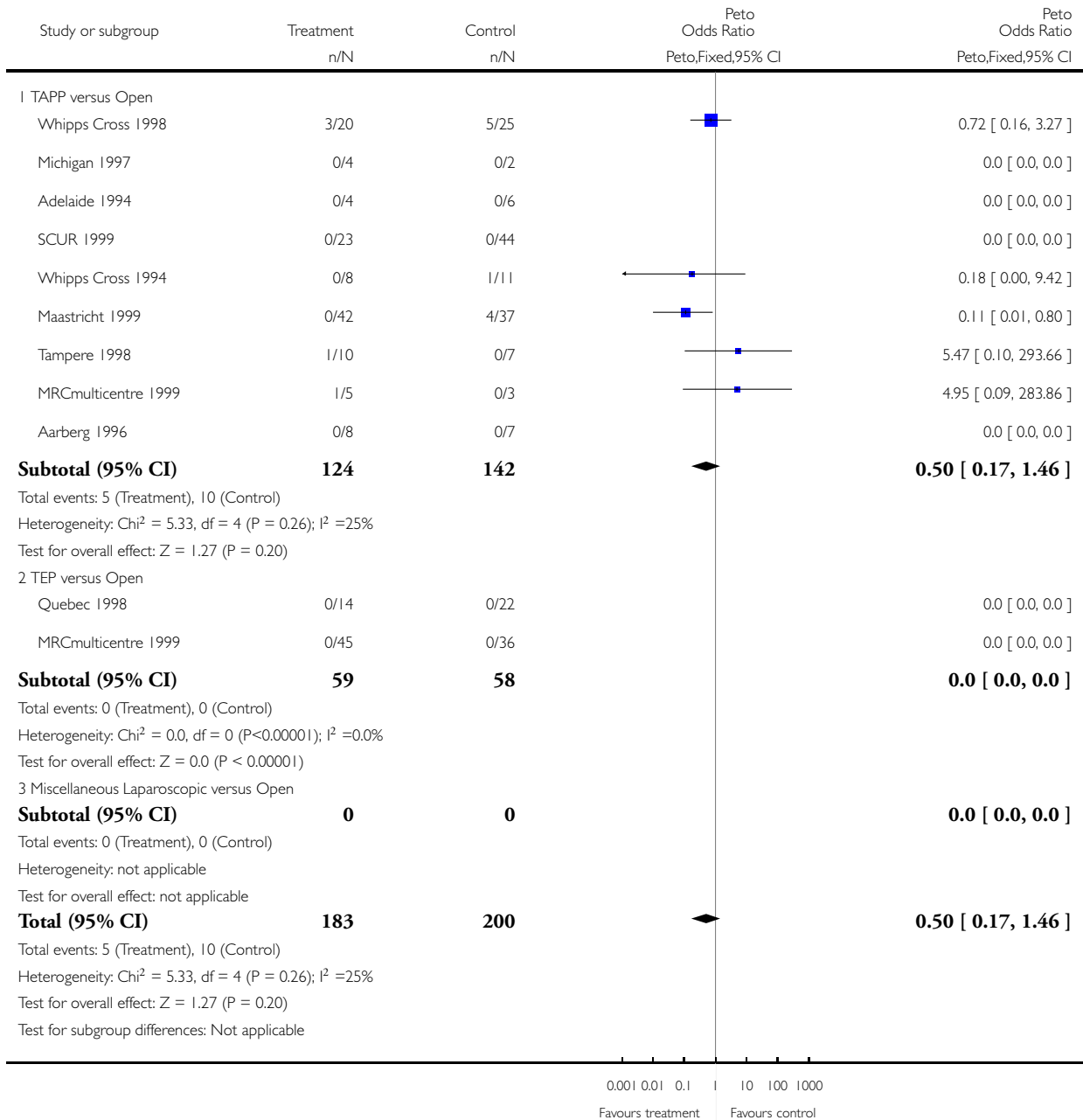


Analysis 4.6. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 6 Wound/superficial infection

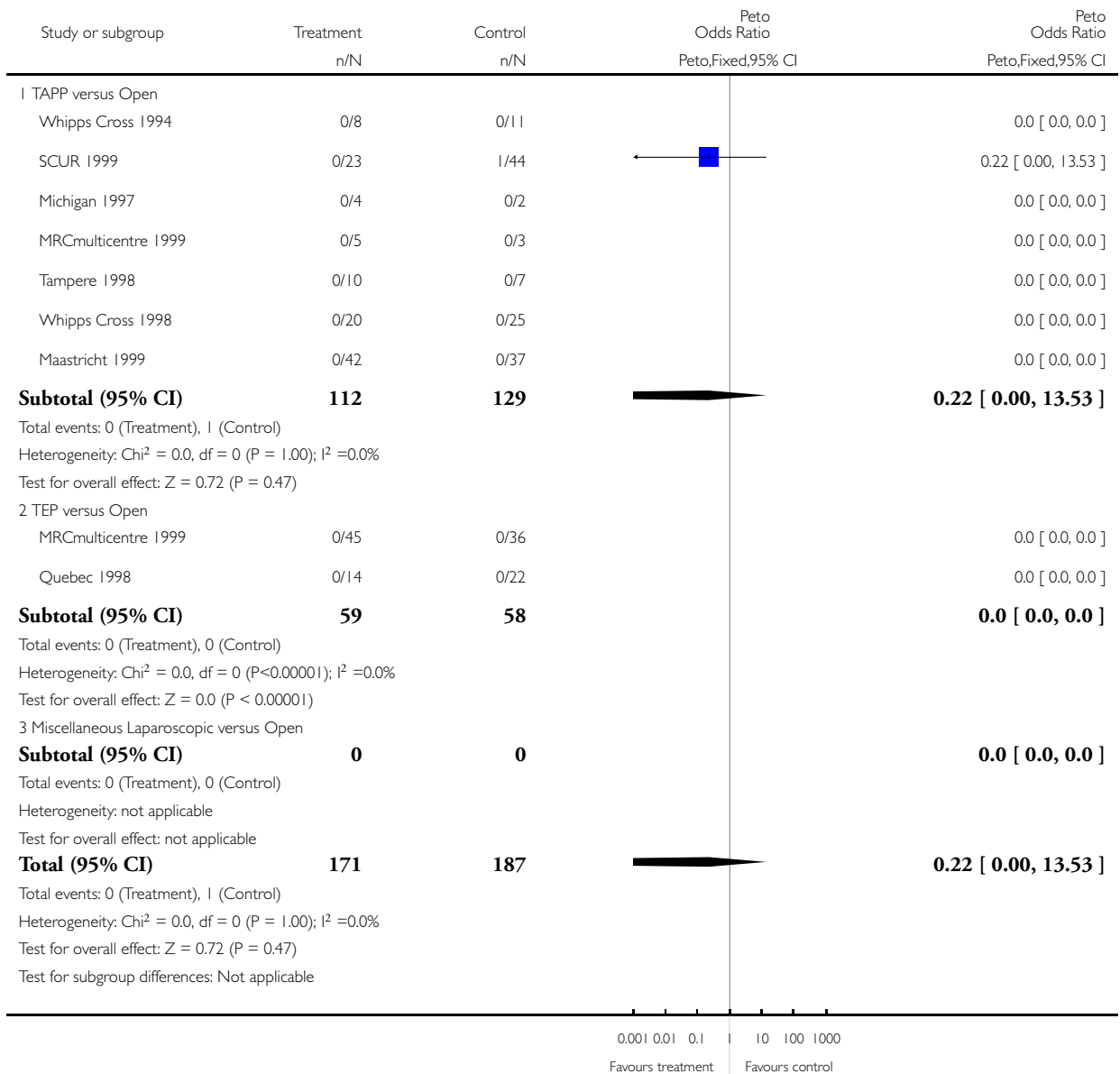


Analysis 4.7. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 7 Mesh/deep infection



Analysis 4.8. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 8 Vascular injury.

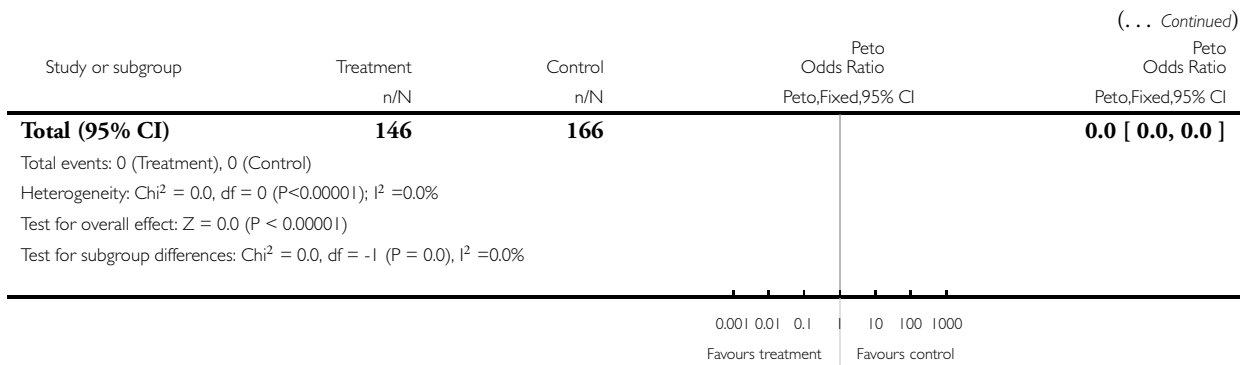
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 8 Vascular injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
I TAPP versus Open				
Aarberg 1996	0/8	0/7		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/6	0/4		0.0 [0.0, 0.0]
Tampere 1998	0/10	0/7		0.0 [0.0, 0.0]
Michigan 1997	0/4	0/2		0.0 [0.0, 0.0]
Whipps Cross 1998	0/20	0/25		0.0 [0.0, 0.0]
SCUR 1999	0/23	0/44		0.0 [0.0, 0.0]
Adelaide 1994	0/4	0/6		0.0 [0.0, 0.0]
Whipps Cross 1994	0/8	0/11		0.0 [0.0, 0.0]
Subtotal (95% CI)	83	106		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Open				
MRCmulticentre 1999	0/49	0/38		0.0 [0.0, 0.0]
Quebec 1998	0/14	0/22		0.0 [0.0, 0.0]
Subtotal (95% CI)	63	60		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 Miscellaneous Laparoscopic versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment Favours control	

(Continued ...)

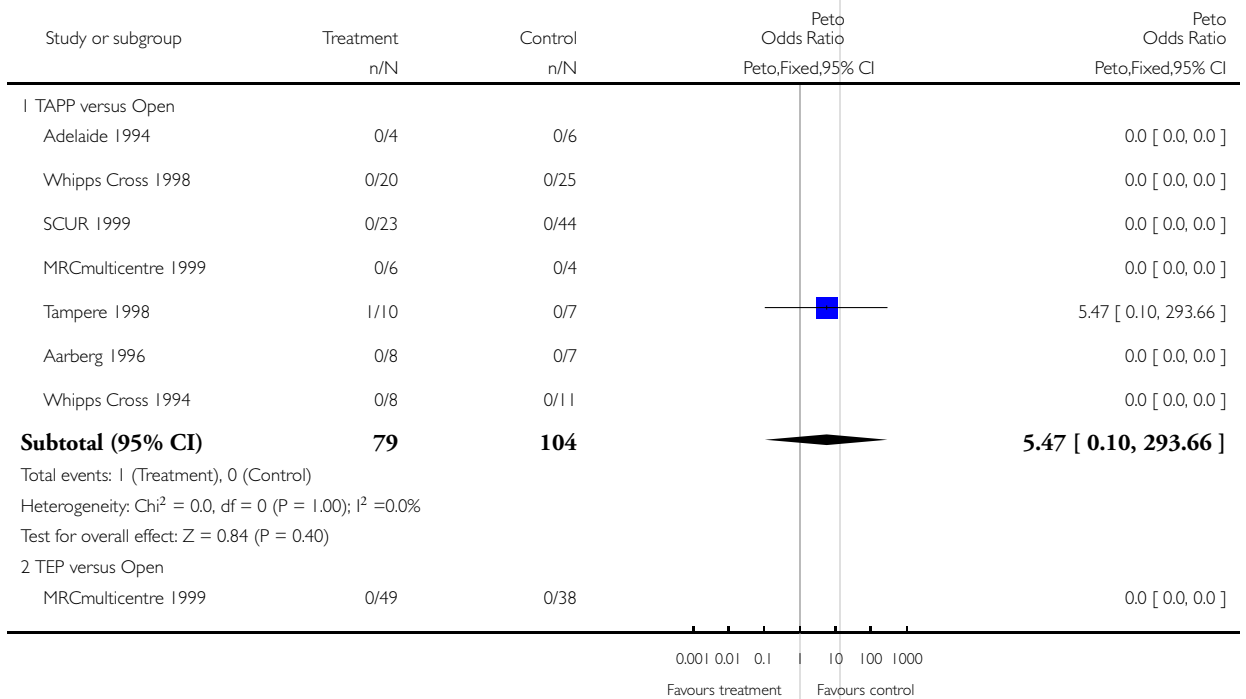


Analysis 4.9. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 9 Visceral injury.

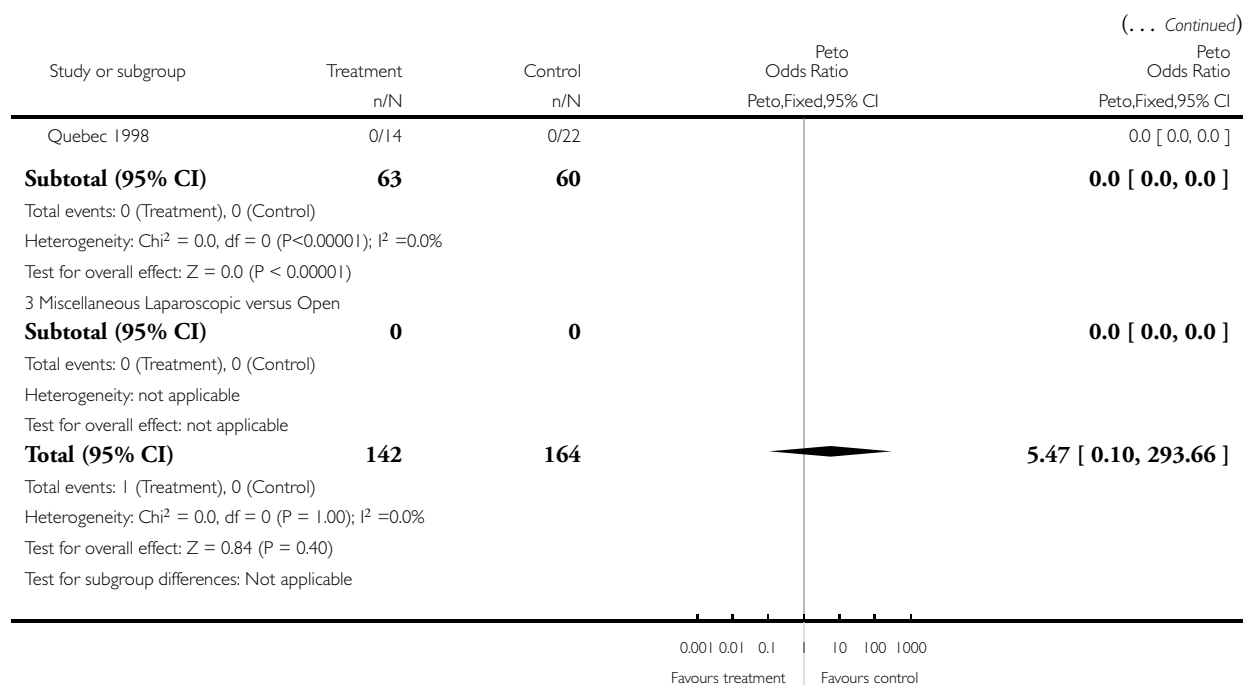
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 9 Visceral injury



(Continued ...)



Analysis 4.10. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 10 Port site hernia

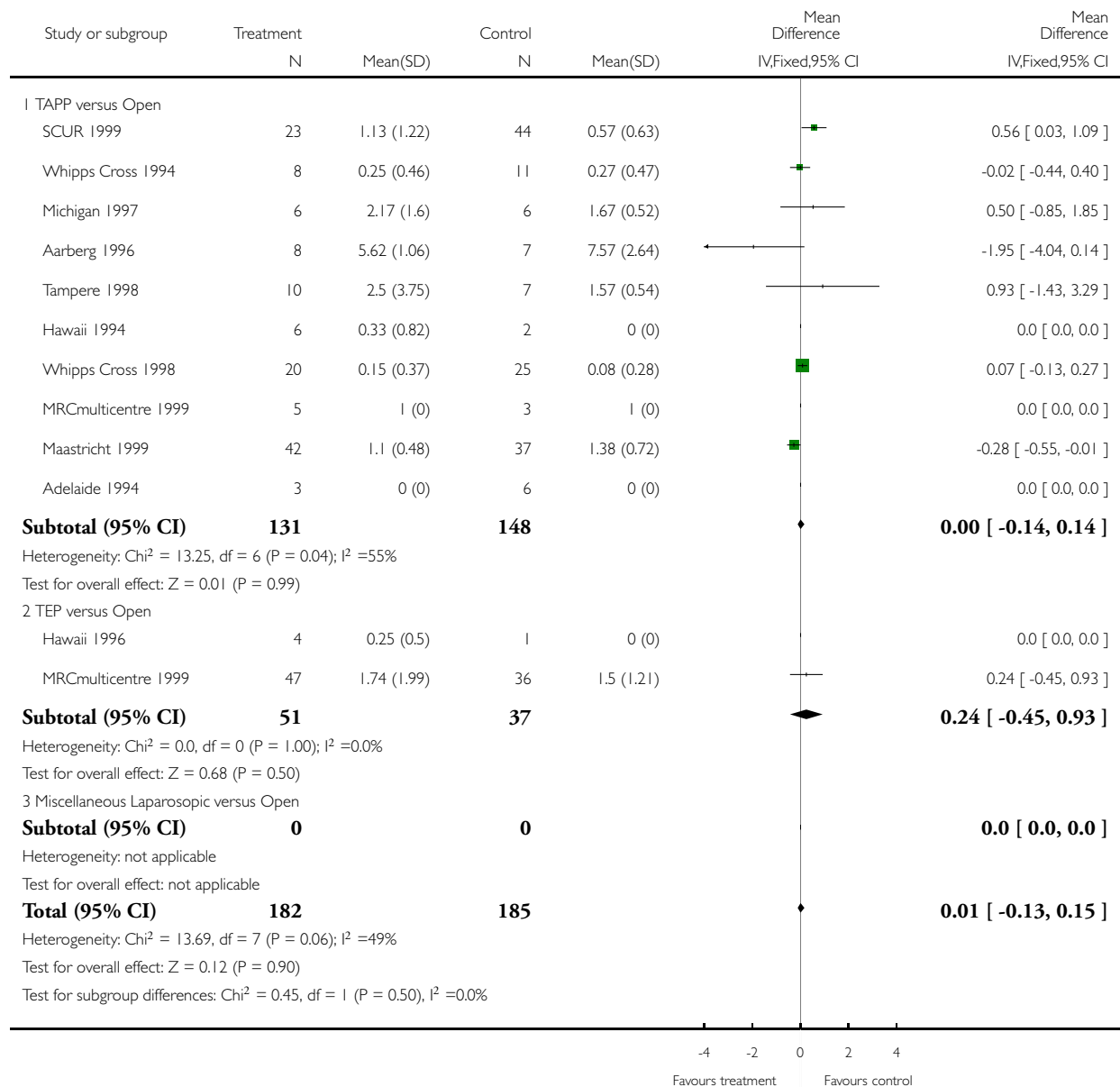
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
I TAPP versus Open				
SCUR 1999	0/23	0/44		0.0 [0.0, 0.0]
Aarberg 1996	0/8	0/7		0.0 [0.0, 0.0]
Whipps Cross 1998	0/20	0/25		0.0 [0.0, 0.0]
Michigan 1997	0/4	0/2		0.0 [0.0, 0.0]
Adelaide 1994	0/4	0/6		0.0 [0.0, 0.0]
Whipps Cross 1994	0/8	0/11		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/5	0/4		0.0 [0.0, 0.0]
Maastricht 1999	0/42	0/37		0.0 [0.0, 0.0]
Subtotal (95% CI)	114	136		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Open				
Quebec 1998	0/14	0/22		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/41	0/34		0.0 [0.0, 0.0]
Subtotal (95% CI)	55	56		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 Miscellaneous Laparoscopic versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	169	192		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 10 100 1000	
			Favours treatment	Favours control

Analysis 4.11. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 11 Length of stay (days)

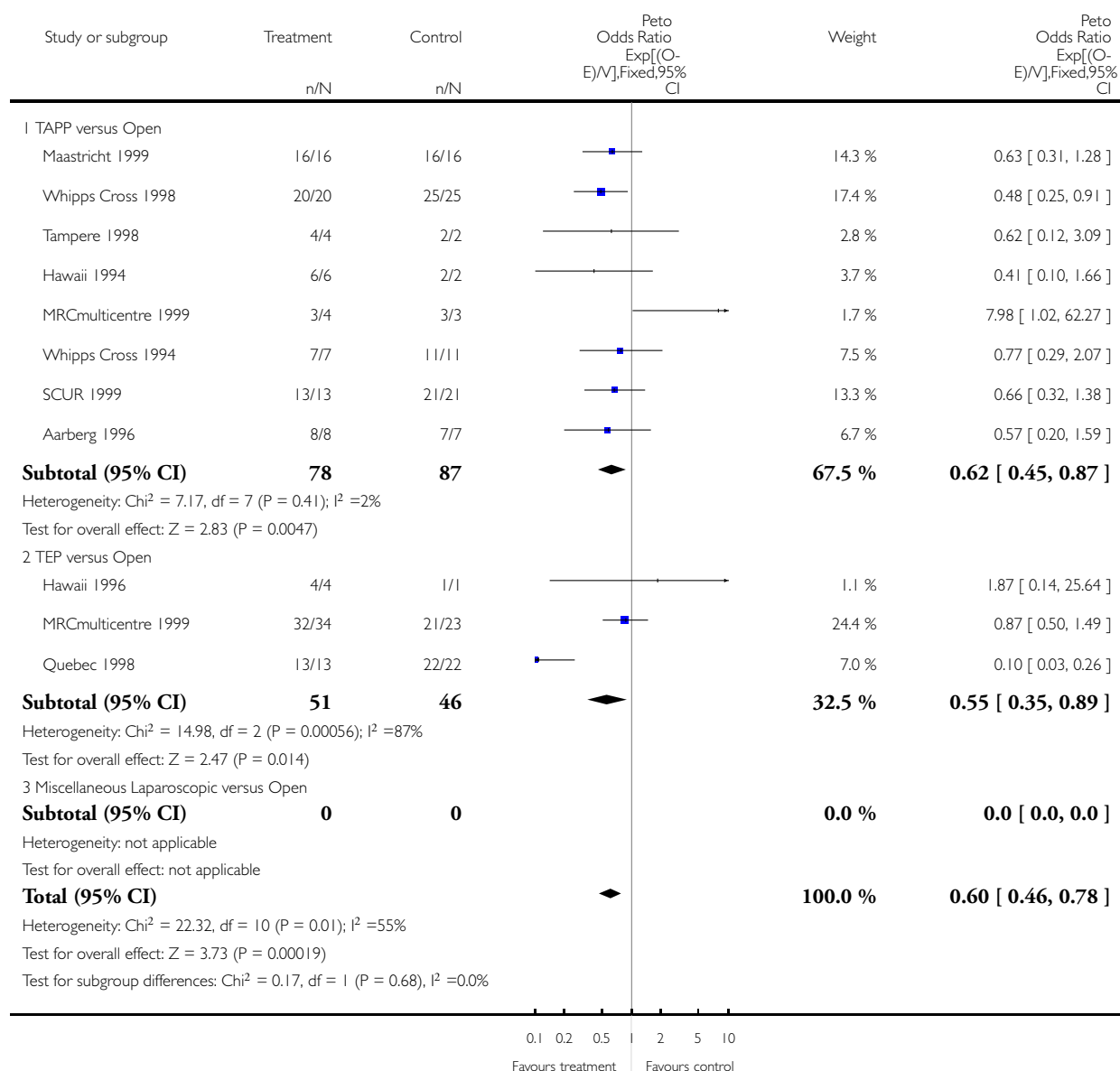


Analysis 4.12. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 12 Time to return to usual activities (days)

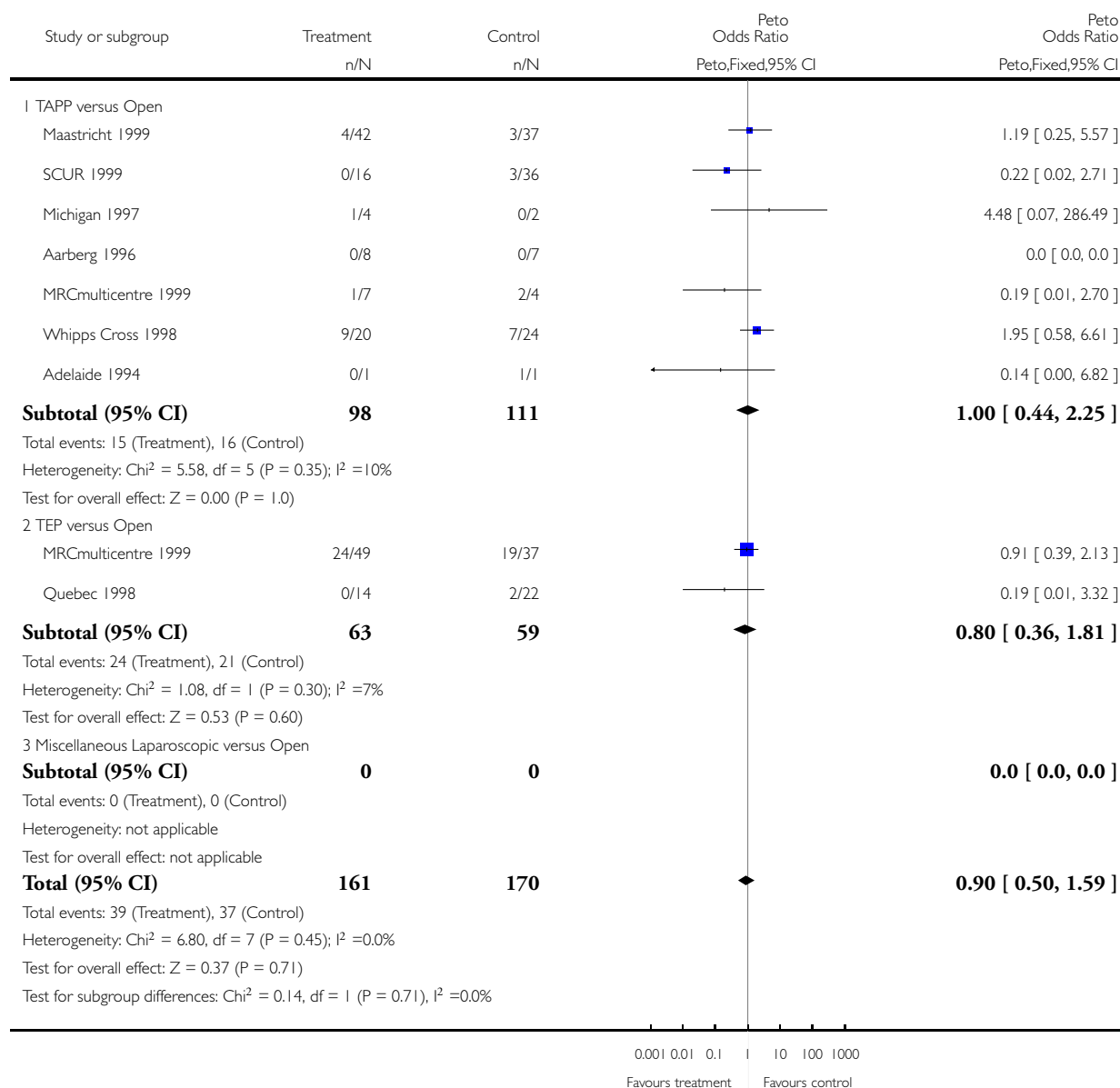


Analysis 4.13. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 13 Persisting pain

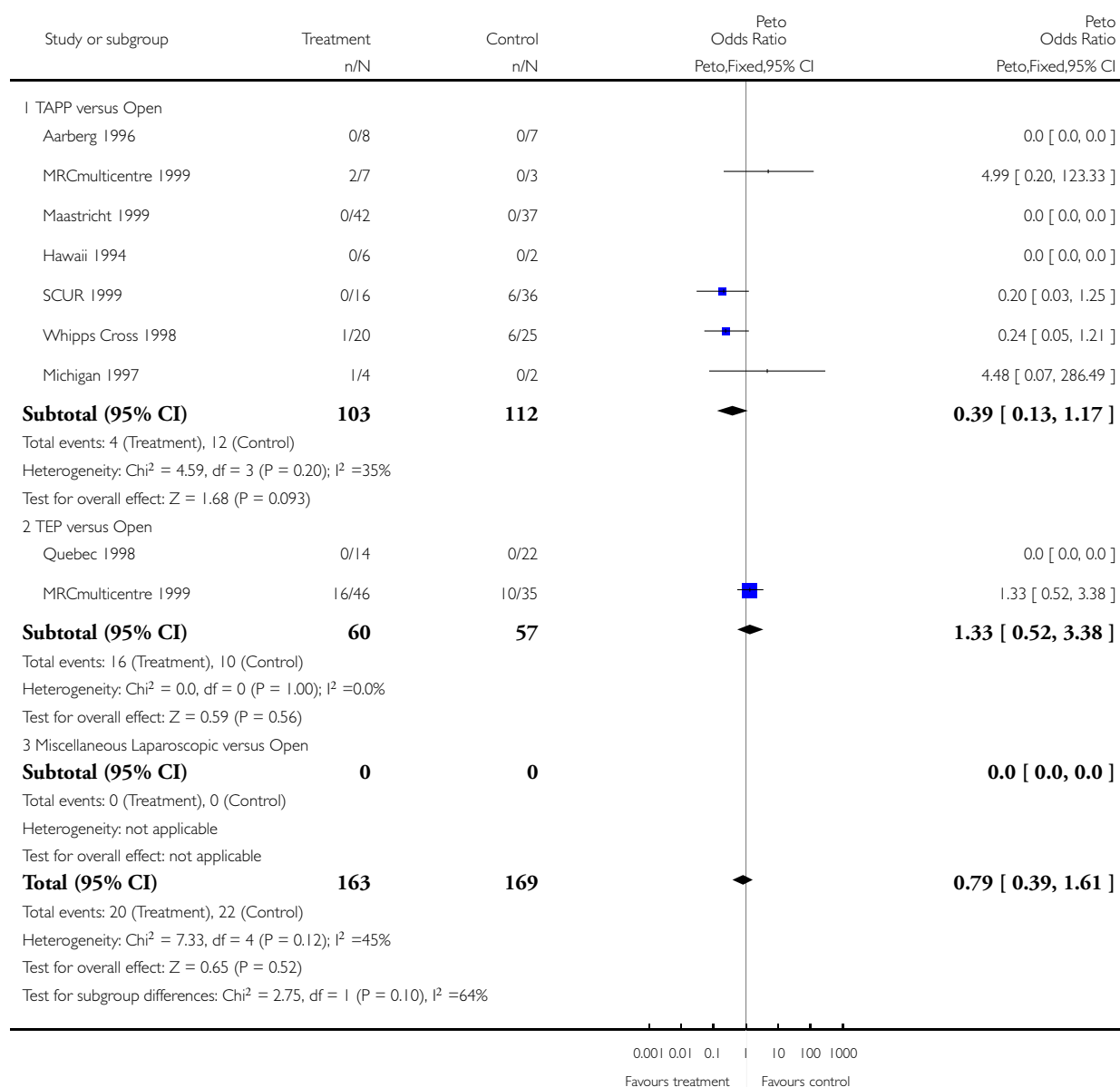


Analysis 4.14. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 14 Persisting numbness

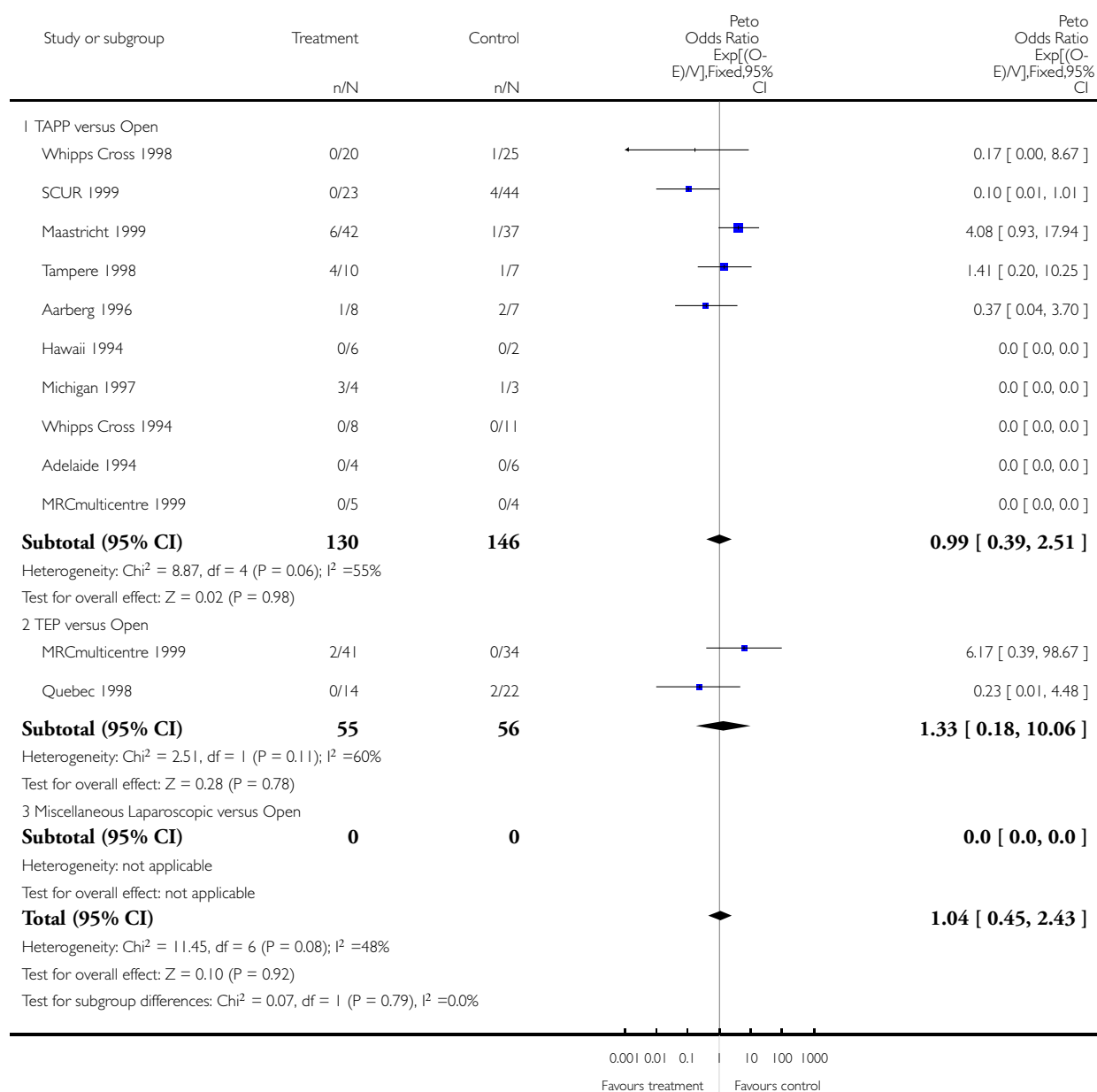


Analysis 4.15. Comparison 4 Laparoscopic versus Open (Recurrent hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 4 Laparoscopic versus Open (Recurrent hernias)

Outcome: 15 Hernia recurrence

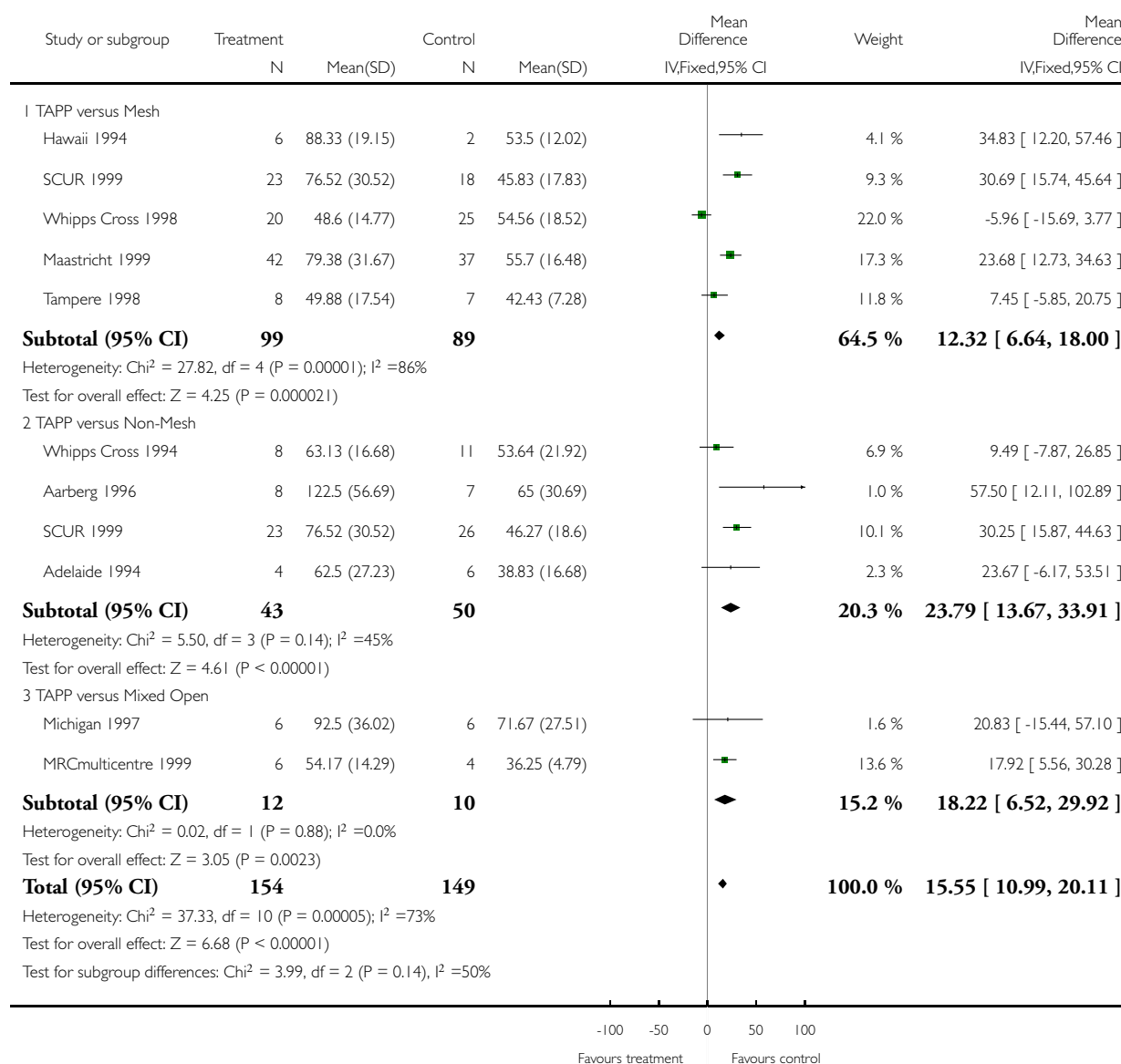


Analysis 5.1. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome I Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: I Duration of operation (minutes)

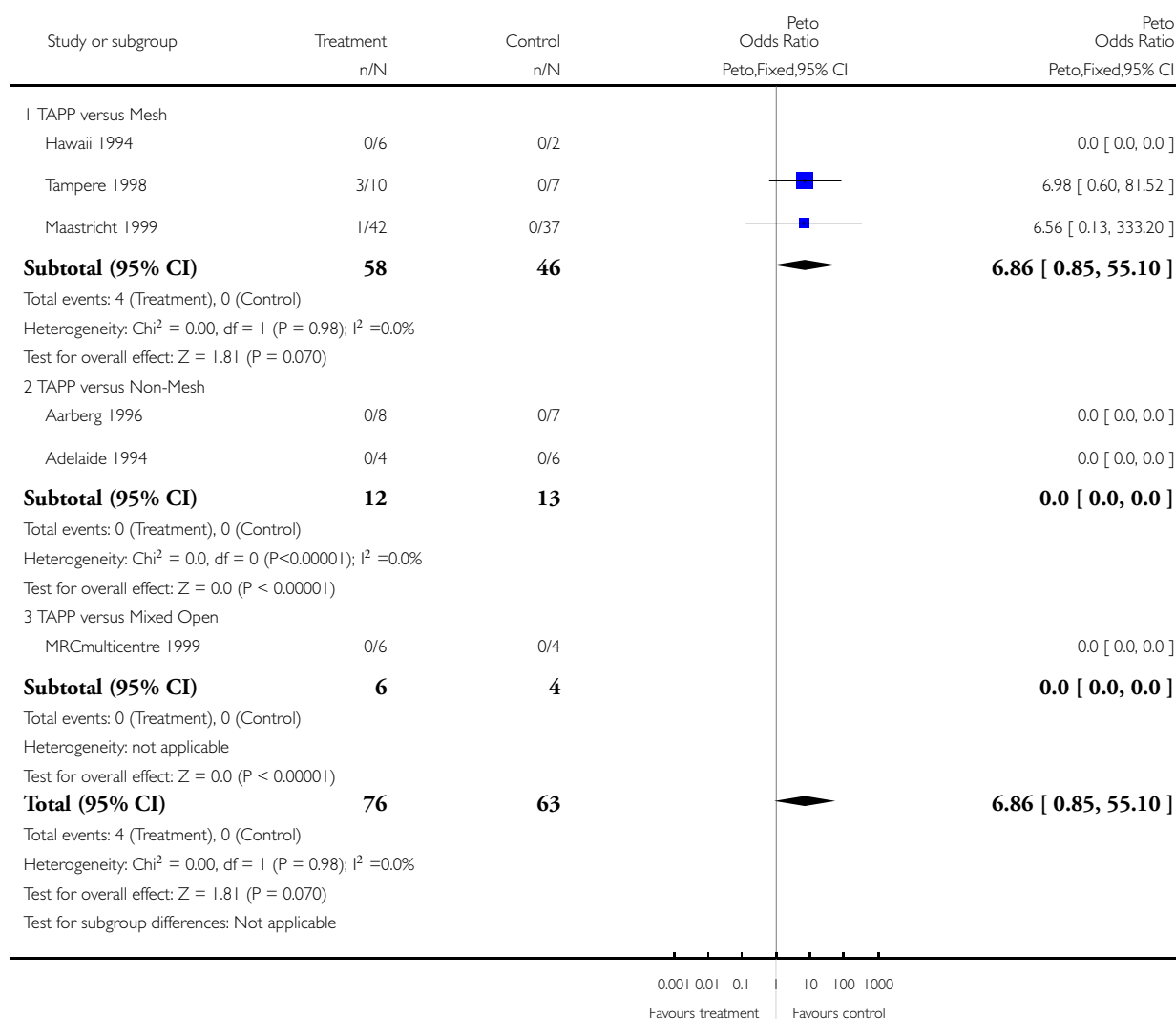


Analysis 5.2. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 2 "Opposite" method initiated

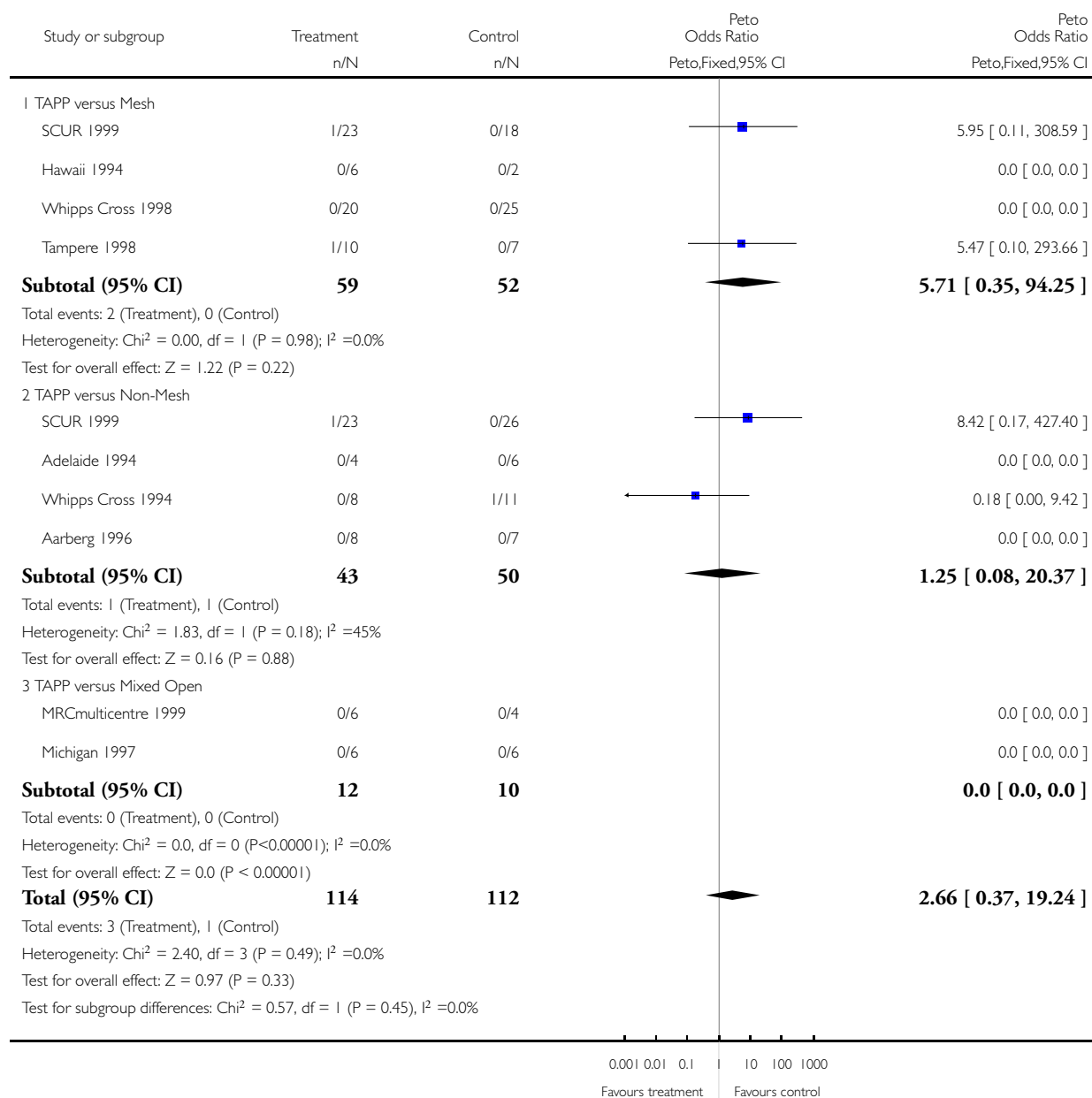


Analysis 5.3. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 3 Conversion

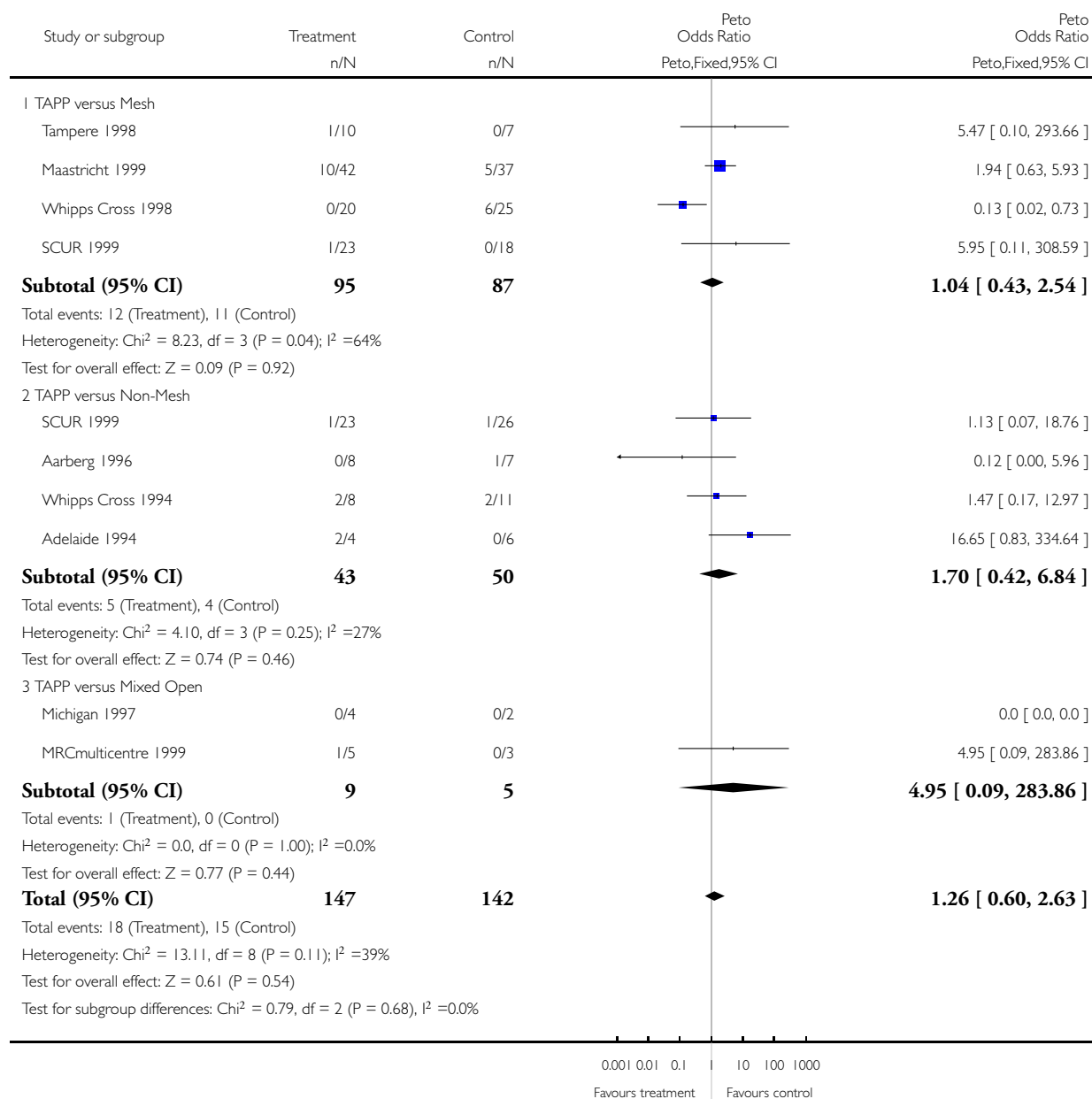


Analysis 5.4. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 4 Haematoma

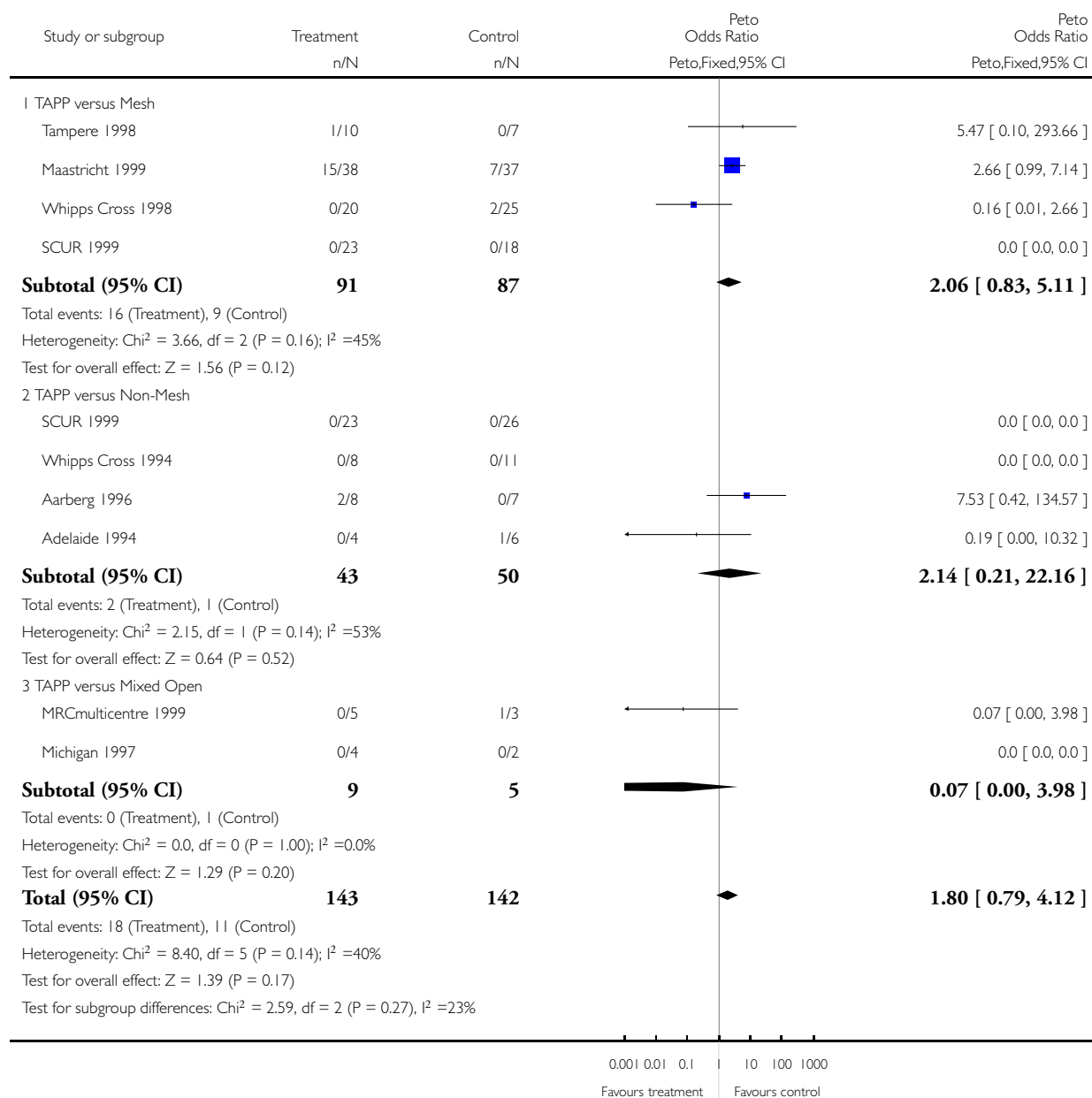


Analysis 5.5. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 5 Seroma

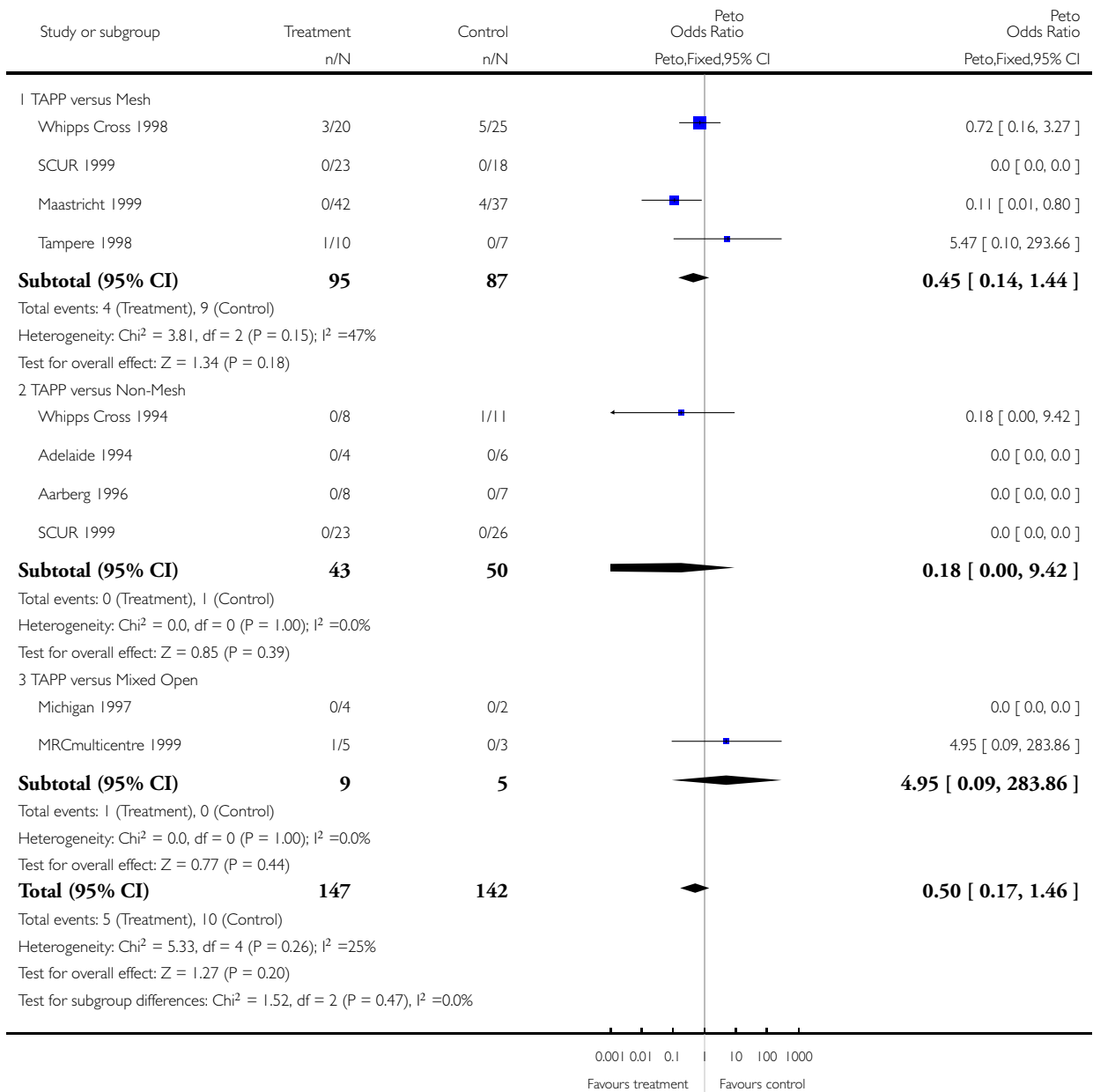


Analysis 5.6. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 6 Wound/superficial infection

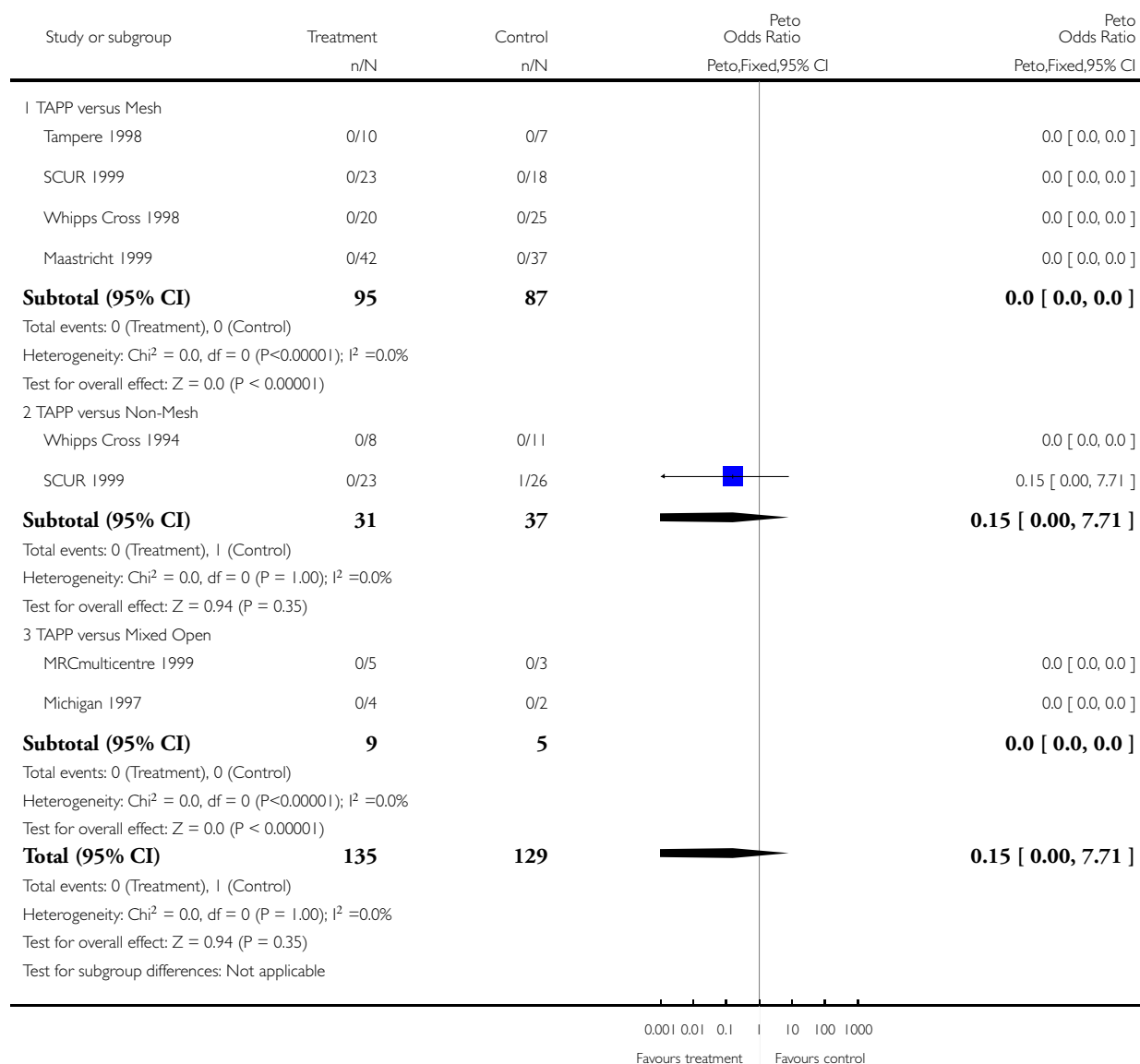


Analysis 5.7. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 7 Mesh/deep infection



Analysis 5.8. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 8 Vascular injury

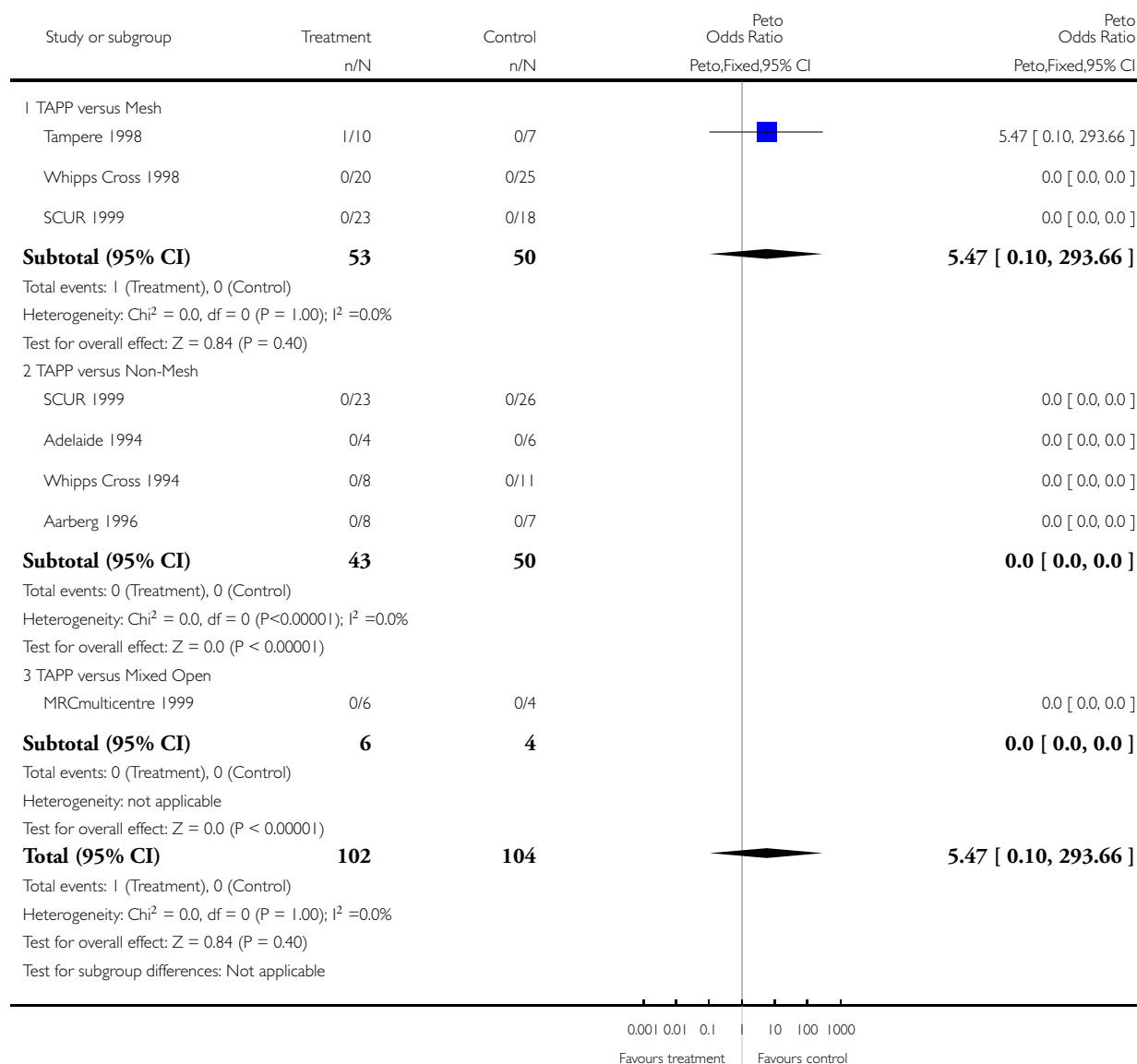
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
I TAPP versus Mesh				
Tampere 1998	0/10	0/7		0.0 [0.0, 0.0]
SCUR 1999	0/23	0/18		0.0 [0.0, 0.0]
Whipps Cross 1998	0/20	0/25		0.0 [0.0, 0.0]
Subtotal (95% CI)	53	50		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TAPP versus Non-Mesh				
Whipps Cross 1994	0/8	0/11		0.0 [0.0, 0.0]
Aarberg 1996	0/8	0/7		0.0 [0.0, 0.0]
Adelaide 1994	0/4	0/6		0.0 [0.0, 0.0]
SCUR 1999	0/23	0/26		0.0 [0.0, 0.0]
Subtotal (95% CI)	43	50		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TAPP versus Mixed Open				
Michigan 1997	0/4	0/2		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/6	0/4		0.0 [0.0, 0.0]
Subtotal (95% CI)	10	6		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	106	106		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\chi^2 = 0.0$, $df = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 5.9. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 9 Visceral injury



Analysis 5.10. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 10 Port site hernia

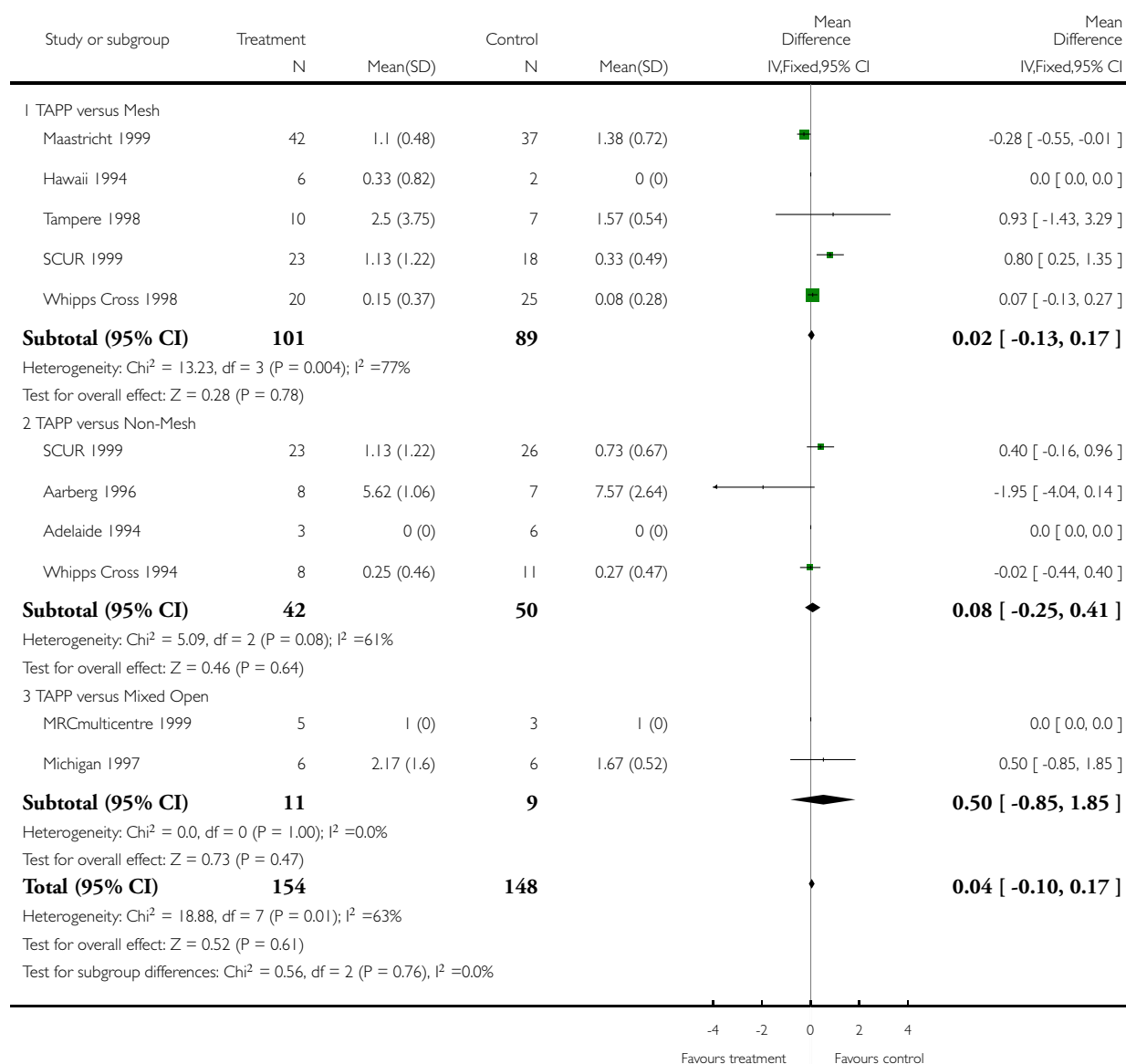
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
SCUR 1999	0/23	0/18		0.0 [0.0, 0.0]
Whipps Cross 1998	0/20	0/25		0.0 [0.0, 0.0]
Maastricht 1999	0/42	0/37		0.0 [0.0, 0.0]
Subtotal (95% CI)	85	80		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TAPP versus Non-Mesh				
Aarberg 1996	0/8	0/7		0.0 [0.0, 0.0]
SCUR 1999	0/23	0/26		0.0 [0.0, 0.0]
Whipps Cross 1994	0/8	0/11		0.0 [0.0, 0.0]
Adelaide 1994	0/4	0/6		0.0 [0.0, 0.0]
Subtotal (95% CI)	43	50		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TAPP versus Mixed Open				
MRCmulticentre 1999	0/5	0/4		0.0 [0.0, 0.0]
Michigan 1997	0/4	0/2		0.0 [0.0, 0.0]
Subtotal (95% CI)	9	6		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	137	136		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\chi^2 = 0.0$, $df = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 5.1.1. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 11 Length of stay (days)

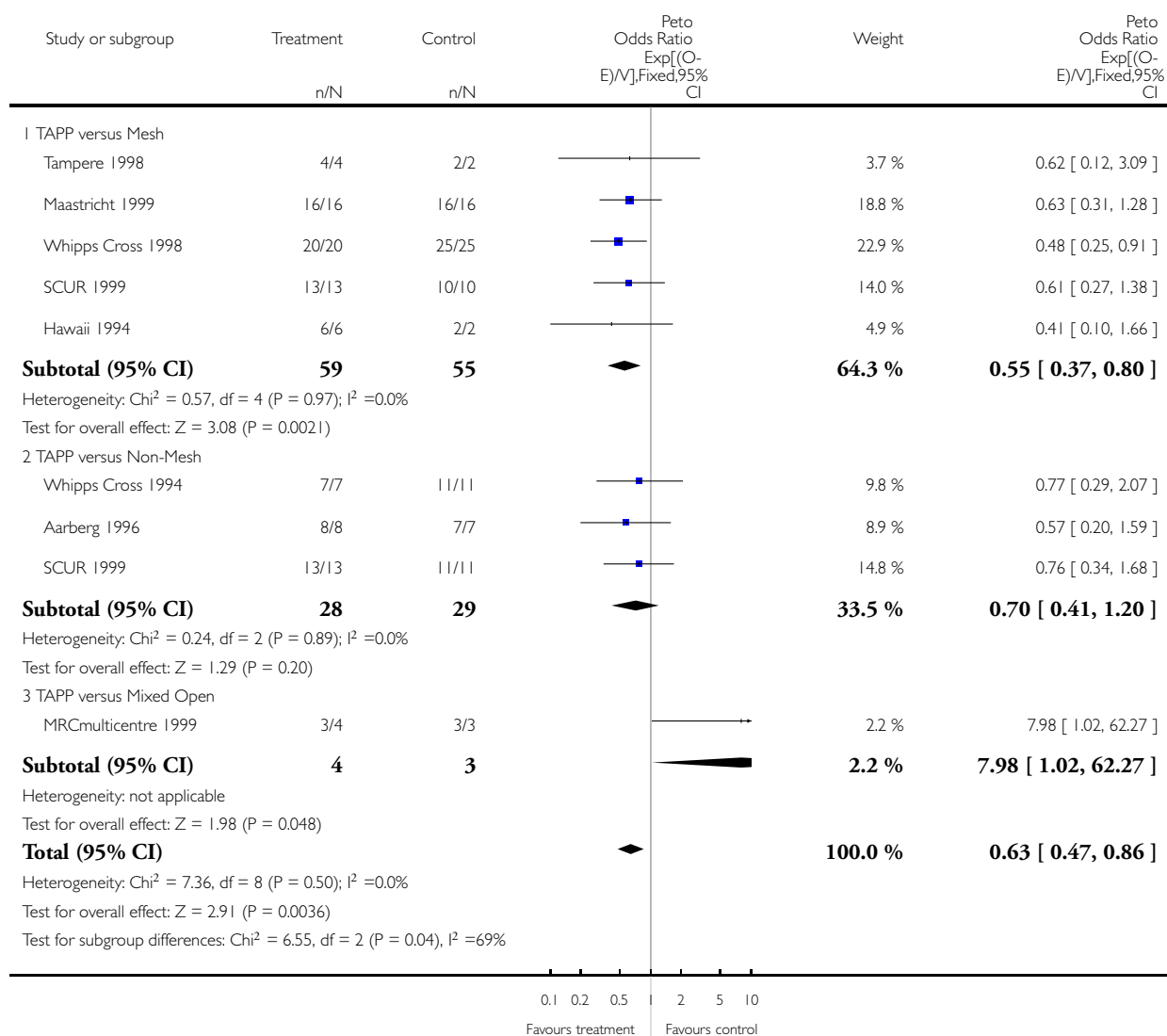


Analysis 5.12. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 12 Time to return to usual activities (days)

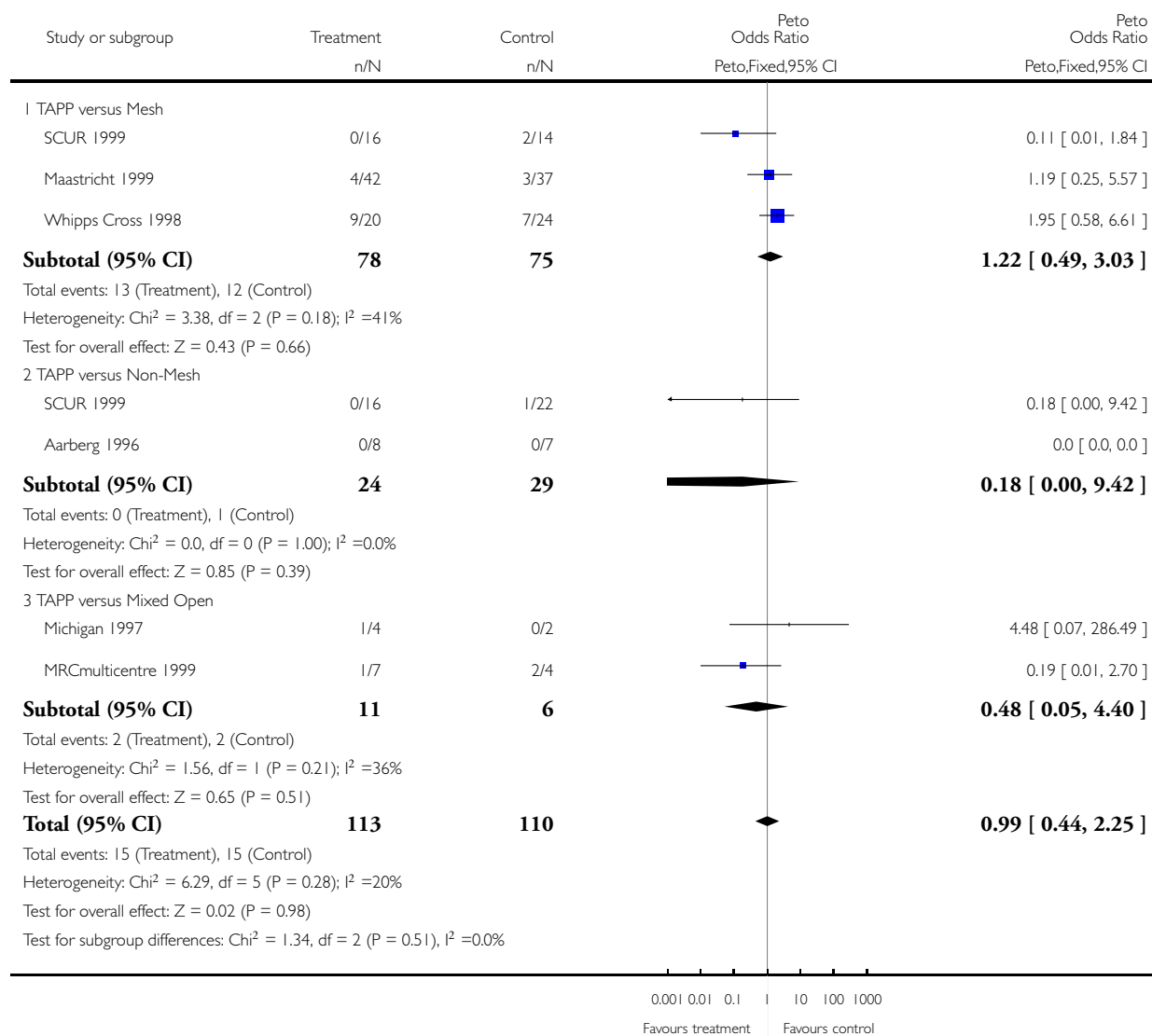


Analysis 5.13. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 13 Persisting pain

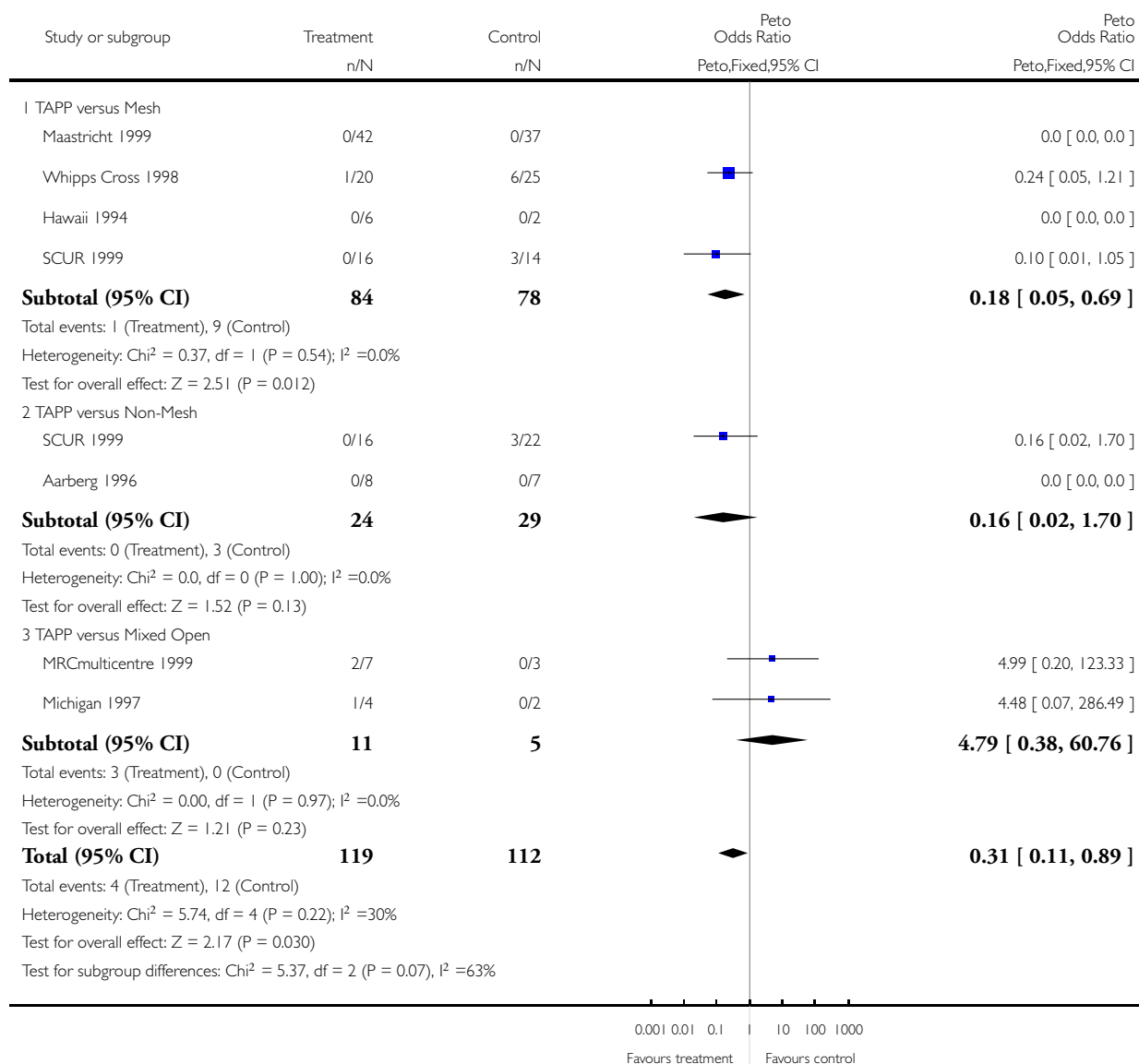


Analysis 5.14. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 14 Persisting numbness

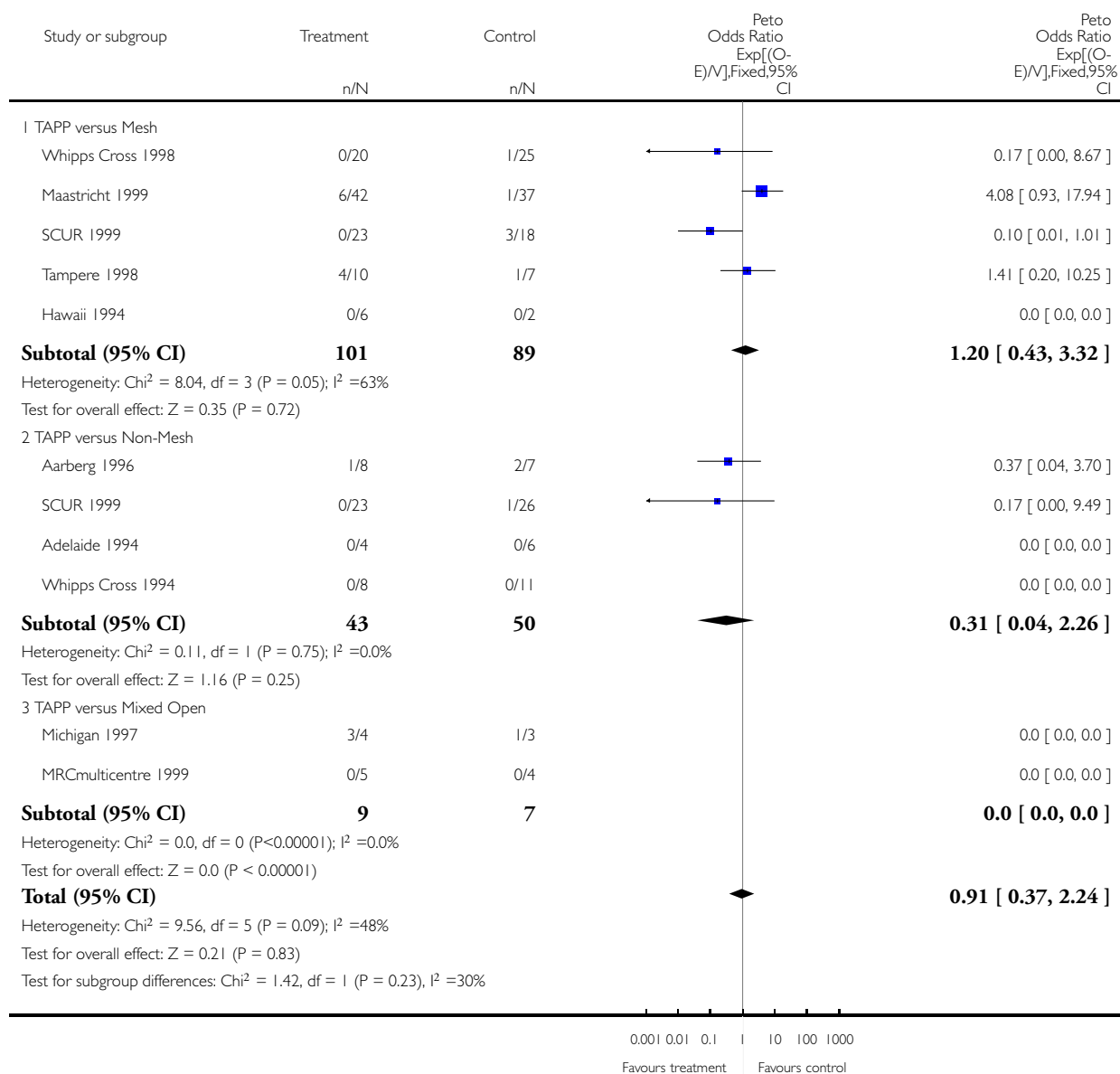


Analysis 5.15. Comparison 5 TAPP versus Open (Recurrent hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 5 TAPP versus Open (Recurrent hernias)

Outcome: 15 Hernia recurrence

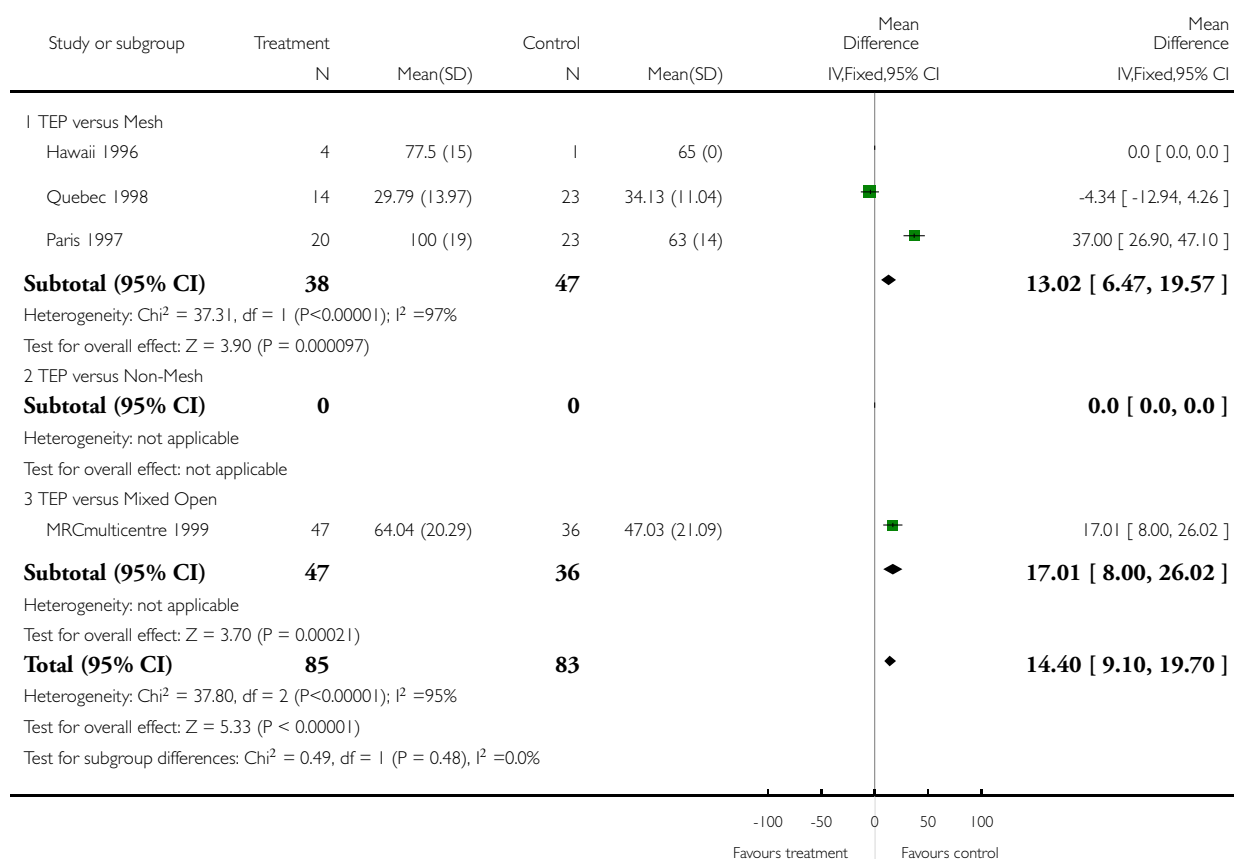


Analysis 6.1. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 1 Duration of operation (minutes)

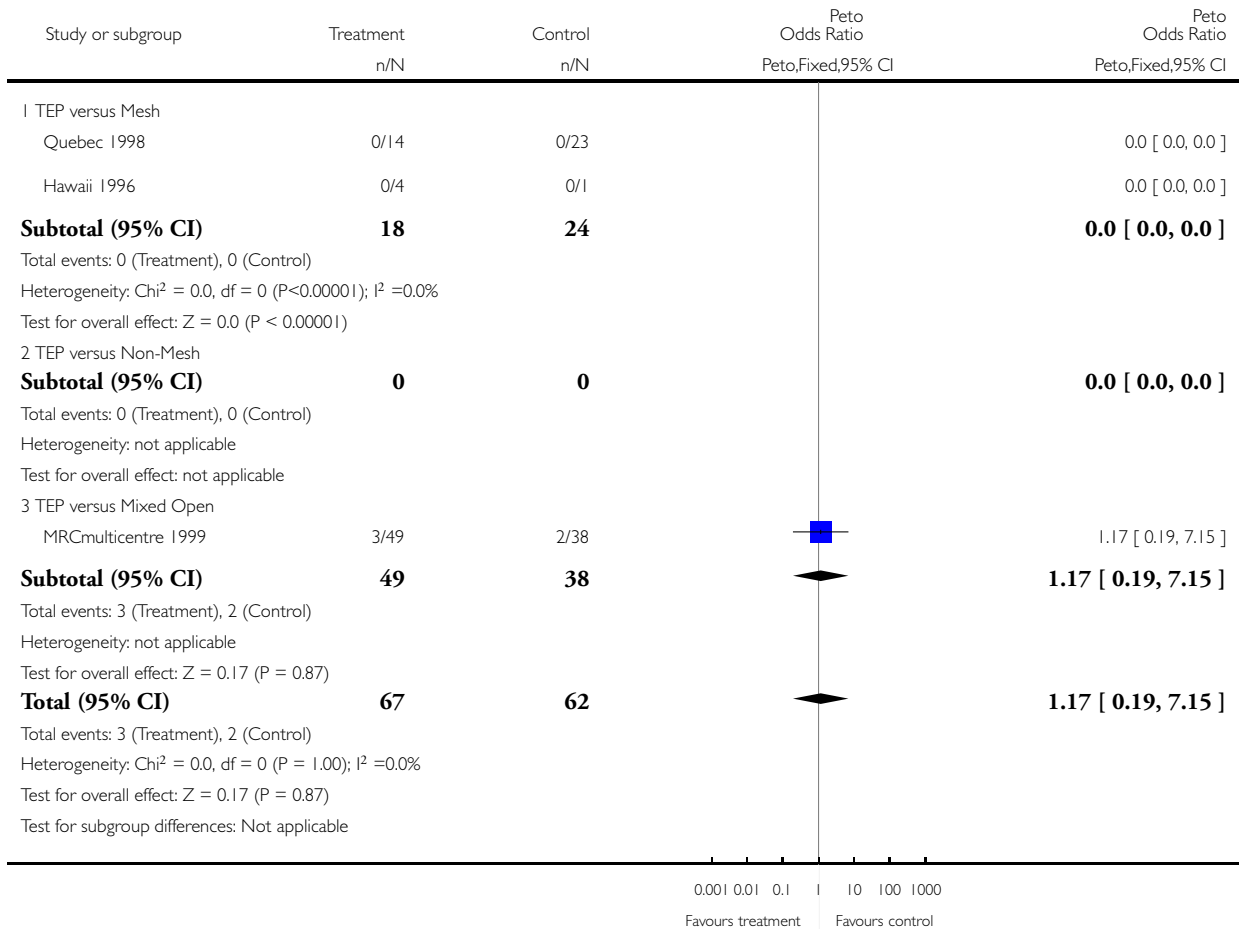


Analysis 6.2. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 2 "Opposite" method initiated

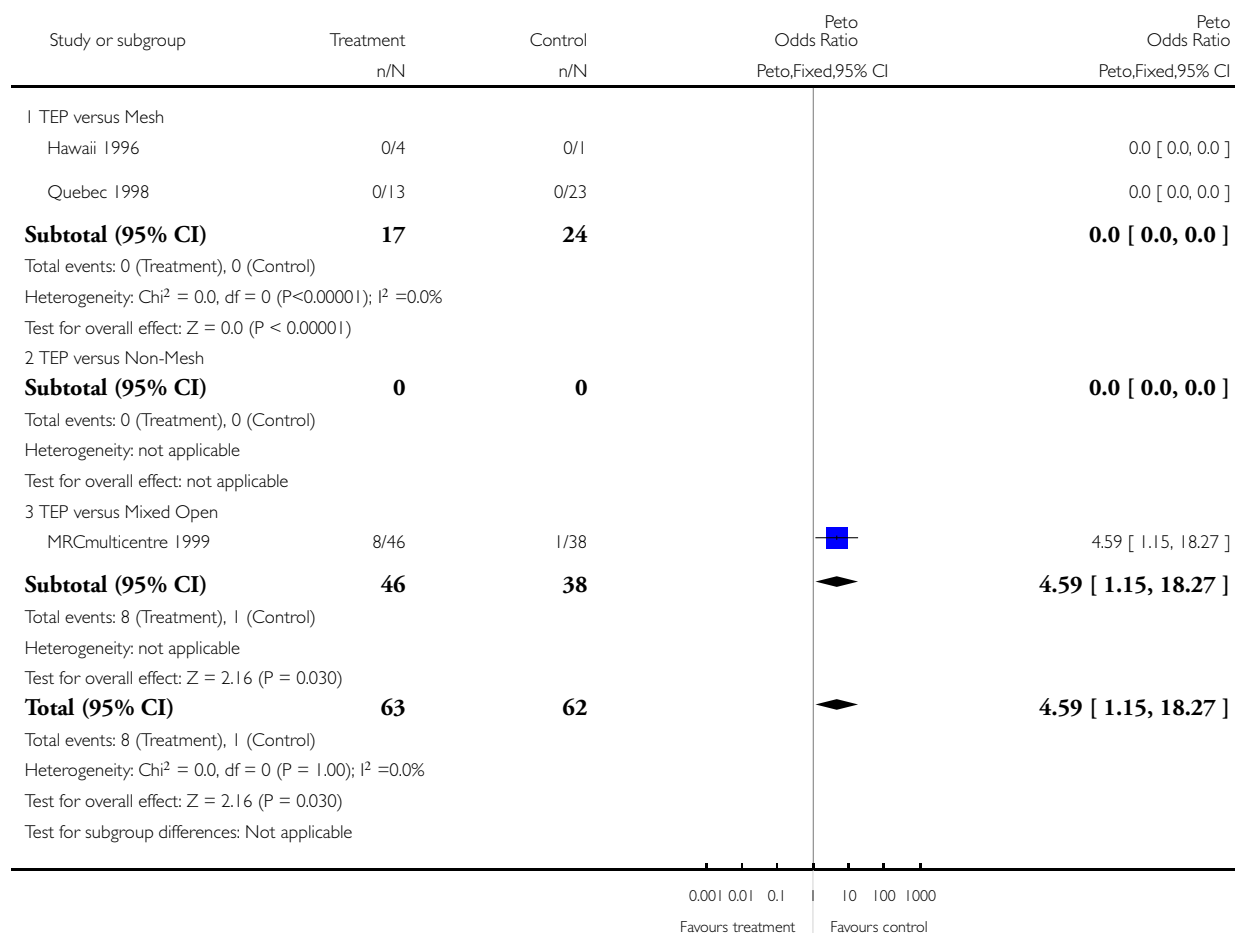


Analysis 6.3. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 3 Conversion

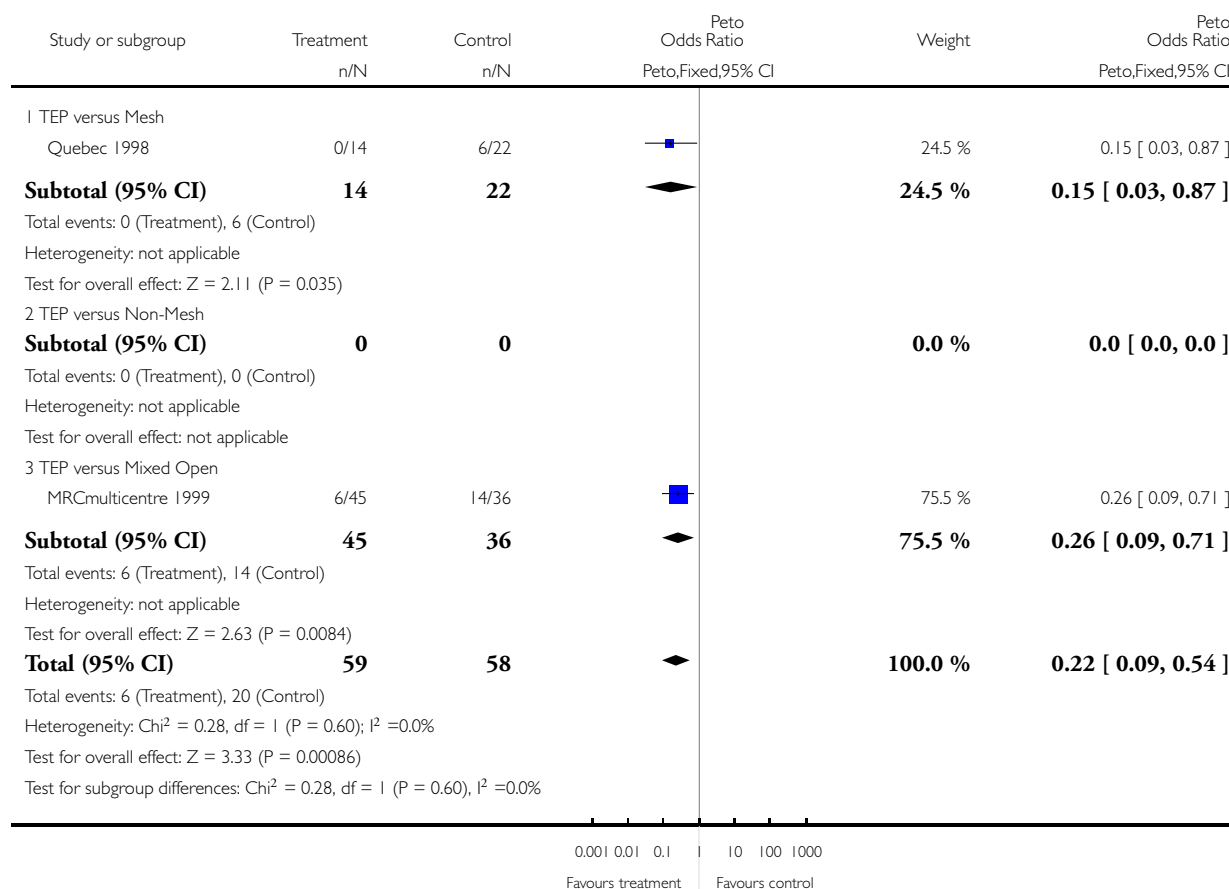


Analysis 6.4. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 4 Haematoma

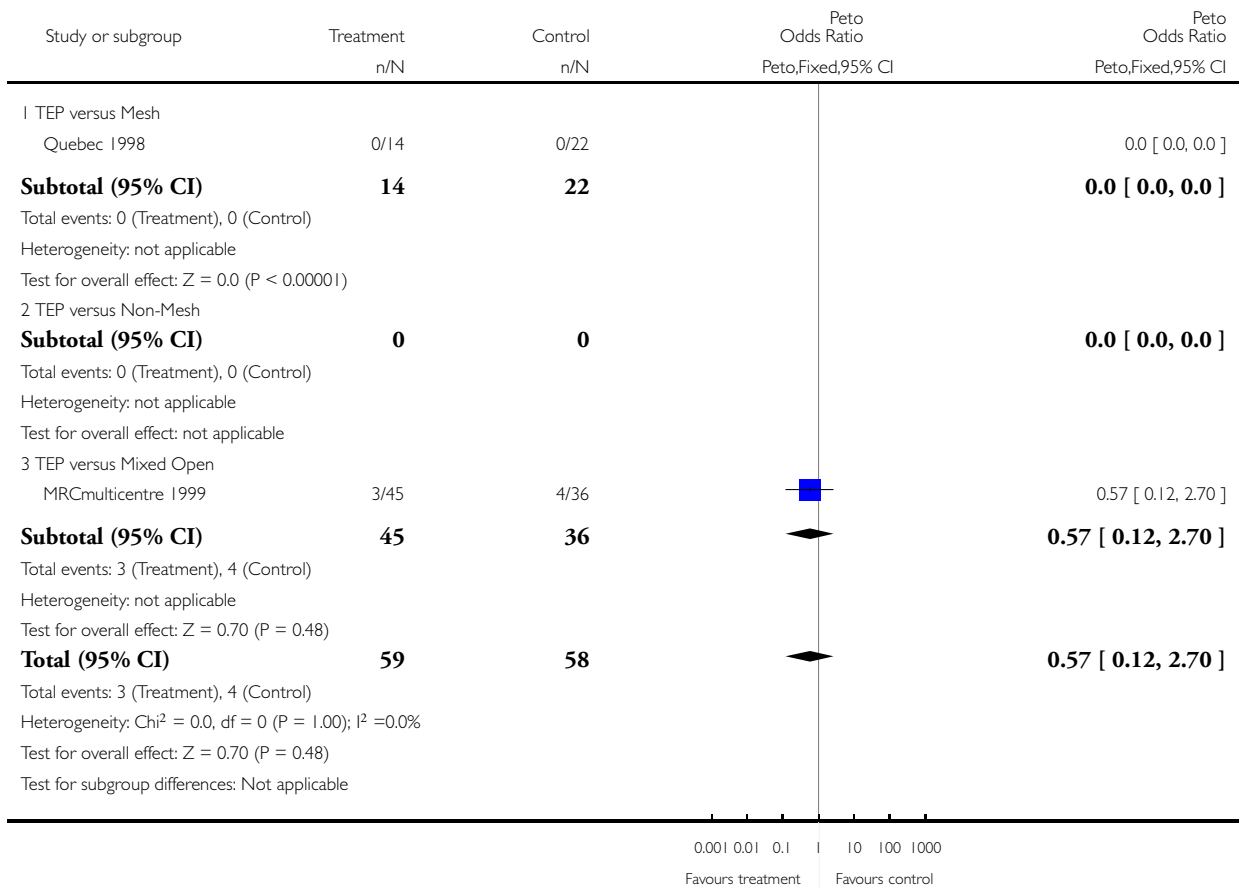


Analysis 6.5. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 5 Seroma



Analysis 6.6. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 6 Wound/superficial infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/14	0/22		0.0 [0.0, 0.0]
Subtotal (95% CI)	14	22		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/45	0/36		0.0 [0.0, 0.0]
Subtotal (95% CI)	45	36		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	59	58		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 6.7. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 7 Mesh/deep infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/14	0/22		0.0 [0.0, 0.0]
Subtotal (95% CI)	14	22		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/45	0/36		0.0 [0.0, 0.0]
Subtotal (95% CI)	45	36		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	59	58		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 10 100 1000	
			Favours treatment	Favours control

Analysis 6.8. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 8 Vascular injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/14	0/22		0.0 [0.0, 0.0]
Subtotal (95% CI)	14	22		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/49	0/38		0.0 [0.0, 0.0]
Subtotal (95% CI)	49	38		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	63	60		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 6.9. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 9 Visceral injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/14	0/22		0.0 [0.0, 0.0]
Subtotal (95% CI)	14	22		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/49	0/38		0.0 [0.0, 0.0]
Subtotal (95% CI)	49	38		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	63	60		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $df = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 6.10. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 10 Port site hernia

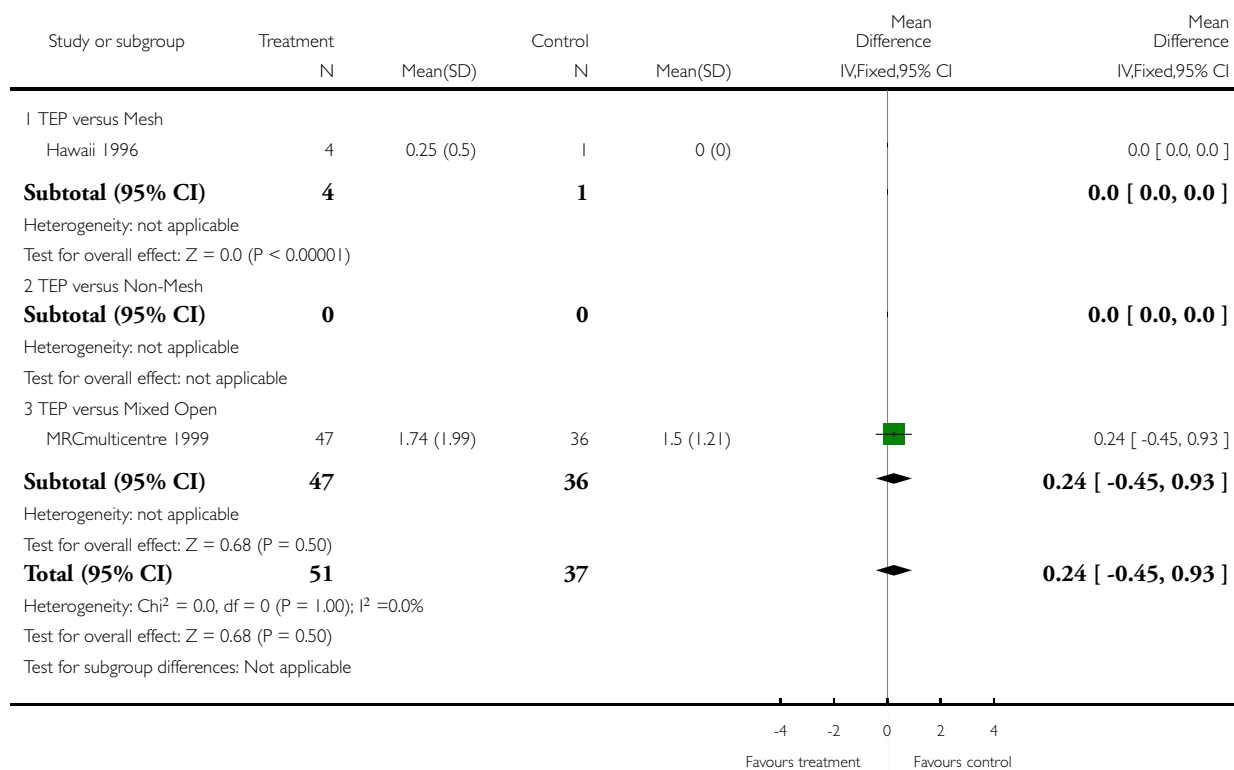
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/14	0/22		0.0 [0.0, 0.0]
Subtotal (95% CI)	14	22		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/41	0/34		0.0 [0.0, 0.0]
Subtotal (95% CI)	41	34		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	55	56		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $df = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 6.11. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 11 Length of stay (days)

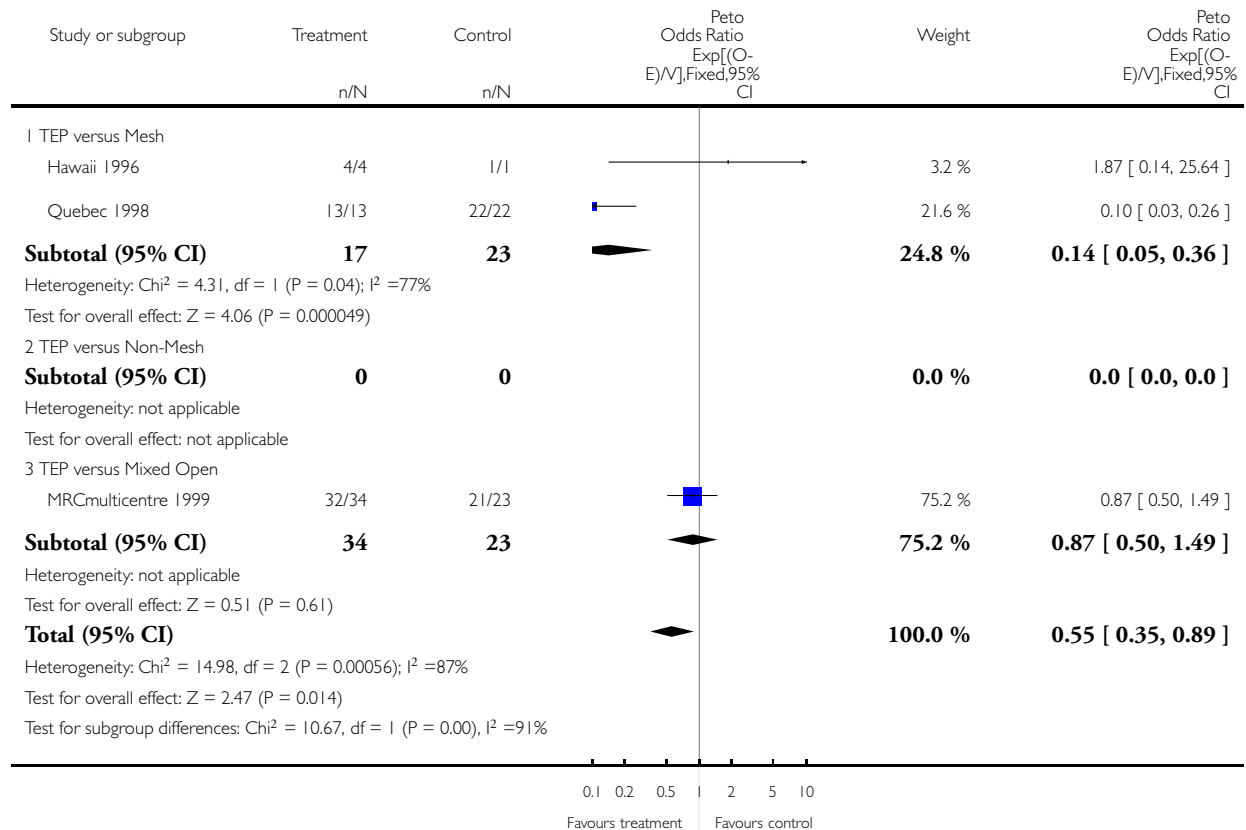


Analysis 6.12. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 12 Time to return to usual activities (days)

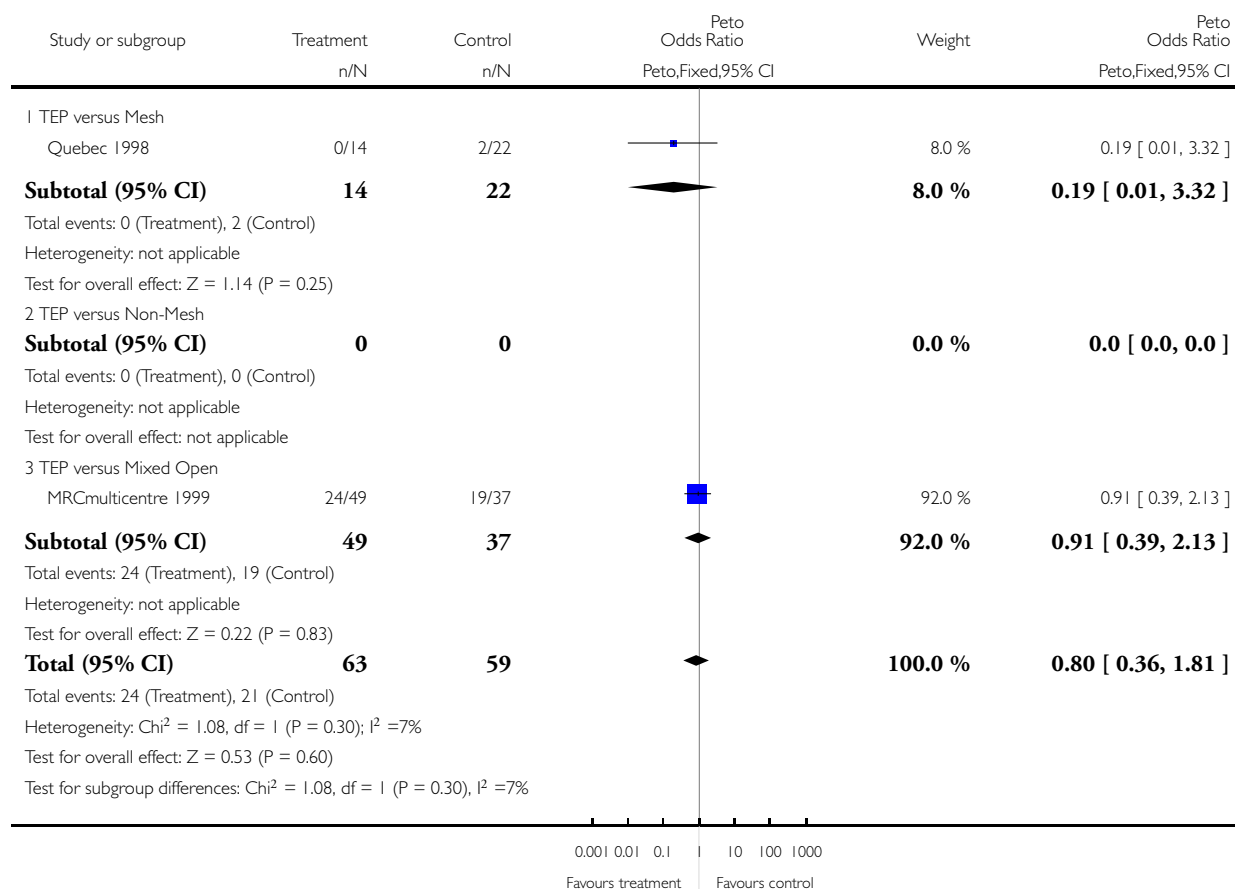


Analysis 6.13. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 13 Persisting pain

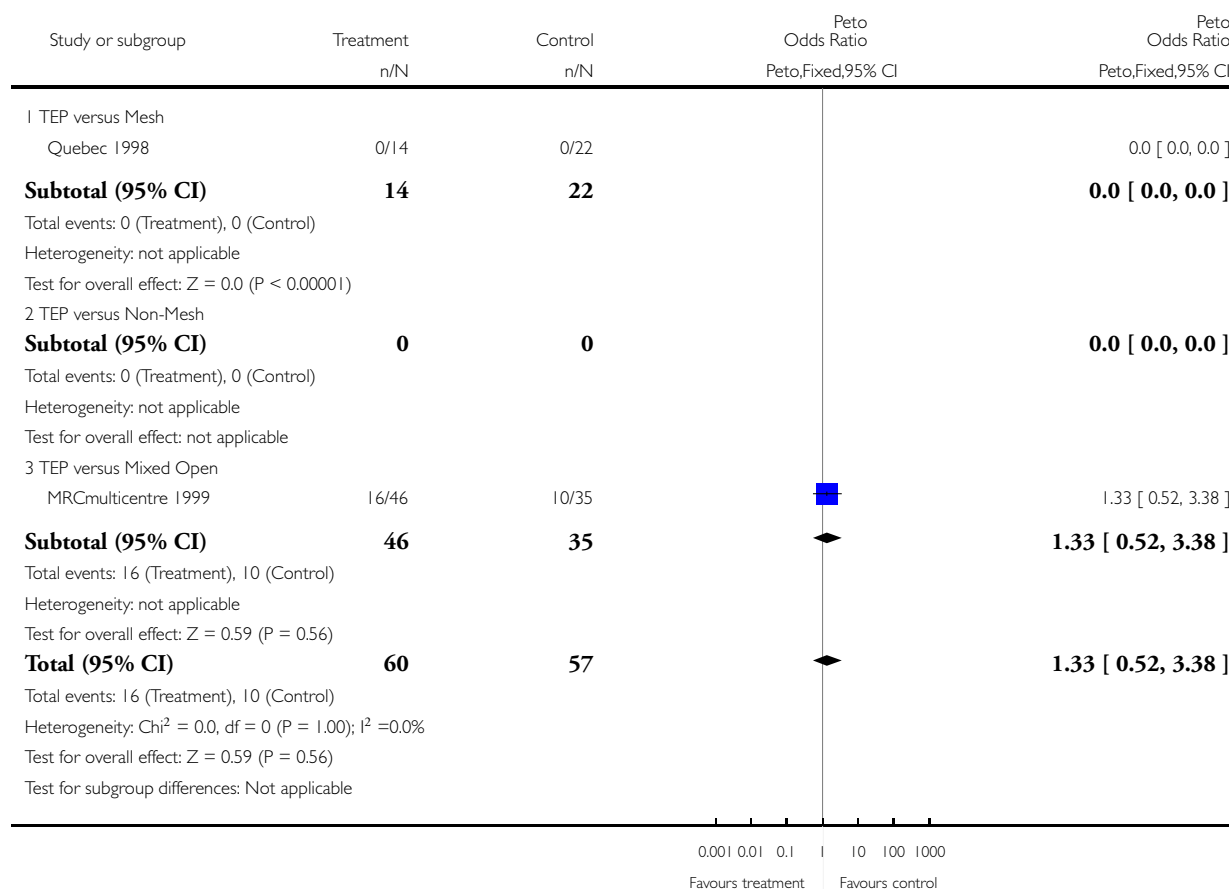


Analysis 6.14. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 14 Persisting numbness

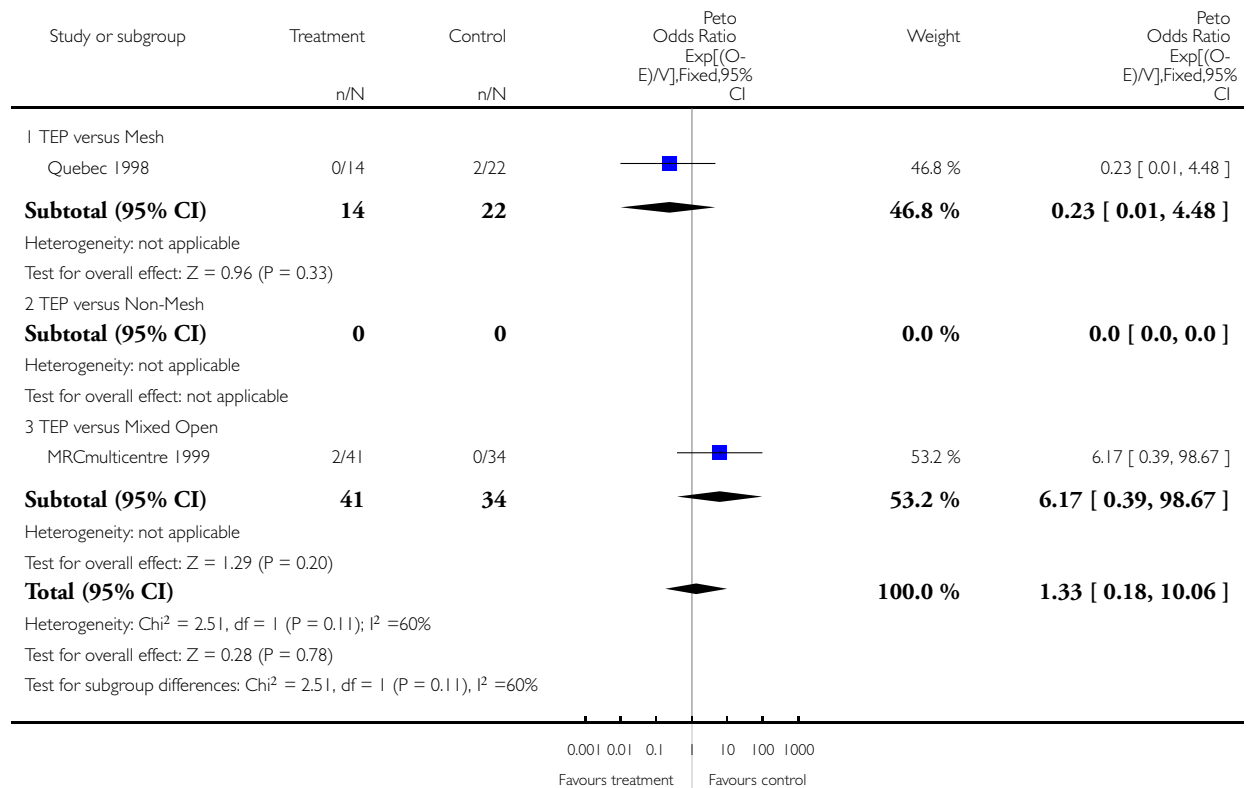


Analysis 6.15. Comparison 6 TEP versus Open (Recurrent hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 6 TEP versus Open (Recurrent hernias)

Outcome: 15 Hernia recurrence

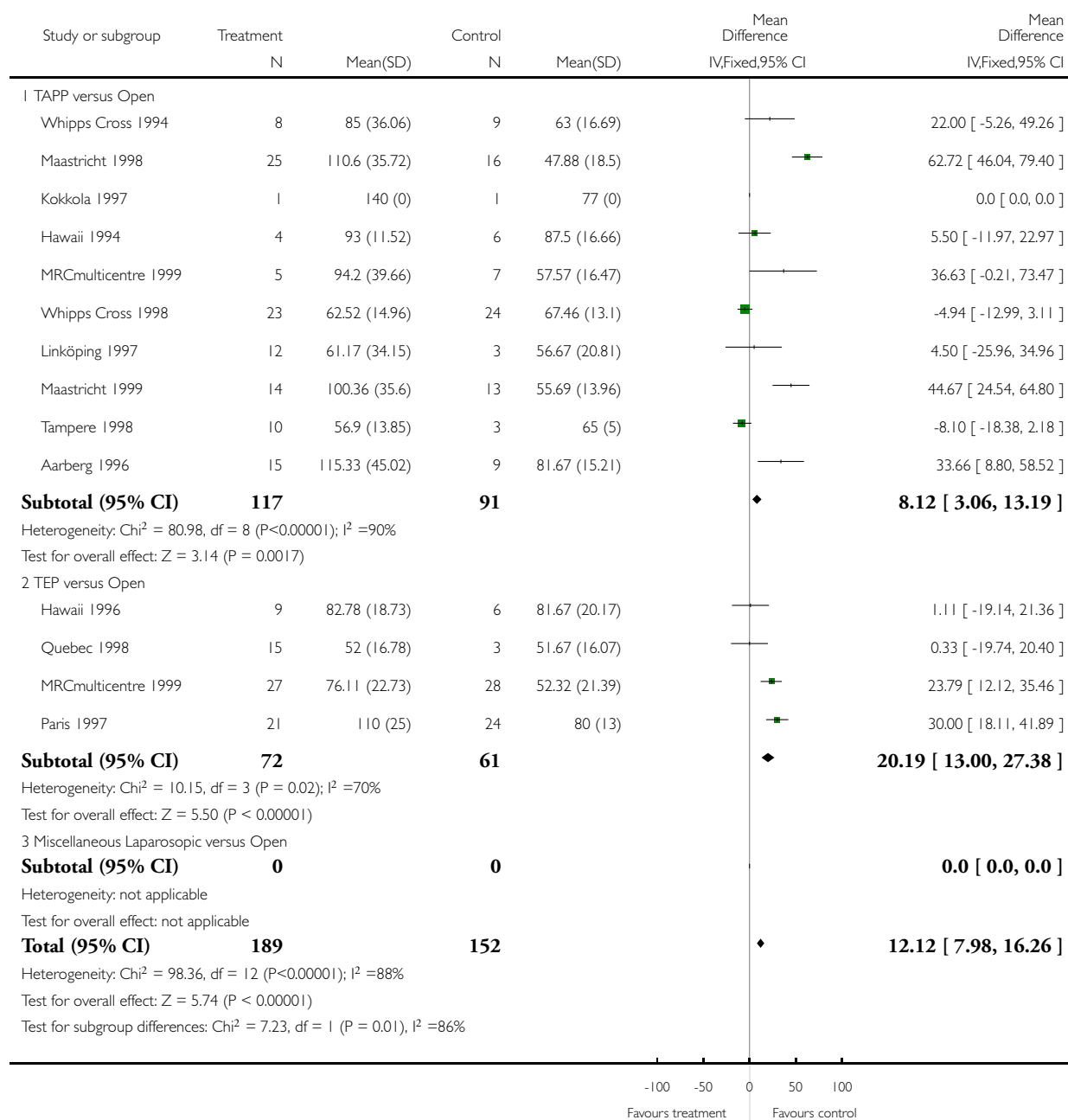


Analysis 7.1. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 1 Duration of operation (minutes)

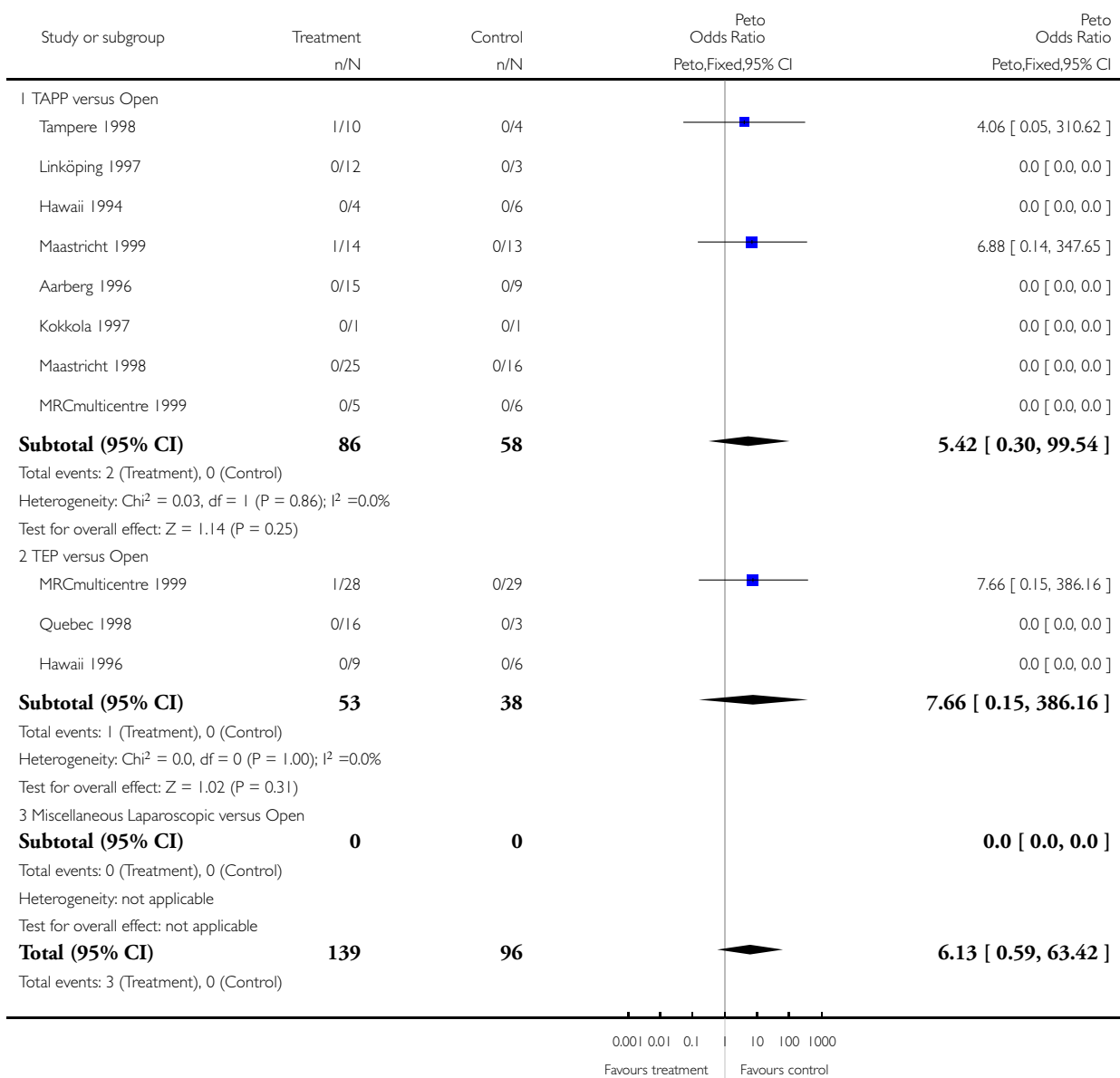


Analysis 7.2. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 2 "Opposite" method initiated



(... Continued)

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
Heterogeneity: $\text{Chi}^2 = 0.05$, $\text{df} = 2$ ($P = 0.98$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 1.52$ ($P = 0.13$)				
Test for subgroup differences: $\text{Chi}^2 = 0.02$, $\text{df} = 1$ ($P = 0.89$), $I^2 = 0.0\%$				

Analysis 7.3. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 3 Conversion.

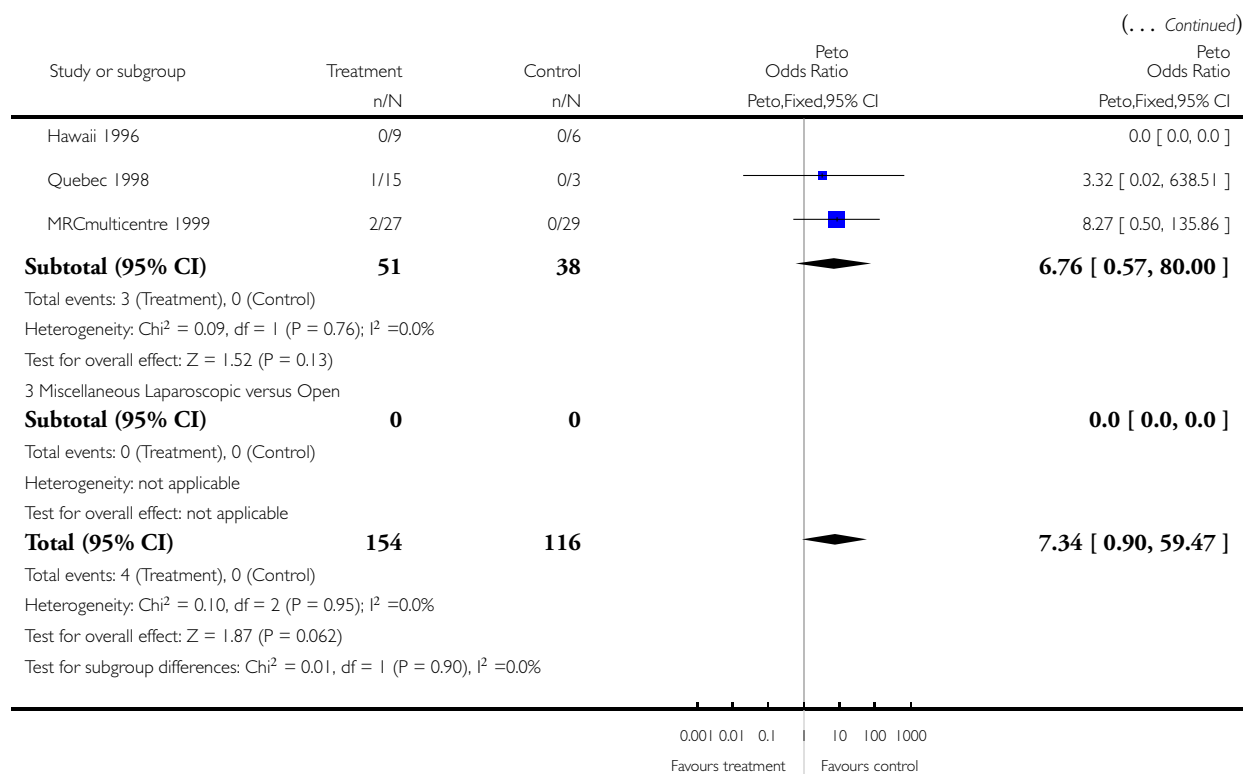
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 3 Conversion

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
I TAPP versus Open				
Whipps Cross 1994	0/8	0/9		0.0 [0.0, 0.0]
Hawaii 1994	0/4	0/6		0.0 [0.0, 0.0]
Linköping 1997	0/12	0/3		0.0 [0.0, 0.0]
MRCmulticentre 1999	1/5	0/6		9.03 [0.18, 462.31]
Aarberg 1996	0/15	0/9		0.0 [0.0, 0.0]
Whipps Cross 1998	0/23	0/24		0.0 [0.0, 0.0]
Maastricht 1998	0/25	0/16		0.0 [0.0, 0.0]
Kokkola 1997	0/1	0/1		0.0 [0.0, 0.0]
Tampere 1998	0/10	0/4		0.0 [0.0, 0.0]
Subtotal (95% CI)	103	78		9.03 [0.18, 462.31]
Total events: 1 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P = 1.00$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 1.10$ ($P = 0.27$)				
2 TEP versus Open				

(Continued ...)

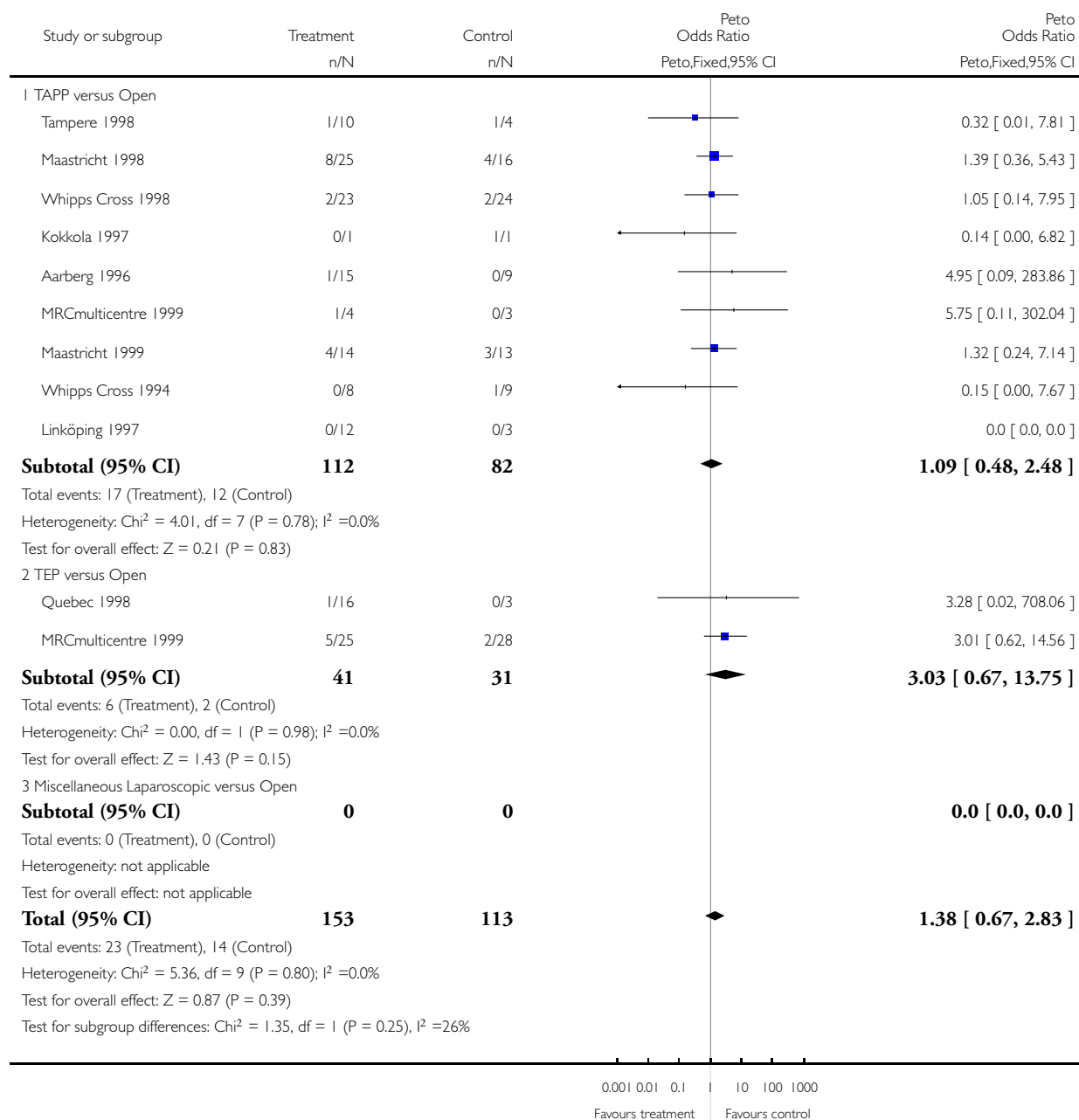


Analysis 7.4. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 4 Haematoma

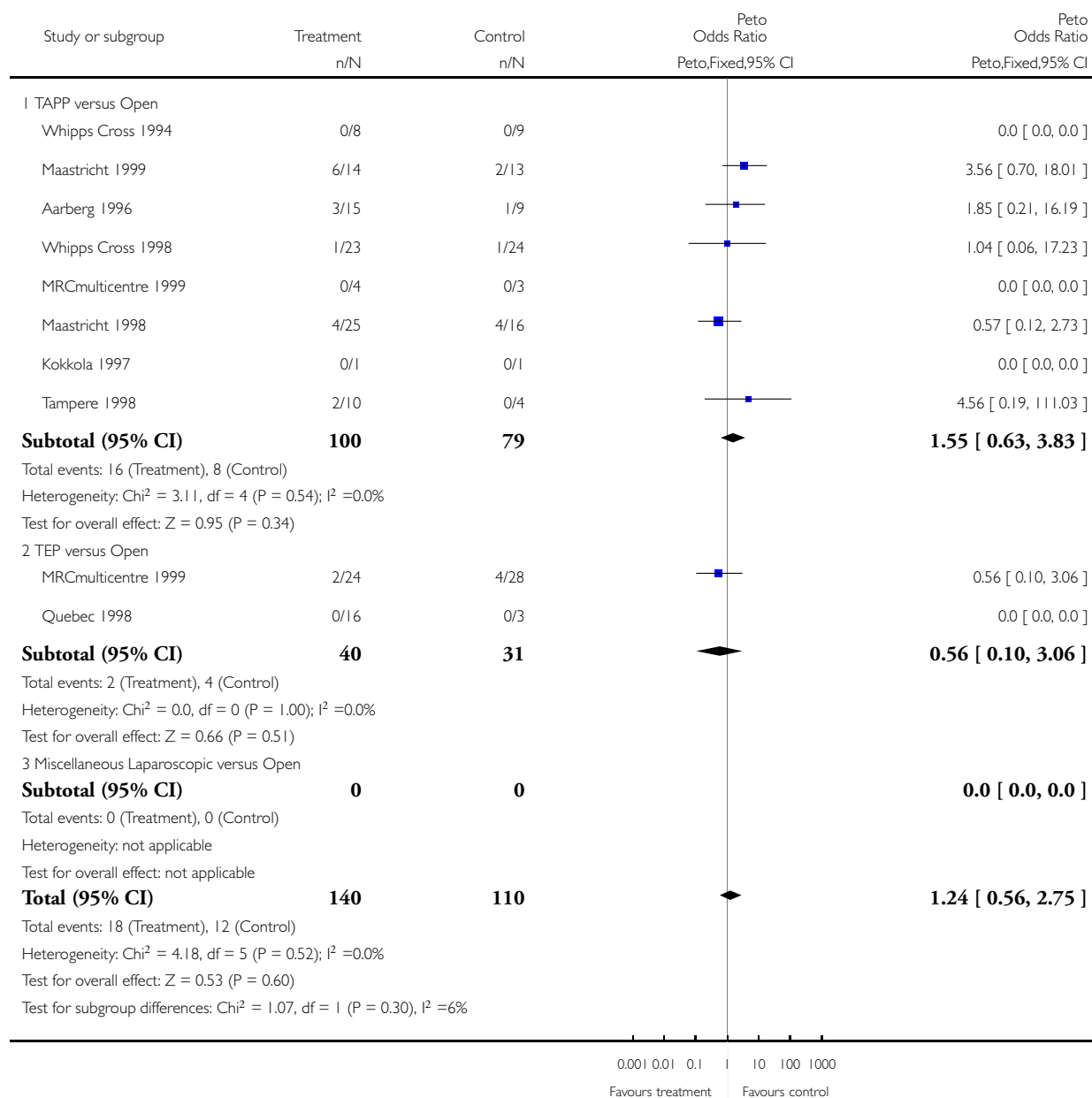


Analysis 7.5. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 5 Seroma

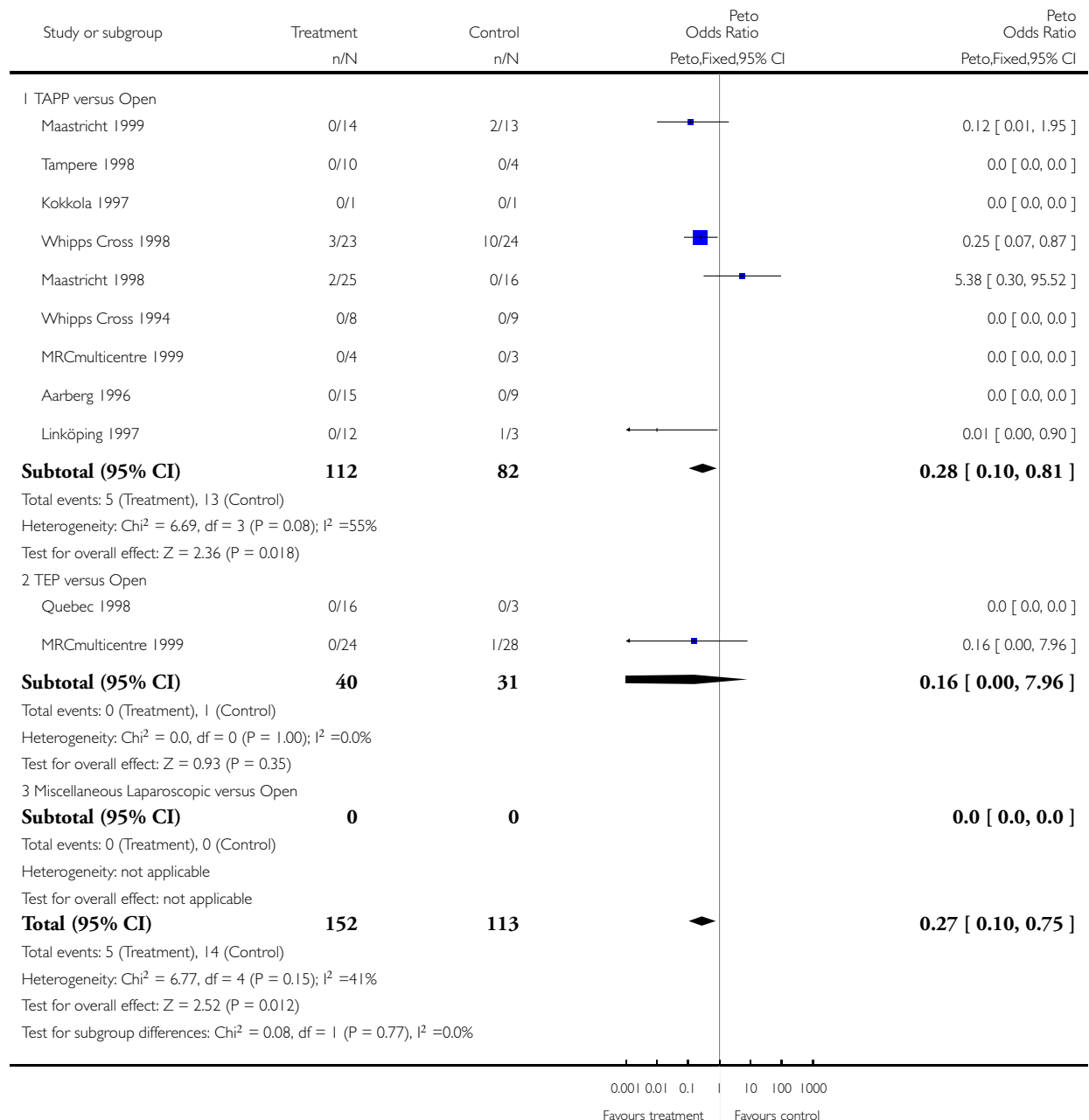


Analysis 7.6. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 6 Wound/superficial infection



Analysis 7.7. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 7 Mesh/deep infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Open				
Maastricht 1999	0/14	0/13		0.0 [0.0, 0.0]
Tampere 1998	0/10	0/4		0.0 [0.0, 0.0]
Whipps Cross 1998	0/23	0/24		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/4	0/3		0.0 [0.0, 0.0]
Kokkola 1997	0/1	0/1		0.0 [0.0, 0.0]
Whipps Cross 1994	0/8	0/9		0.0 [0.0, 0.0]
Subtotal (95% CI)	60	54		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Open				
Quebec 1998	0/16	0/3		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/24	0/28		0.0 [0.0, 0.0]
Subtotal (95% CI)	40	31		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 Miscellaneous Laparoscopic versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	100	85		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\chi^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\chi^2 = 0.0$, $df = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 7.8. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 8 Vascular injury

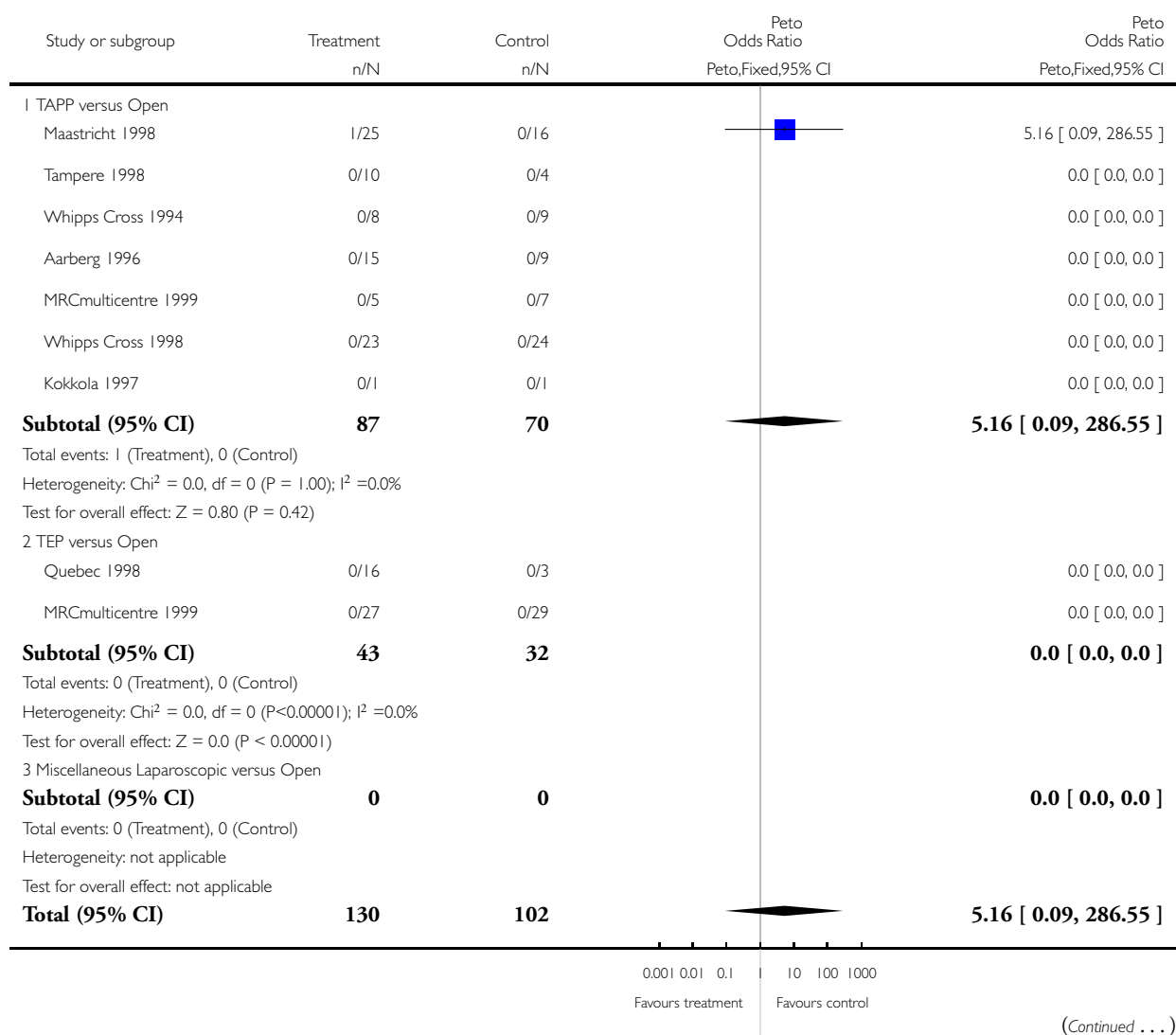
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
I TAPP versus Open				
MRCmulticentre 1999	0/5	0/7		0.0 [0.0, 0.0]
Whipps Cross 1994	0/8	0/9		0.0 [0.0, 0.0]
Tampere 1998	0/10	0/4		0.0 [0.0, 0.0]
Aarberg 1996	0/15	0/9		0.0 [0.0, 0.0]
Whipps Cross 1998	0/23	0/24		0.0 [0.0, 0.0]
Kokkola 1997	0/1	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	62	54		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Open				
Quebec 1998	0/16	0/3		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/27	0/29		0.0 [0.0, 0.0]
Subtotal (95% CI)	43	32		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 Miscellaneous Laparoscopic versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	105	86		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 10 100 1000	
			Favours treatment	Favours control

Analysis 7.9. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 9 Visceral injury



(... Continued)

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
Total events: 1 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P = 1.00$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.80$ ($P = 0.42$)				
Test for subgroup differences: Not applicable				
<div>0.001 0.01 0.1 1 10 100 1000</div> <div>Favours treatment Favours control</div>				

Analysis 7.10. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 10 Port site hernia.

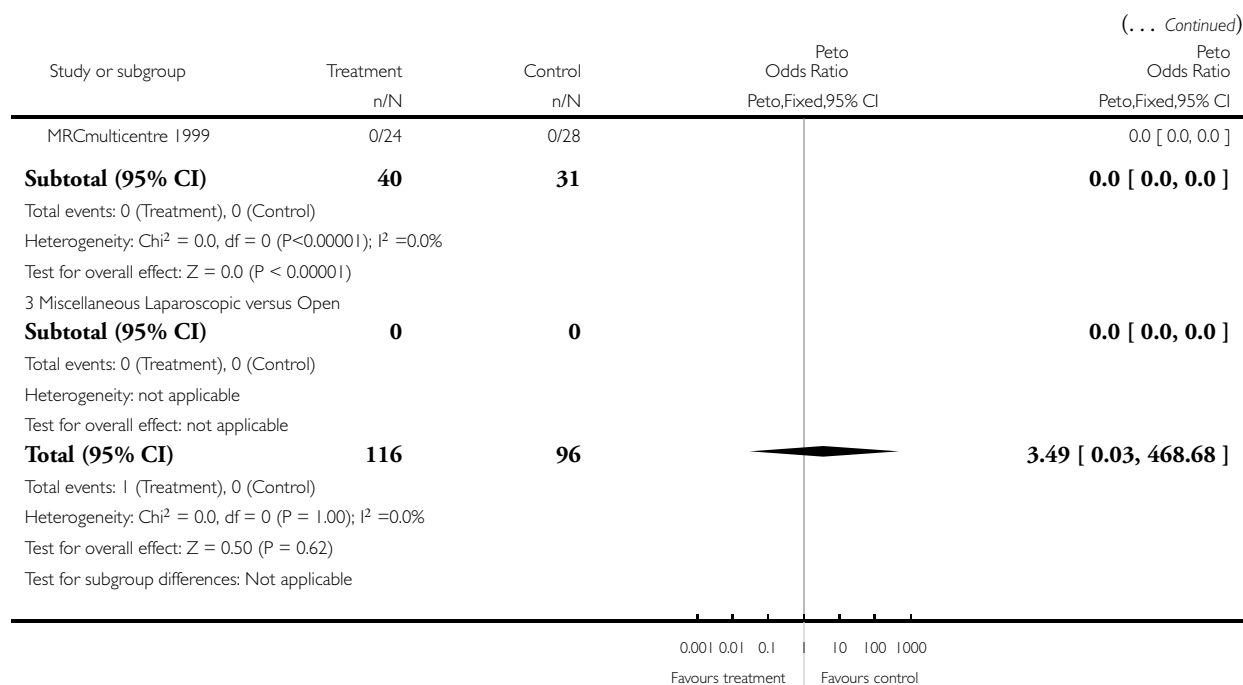
Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 10 Port site hernia

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Open				
Whipps Cross 1998	0/23	0/24		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/3	0/6		0.0 [0.0, 0.0]
Linköping 1997	1/12	0/3		3.49 [0.03, 468.68]
Whipps Cross 1994	0/8	0/9		0.0 [0.0, 0.0]
Aarberg 1996	0/15	0/9		0.0 [0.0, 0.0]
Maastricht 1999	0/14	0/13		0.0 [0.0, 0.0]
Kokkola 1997	0/1	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	76	65		3.49 [0.03, 468.68]
Total events: 1 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P = 1.00$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.50$ ($P = 0.62$)				
2 TEP versus Open				
Quebec 1998	0/16	0/3		0.0 [0.0, 0.0]
<div>0.001 0.01 0.1 1 10 100 1000</div> <div>Favours treatment Favours control</div>				

(Continued ...)

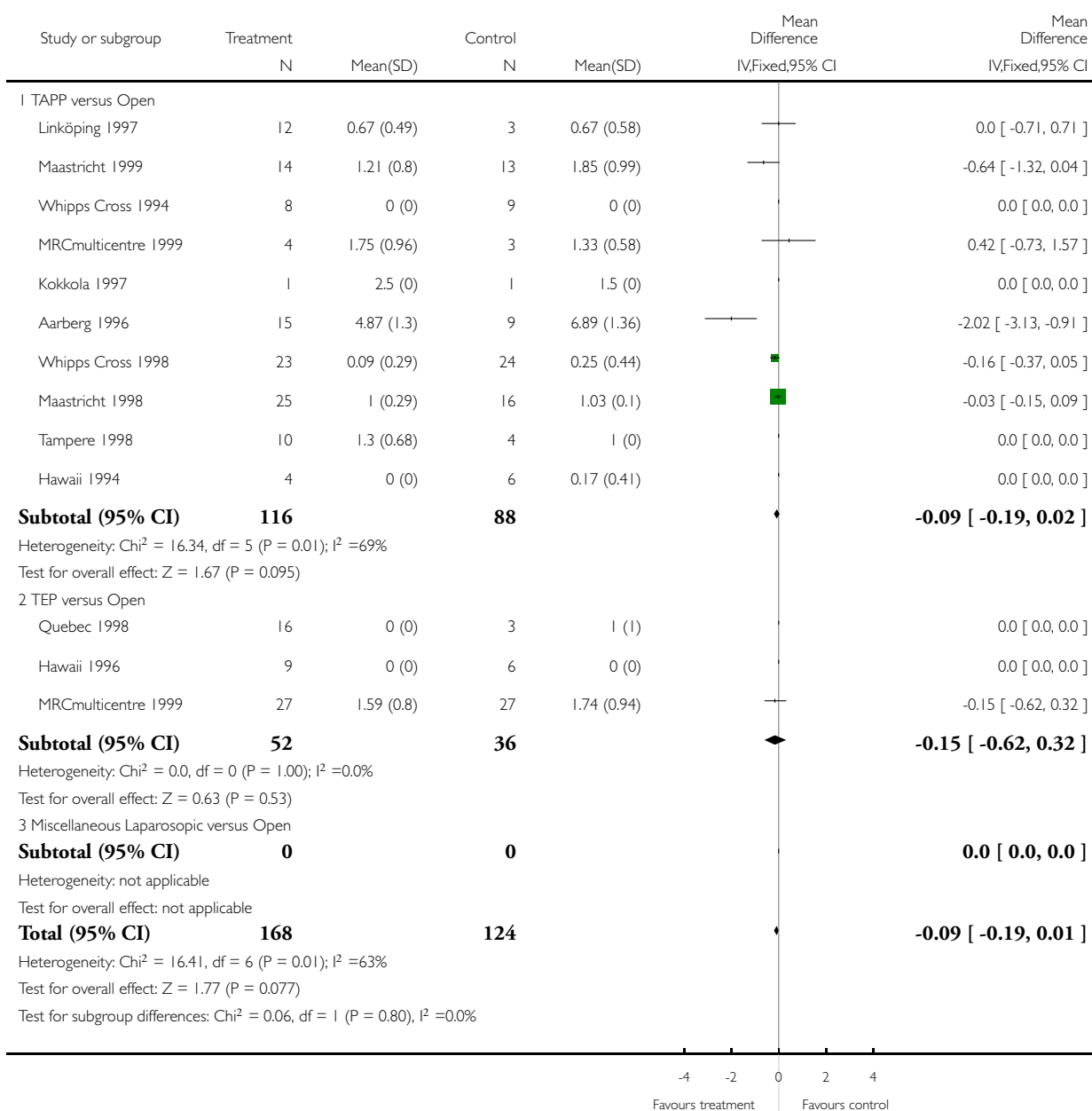


Analysis 7.11. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 11 Length of stay (days)

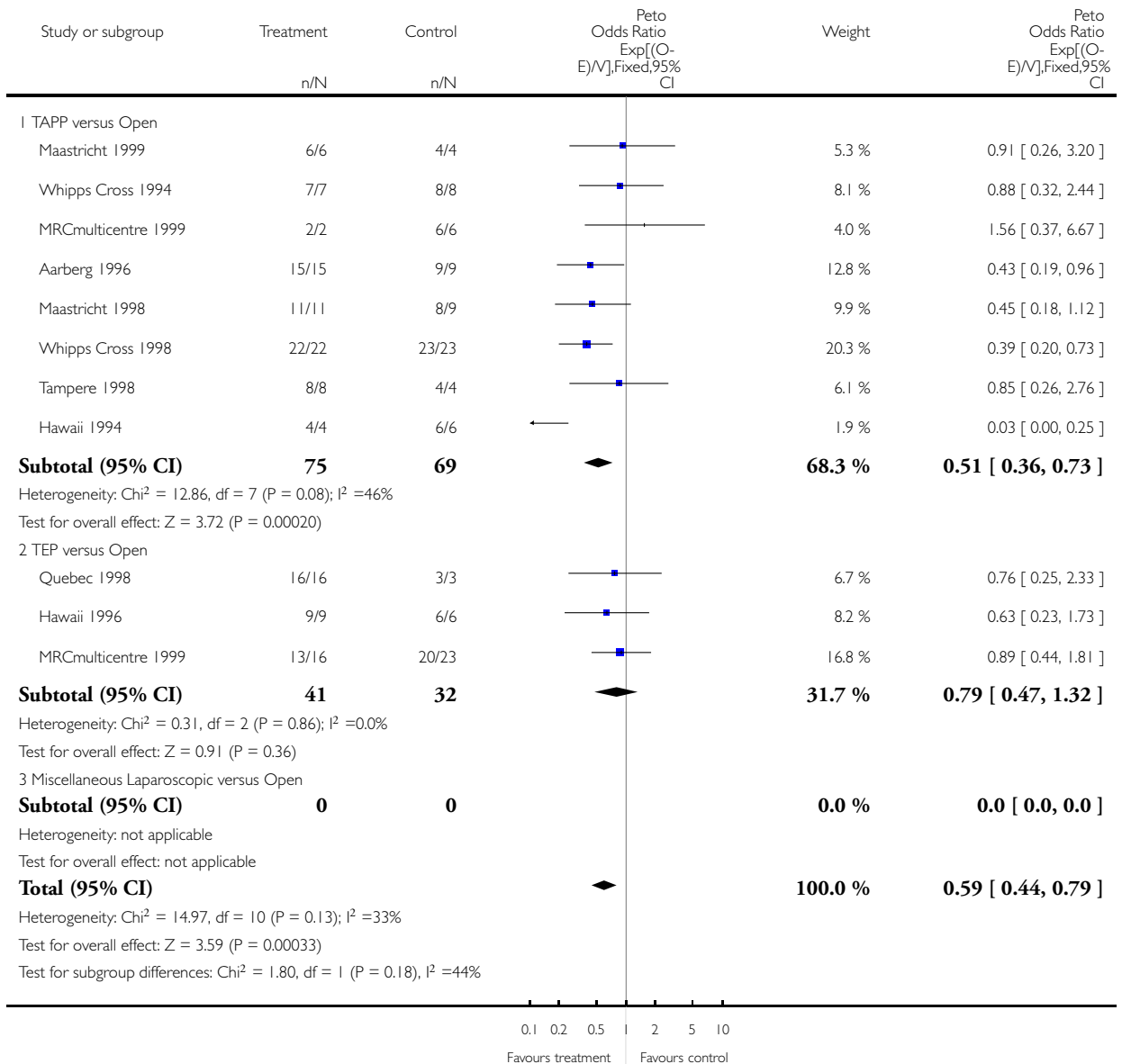


Analysis 7.12. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 12 Time to return to usual activities (days)

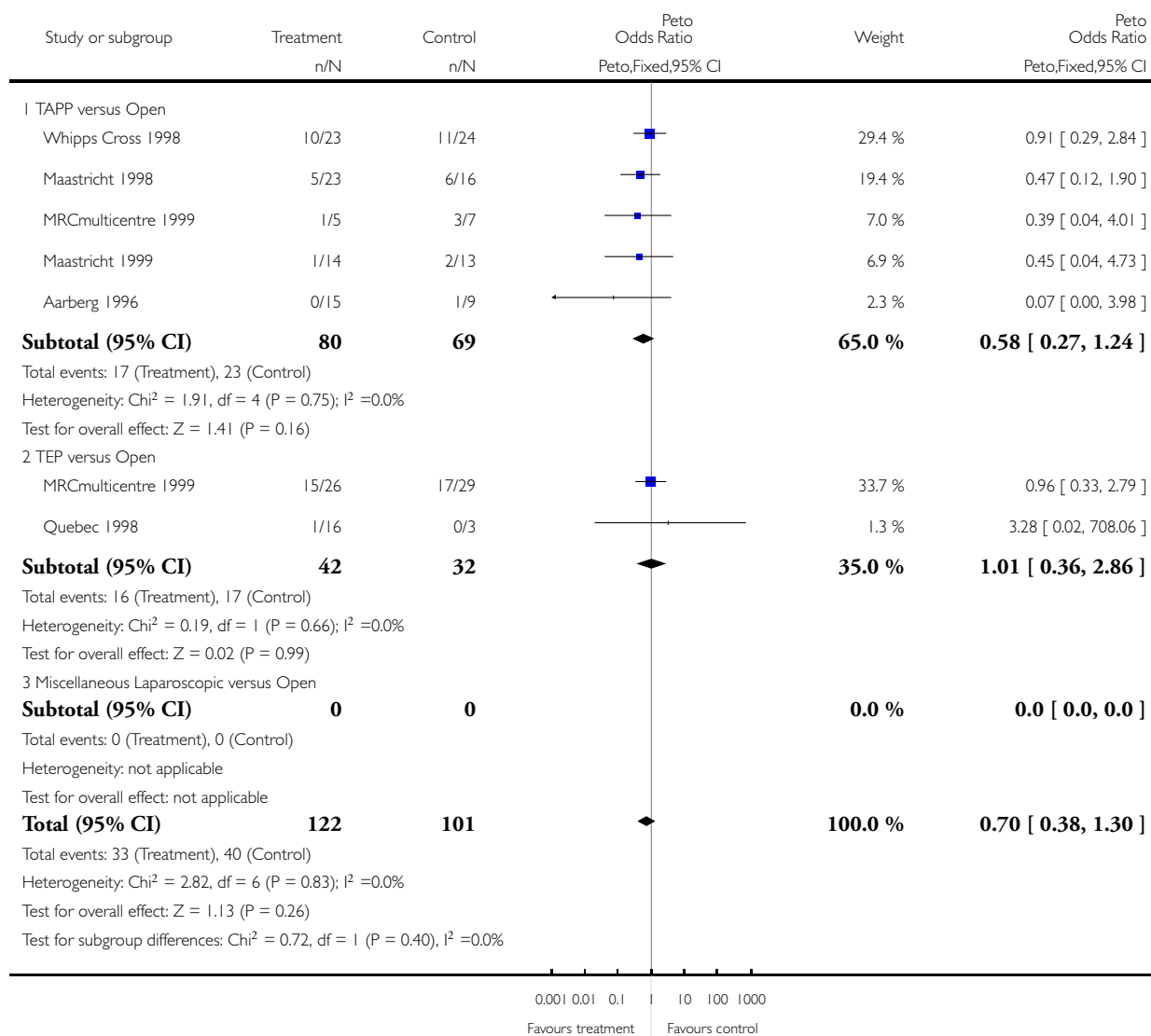


Analysis 7.13. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 13 Persisting pain

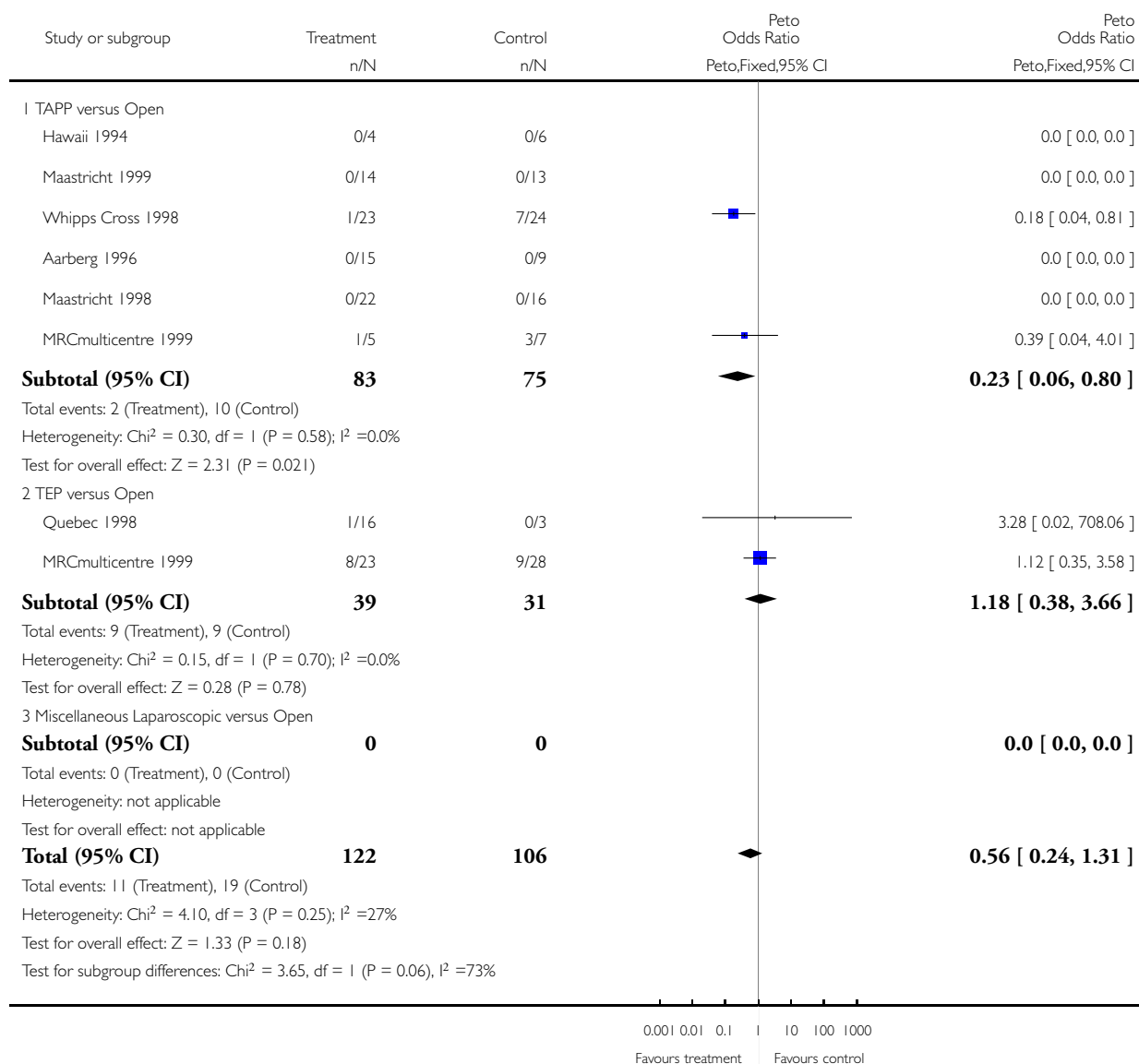


Analysis 7.14. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 14 Persisting numbness

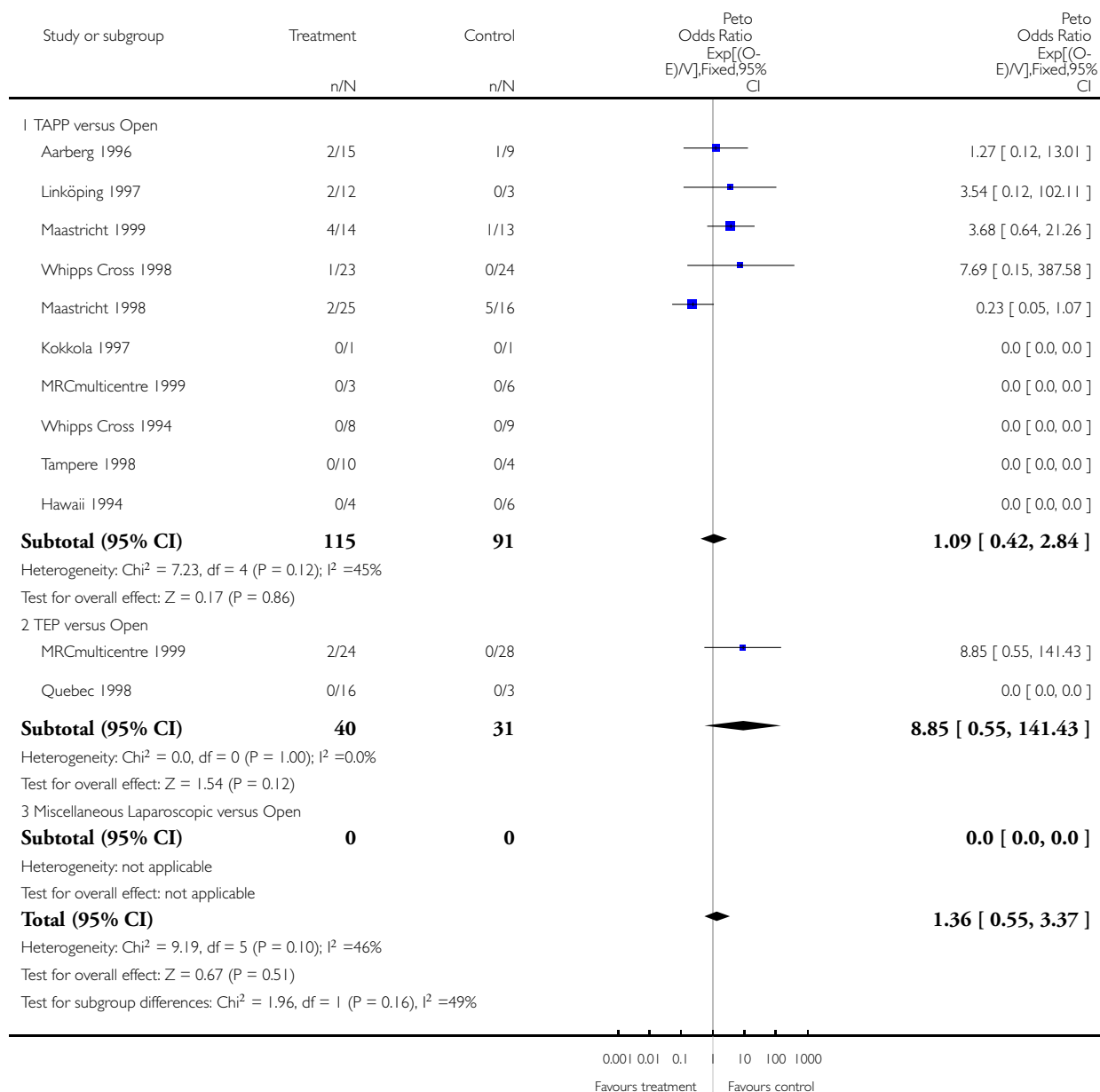


Analysis 7.15. Comparison 7 Laparoscopic versus Open (Bilateral hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 7 Laparoscopic versus Open (Bilateral hernias)

Outcome: 15 Hernia recurrence

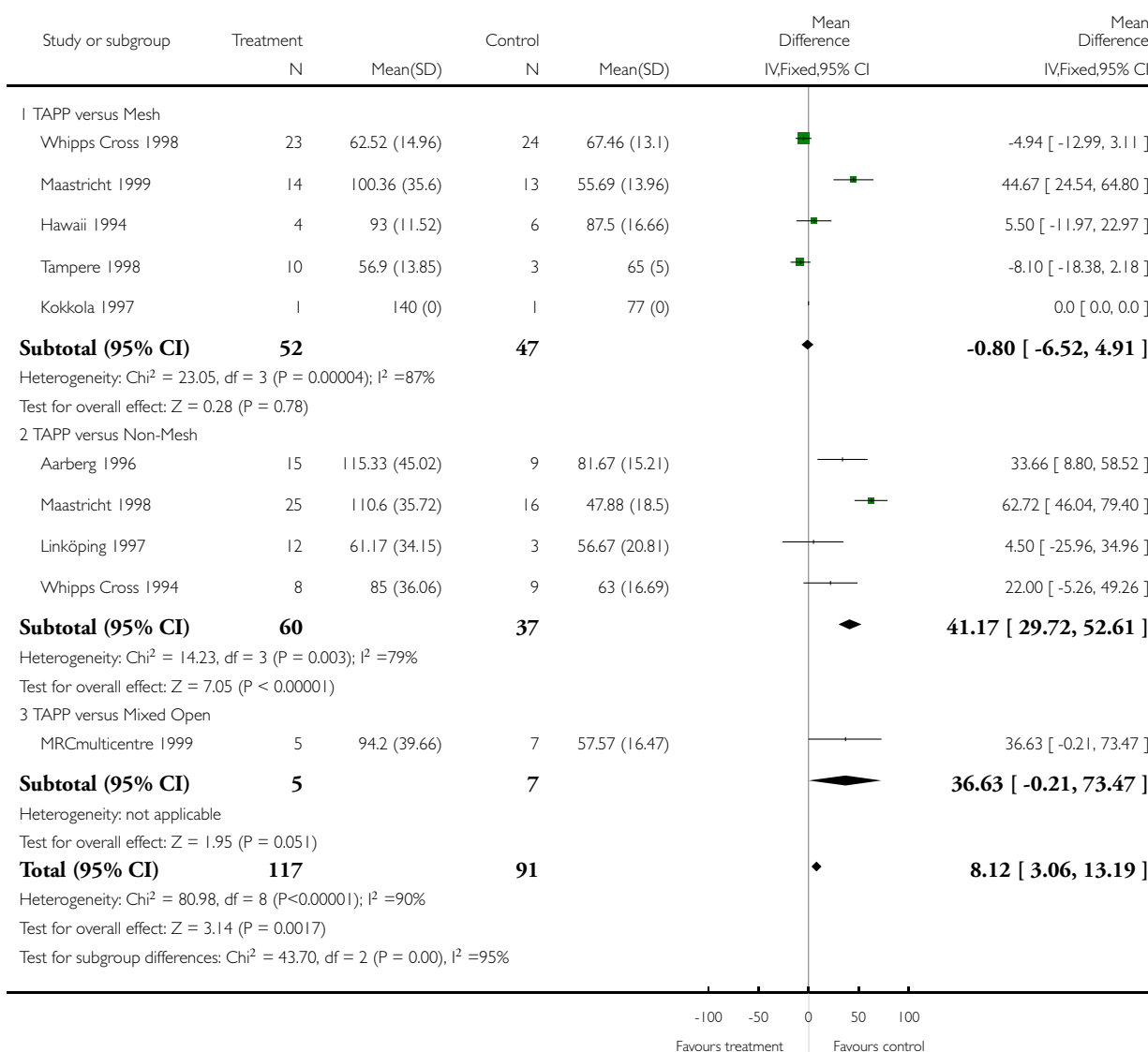


Analysis 8.1. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 1 Duration of operation (minutes)

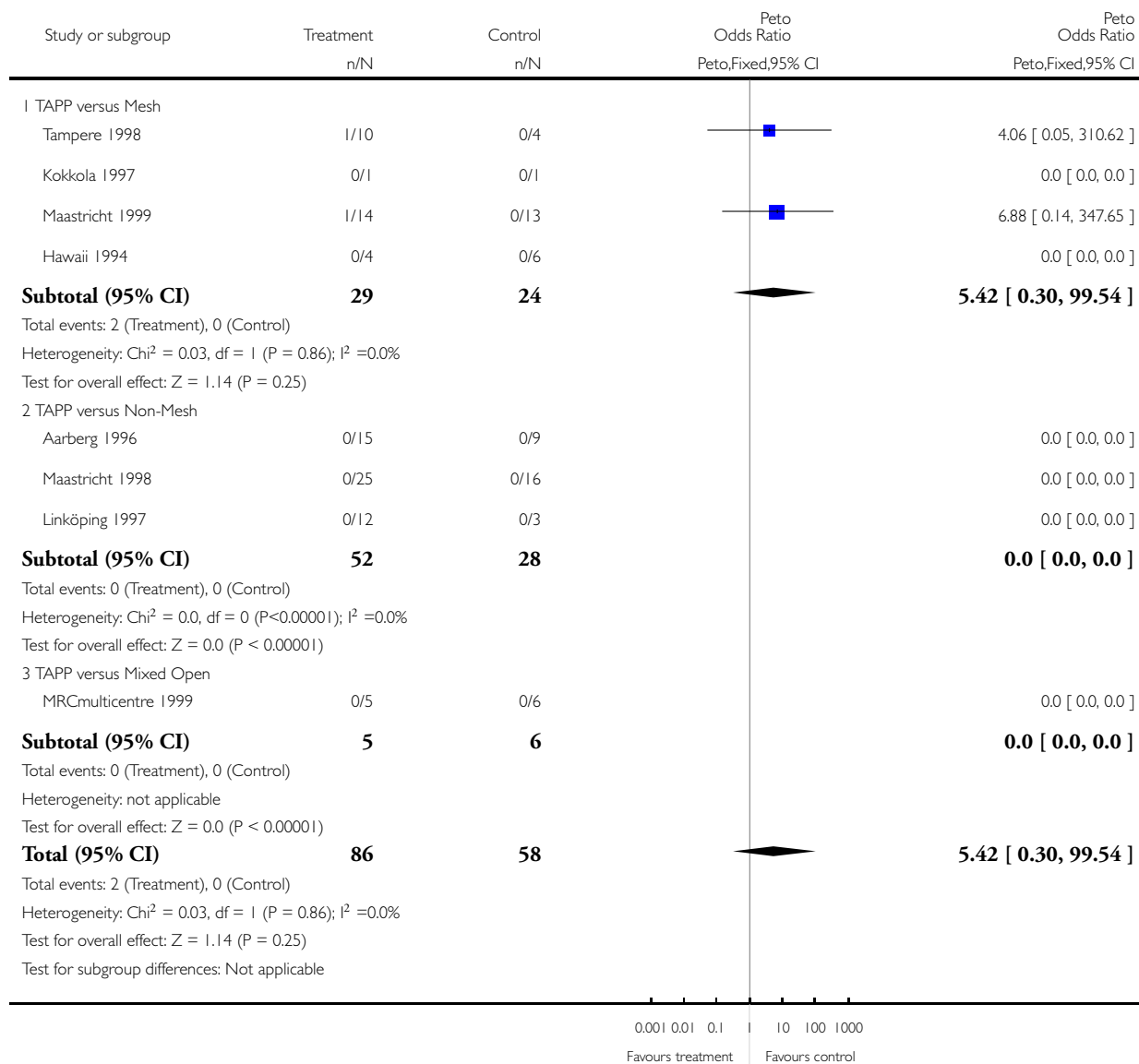


Analysis 8.2. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 2 "Opposite" method initiated

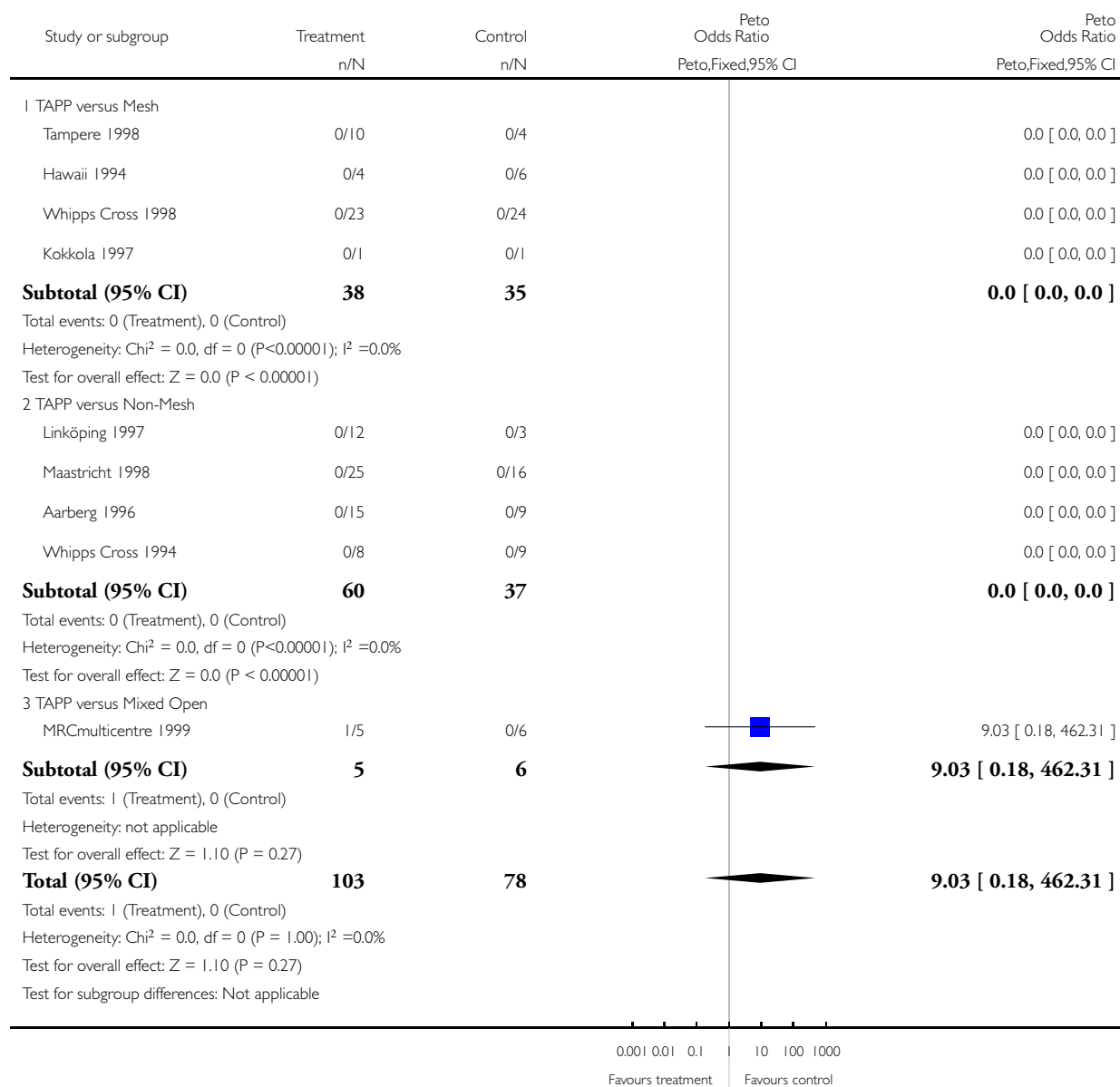


Analysis 8.3. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 3 Conversion

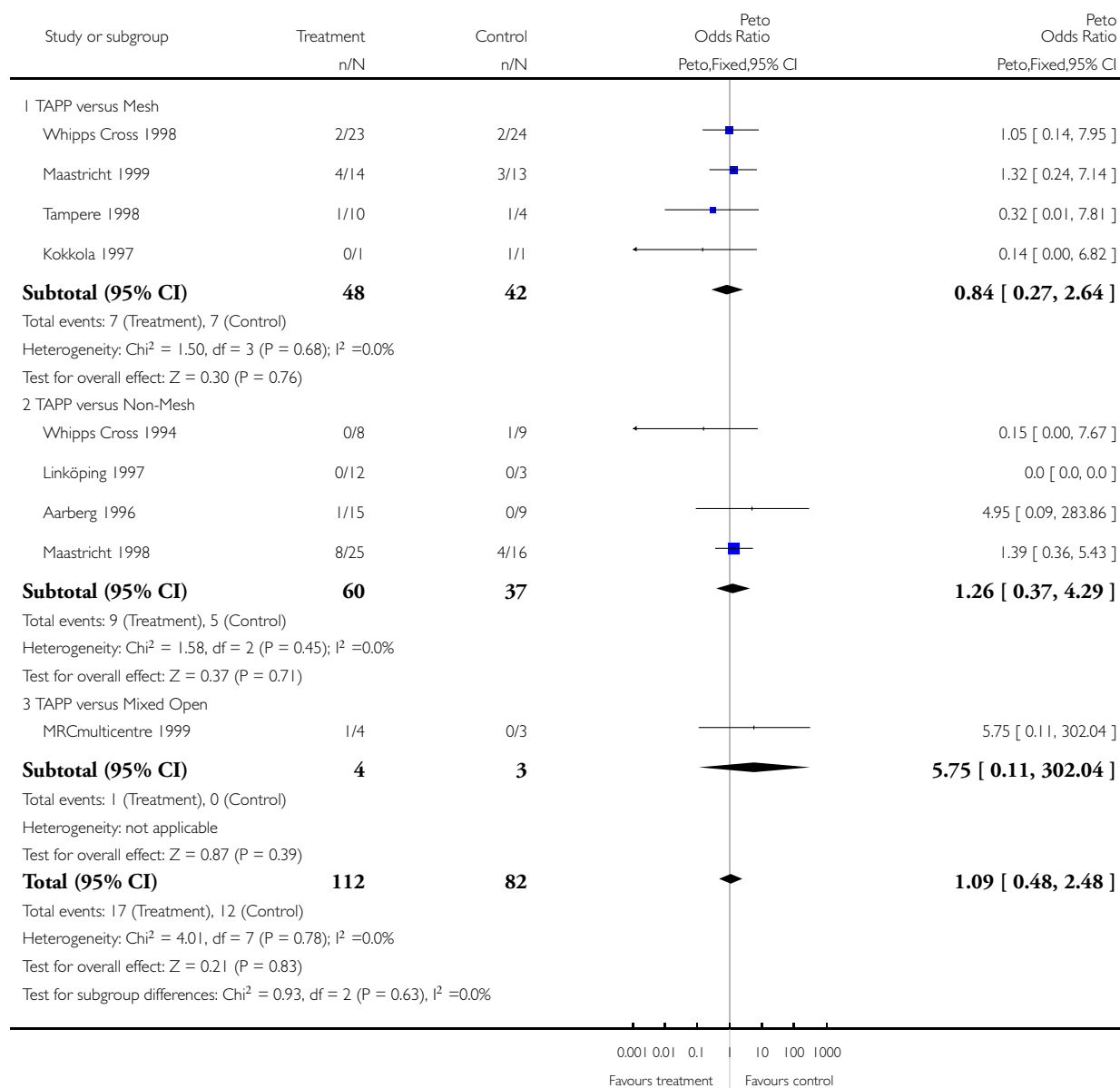


Analysis 8.4. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 4 Haematoma

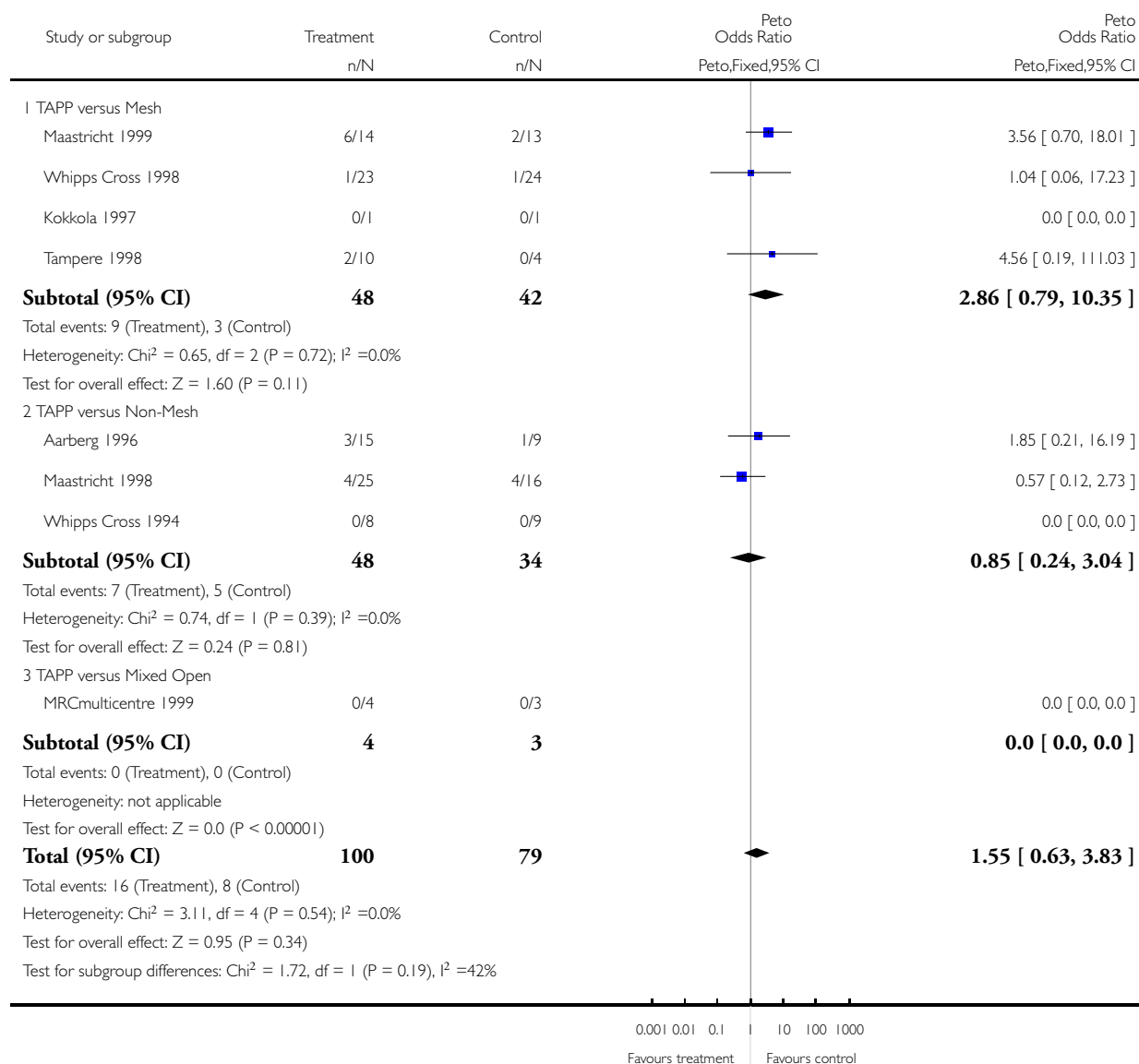


Analysis 8.5. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 5 Seroma

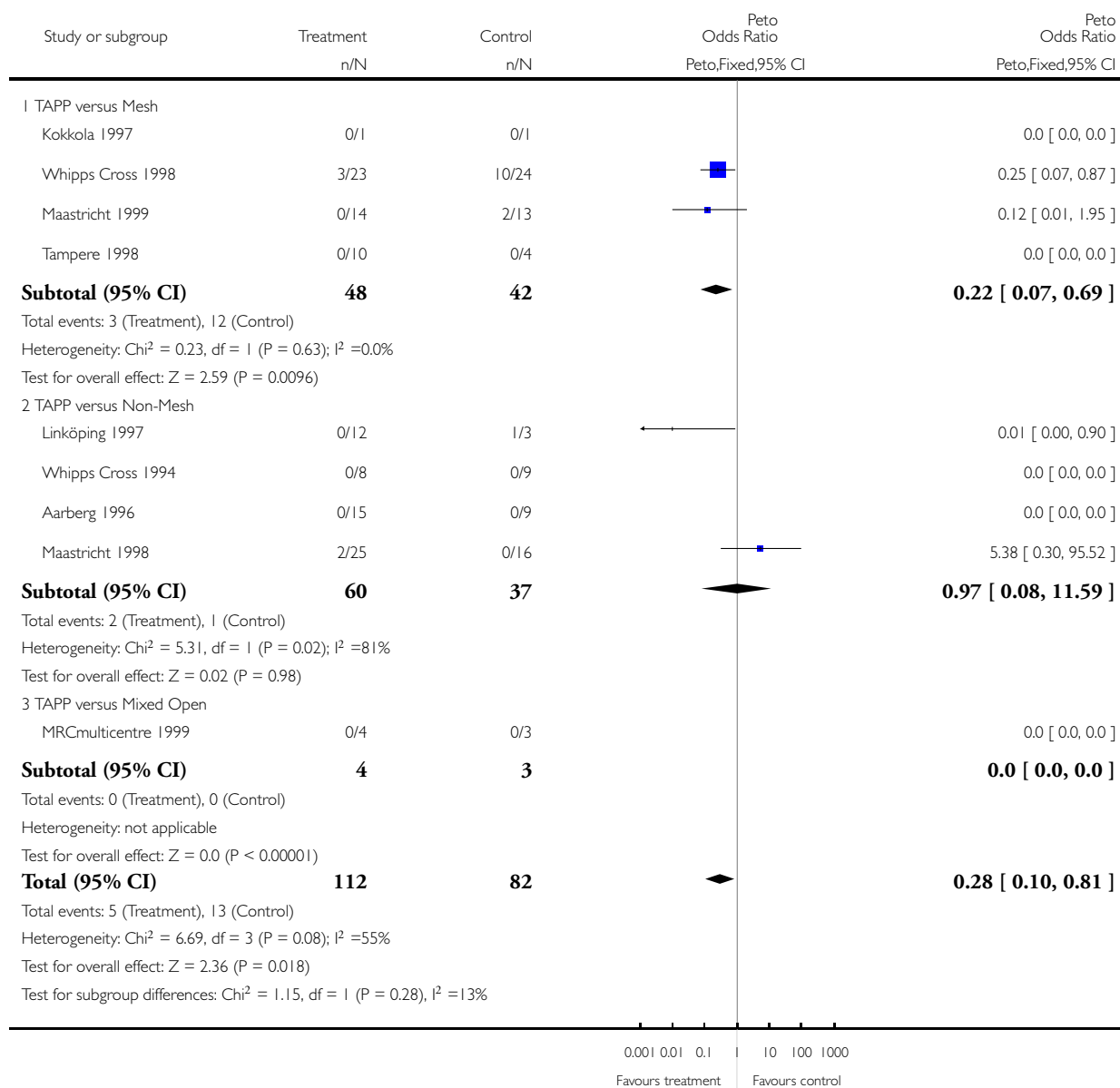


Analysis 8.6. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 6 Wound/superficial infection



Analysis 8.7. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 7 Mesh/deep infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Tampere 1998	0/10	0/4		0.0 [0.0, 0.0]
Kokkola 1997	0/1	0/1		0.0 [0.0, 0.0]
Whipps Cross 1998	0/23	0/24		0.0 [0.0, 0.0]
Maastricht 1999	0/14	0/13		0.0 [0.0, 0.0]
Subtotal (95% CI)	48	42		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² =0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
2 TAPP versus Non-Mesh				
Whipps Cross 1994	0/8	0/9		0.0 [0.0, 0.0]
Subtotal (95% CI)	8	9		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
3 TAPP versus Mixed Open				
MRCmulticentre 1999	0/4	0/3		0.0 [0.0, 0.0]
Subtotal (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Total (95% CI)	60	54		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² =0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Test for subgroup differences: Chi ² = 0.0, df = -1 (P = 0.0), I ² =0.0%				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 8.8. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 8 Vascular injury

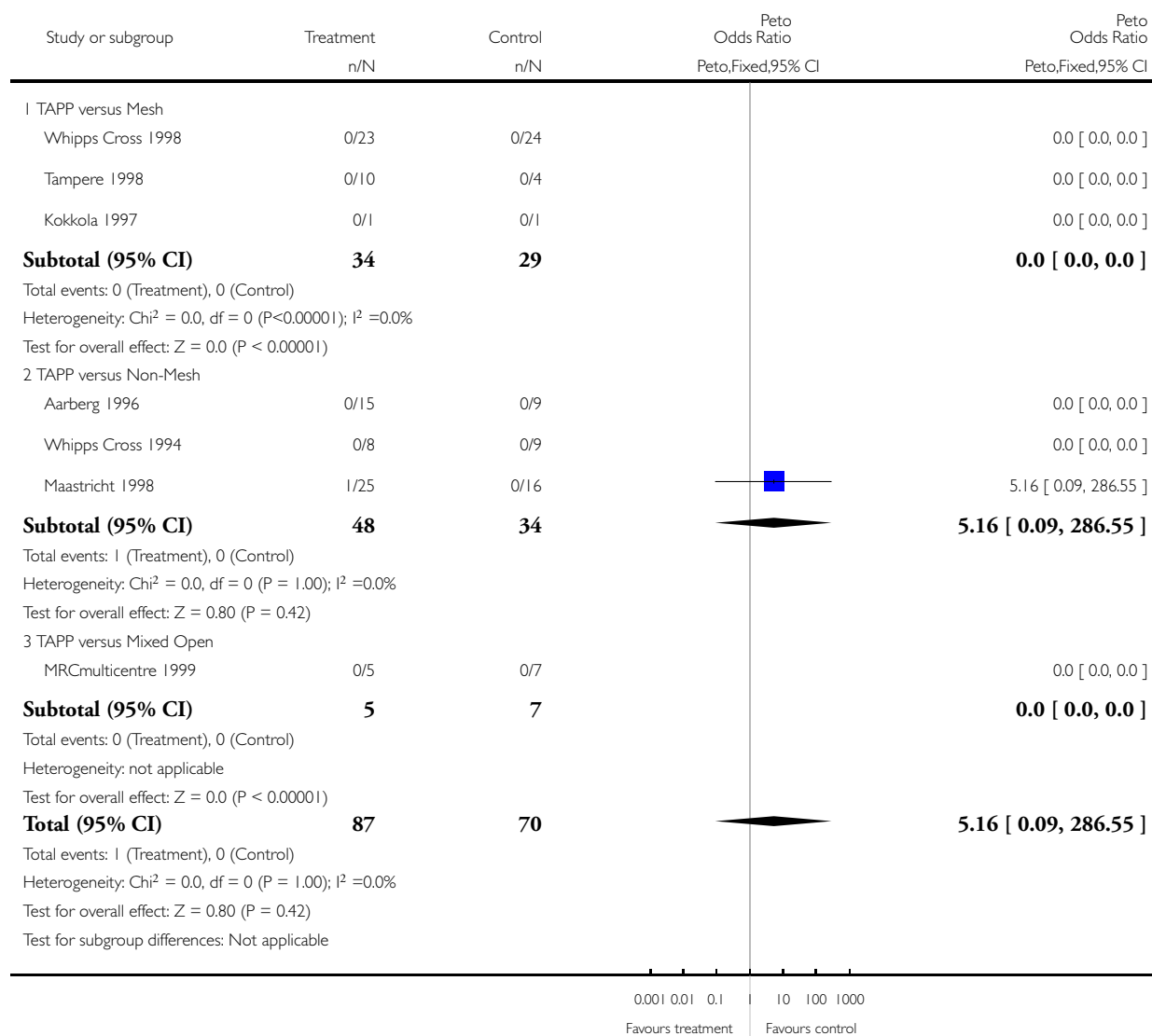
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Whipps Cross 1998	0/23	0/24		0.0 [0.0, 0.0]
Kokkola 1997	0/1	0/1		0.0 [0.0, 0.0]
Tampere 1998	0/10	0/4		0.0 [0.0, 0.0]
Subtotal (95% CI)	34	29		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TAPP versus Non-Mesh				
Whipps Cross 1994	0/8	0/9		0.0 [0.0, 0.0]
Aarberg 1996	0/15	0/9		0.0 [0.0, 0.0]
Subtotal (95% CI)	23	18		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TAPP versus Mixed Open				
MRCmulticentre 1999	0/5	0/7		0.0 [0.0, 0.0]
Subtotal (95% CI)	5	7		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	62	54		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 8.9. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 9 Visceral injury

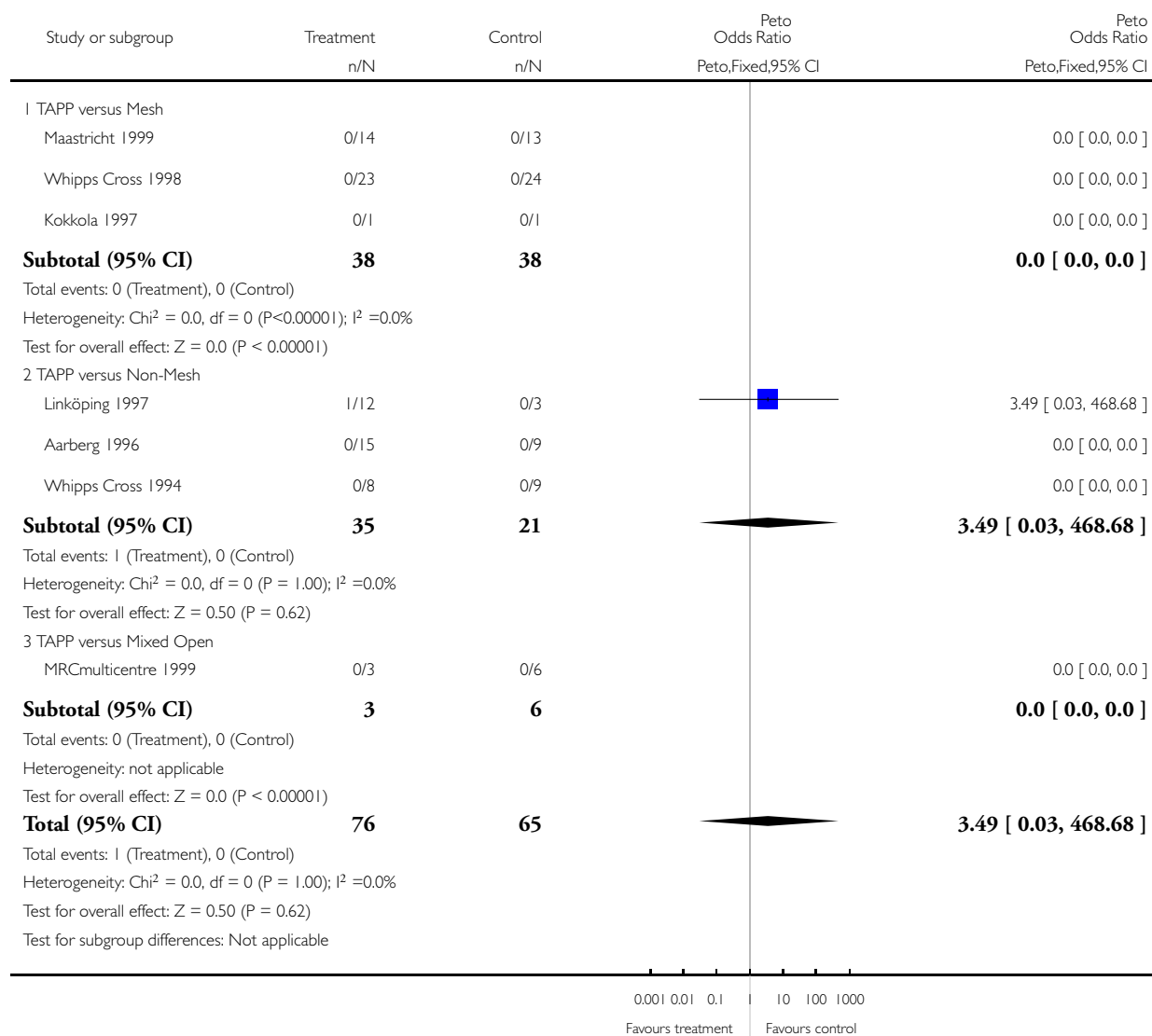


Analysis 8.10. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 10 Port site hernia

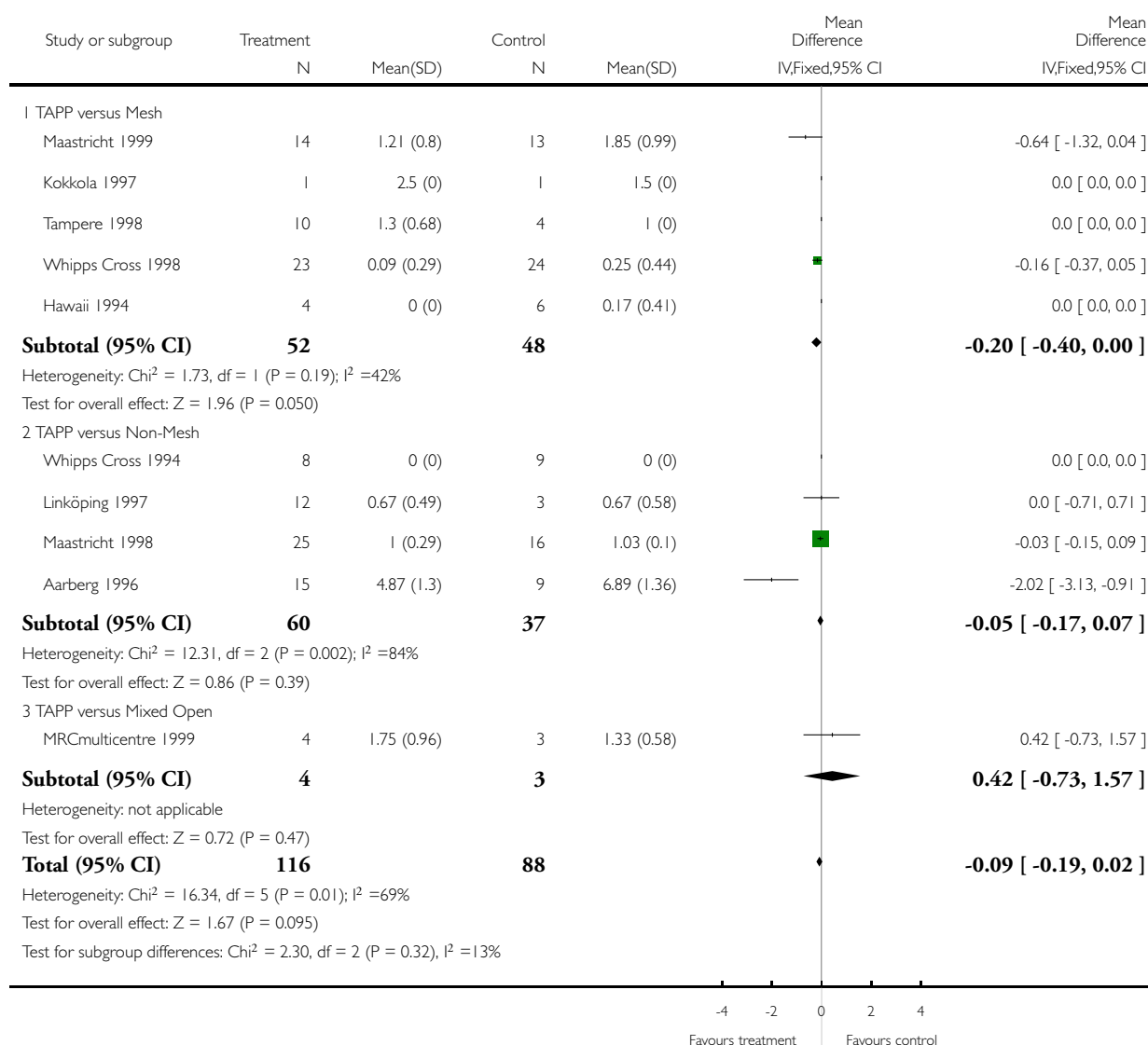


Analysis 8.11. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 11 Length of stay (days)

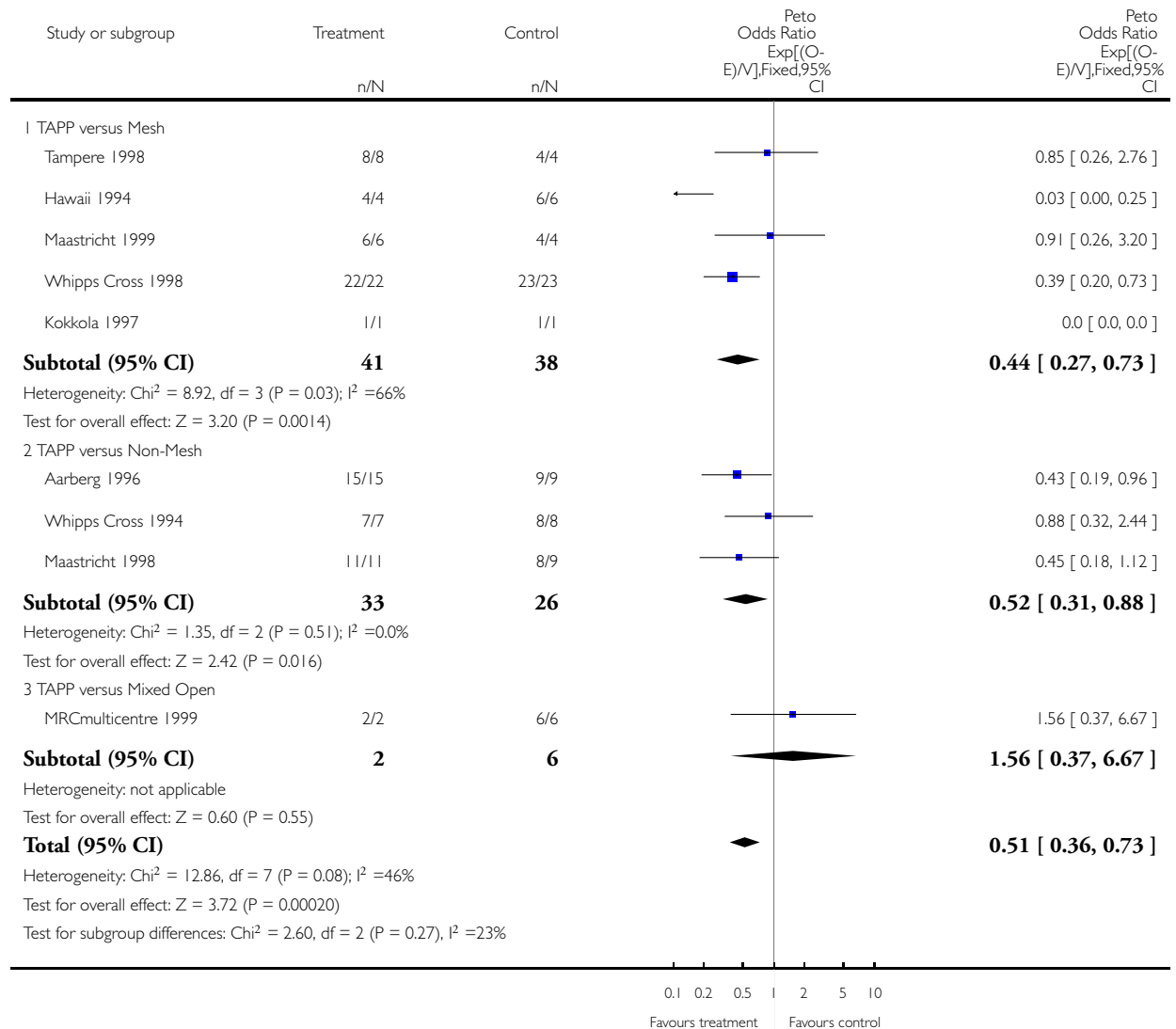


Analysis 8.12. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 12 Time to return to usual activities (days)

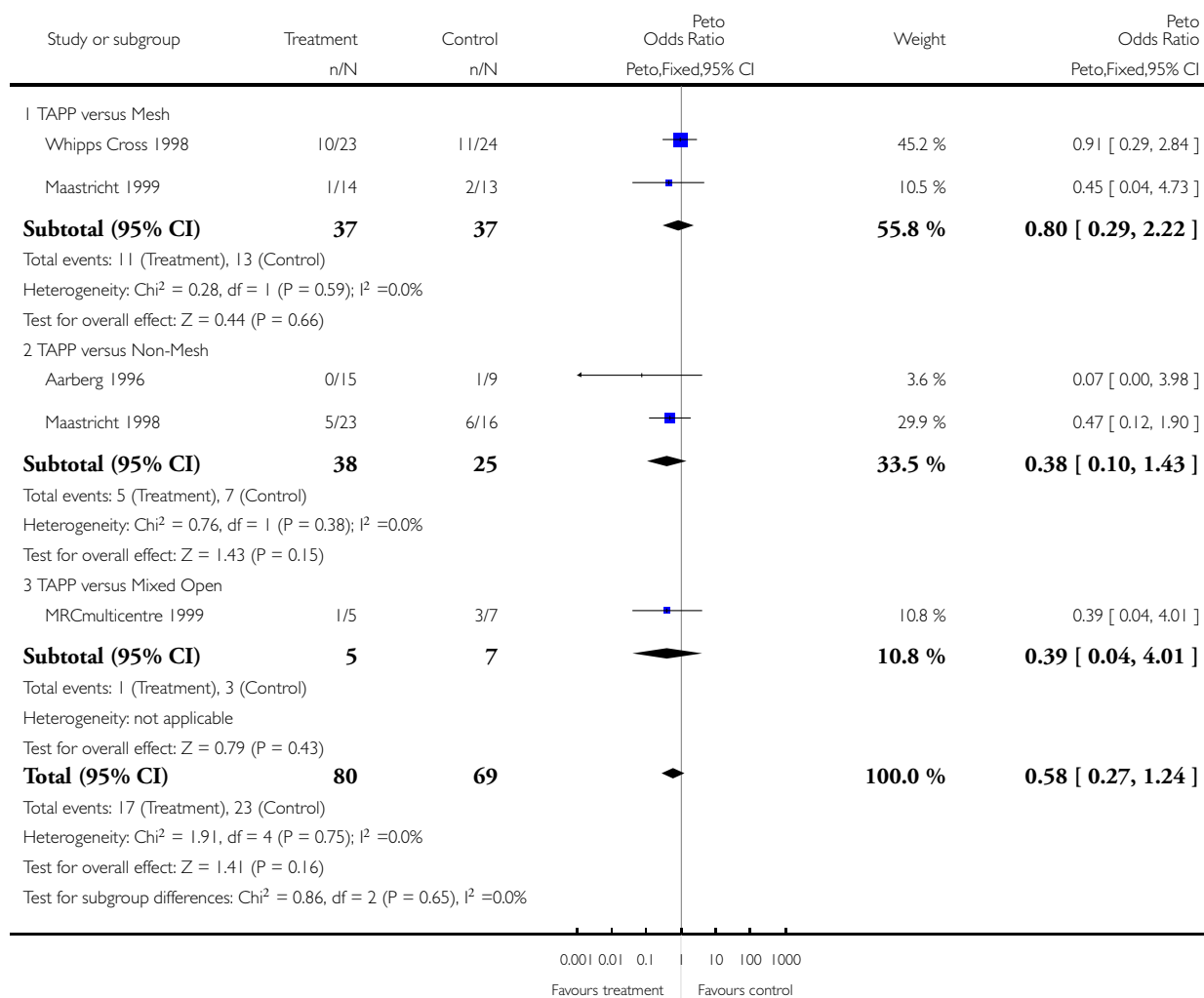


Analysis 8.13. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 13 Persisting pain

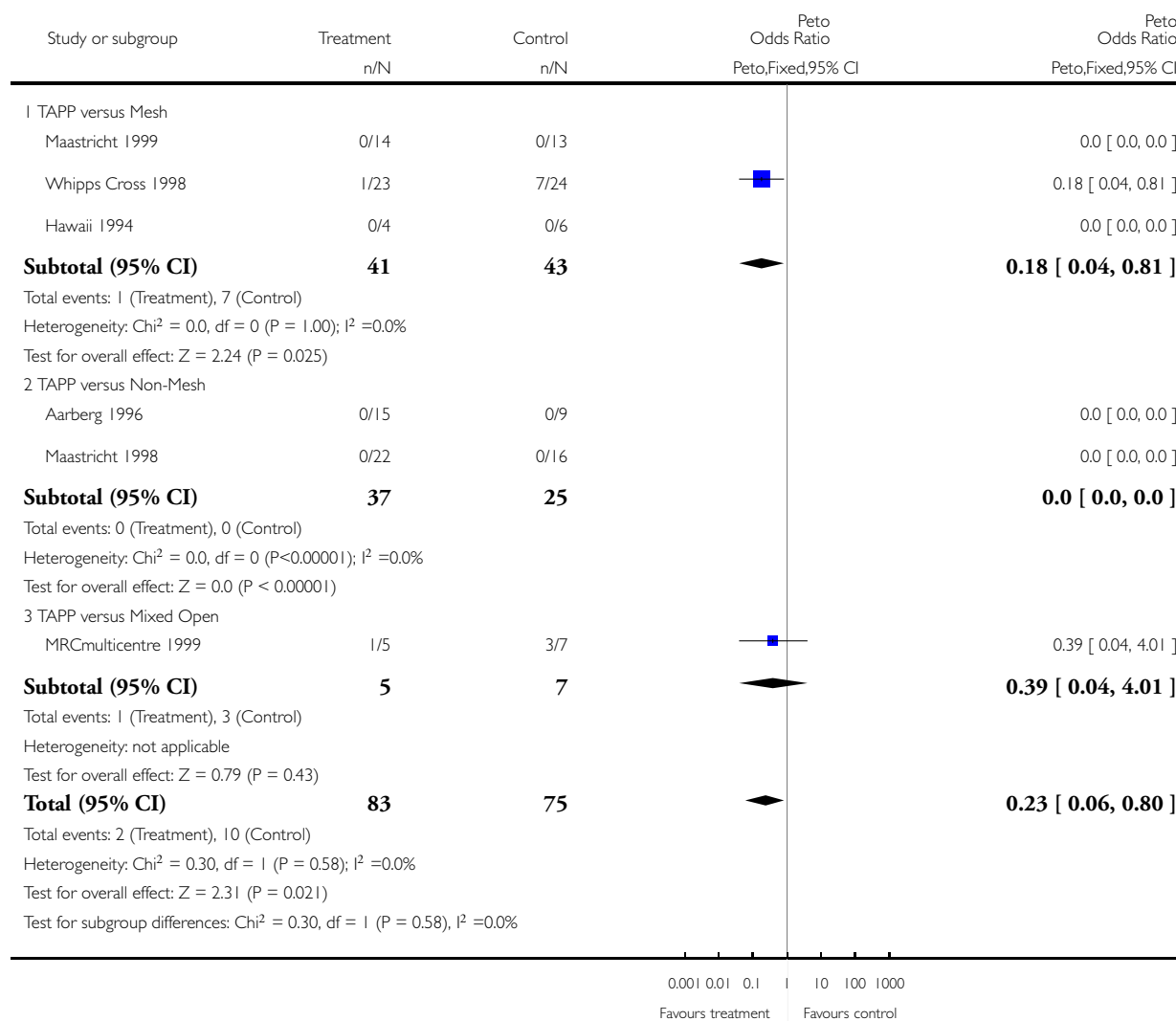


Analysis 8.14. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 14 Persisting numbness

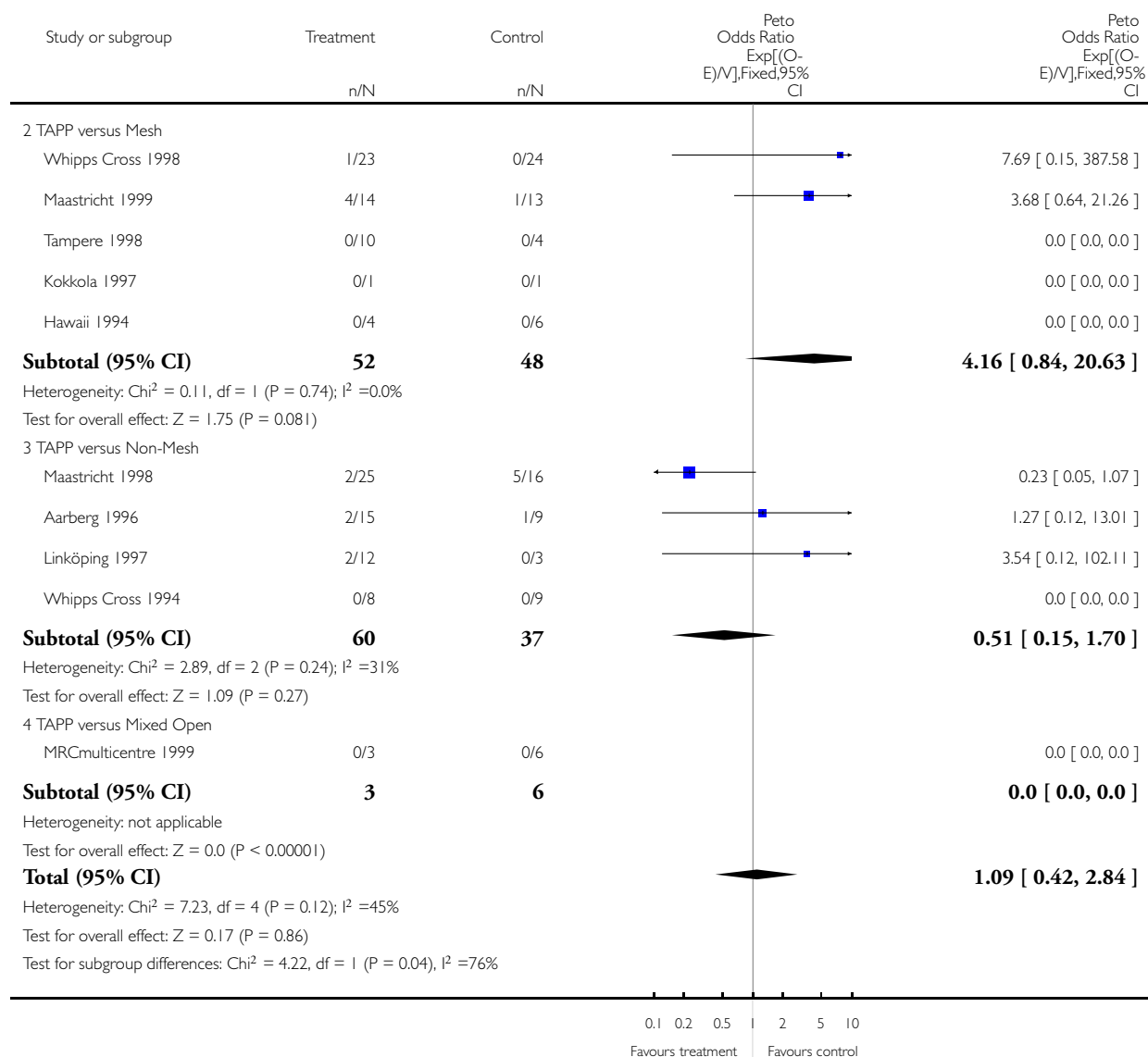


Analysis 8.15. Comparison 8 TAPP versus Open (Bilateral hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 8 TAPP versus Open (Bilateral hernias)

Outcome: 15 Hernia recurrence

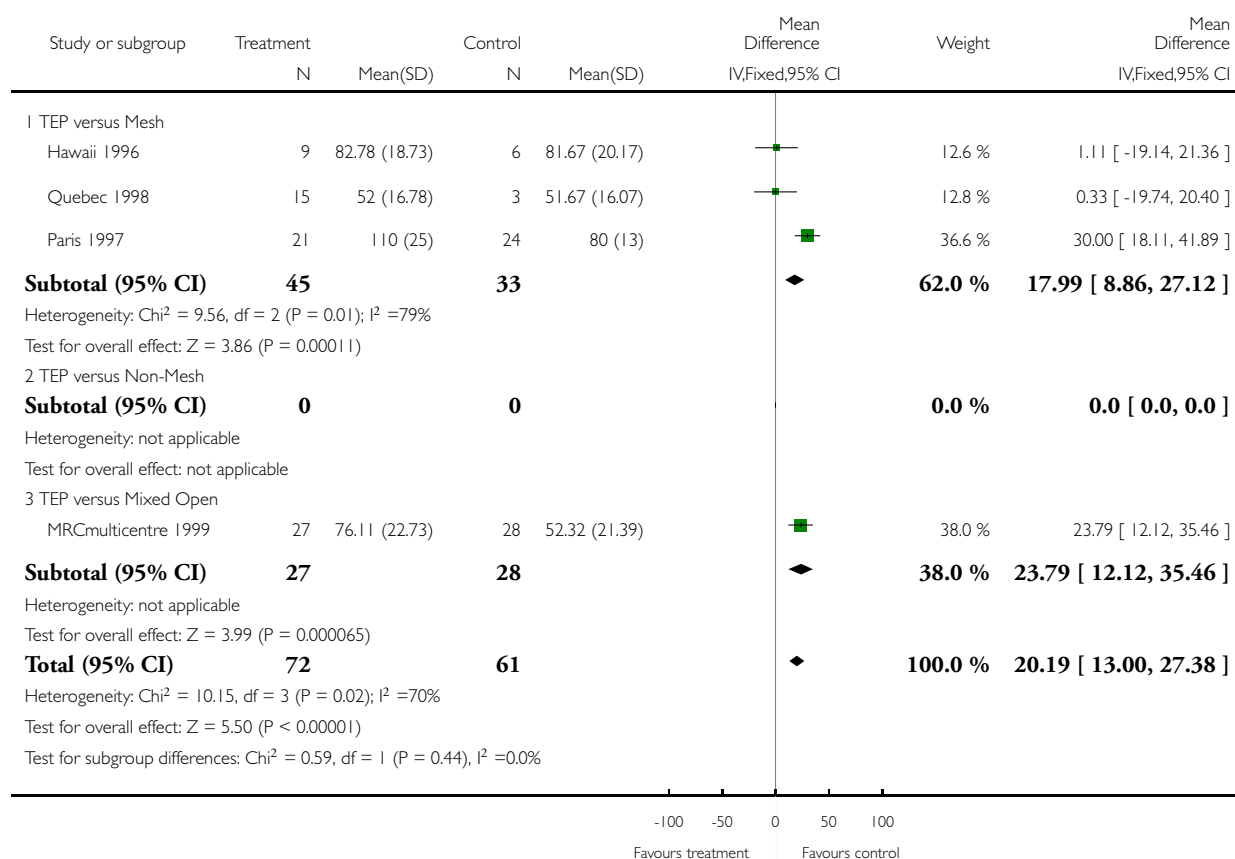


Analysis 9.1. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 1 Duration of operation (minutes)

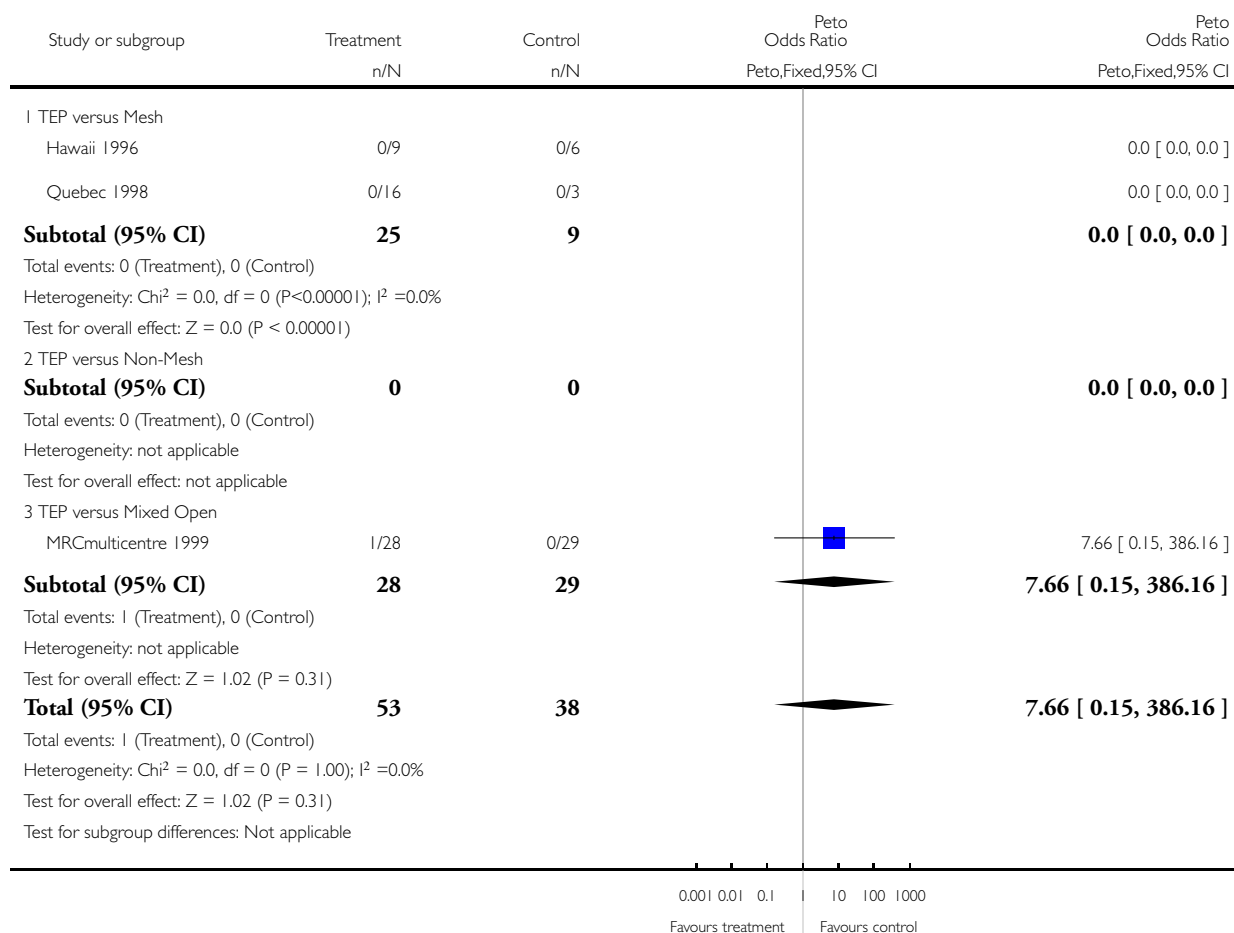


Analysis 9.2. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 2 "Opposite" method initiated

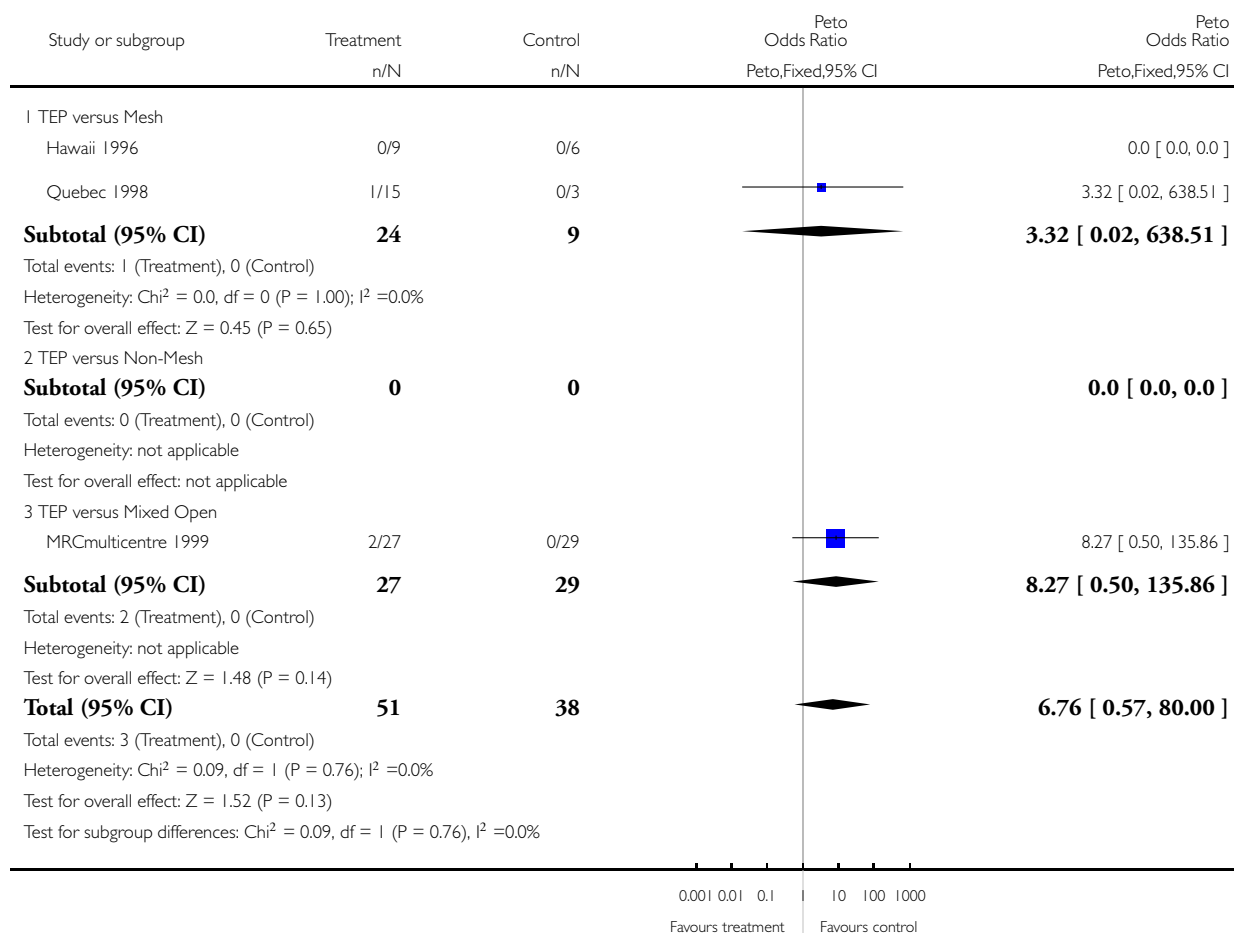


Analysis 9.3. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 3 Conversion

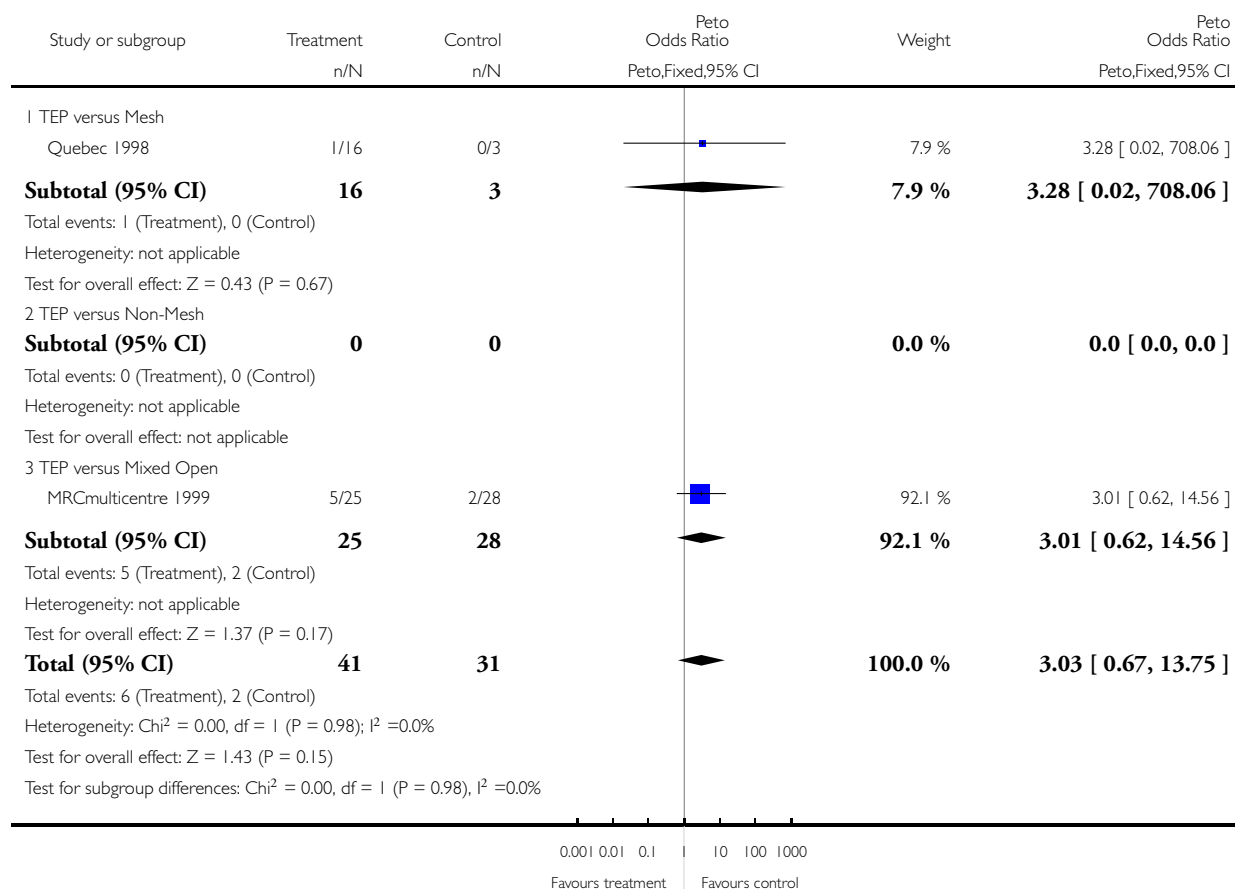


Analysis 9.4. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 4 Haematoma

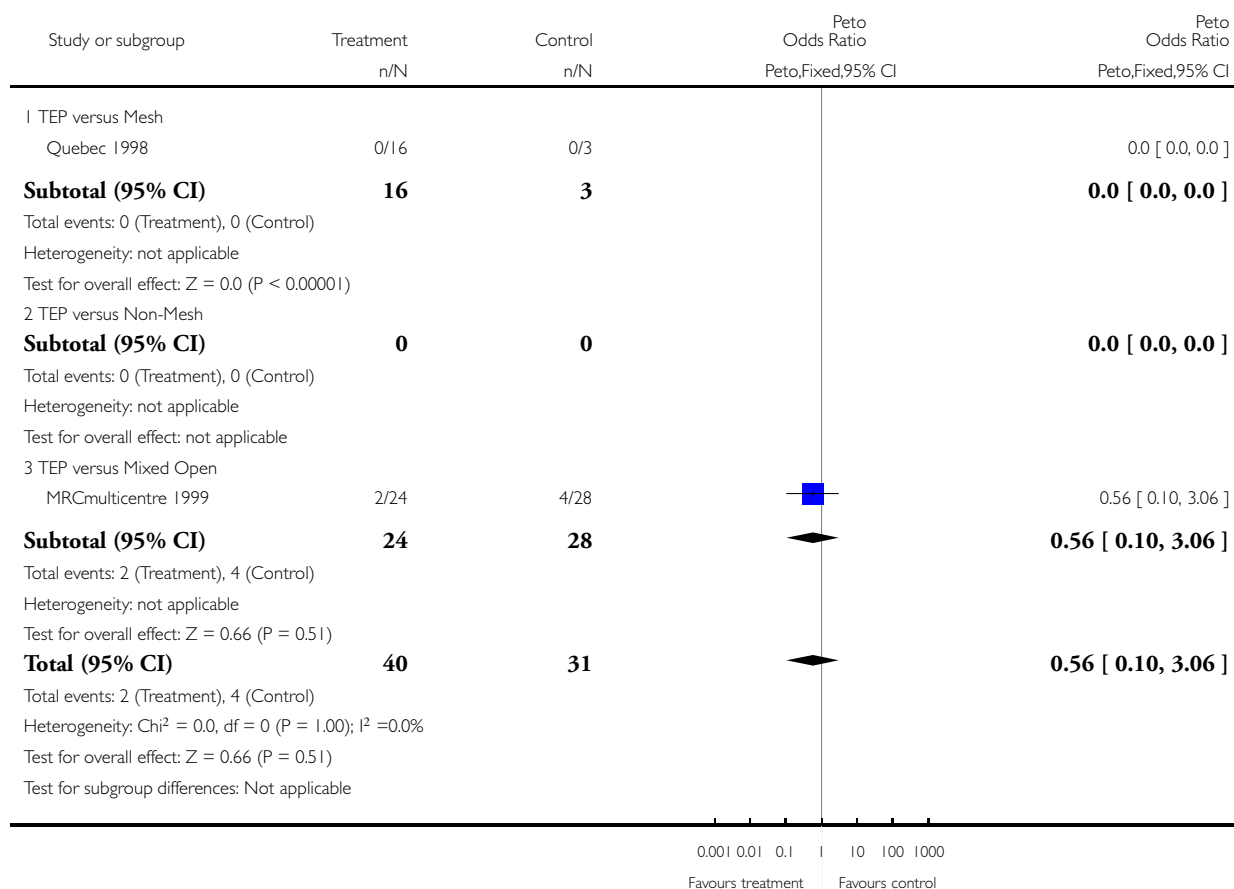


Analysis 9.5. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 5 Seroma

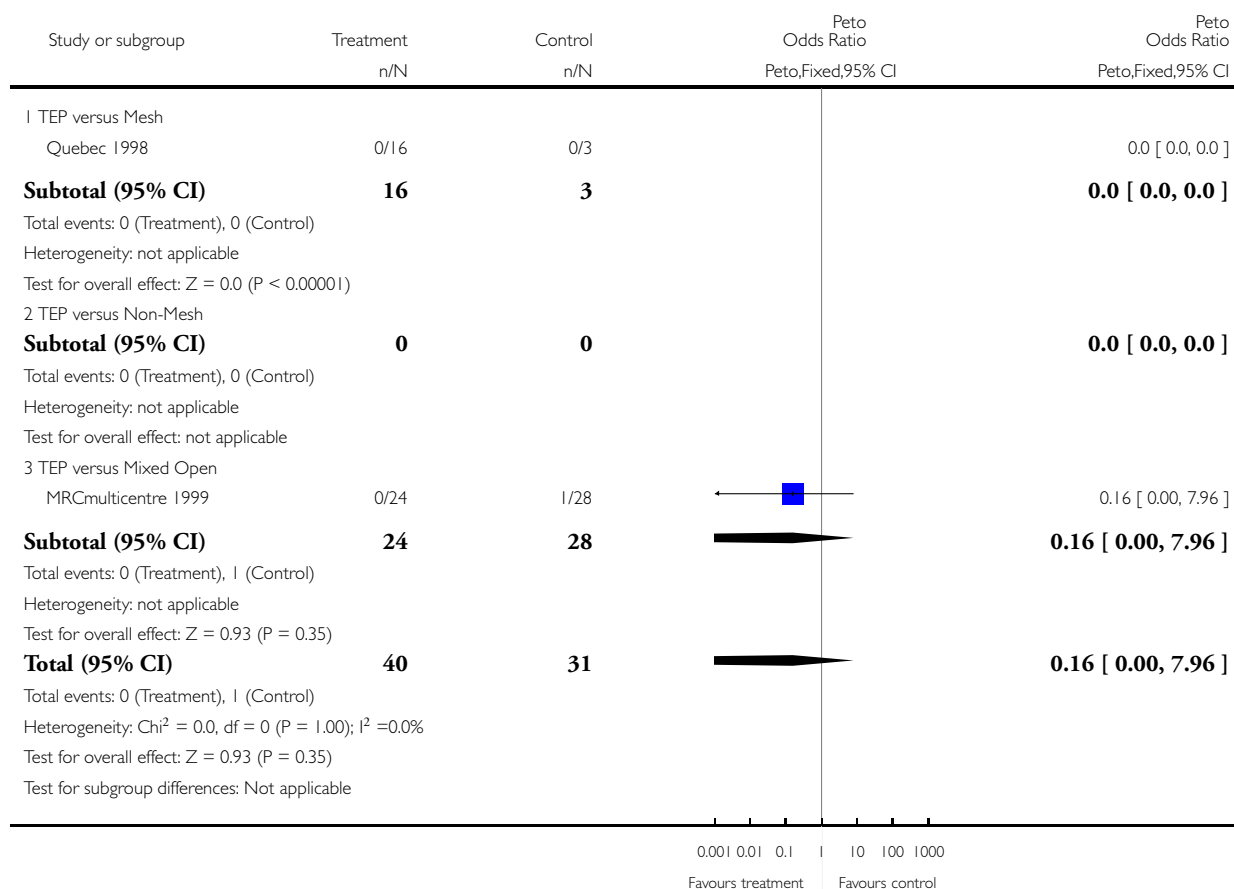


Analysis 9.6. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 6 Wound/superficial infection



Analysis 9.7. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 7 Mesh/deep infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/16	0/3		0.0 [0.0, 0.0]
Subtotal (95% CI)	16	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/24	0/28		0.0 [0.0, 0.0]
Subtotal (95% CI)	24	28		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	40	31		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 9.8. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 8 Vascular injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/16	0/3		0.0 [0.0, 0.0]
Subtotal (95% CI)	16	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/27	0/29		0.0 [0.0, 0.0]
Subtotal (95% CI)	27	29		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	43	32		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 9.9. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 9 Visceral injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/16	0/3		0.0 [0.0, 0.0]
Subtotal (95% CI)	16	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/27	0/29		0.0 [0.0, 0.0]
Subtotal (95% CI)	27	29		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	43	32		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $df = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 9.10. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 10 Port site hernia

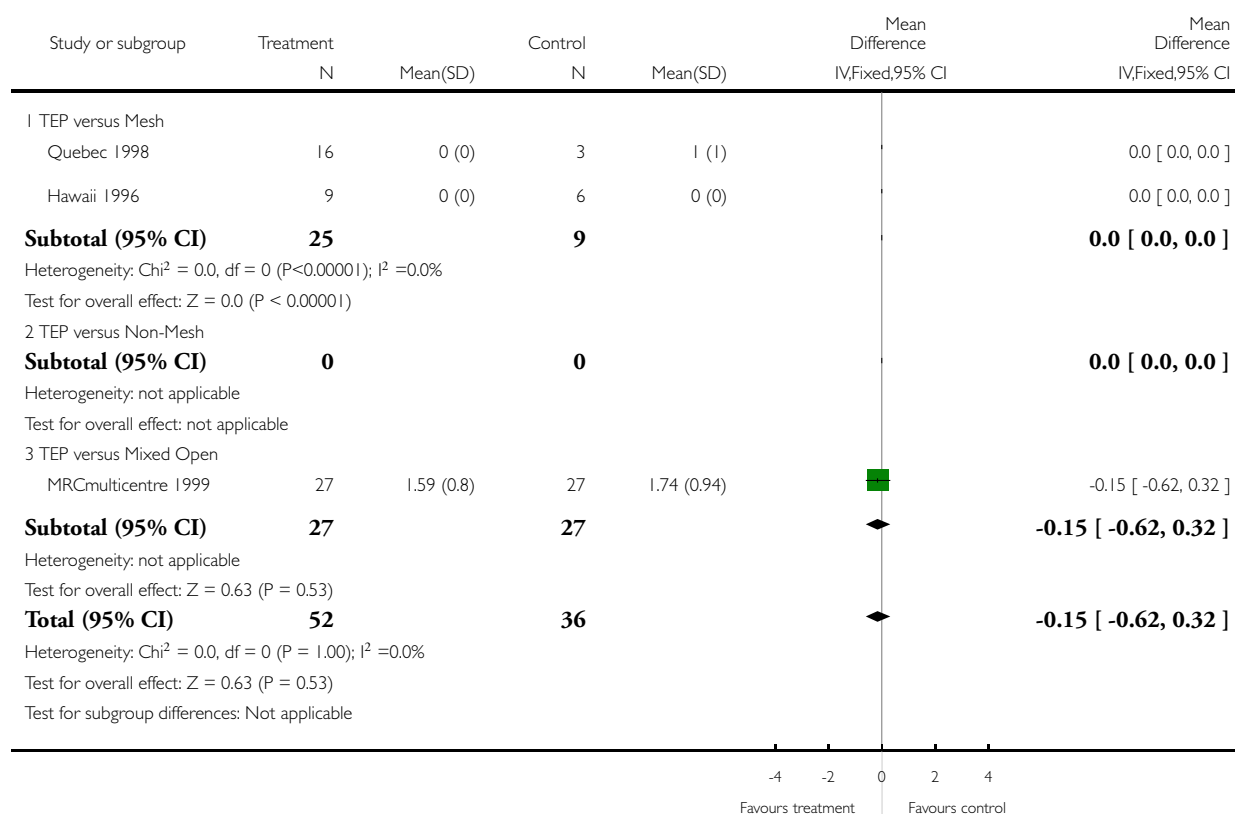
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/16	0/3		0.0 [0.0, 0.0]
Subtotal (95% CI)	16	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/24	0/28		0.0 [0.0, 0.0]
Subtotal (95% CI)	24	28		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	40	31		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $df = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 9.1.1. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 11 Length of stay (days)

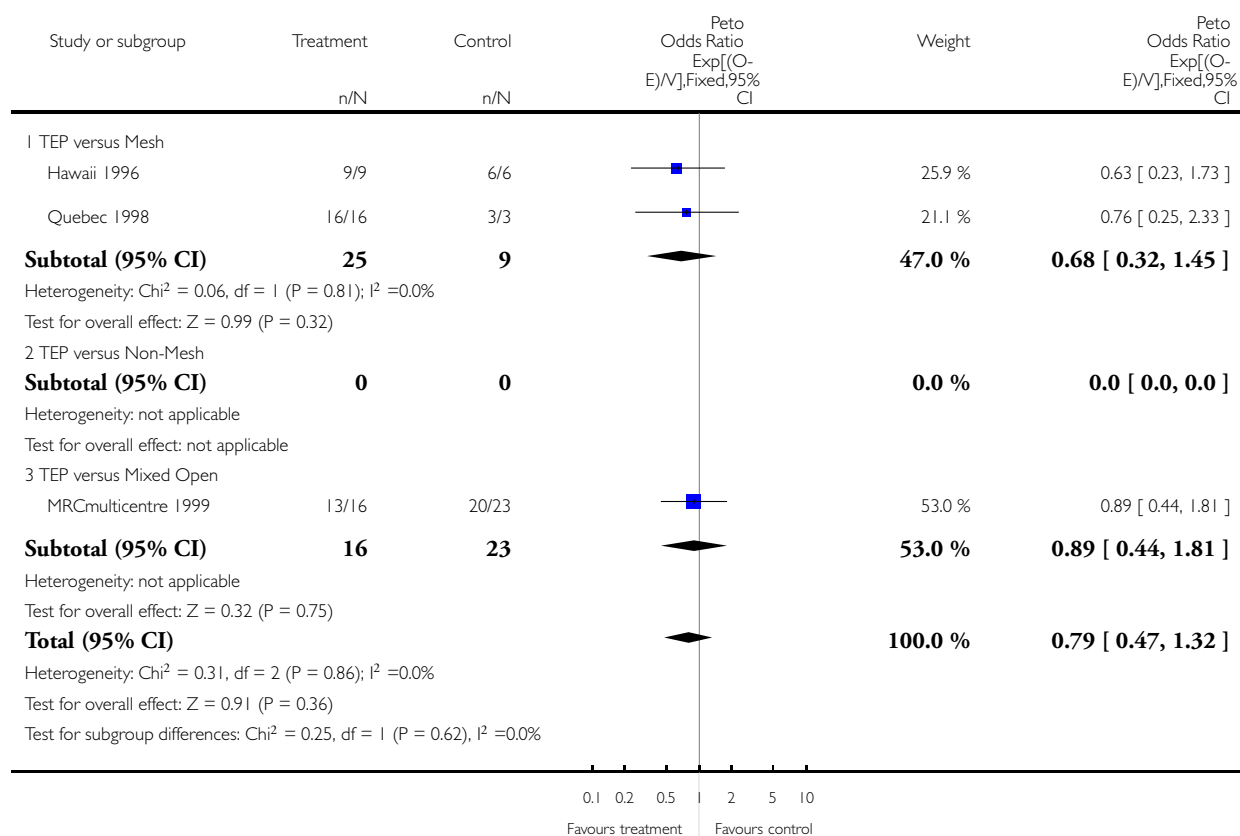


Analysis 9.12. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 12 Time to return to usual activities (days)

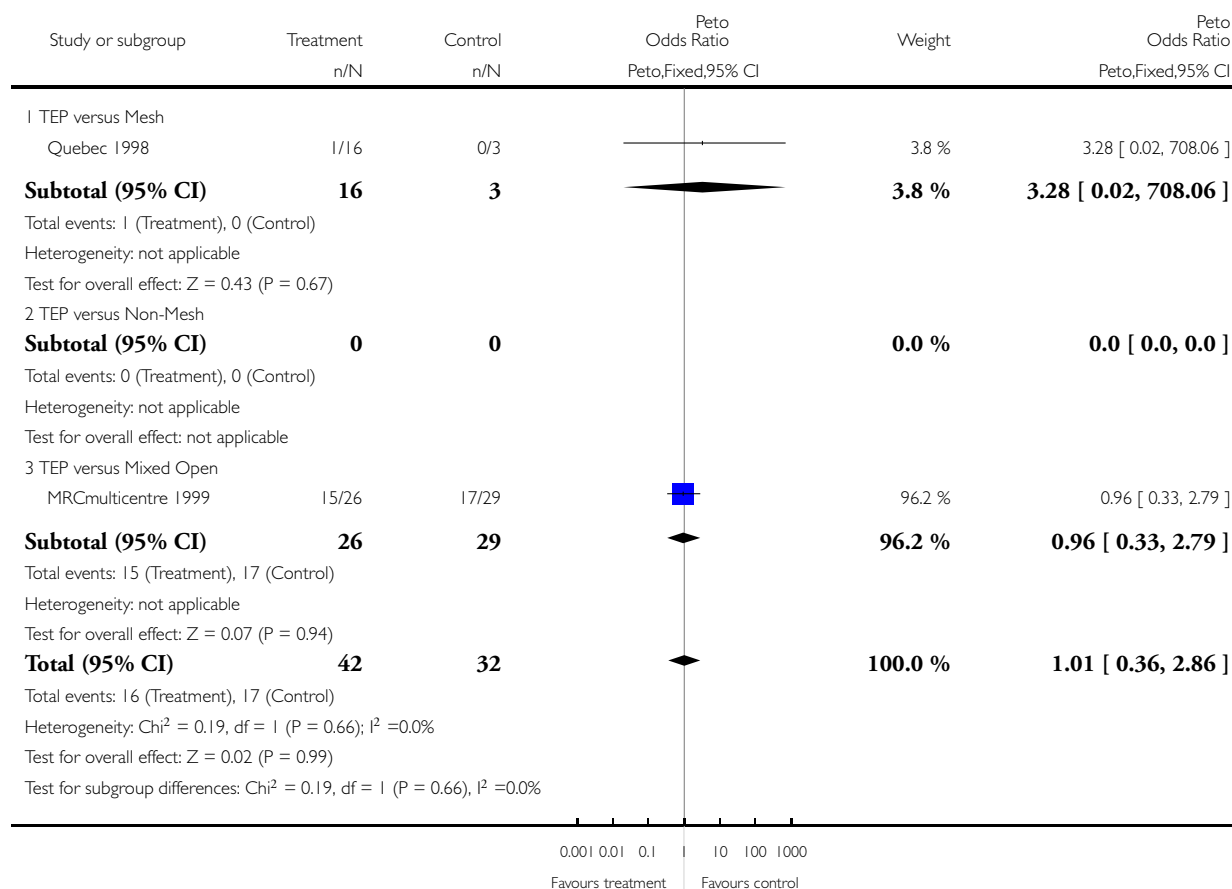


Analysis 9.13. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 13 Persisting pain

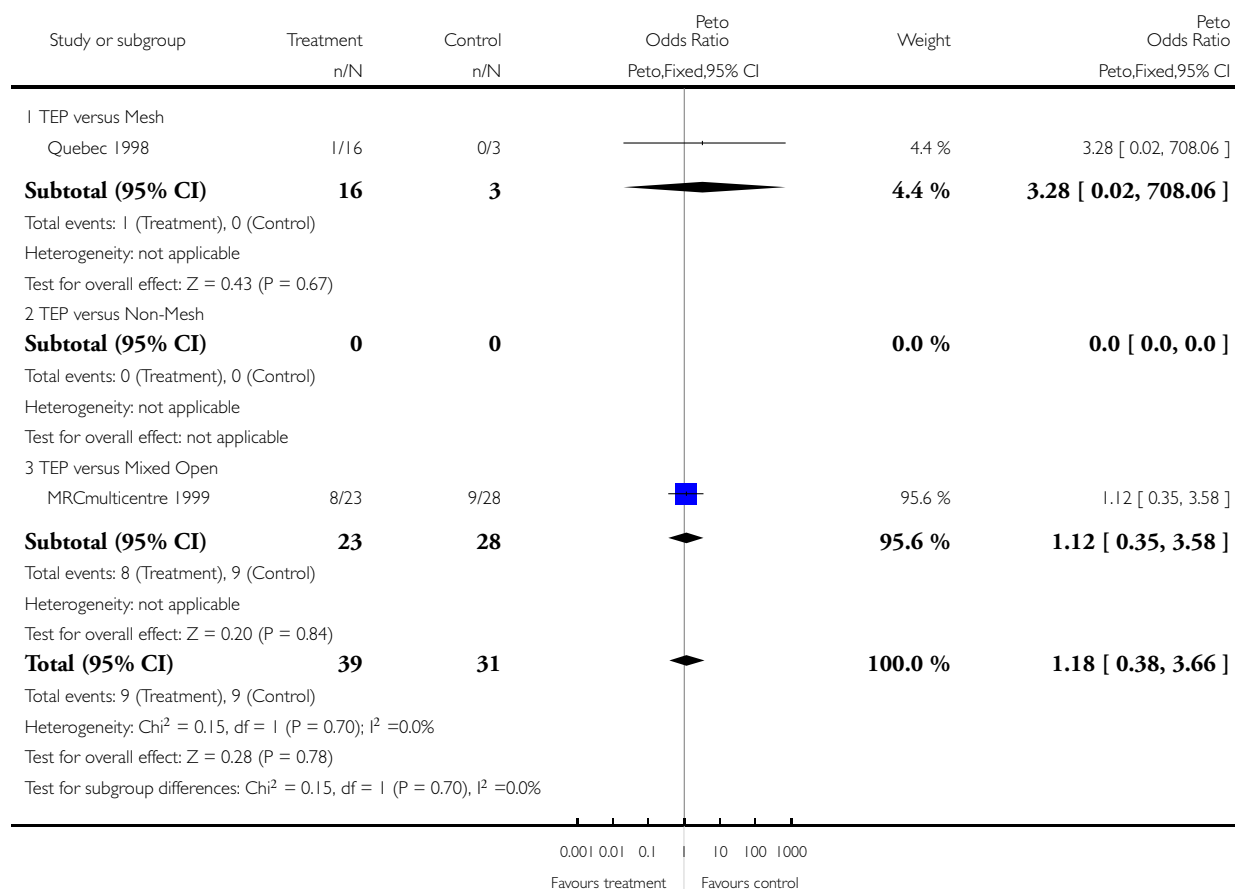


Analysis 9.14. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 14 Persisting numbness

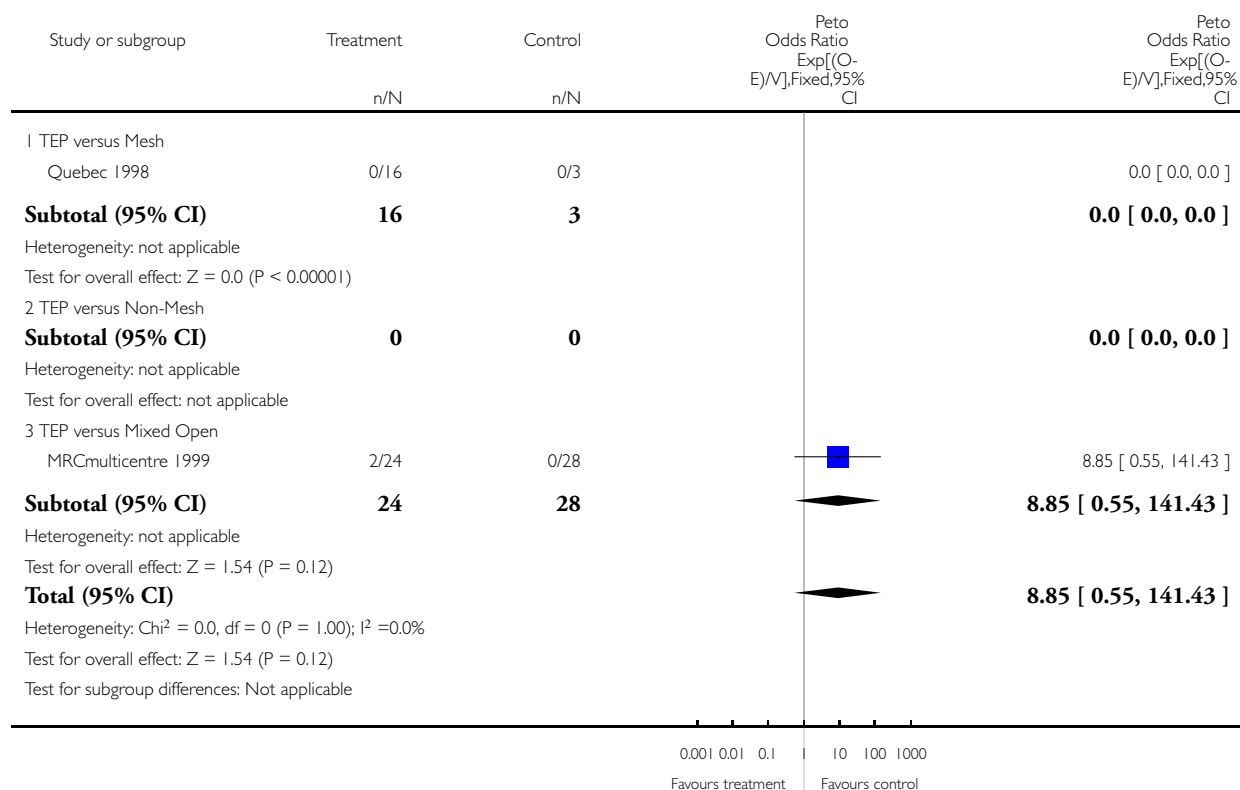


Analysis 9.15. Comparison 9 TEP versus Open (Bilateral hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 9 TEP versus Open (Bilateral hernias)

Outcome: 15 Hernia recurrence

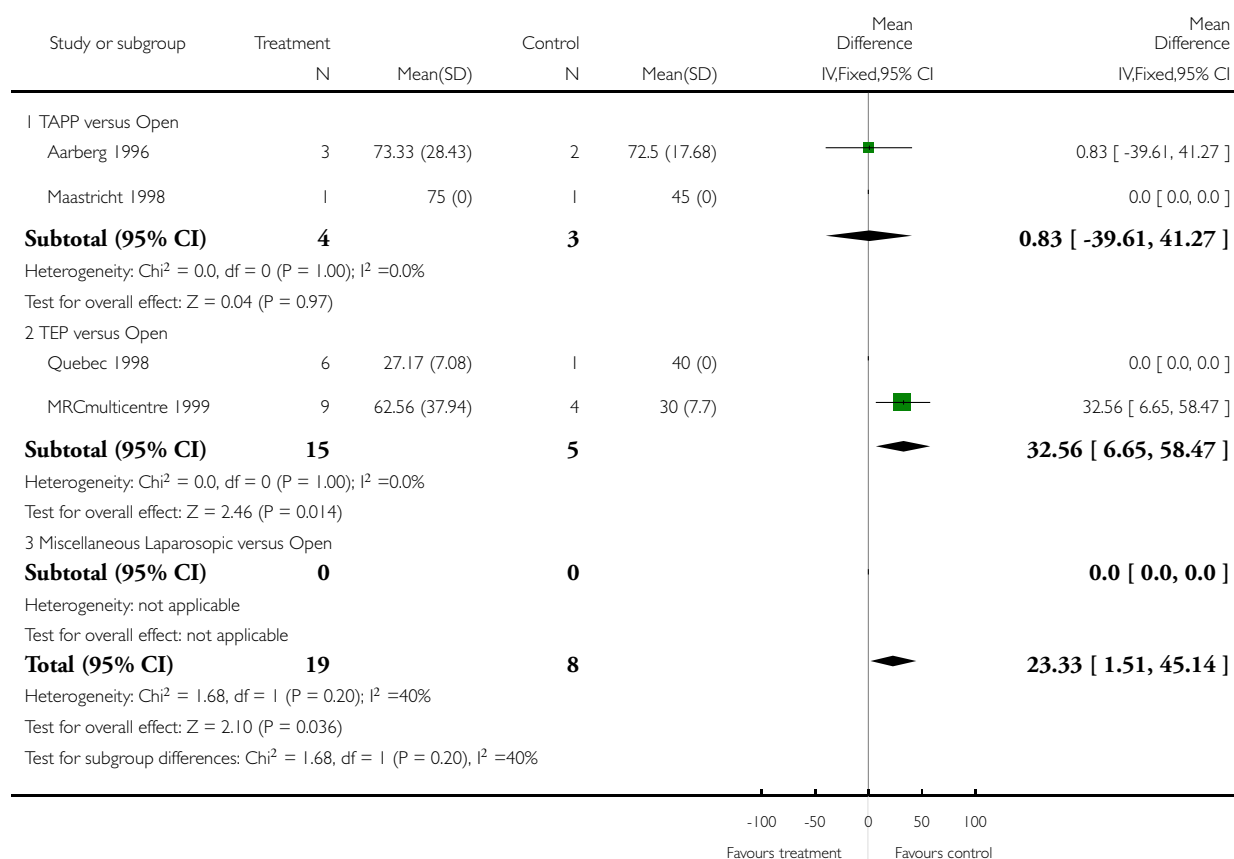


Analysis 10.1. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 1 Duration of operation (minutes)

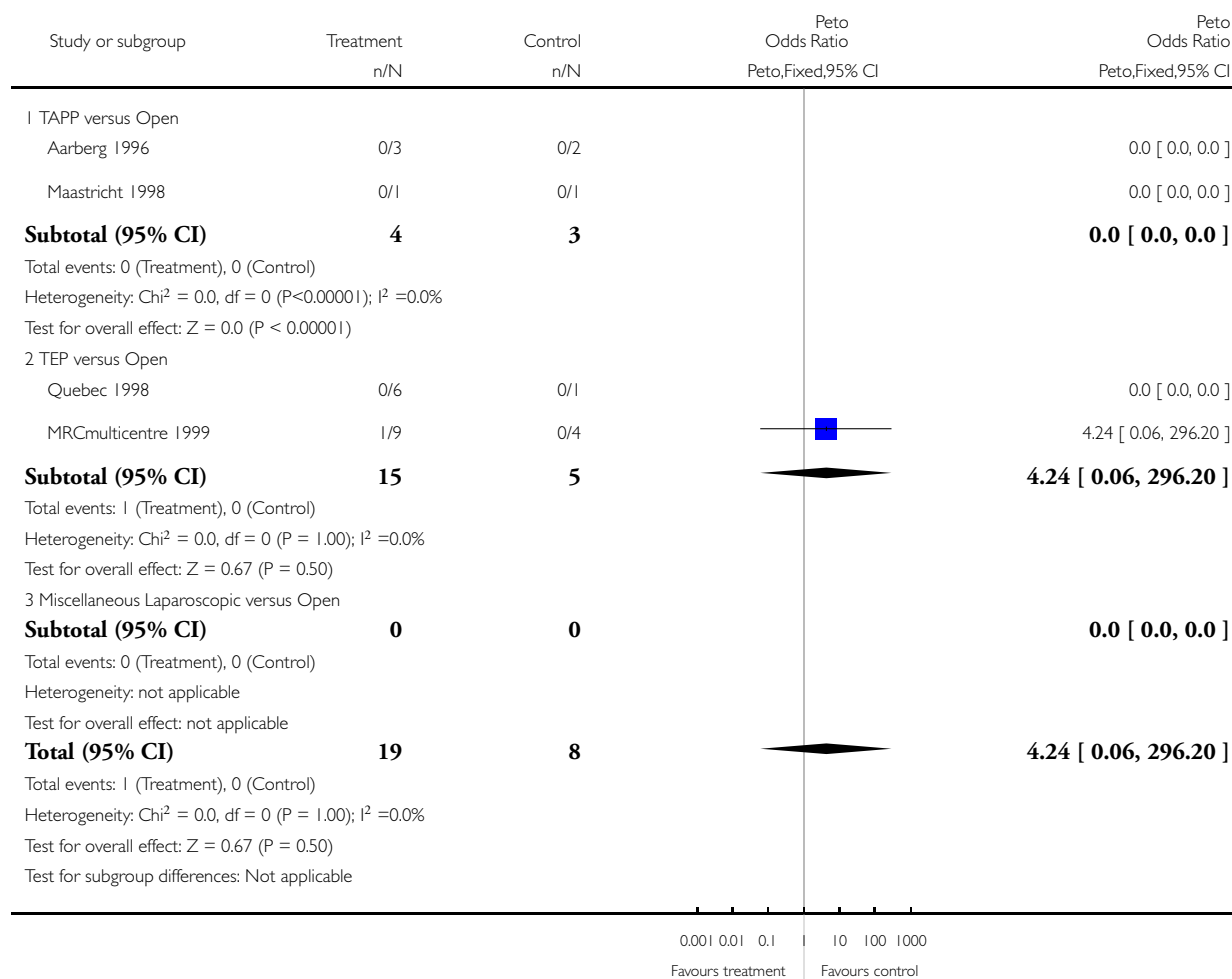


Analysis 10.2. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 2 "Opposite" method initiated

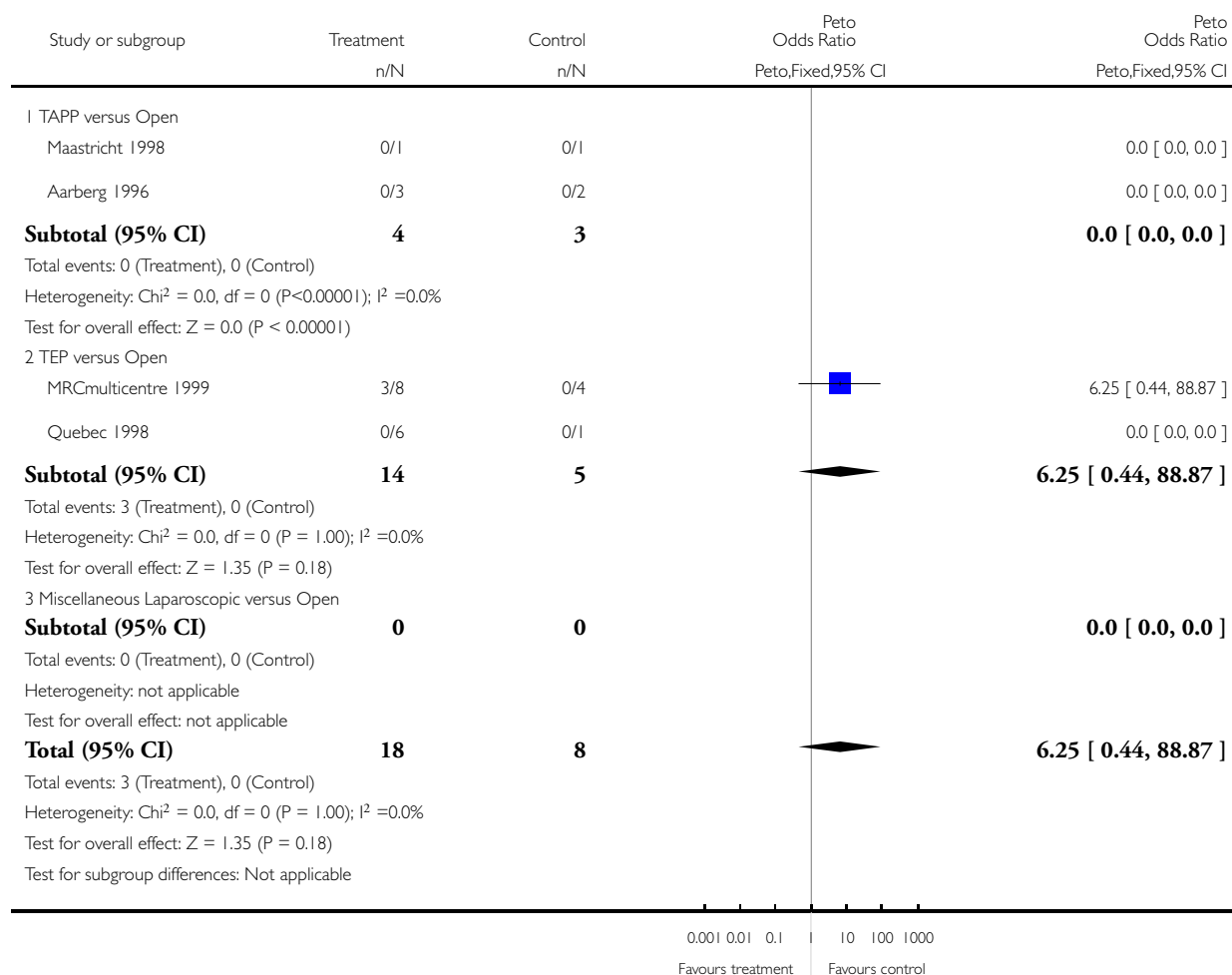


Analysis 10.3. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 3 Conversion

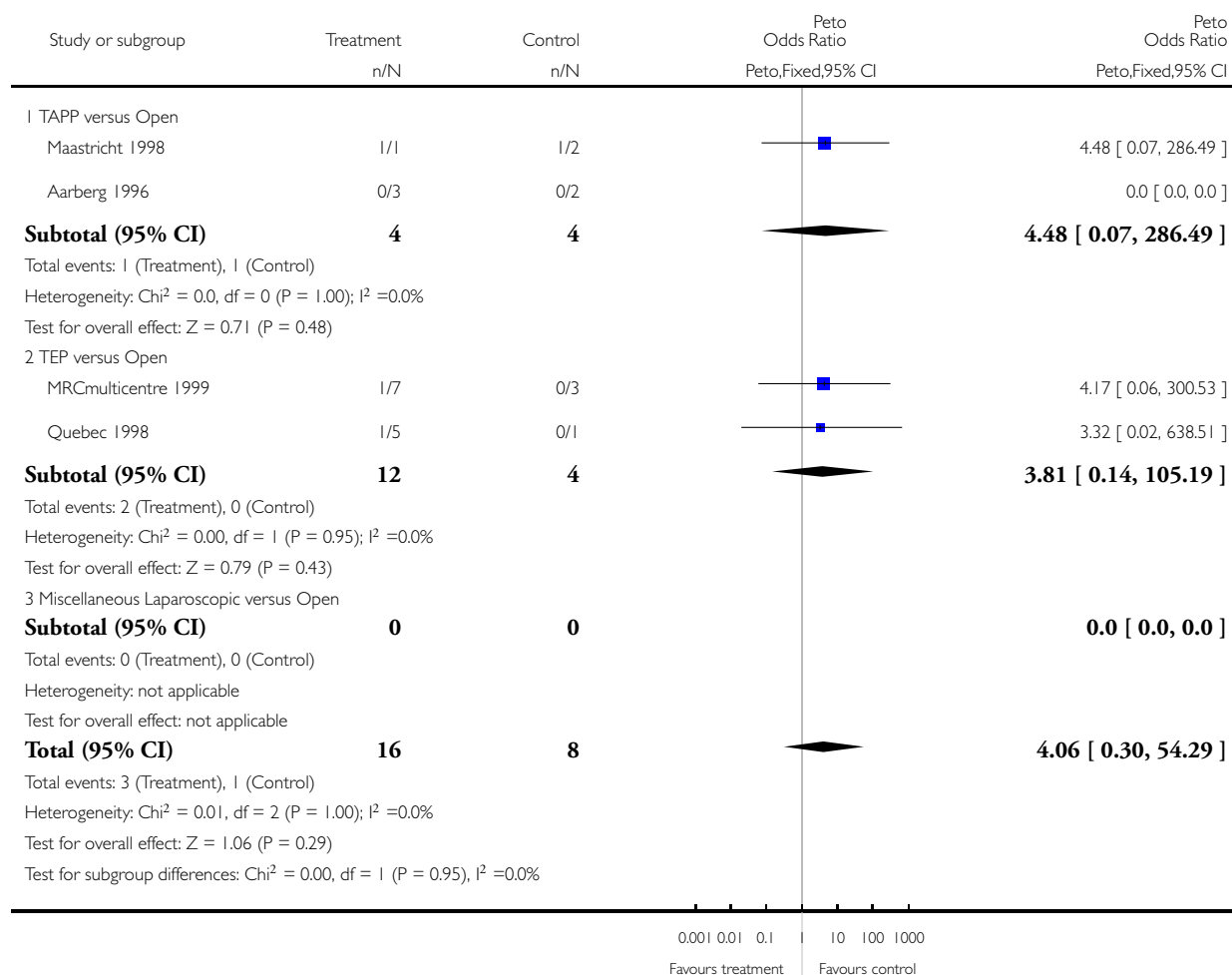


Analysis 10.4. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 4 Haematoma

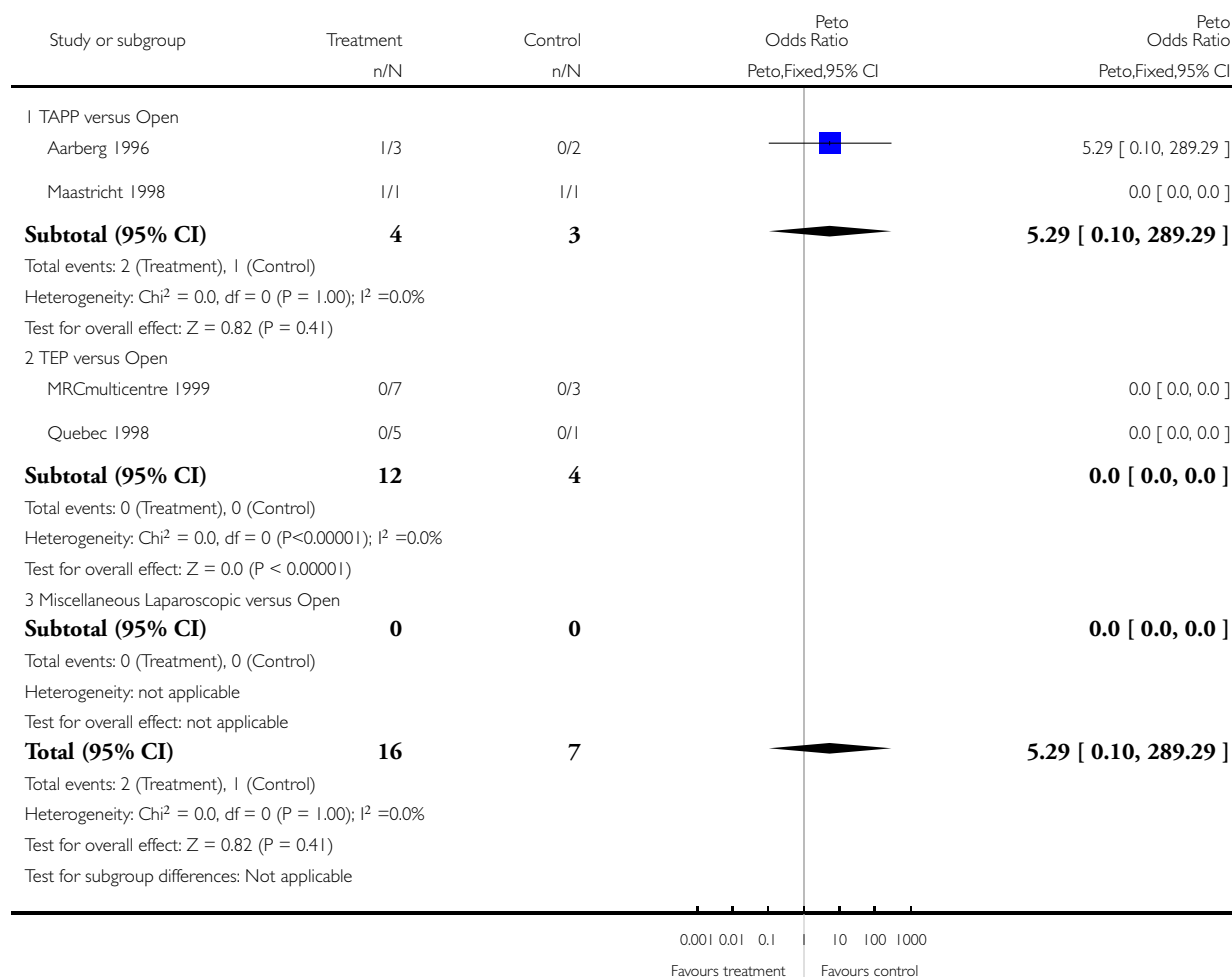


Analysis 10.5. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 5 Seroma

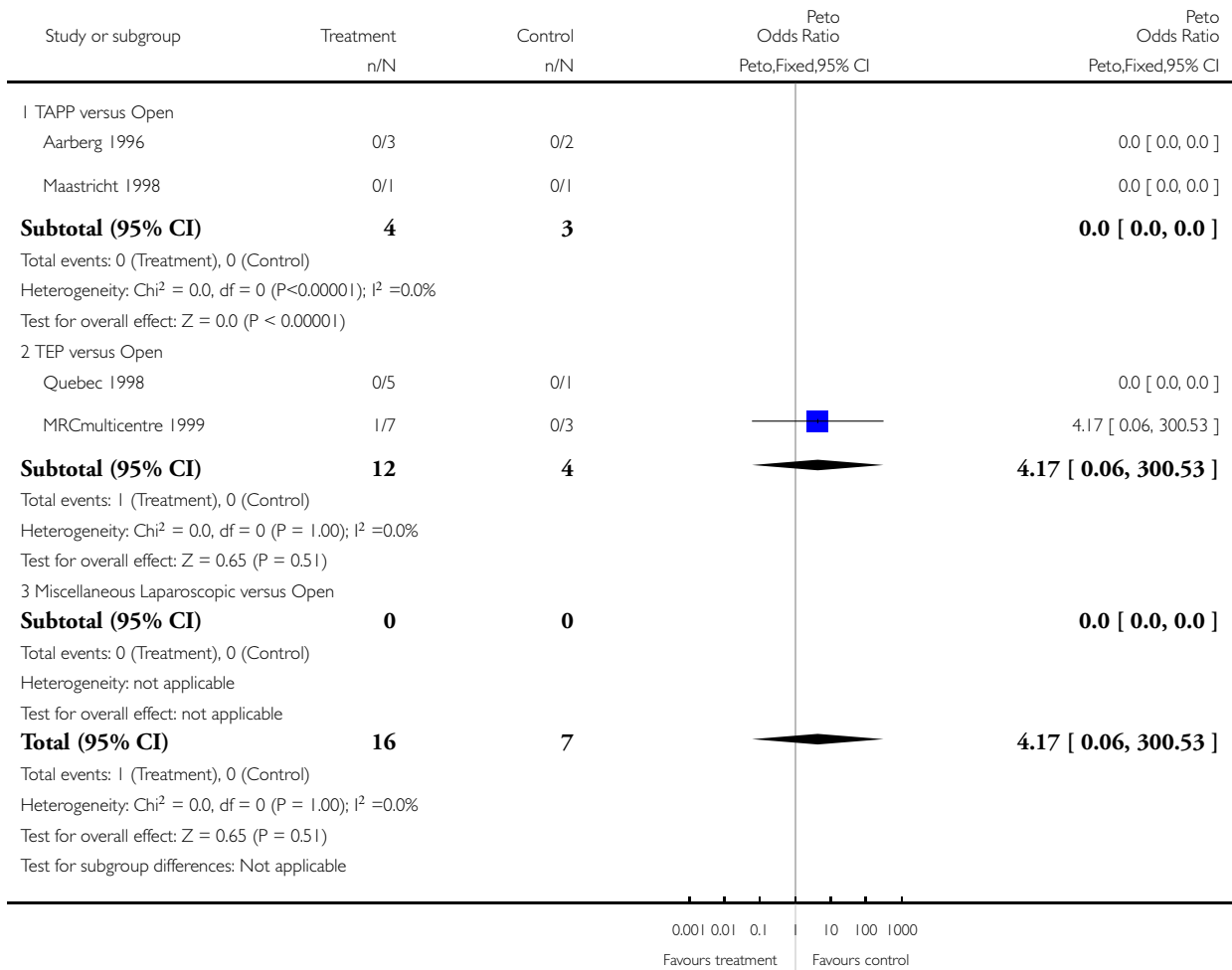


Analysis 10.6. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 6 Wound/superficial infection



Analysis 10.7. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 7 Mesh/deep infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
2 TEP versus Open				
MRCmulticentre 1999	0/7	0/3		0.0 [0.0, 0.0]
Quebec 1998	0/5	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	12	4		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 Miscellaneous Laparoscopic versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	12	4		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 10.8. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 8 Vascular injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
I TAPP versus Open				
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Subtotal (95% CI)	3	2		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
2 TEP versus Open				
Quebec 1998	0/5	0/1		0.0 [0.0, 0.0]
MRCmulticentre 1999	0/9	0/4		0.0 [0.0, 0.0]
Subtotal (95% CI)	14	5		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² =0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
3 Miscellaneous Laparoscopic versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	17	7		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² =0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Test for subgroup differences: Chi ² = 0.0, df = -1 (P = 0.0), I ² =0.0%				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment Favours control	

Analysis 10.9. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 9 Visceral injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Open				
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Maastricht 1998	0/1	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Open				
MRCmulticentre 1999	0/9	0/4		0.0 [0.0, 0.0]
Quebec 1998	0/5	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	14	5		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 Miscellaneous Laparoscopic versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	18	8		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 10.10. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 10 Port site hernia

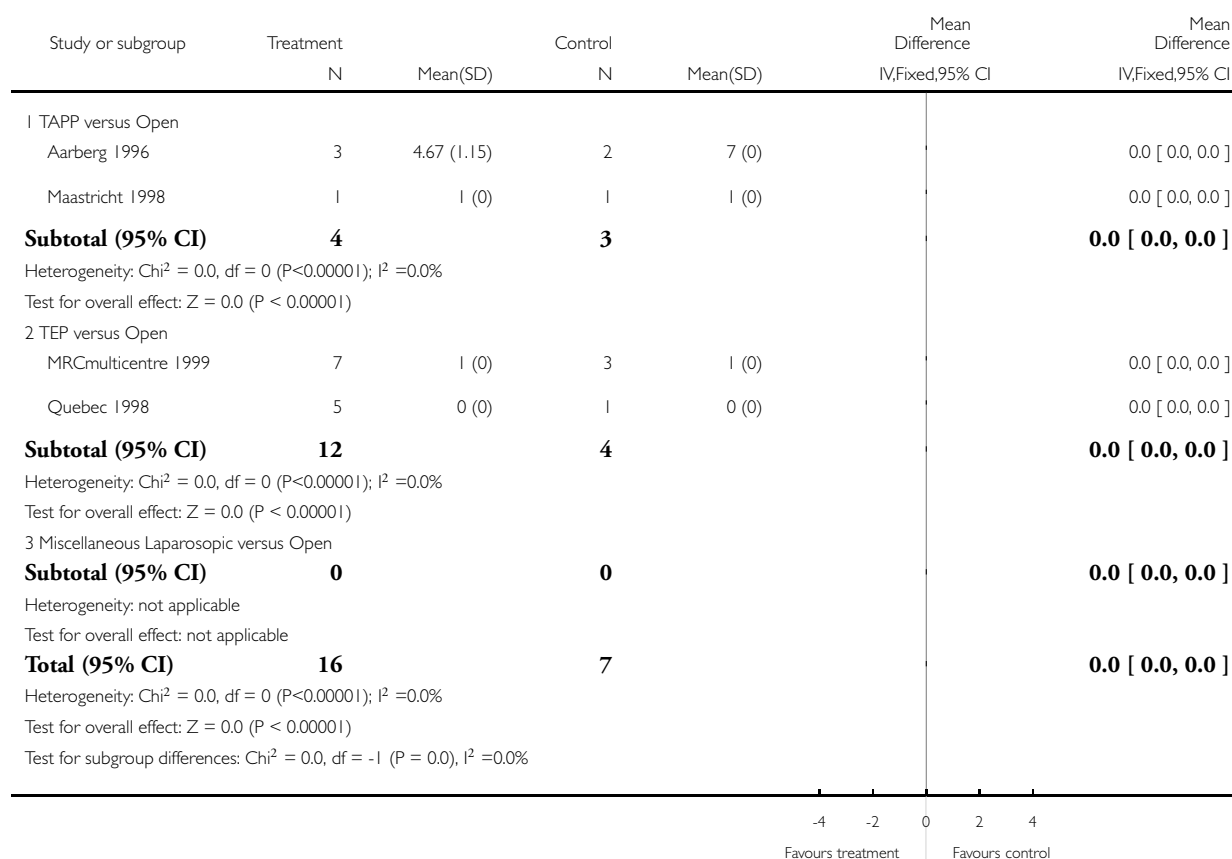
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Open				
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Subtotal (95% CI)	3	2		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
2 TEP versus Open				
MRCmulticentre 1999	0/8	0/4		0.0 [0.0, 0.0]
Quebec 1998	0/5	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	13	5		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² =0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
3 Miscellaneous Laparoscopic versus Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	16	7		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² =0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Test for subgroup differences: Chi ² = 0.0, df = -1 (P = 0.0), I ² =0.0%				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 10.11. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 11 Length of stay (days)

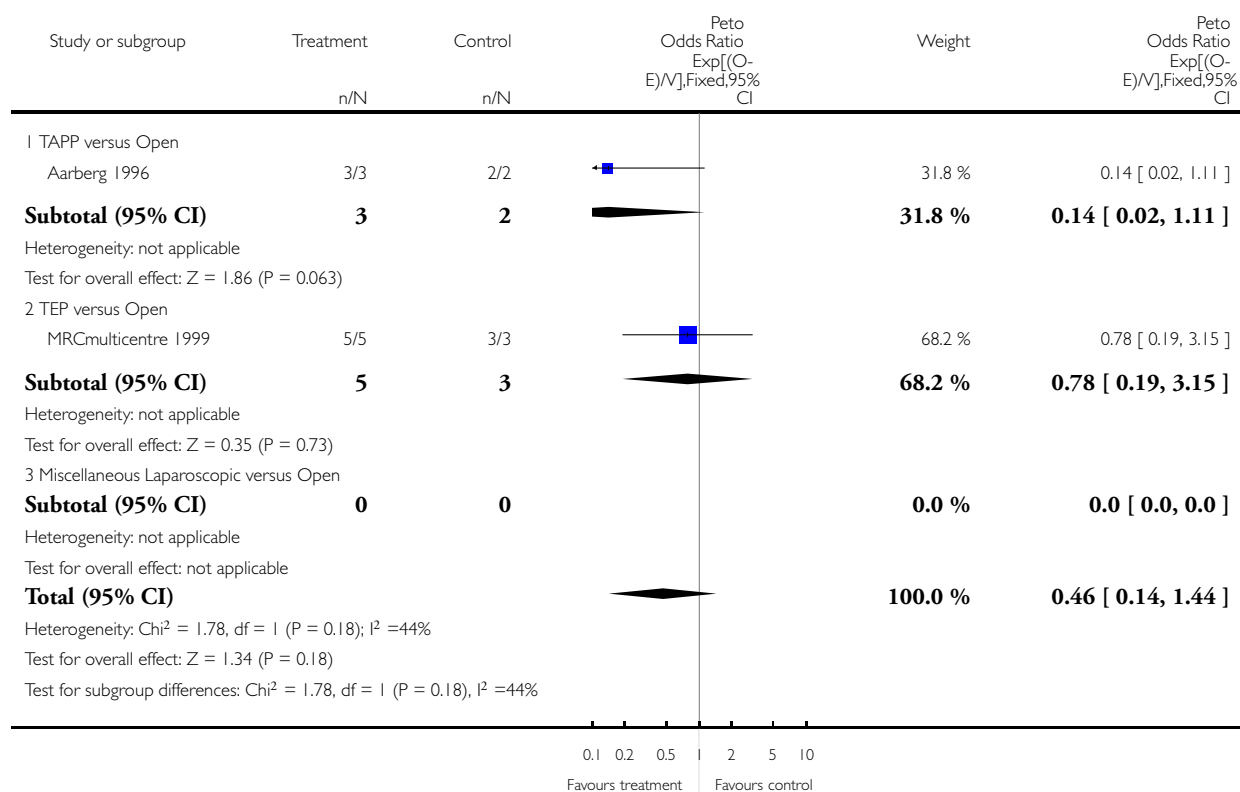


Analysis 10.12. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 12 Time to return to usual activities (days)

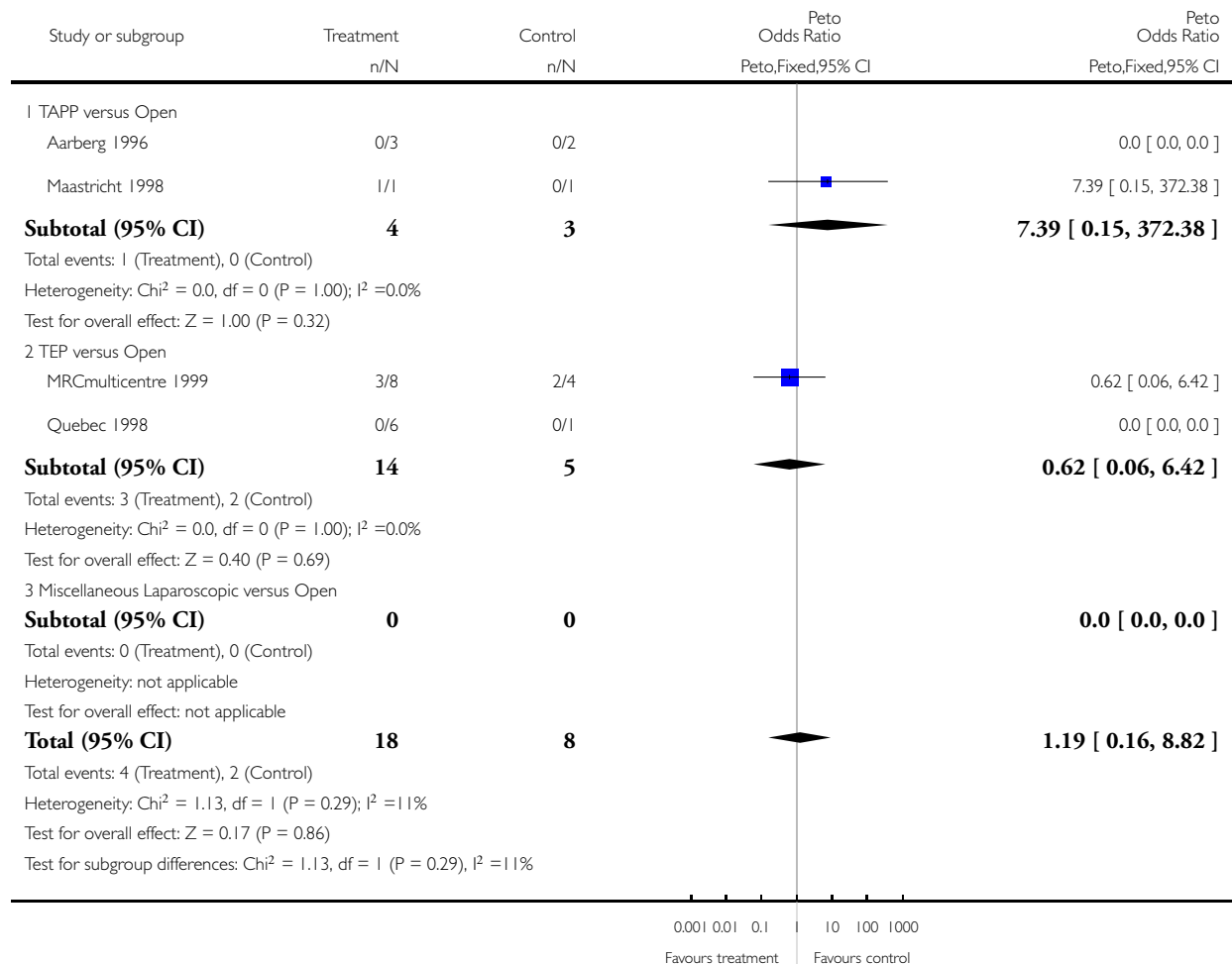


Analysis 10.13. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 13 Persisting pain

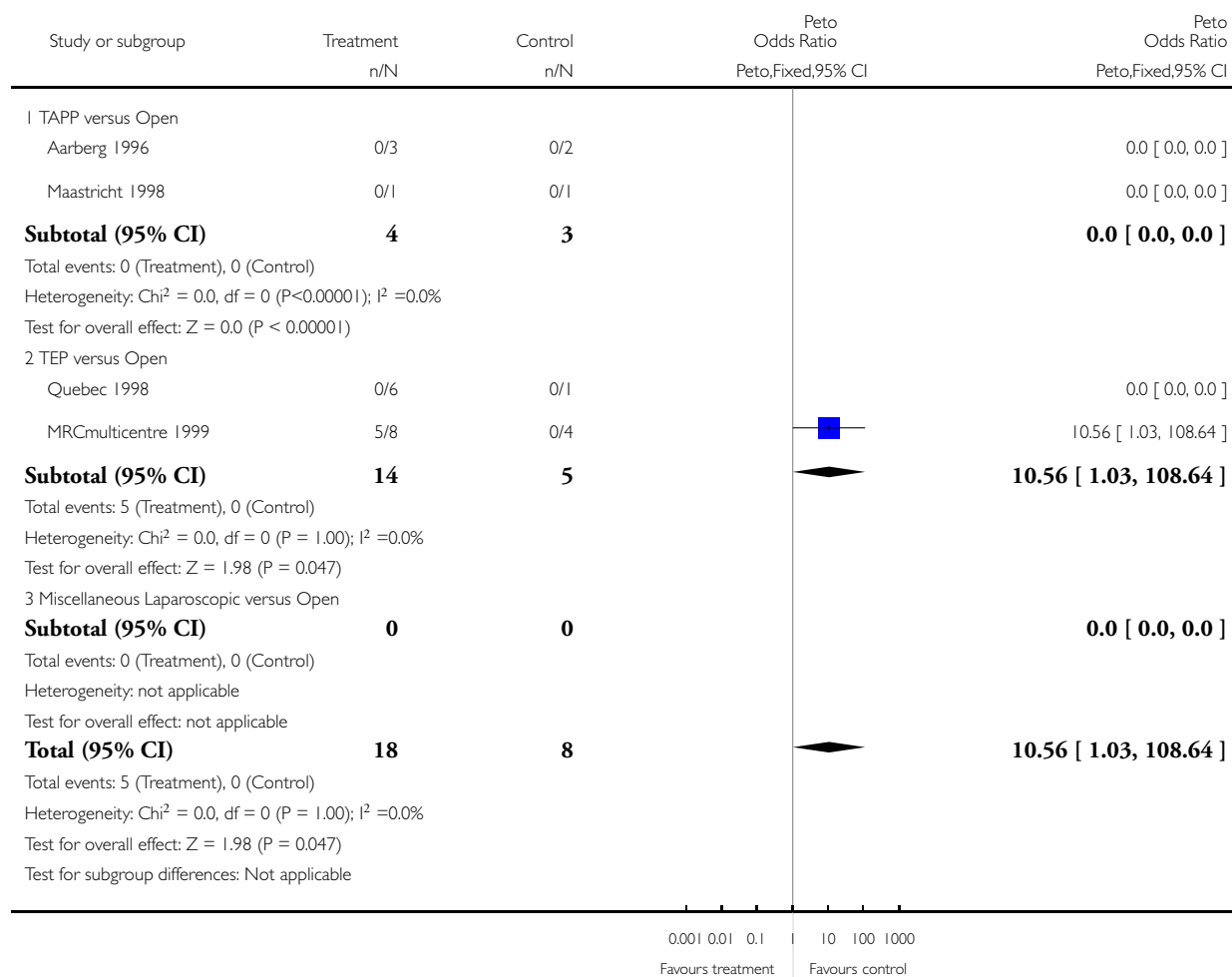


Analysis 10.14. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 14 Persisting numbness

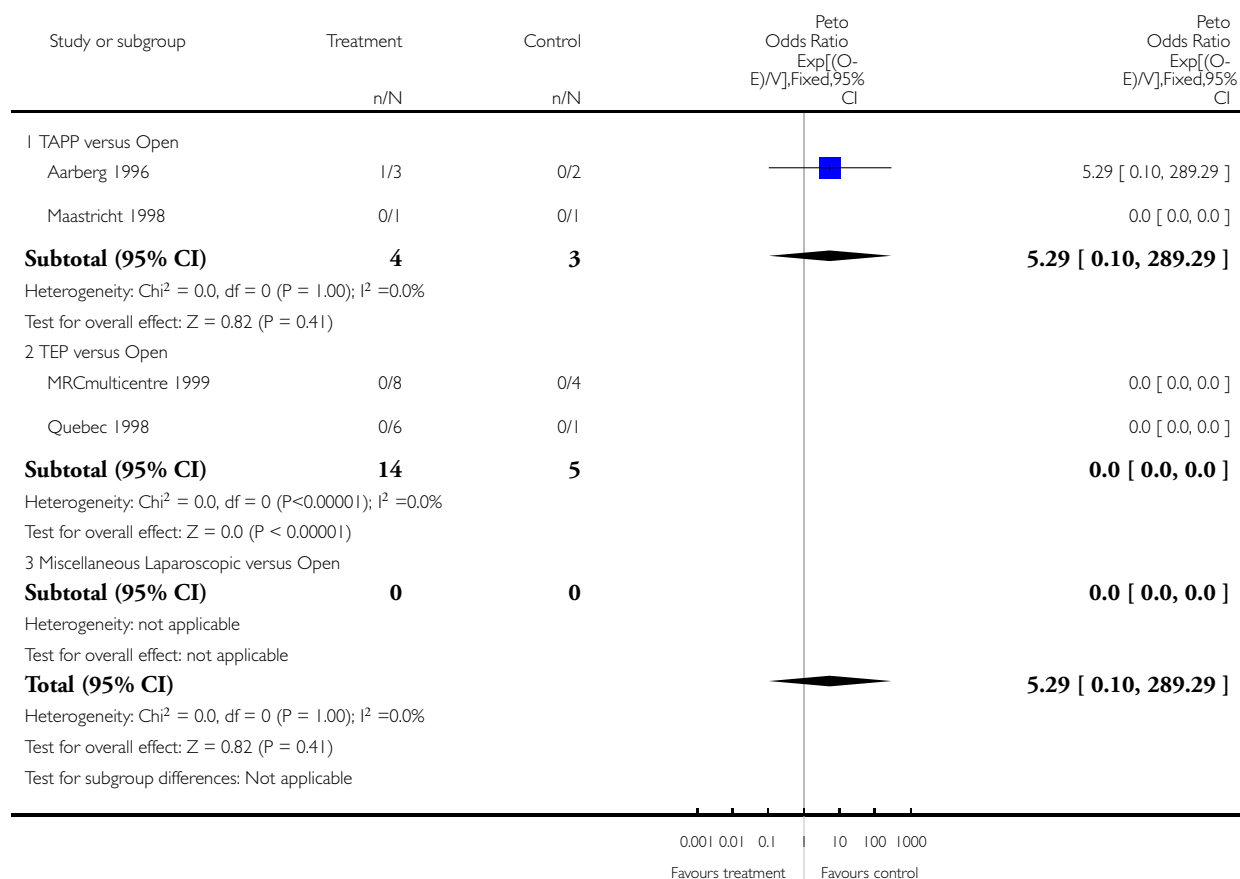


Analysis 10.15. Comparison 10 Laparoscopic versus Open (Femoral hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 10 Laparoscopic versus Open (Femoral hernias)

Outcome: 15 Hernia recurrence

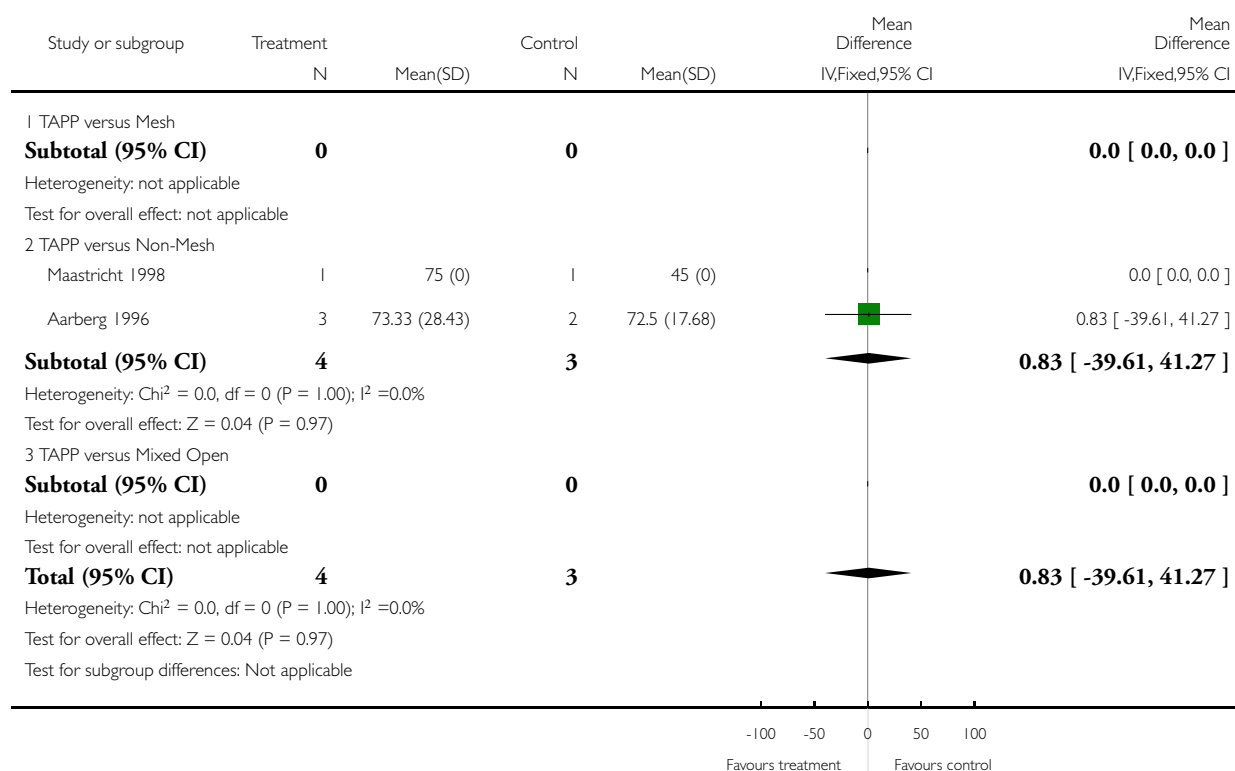


Analysis 11.1. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 1 Duration of operation (minutes)



Analysis 11.2. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 2 "Opposite" method initiated

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
2 TAPP versus Non-Mesh				
Maastricht 1998	0/1	0/1		0.0 [0.0, 0.0]
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Subtotal (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TAPP versus Mixed Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 11.3. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 3 Conversion

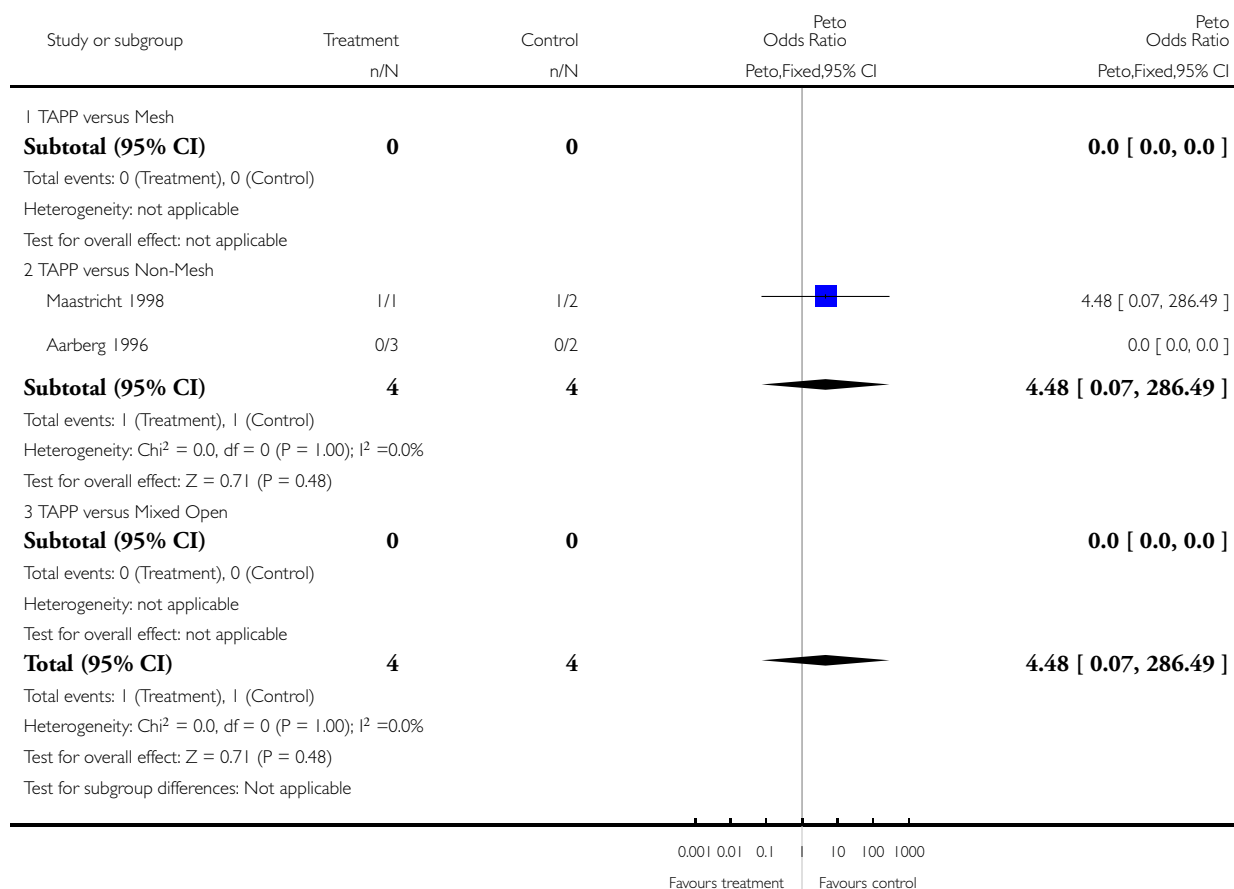
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
2 TAPP versus Non-Mesh				
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Maastricht 1998	0/1	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TAPP versus Mixed Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 11.4. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 4 Haematoma

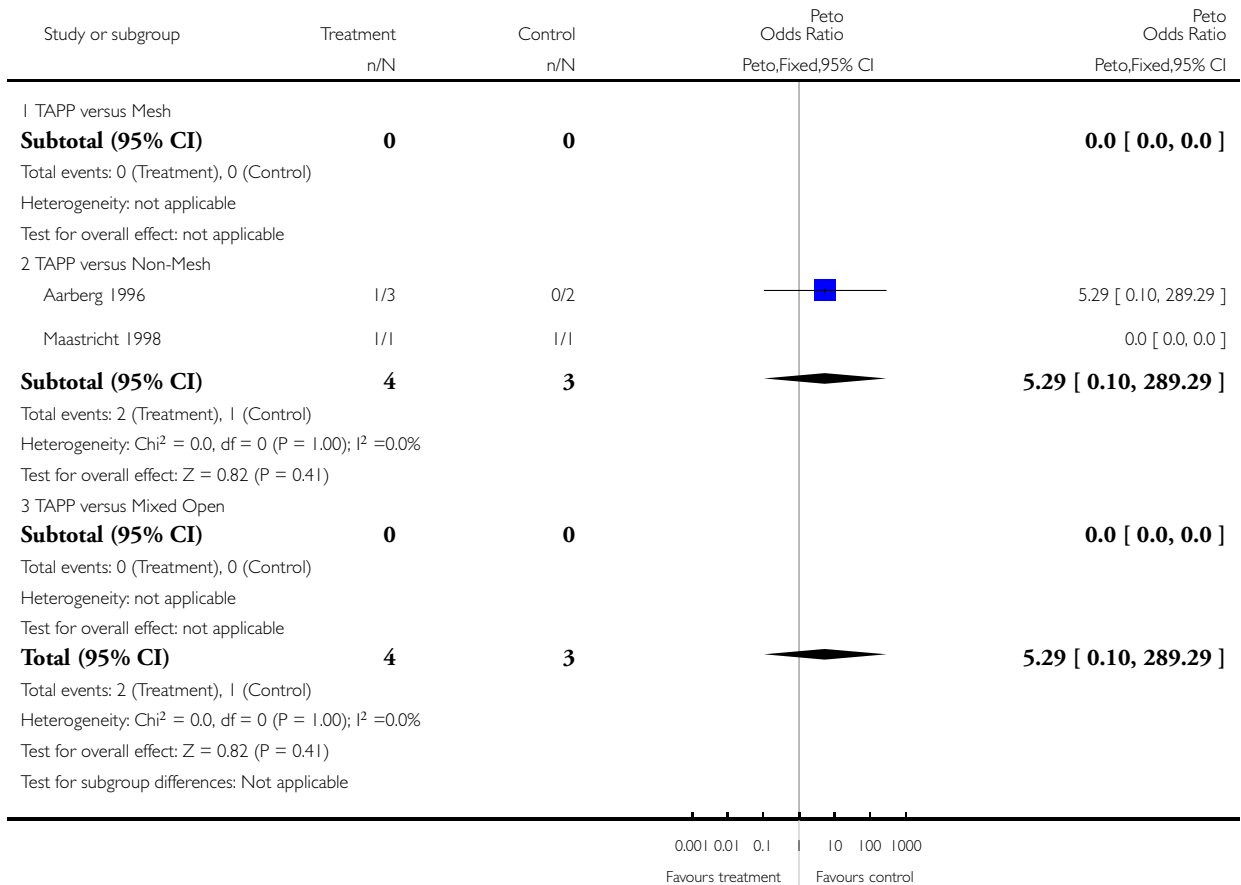


Analysis 11.5. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 5 Seroma



Analysis 11.6. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 6 Wound/superficial infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
2 TAPP versus Non-Mesh				
Maastricht 1998	0/1	0/1		0.0 [0.0, 0.0]
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Subtotal (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TAPP versus Mixed Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 11.8. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 8 Vascular injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
2 TAPP versus Non-Mesh				
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Subtotal (95% CI)	3	2		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
3 TAPP versus Mixed Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	3	2		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Test for subgroup differences: Chi ² = 0.0, df = -1 (P = 0.0), I ² = 0.0%				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 11.9. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 9 Visceral injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
2 TAPP versus Non-Mesh				
Maastricht 1998	0/1	0/1		0.0 [0.0, 0.0]
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Subtotal (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TAPP versus Mixed Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = 1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 11.10. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 10 Port site hernia

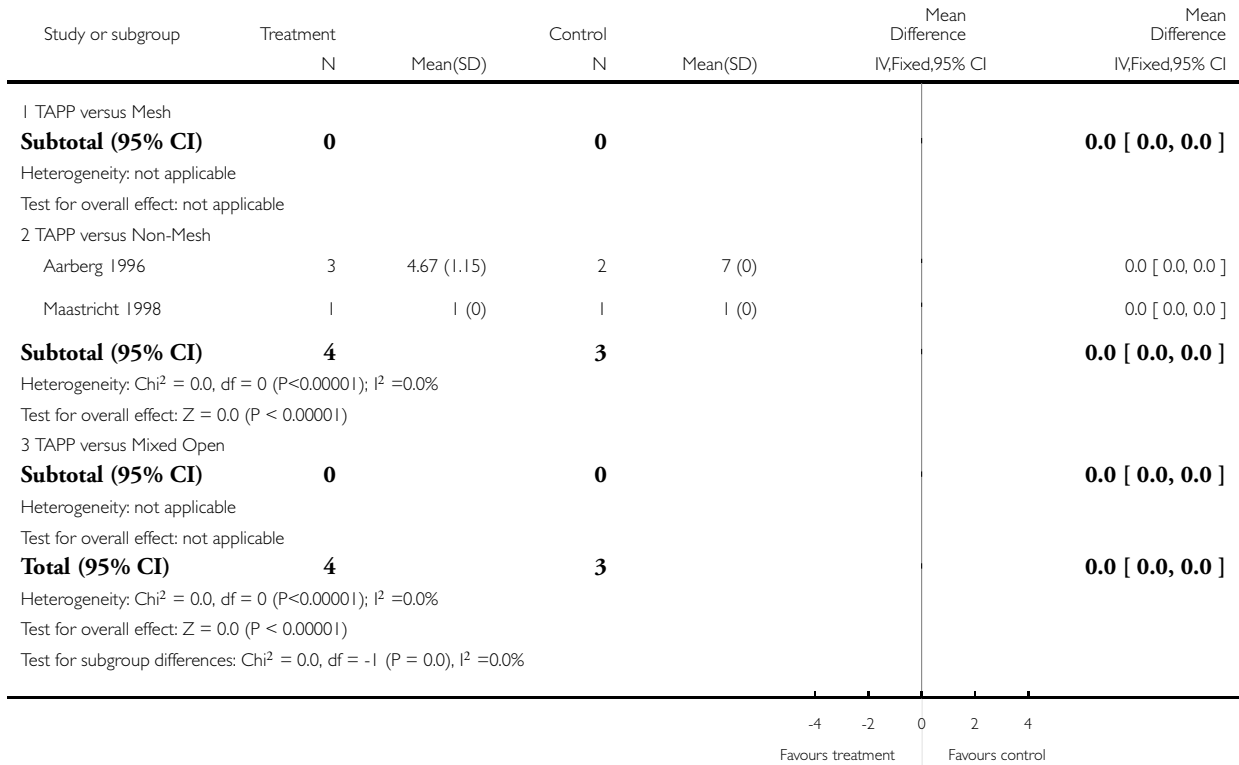
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
2 TAPP versus Non-Mesh				
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Subtotal (95% CI)	3	2		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
3 TAPP versus Mixed Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	3	2		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Test for subgroup differences: Chi ² = 0.0, df = -1 (P = 0.0), I ² = 0.0%				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 11.11. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 11 Length of stay (days)

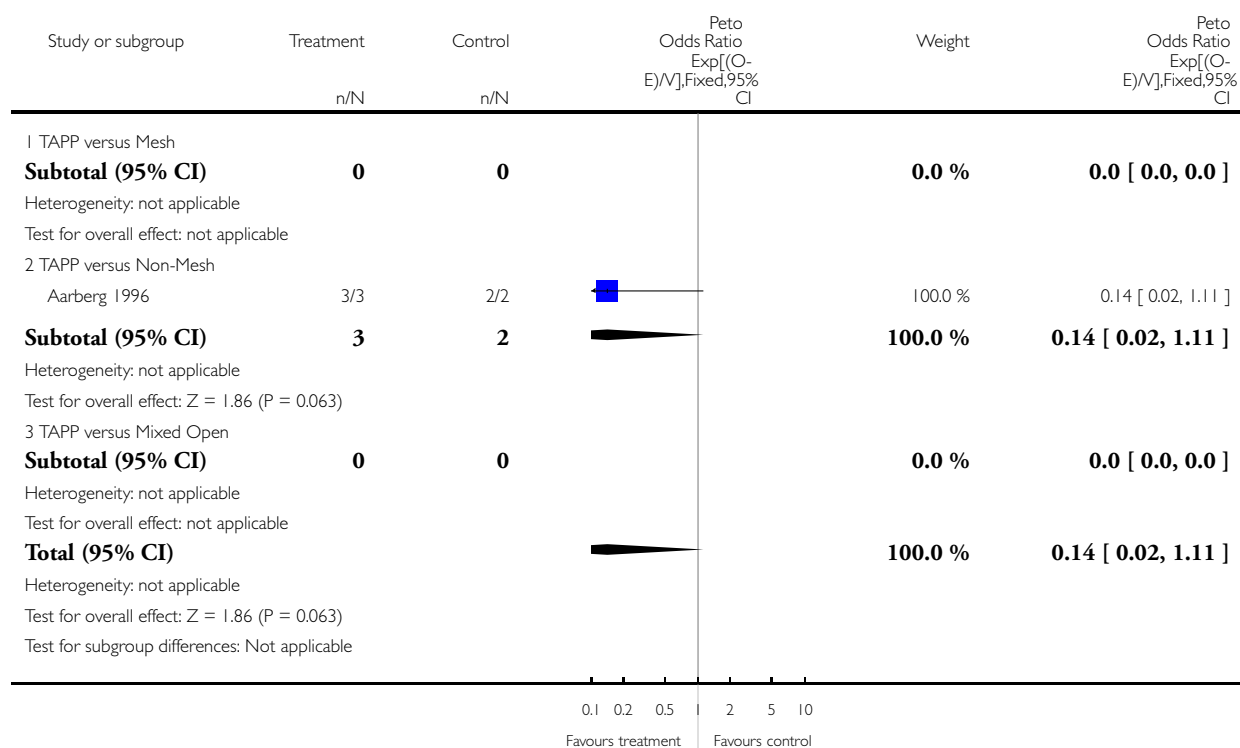


Analysis 11.12. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 12 Time to return to usual activities (days)

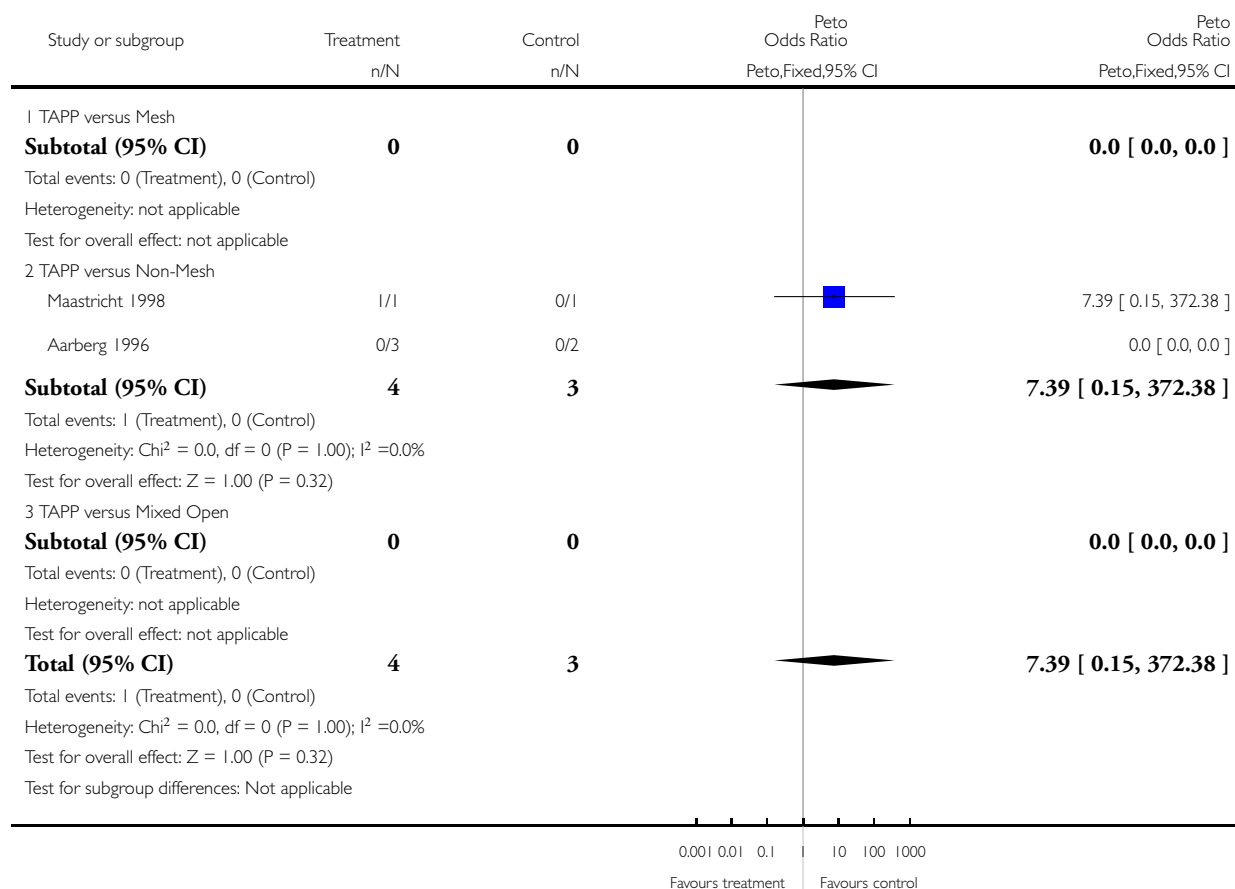


Analysis 11.13. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 13 Persisting pain



Analysis 11.14. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 14 Persisting numbness

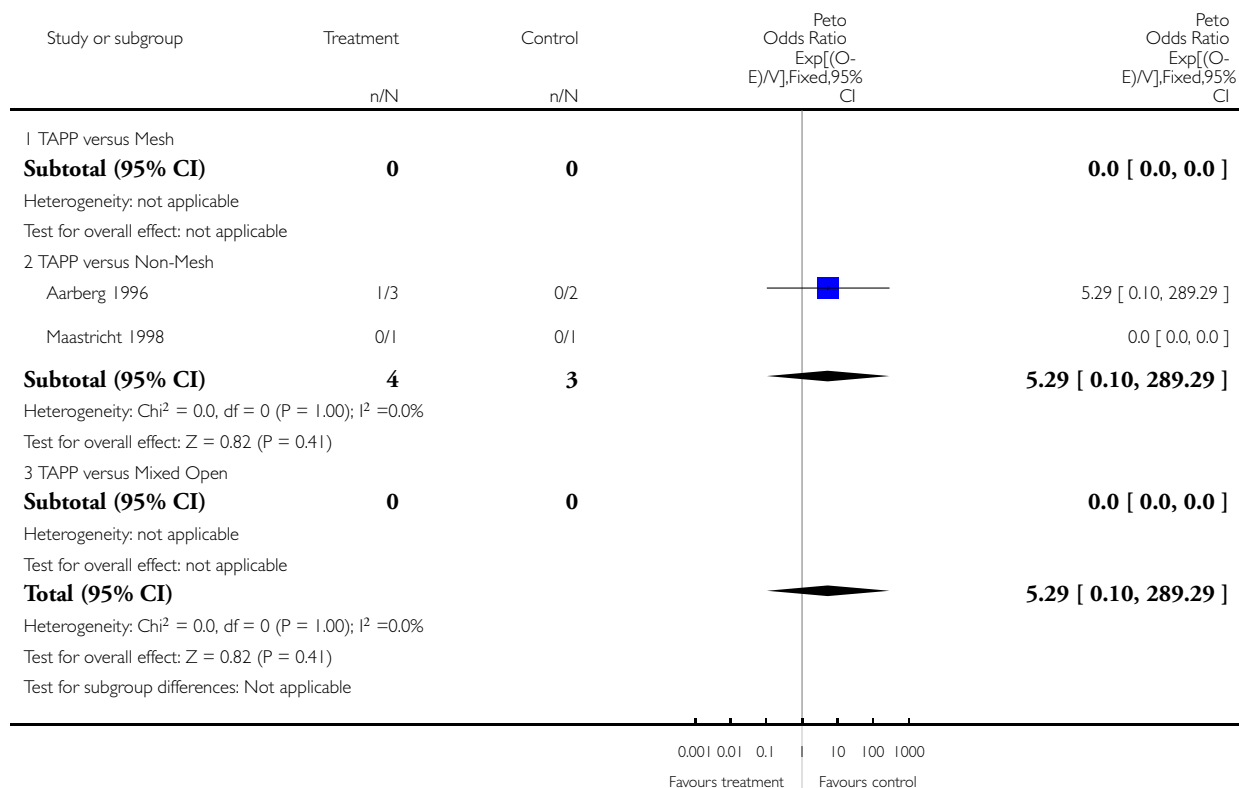
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TAPP versus Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
2 TAPP versus Non-Mesh				
Aarberg 1996	0/3	0/2		0.0 [0.0, 0.0]
Maastricht 1998	0/1	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
3 TAPP versus Mixed Open				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
Total (95% CI)	4	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 11.15. Comparison 11 TAPP versus Open (Femoral hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 11 TAPP versus Open (Femoral hernias)

Outcome: 15 Hernia recurrence

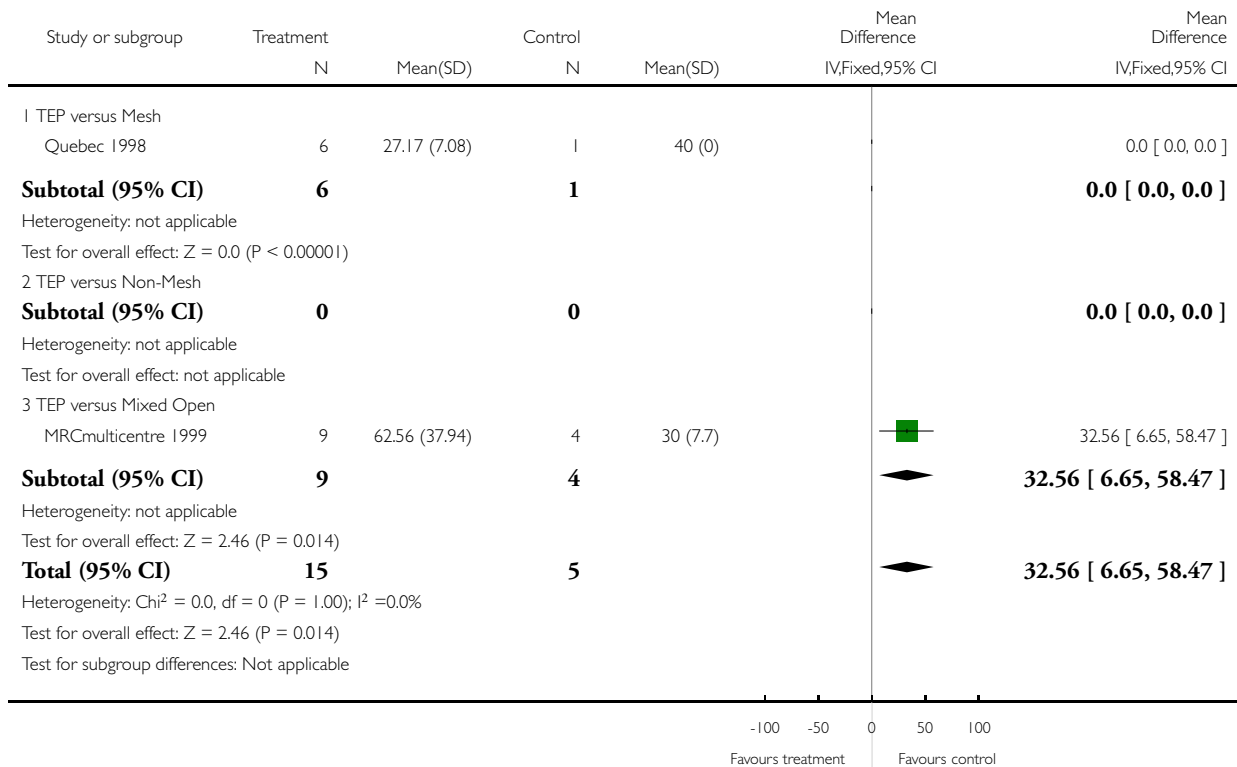


Analysis 12.1. Comparison 12 TEP versus Open (Femoral hernias), Outcome 1 Duration of operation (minutes).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 1 Duration of operation (minutes)

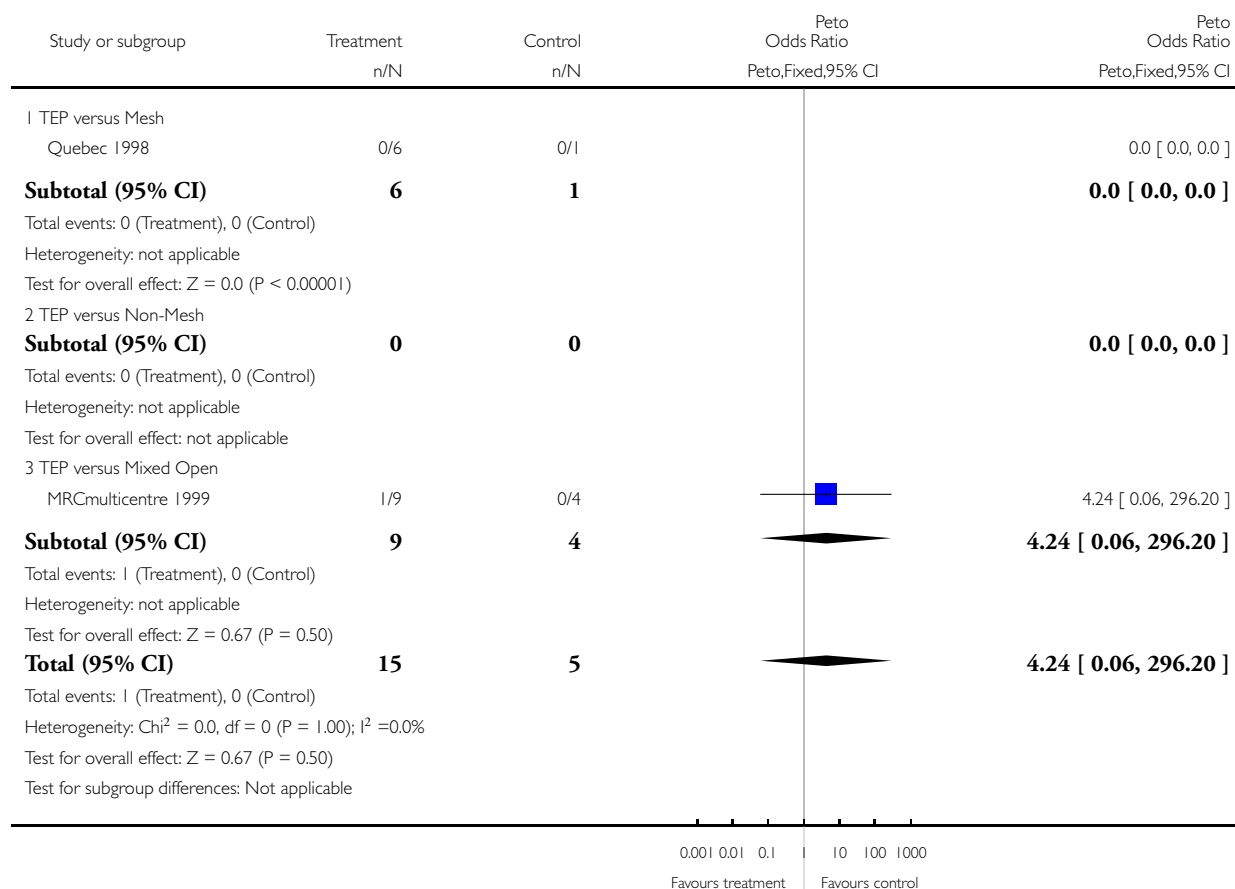


Analysis 12.2. Comparison 12 TEP versus Open (Femoral hernias), Outcome 2 "Opposite" method initiated.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 2 "Opposite" method initiated

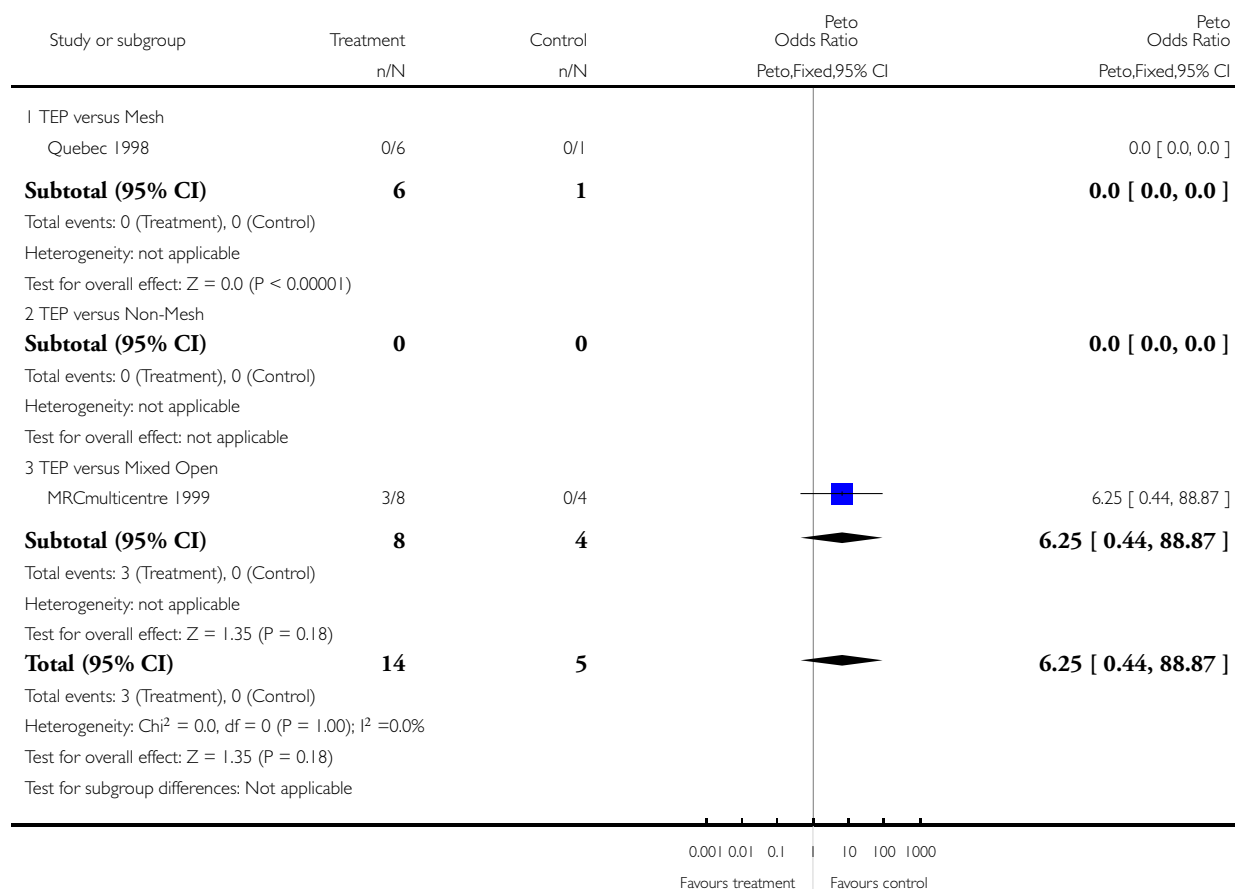


Analysis 12.3. Comparison 12 TEP versus Open (Femoral hernias), Outcome 3 Conversion.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 3 Conversion

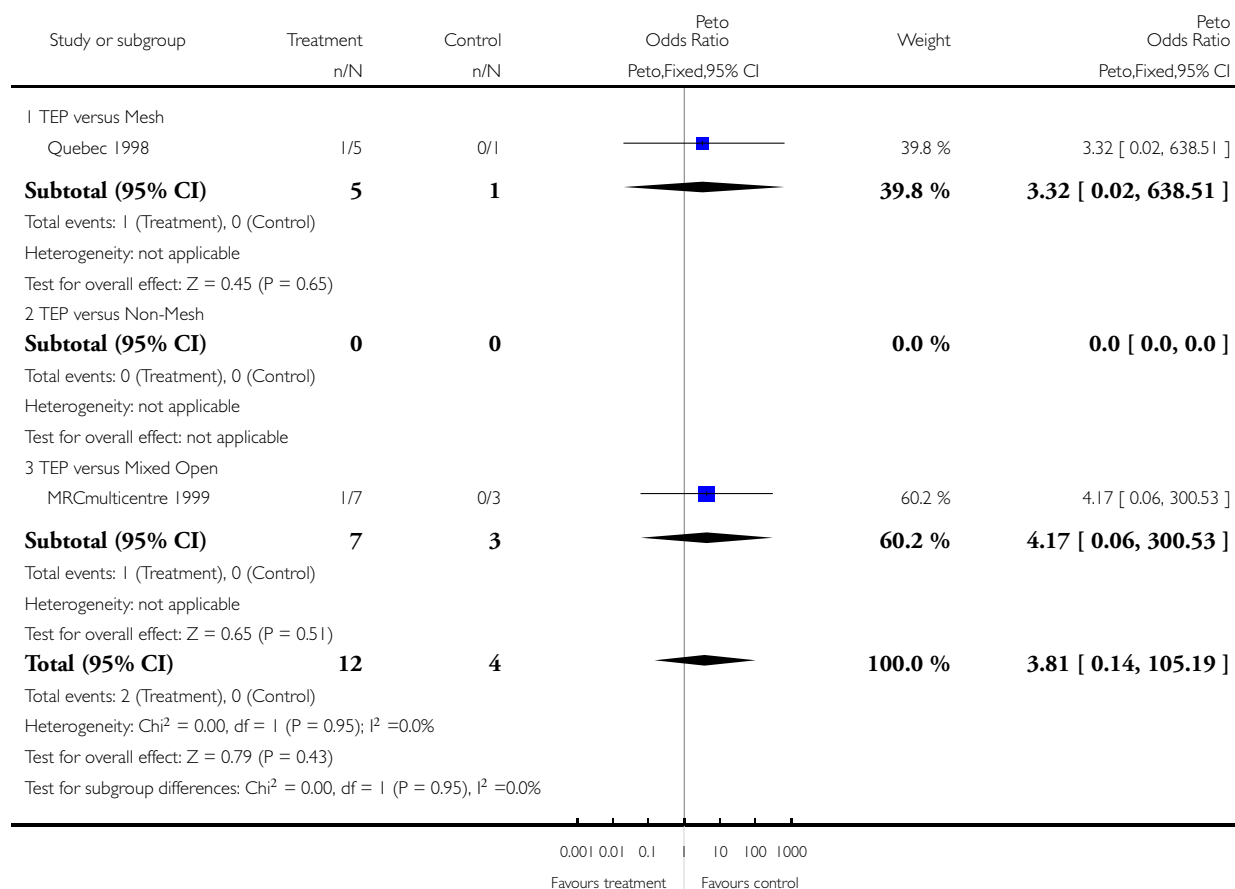


Analysis 12.4. Comparison 12 TEP versus Open (Femoral hernias), Outcome 4 Haematoma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 4 Haematoma

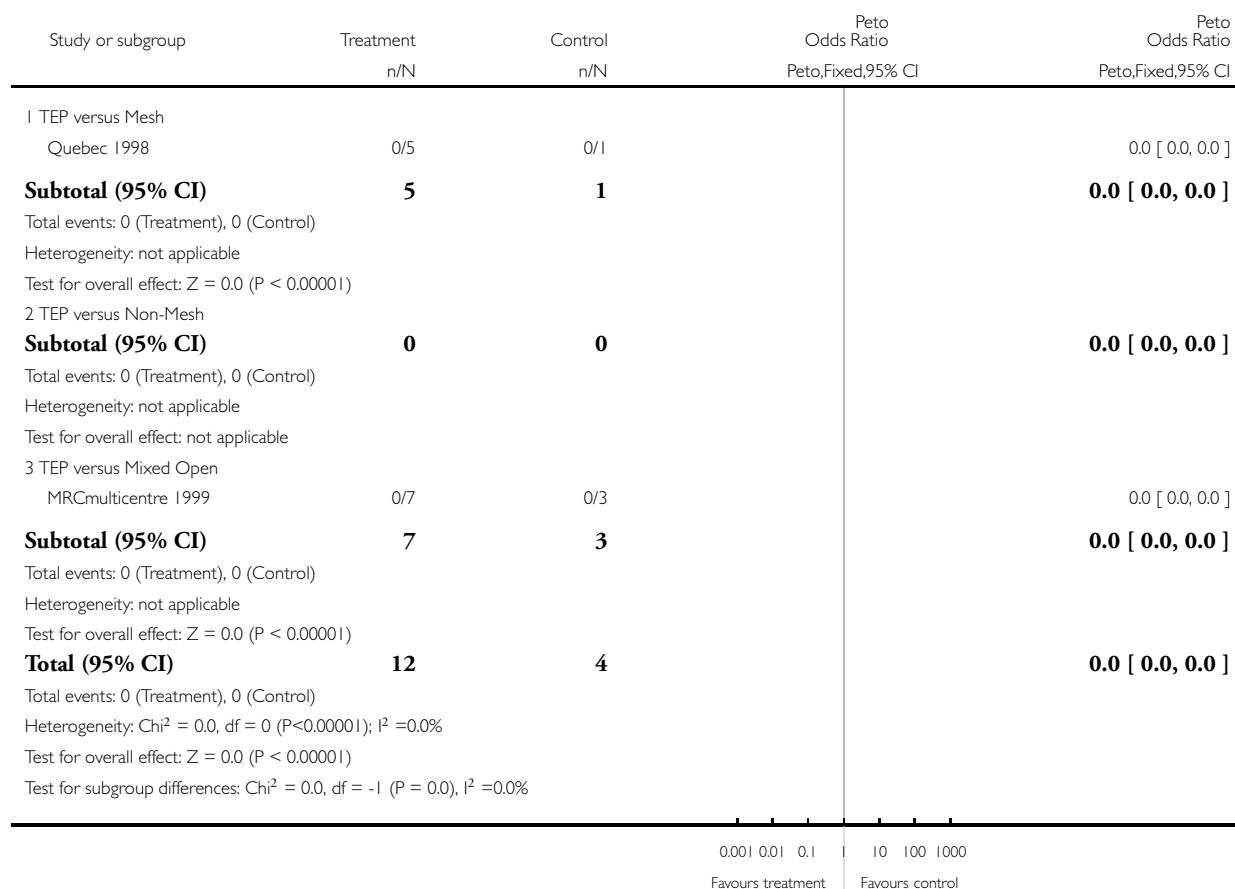


Analysis 12.5. Comparison 12 TEP versus Open (Femoral hernias), Outcome 5 Seroma.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 5 Seroma

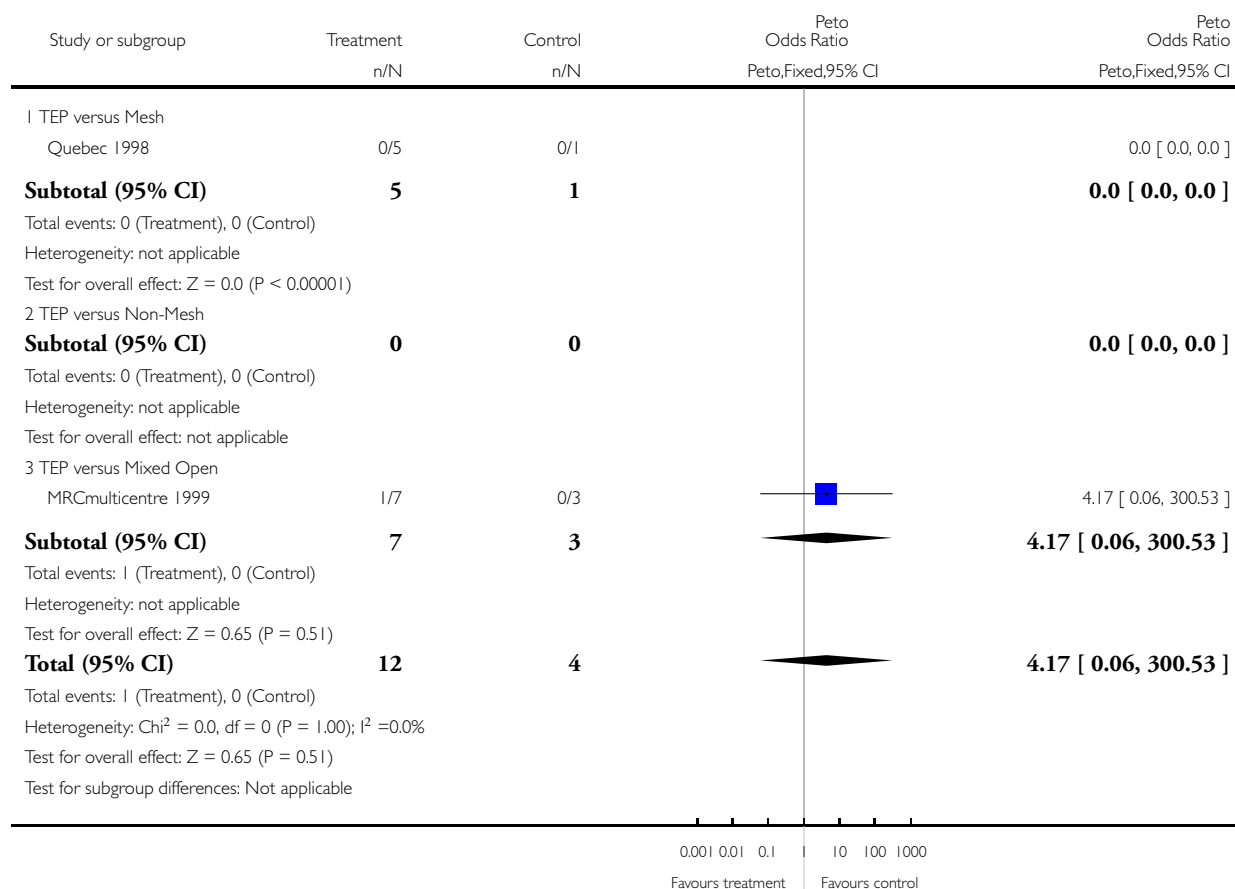


Analysis 12.6. Comparison 12 TEP versus Open (Femoral hernias), Outcome 6 Wound/superficial infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 6 Wound/superficial infection



Analysis 12.7. Comparison 12 TEP versus Open (Femoral hernias), Outcome 7 Mesh/deep infection.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 7 Mesh/deep infection

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/5	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	5	1		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/7	0/3		0.0 [0.0, 0.0]
Subtotal (95% CI)	7	3		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	12	4		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $df = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 12.8. Comparison 12 TEP versus Open (Femoral hernias), Outcome 8 Vascular injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 8 Vascular injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/5	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	5	1		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/9	0/4		0.0 [0.0, 0.0]
Subtotal (95% CI)	9	4		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	14	5		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $\text{df} = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $\text{df} = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 12.9. Comparison 12 TEP versus Open (Femoral hernias), Outcome 9 Visceral injury.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 9 Visceral injury

Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/5	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	5	1		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/9	0/4		0.0 [0.0, 0.0]
Subtotal (95% CI)	9	4		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	14	5		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $df = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 12.10. Comparison 12 TEP versus Open (Femoral hernias), Outcome 10 Port site hernia.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 10 Port site hernia

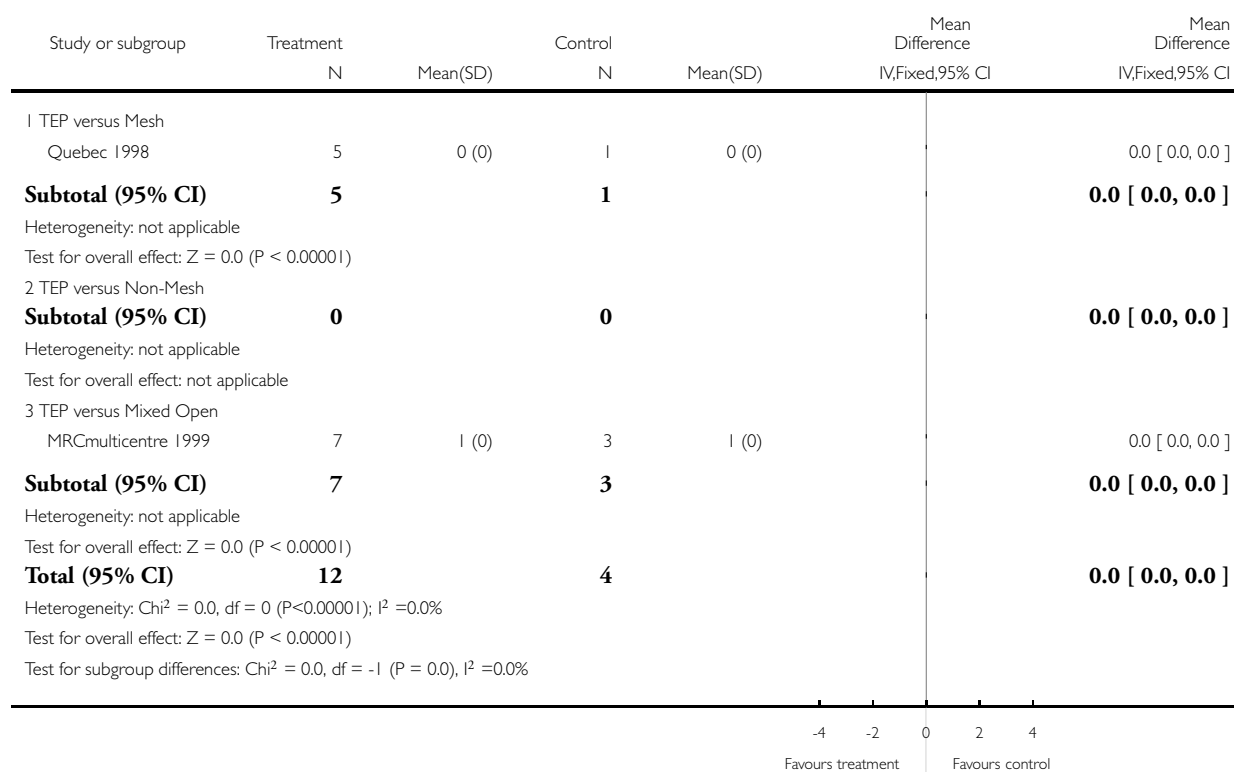
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Peto,Fixed,95% CI	Peto Odds Ratio Peto,Fixed,95% CI
1 TEP versus Mesh Quebec 1998	0/5	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	5	1		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open MRCmulticentre 1999	0/8	0/4		0.0 [0.0, 0.0]
Subtotal (95% CI)	8	4		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: not applicable				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Total (95% CI)	13	5		0.0 [0.0, 0.0]
Total events: 0 (Treatment), 0 (Control)				
Heterogeneity: $\text{Chi}^2 = 0.0$, $df = 0$ ($P < 0.00001$); $I^2 = 0.0\%$				
Test for overall effect: $Z = 0.0$ ($P < 0.00001$)				
Test for subgroup differences: $\text{Chi}^2 = 0.0$, $df = -1$ ($P = 0.0$), $I^2 = 0.0\%$				
			0.001 0.01 0.1 1 10 100 1000	
			Favours treatment	Favours control

Analysis 12.11. Comparison 12 TEP versus Open (Femoral hernias), Outcome 11 Length of stay (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 11 Length of stay (days)

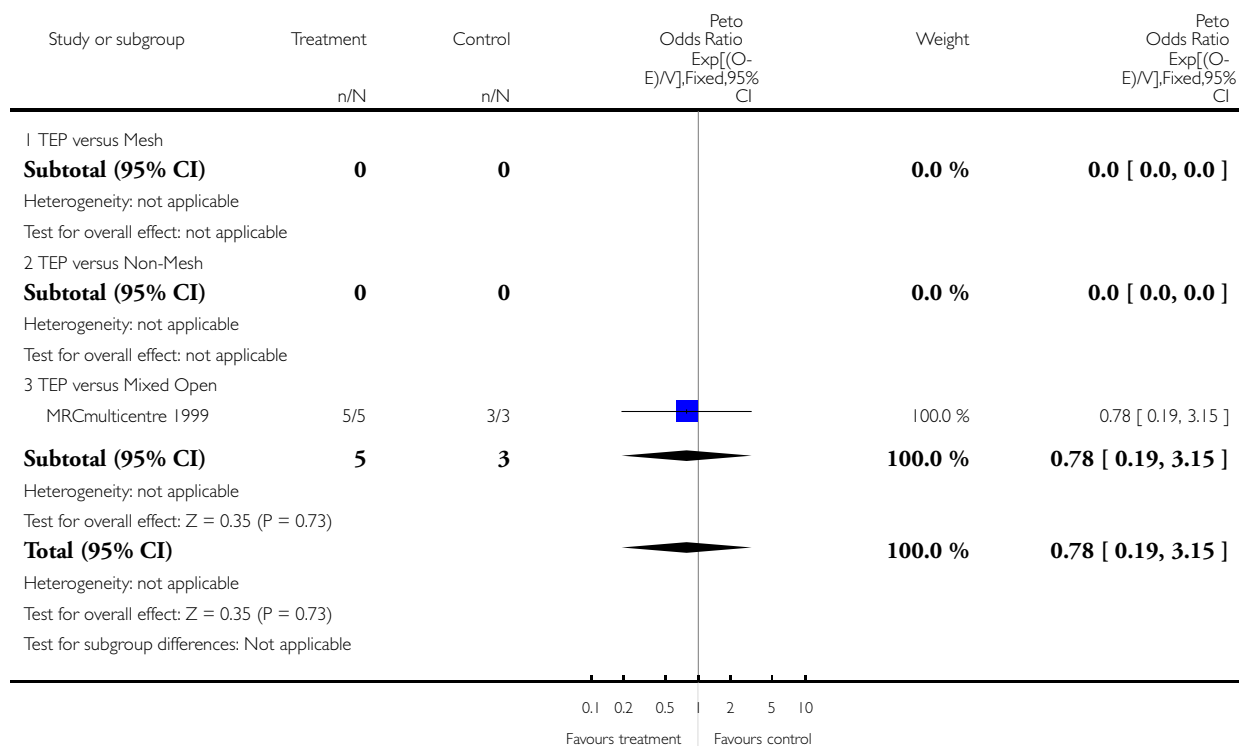


Analysis 12.12. Comparison 12 TEP versus Open (Femoral hernias), Outcome 12 Time to return to usual activities (days).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 12 Time to return to usual activities (days)

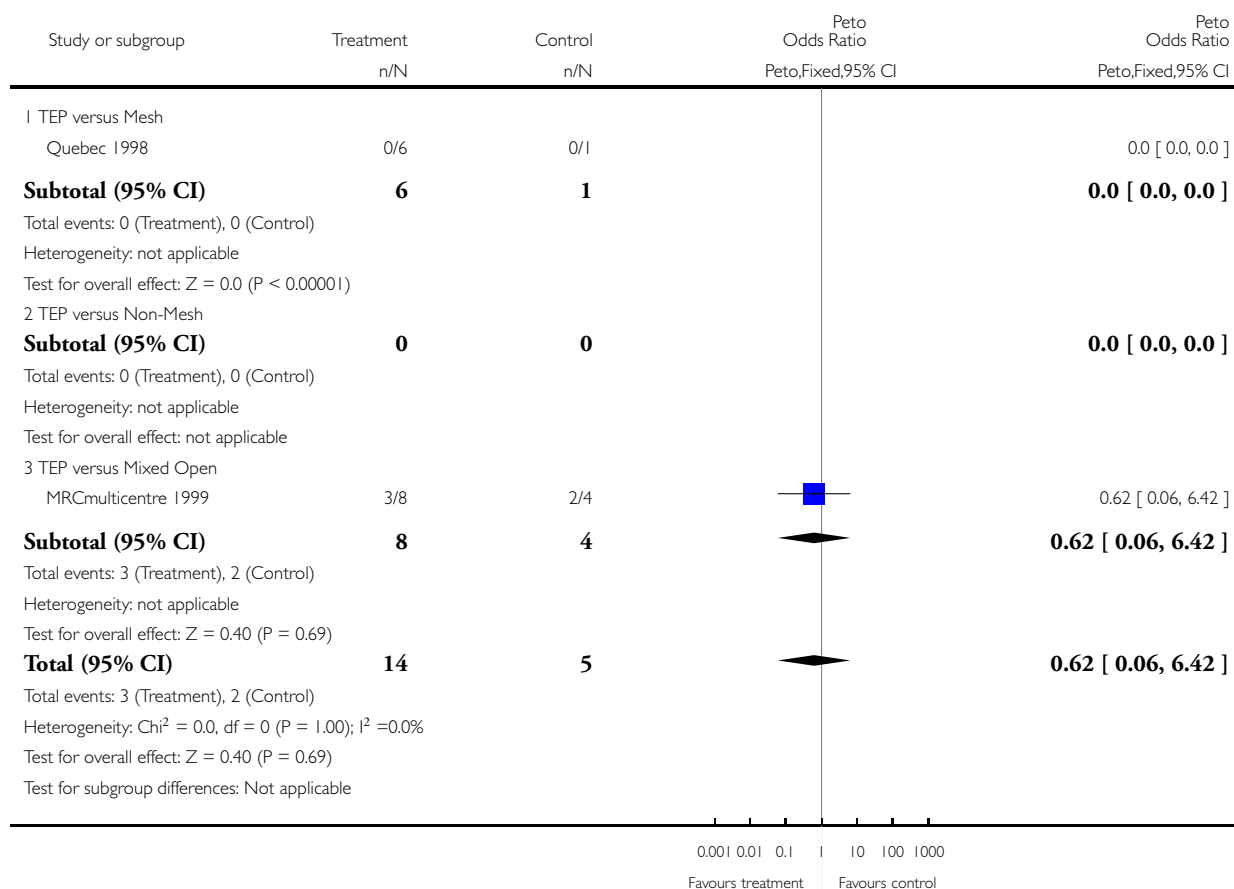


Analysis 12.13. Comparison 12 TEP versus Open (Femoral hernias), Outcome 13 Persisting pain.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 13 Persisting pain

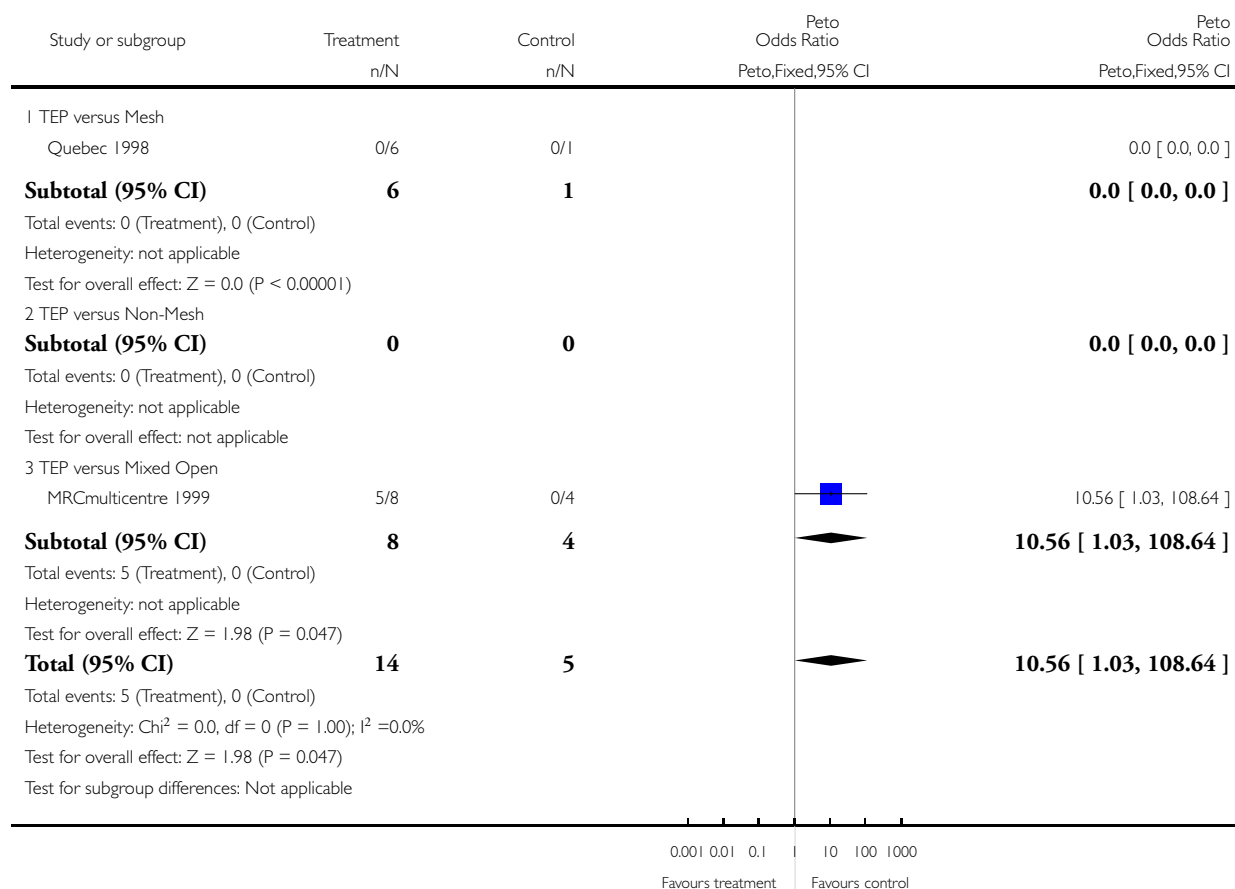


Analysis 12.14. Comparison 12 TEP versus Open (Femoral hernias), Outcome 14 Persisting numbness.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 14 Persisting numbness



Analysis 12.15. Comparison 12 TEP versus Open (Femoral hernias), Outcome 15 Hernia recurrence.

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 12 TEP versus Open (Femoral hernias)

Outcome: 15 Hernia recurrence

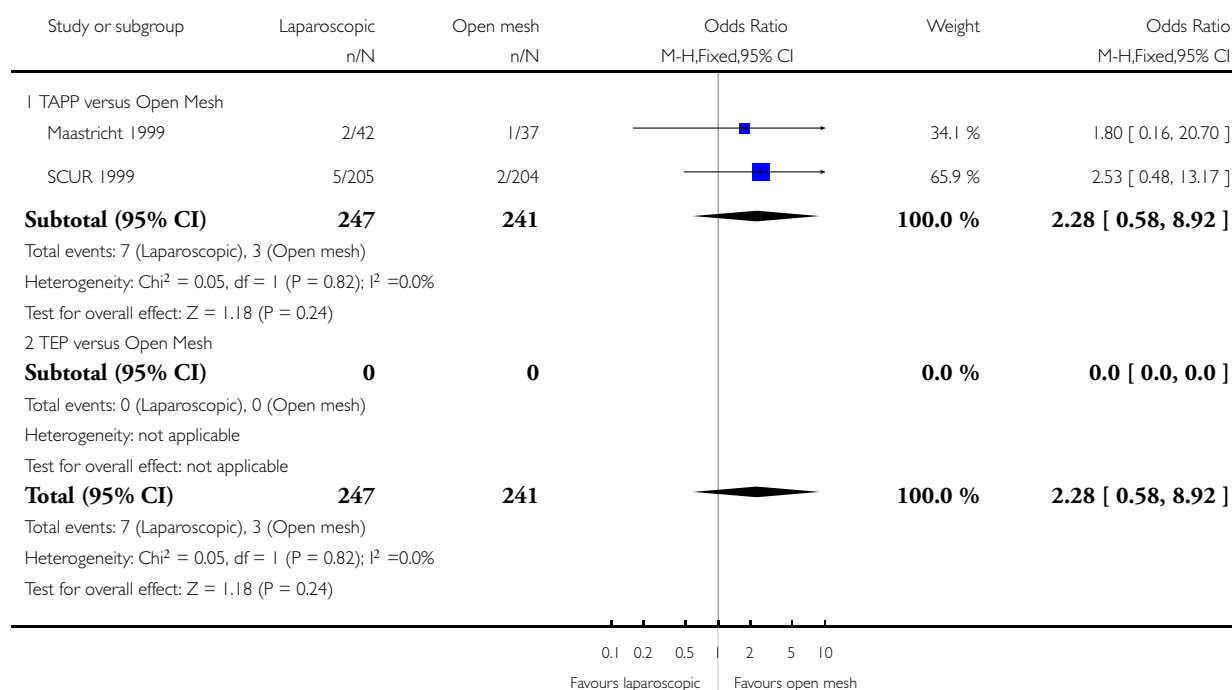
Study or subgroup	Treatment n/N	Control n/N	Peto Odds Ratio Exp[(O- E)/N],Fixed,95% CI	Peto Odds Ratio Exp[(O- E)/N],Fixed,95% CI
1 TEP versus Mesh				
Quebec 1998	0/6	0/1		0.0 [0.0, 0.0]
Subtotal (95% CI)	6	1		0.0 [0.0, 0.0]
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
2 TEP versus Non-Mesh				
Subtotal (95% CI)	0	0		0.0 [0.0, 0.0]
Heterogeneity: not applicable				
Test for overall effect: not applicable				
3 TEP versus Mixed Open				
MRCmulticentre 1999	0/8	0/4		0.0 [0.0, 0.0]
Subtotal (95% CI)	8	4		0.0 [0.0, 0.0]
Heterogeneity: not applicable				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Total (95% CI)				0.0 [0.0, 0.0]
Heterogeneity: Chi ² = 0.0, df = 0 (P<0.00001); I ² =0.0%				
Test for overall effect: Z = 0.0 (P < 0.00001)				
Test for subgroup differences: Chi ² = 0.0, df = -1 (P = 0.0), I ² =0.0%				
			0.001 0.01 0.1	10 100 1000
			Favours treatment	Favours control

Analysis 13.1. Comparison 13 Laparoscopic versus mesh (published data), Outcome 1 Persisting pain (published data).

Review: Laparoscopic techniques versus open techniques for inguinal hernia repair

Comparison: 13 Laparoscopic versus mesh (published data)

Outcome: 1 Persisting pain (published data)



FEEDBACK

Wrong data entry in 'tables of comparisons'

Summary

There is a false data entry in the above-mentioned review. The recurrence rates in the comparison "TAPP versus Non-Mesh (Comparison 02-15)" contain data from a trial called "Nyborg 1999". The trial arm on mesh repair is said to contain 438 patients, but the trial in truth only had 138 patients in this treatment arm. This typing error has potential effects on the results, because the trial is now receiving an exaggeratedly high weight in the statistical analysis.

I certify that I have no affiliations with or involvement in any organisation or entity with a direct financial interest in the subject matter of my criticisms.

Contributors

Comment by Stefan Sauerland (a clinical researcher and Cochrane reviewer) (13/02/03 16:45:08)
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WHAT'S NEW

Last assessed as up-to-date: 5 November 2002.

Date	Event	Description
5 August 2008	Amended	Converted to new review format.

HISTORY

Protocol first published: Issue 3, 1999

Review first published: Issue 4, 2000

Date	Event	Description
6 November 2002	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

AG led the review team.

The protocol was developed by members of the Secretariat and the Steering Committee on behalf of the EU Hernia Trialists Collaboration.

The search strategy development, abstract assessment and full text quality assessment were performed by KMc.

Data collection and data queries were co-ordinated by KMc.

Recoding and reanalysis of IPD were carried out by NS.

Other data abstraction and methodological quality assessment were conducted by KMc, NS and SR.

The data input to Revman was performed mainly by KMc.

The interpretation of results was undertaken by members of the Secretariat and the Steering Committee on behalf of the EU Hernia Trialists Collaboration.

The clinical interpretation was led by PMNYHG.

All reviewers contributed to the writing of the report, which was led by KMc and AG

DECLARATIONS OF INTEREST

There are no known conflicts of interest.

SOURCES OF SUPPORT

Internal sources

- University of Aberdeen, Health Services Research Unit, UK.

External sources

- European Union, Biomed 2 Workprogramme, Not specified.

INDEX TERMS

Medical Subject Headings (MeSH)

Surgical Mesh; Hernia, Inguinal [surgery]; Laparoscopy [adverse effects; * methods]; Pain, Postoperative; Postoperative Complications [etiology]; Randomized Controlled Trials as Topic; Recurrence [prevention & control]

MeSH check words

Humans