Hernia (2005) 9: 242–244
DOI 10.1007/s10029-005-0334-x

ORIGINAL ARTICLE

M. Hidalgo · M. J. Castillo · J. L. Eymar · A. Hidalgo

Lichtenstein inguinal hernioplasty: sutures versus glue

Received: 4 October 2004 / Accepted: 14 March 2005 / Published online: 13 May 2005
© Springer-Verlag 2005

Abstract *Introduction*: This was a prospective, randomised study undertaken from January 2001 to July 2003 firstly to assess the possibility of using glues to fix meshes, secondly to verify whether or not this leads to a higher hernia recurrence rate, and thirdly to assess post-operative pain. *Methods*: This study covered a total of 55 patients with bilateral hernias who presented similar characteristics on both sides and on whom fixation of the mesh was undertaken differently, depending on the side. On the right side polypropylene sutures were used (prolene 2/0), while on the left, attachment was done using glue (Tissucol). *Results and conclusions*: Results were similar in both inguinal regions, although there was less post-operative pain and less inflammatory reaction on the left side. There was no hernia recurrence in the follow-up at the end of 1 year

Keywords Inguinal hernia · Lichtenstein · Inguinal pain · Glue · Randomised prospective study

Introduction

Prosthetic repair techniques are currently the most valid solution for surgical treatment of abdominal wall hernias, since the tension-free concept is the basis of ideal treatment today and there is no doubt that the use of prostheses totally satisfies the premises of this concept [1].

M. Hidalgo (✉)
Department in General and gastroenterology,
Universidad Complutense Madrid,
Surgery 12 de Octubre University Hospital, Madrid, Spain
E-mail: mhidalgo.hdoc@salud.madrid.org
Tel.: +34-91-3908240
Fax: +34-91-3908062/+34-91-3908523

M. J. Castillo · J. L. Eymar · A. Hidalgo
Servicio de cirugia general y digestiva,
Hospital Na Sa del Rosario, Madrid, Spain

The new and modern techniques are not, however, without complications and, in fact, give rise sometimes to undesirable situations. One of the most frequent complications which presents after abdominal wall hernia surgery is post-operative pain which, at times, is chronic and permanent and leads to poor quality of life [2–5].

The aim of this study was to assess post-operative pain using the Lichtenstein technique, considered by many surgeons as the "gold standard", and which brings in major variations: the fixation of the prosthesis using either suture material or collagen fibrin. We also attempt to evaluate whether or not fixing the mesh with these glues leads to a higher recurrence rate.

Materials and methods

This study was carried out on 55 patients between the months of January 2001 and July 2003. The patients presented bilateral inguinal hernia and had undergone correction of both hernias in one operation using the Lichtenstein technique.

All patients were male, between the ages of 49 and 71 years. Associated risk factors were obesity (56.3%), hypertension (32.7%), and obstructive pulmonary disease (20%).

All patients were operated on by the same surgeon with the same surgical technique in all cases, Lichtenstein, using a polypropylene mesh as prosthetic material. The characteristics of the hernias were similar on both sides and there were no significant differences in their classification.

For the treatment of the hernia sac and its release and resection to the base, two different procedures were adopted. In inguinal-escrotal hernias where the sac should be opened, for technical difficulties or accidental opening, it was resected, with transfixion ligature in the base (20% in the right side and 18.1% in the left side).

In the other patients, regardless of the type of hernia, the sac was invaginated. In 44 cases in the right side

(80%) and in 45 cases (81.8%) in the left side, a duplication of the transversalis fascia was also performed by single silk 2/0 stiches.

In all patients a polypropylene prosthesis of 15×7 cms was used. In the right side, the fixation of the prosthesis was made by single polypropylene 2/0 stiches,while in the left side the fixation was made with fibrin sealant (Tissucol Duo) (2 cc). In the first 23 patients the sealant was applied through a catheter, while in the other 23 the spray form was used.

The anaesthesia was regional (epidural) in all patients, with a catheter for clarity before surgery, this being removed on completion of the surgical procedure. Antibiotic prophylaxis with third generation cephalosporin was used systematically (2 g before surgery), continuing with 1 g every 24 h post-operatively for a duration of 2 days.

Thirtyfour patients (61.8%) were given thromboembolic prophylaxis with low molecular weight heparin for 48 h after surgery. Post-operative assessment of both groups included local complications such as infection of the operated hernia, seroma, haematoma, post-operative pain (assessment using visual analog scale); urinary retention and hernia recurrence during the first year.

All patients were evaluated at 30 days, 3 months, 6 months and 1 year after surgery and had answered a previously established protocol.

Results

Objective data found in the assessment was as follows: There were no incidents whatsoever during surgery in the case of any patient. Positioning the mesh was undertaken without difficulty in the case of both groups: fixation with suture or fibrin glue. Regional anaesthetic did not cause any complication either immediately post-operatively or at thirty days following surgery. There were no episodes of urinary retention.

Secondary complications to surgery which appeared in the first month were as follows: Right inguinal region: haematoma of the surgical wound in one patient with thromboembolic prophylaxis, which it was necessary to drain. Scrotal oedema and oedema of the surgical wound in two patients which remitted in a short space of time. Mild, persistent pain in two patients and moderate in two others which ceased with analgesics in a period of 4 days to 2 weeks. Pain assessment was individualised in each inguinal region. It was found that, on this side, 15 patients presented no pain whatsoever (32%); 26 patients (47.2%) presented very mild pain, according to the analog scale (mean 2 points, assessment scale between 1 and 10); 14 patients (25.4%) had moderate pain: 4 points on a scale of 10. The pain remitted rapidly in all cases with analgesics (metamizol). One patient began with pain of moderate intensity (according to analog scale) one month after surgery and remained stable, although this was tolerable at 1 year after surgery.

There was no hernia recurrence whatsoever. Left inguinal region: a seroma which resolved with suitable drainage A scrotal oedema in the surgery area which remitted at 3 days. One patient presented mild pain which remitted with oral analgesics on the fourth day after surgery. The same as was the case for another patient who presented the same symptomatology on the right side. Specific valuation of pain in this inguinal region was as follows: 44 patients (80%) presented no pain symptoms whatsoever; 10 patients (18%) presented mild pain and one (1.8%) presented moderate pain (4 points on the analog scale with values between 1 and 10). At 1 year following surgery no patients presented chronic pain.

There were no recurring hernias. All patients were questioned specifically on pain and post-operative comfort at 48 h and 8 days after surgery, with clear distinction between the two inguinal regions. From these results it may be deduced that comfort was greater on the left side and that there was less local inflammatory reaction in this area (clinical data verified through physical examination). Pain was more often present and more frequent on the right side, although tolerable in all cases, albeit requiring higher doses of analgesia. Return to normal work was on average after 16 days.

Discussion

The presence of pain in the inguinal area after surgery for inguino-femoral hernia has been increasingly referred to in the literature of medical journals.

We should recall that the ilioinguinal nerve as well as the iliohypogastric and the genital nerves partially enervates the internal oblique muscle as well as the transverse muscle of the abdomen and the inguinal ligament, and that its radius of action reaches the base of the penis and scrotum. Therefore post-operative neuralgias present in the inguinal region are fundamentally due to nerve entrapment, either as a consequence of direct traumatisms during surgery, or inflammatory alterations of the area on the nerve route, secondary to the surgery practised. Nerve compression when suturing the mesh is another possibility to bear in mind when assessing neuralgia.

Many publications reflect this possibility [2–5] and for this reason achieving total disappearance of pain after hernia surgery of the abdominal wall has become a key objective. A number of different studies which have appeared recently tackle the problem of sutures, or the possibility of fixation with mesh and no stitches [5–7].

The use of glues has been advocated for different surgical indications: liver resection [8, 9]; fistulae [10–13], intraoperative haemorrhages [14, 15]. Recently Katkouda proposed the use of these glues in laparoscopy—hernia surgery of the abdominal wall, principally to avoid neurinomas which may appear at the points of implant of the takers (unpublished data) and which are the cause of neuralgias which may require repeat surgery

Also, the reaction of the periosteum at pubic tubercle level where the inside edge of the mesh is attached using a suture stitch, is a source of controversy due to the frequent neuralgias located at this level [16, 17].

There is a certain doubt as to whether glue provides sufficient and necessary attachment of the mesh and whether or not its use could lead to hernia recurrence in the long term. From the analysis and follow-up undertaken in the group of patients included in our study, it is deduced that recurrences did not present during the first year, although the follow-up is relatively short. Helbling's study [7] provides similar results, although the follow-up period is even shorter. Nevertheless, pure logic makes it unthinkable that detachment of the glue could occur after 1 year. The best post-surgical tolerance, with less pain and discomfort in the region where glue has been used is in keeping with the absence of suture stitches, and therefore with a less inflammatory component and less possibility of entrapment of the iliopubic nerve branches. Also, the absence of neuralgia at the pubic tubercle level underlines the importance of sutures in the appearance of this complication.

Prosthesis design could also condition complications and whereas those which are flat in form are easily fixable, others such as the plugs require attachment using stitches, since their movement and emigration is unpredictable.

In this study there are two controversial points which may have a bearing on the use of glues. On the one hand the non-removal of the hernia sac on the left side, and on the other hand the contraction of the meshes, a fact borne out by different authors [18–20]. Referring to the first of these, it can be stated that follow-up on all patients has not revealed any recurrence. This would corroborate previous experience as regards the treatment of the hernia sac, and that its extirpation or reintroduction through the internal orifice does not affect hernia recurrence.

With regard to the second aspect, there is no specific data as regards contraction of the meshes, or whether this may be greater or lesser depending on the method of attachment. The point fully demonstrated is that of contraction of the polypropylene meshes, which sometimes reach 30% of their surface area. Fresh studies have to be carried out to determine whether or not their attachment can compromise the scale of the contraction and whether this may affect recurrence in the long term.

References

1. Lichtenstein I, Shulman A, amid P, Montlor M (1989) The tension free hernioplasty. Am J surg 157:188–193
2. Amid PK, Lichtenstein I (1998) Long term result and current status of the Lichtenstein open tension free hernioplasty. Hernia 2:89–94
3. Coderre TJ, Katz J, Vaccarino Al, MelzacK R (1993) Review article. Contribution of central neuroplasticity to pathological pain, Review of clinical and experimental evidence. Pain 52:259–285
4. Kawit R, Feichter A, Fuchsjager N, Kux M (1999) Postoperative pain and return to activity after five different types of inguinal herniorrhaphy. Hernia 3:31–35
5. Paajanen H (2002) Do absorbable mesh sutures cause less chronic pain than non-absorbable sutures after Lichtenstein inguinal herniorrhaphy? Hernia 6:117–120
6. Chelala E, Gaede F, Douillez V, Dessily M, Alle JL (2003) The suturing concept for laparoscopic mesh fixation in ventral and incisional hernias: preliminary results. Hernia 7:191–196
7. Helbling C, Schlumpf R (2003) Sutureless Lichtenstein: first results of a prospective randomised clinical trial. Hernia 7:80–84
8. Dunn CJ, Goa KL (1999) Fibrin sealant: a review of its use in surgery and endoscopy. Drugs 58(5):863–886
9. Chapman WC, Clavien PA, Fung J, Khanna A, Bonhan A (2000):Effective control of hepatic bleeding with a novel collagen based composite combined with autologous plasma; results of a randomised controlled trial. Arch Surg 135(10):1200–1205
10. Hwang TL, Chen MF (1996) Randomised trial of fibrin tissue glue for low output enterocutaneous fistula. Br J surg 83(1):112
11. Eleftheriadis E, Tzartinoglon E, Kotzampassi K, Aletras H (1990) Early endoscopy fibrin sealing of high output postoperative enterocutaneous fistulas. Acta chir Scand 186(9):625–628
12. Battaglia G, Morbin T, Patarnello E, Merkel C, Corona MC, Ancona E(2000) Visceral fistula as a complication of endoscopy treatment of oesophageal and gastric varices using isobutyl-2–cianoacryale: report of two cases. Gastr Endosc 52(2):267–270
13. Rabago LR, Herrera N, Castro JJ, Marcos J, Gea F, Mora P, Blesa C (2000) Tratamiento conservador de las complicaciones severas del esófago mediante pegamento de fibrina (Tissucol*). Rev esp enferm dig 92(7):470–471
14. Uranus S (1994) Indications and techniques for fibrin sealing in spleen surgery. In: Waclawiczek SG, Daum R (eds) Fibrin sealing in surgical and nonsurgical fields. General and abdominal surgery—pediatric surgery vol 2. Springer, Berlin Heidelberg New York, pp 33–44
15. Waclawiczek HW, Meiser G (1990) La colle de fibrine en chirurgie 10 ans d'expérience. Lyon Chir 86(5):412–419
16. Ingoldby CJH (1997) Laparoscopic and conventional repair of groin disruption in sportsmen. Br J surg 84:213–215
17. Leblanc KE, Leblanc KA (2003) Groin pain in athletes. Hernia 7:68–71
18. Amid PK (2003) The Lichtenstein repair in 2002: an overview of causes of recurrence after Lichtenstein tension Free hernioplasty. Hernia 7:13–16
19. Vega VR (2002) Estudio clínico experimental de la contracción de las mallas de polipropileno empleadas en la reparación de eventraciones. Tesis doctoral. Universidad de Cádiz.Facultad de Medicina
20. Celdran A, Amid PK (2000) Biomateriales y prótesis. In: Fundamentos y técnicas de la hernioplastia sin tensión. Fundación Jiménez Díaz. Madrid, pp 51–57