

## CASE ONE

**Short case number: 3\_11\_1**

**Category: Gastrointestinal & Hepatobiliary**

**Discipline: Surgery**

**Setting: General practice**

**Topic: Inguinal hernias**

### Case

**Martin Foster, aged 25 years, presents complaining of a lump in his groin. He reports that the lump appeared a few weeks after commencing his new job as a furniture removalist.**

### Questions

1. Outline your differential diagnosis of Martin's lump.
2. What are the differences in clinical presentation, anatomy and pathophysiology of direct and indirect inguinal hernias and femoral hernias?
3. Briefly summarise the relations of the layers of the abdominal wall and their reflections in the groin.
4. Outline the treatment of groin hernias.
5. Summarise the key findings of the Cochrane review that compared outcomes of hernia repair comparing mesh versus non-mesh repairs.
6. Summarise the evidence for laparoscopic compared to open hernia repairs.
7. In a table summarise the relative incidence of direct, indirect and femoral hernias in men, women and children.
8. Briefly describe the following surgical incisions: midline, paramedian, transverse, McBurney, subcostal, Pfannensteil and kidney transplant incision (donor).

### Suggested reading:

- Henry MM, Thompson JN, editors. Clinical Surgery. 3<sup>rd</sup> edition. Edinburgh: Saunders; 2012. Chapter 26 Hernia pg 431-445
- Garden OJ, Bradbury AW, Forsythe JLR, Parks RW, editors. Davidson's Principles and Practice of Surgery. 6th edition. Philadelphia: Churchill Livingstone Elsevier; 2012. Chapter 11.

### Further reading:

- Lockhart, K., Dunn, D., Teo, S., et al. Mesh versus non-mesh for inguinal and femoral hernia repair. Cochrane Database of Systematic Reviews, 13 September 2018.
- <https://doi.org/10.1002/14651858.CD011517.pub2> McCormack K, Scott N, Go PM, Ross SJ, Grant A, Collaboration the EU Hernia Trialists. Laparoscopic techniques versus open techniques for inguinal hernia repair. Cochrane Database of Systematic Reviews 2003, Issue 1. Art. No.: CD001785. DOI: 10.1002/14651858.CD001785.  
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001785/full>

## ANSWERS

### 1. Outline your differential diagnosis of Martin's lump

Causes of groin swelling include:

- Inguinal hernia
- femoral hernia
- hydrocele
- encysted hydrocele of the cord or of the peritoneovaginal canal
- undescended or ectopic testis
- lipoma of the cord
- epididymal cyst
- lymphadenopathy
- femoral artery aneurysm

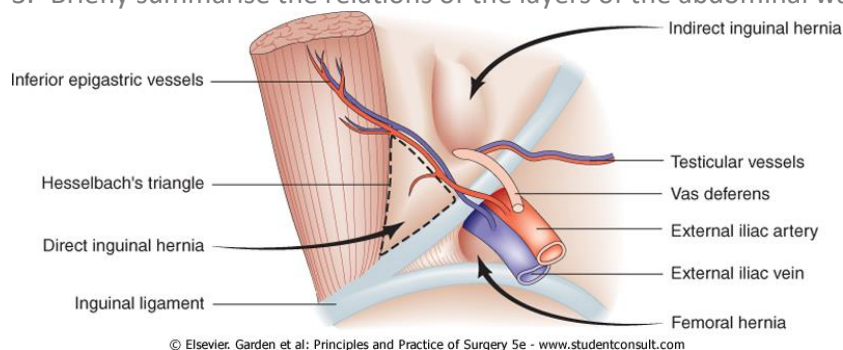
### 2. What are the differences in clinical presentation, anatomy and pathophysiology of direct and indirect inguinal hernias and femoral hernias?

Indirect v. direct inguinal hernia

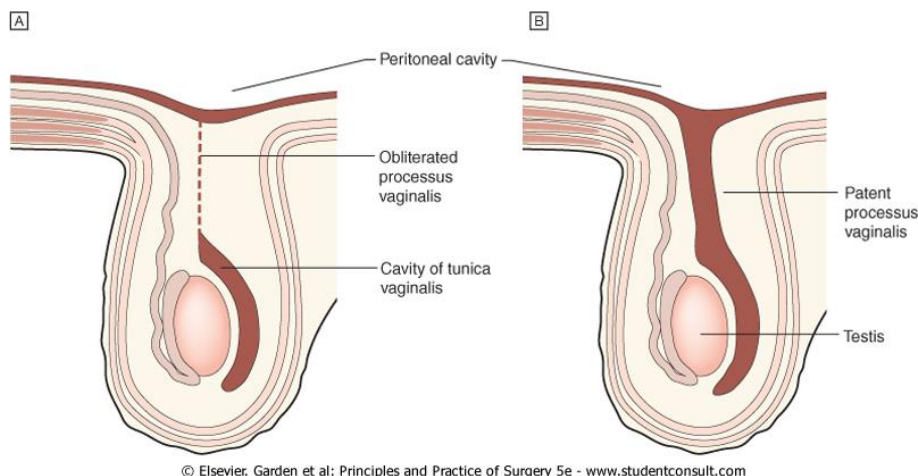
	<b>Indirect</b>	<b>Direct</b>
Patient's age	Any age but usually young	Older
Cause	May be congenital	Acquired
Bilateral	20%	50%
Protrusion on coughing	Oblique	Straight
Appearance on standing	Does not reach full size immediately	Reaches full size immediately
Reduction on lying down	May not reduce immediately	May reduce immediately
Descent into scrotum	Common	Rare
Occlusion of internal ring	Controls	Does not control
Neck of sac	Narrow	Wide
Strangulation	Not uncommon	Unusual
Relation to inferior epigastric vessels	Lateral	Medial

- An indirect hernia that extends beyond the external ring appears above and medial to the pubic tubercle
- Inguinal hernias: a reducible indirect hernia can be completely controlled with a fingertip placed firmly over the internal ring.
- Femoral Hernia: the upper medial border of a femoral hernia is always below and lateral to the pubic tubercle. In a small hernia, a cough impulse is only rarely detected. A larger hernia may be seen to bulge on straining just below the medial part of the inguinal ligament

3. Briefly summarise the relations of the layers of the abdominal wall and their reflections unto the groin.



**Anatomy of the internal inguinal ring, showing sites of herniation from within.**



4. Outline the treatment of groin hernias.

Adults with a symptomatic inguinal hernia should be offered surgery. Open mesh repair or laparoscopic repair aims to reduce post-operative pain to a minimum, enabling most procedures to be undertaken as day cases. Inguinal hernias can be controlled by a truss, but this is uncomfortable and is now seldom indicated, as repair using local or regional anaesthetic techniques can be employed in higher-risk patients.

The identification of an inguinal hernia in any child is *always* an indication to operate. In newborns, the procedure must be carried out with some urgency because of the risk of strangulation. In very premature infants, the procedure may need to be done under regional block alone, and where general anaesthesia is used, elective post-operative ventilation may be required. In older children, elective surgery is usually undertaken on a day-case basis, with liberal use of local anaesthetic blocks for post-operative pain relief. The simplest and most common surgical procedure now performed is the Lichtenstein open tension-free repair, which involves the insertion of a synthetic mesh underneath the spermatic cord. The mesh is secured to the aponeurotic tissue overlying the pubic bone medially, the inguinal ligament inferiorly, and the internal oblique aponeurosis and conjoint tendon superiorly. Laterally, the mesh is divided and its two sides wrapped around the spermatic cord and sutured in place.

Laparoscopic hernia repair, using a pre-peritoneal approach, is increasing in popularity. The technique involves excising or reducing the hernial sac and inserting a mesh.

A femoral hernia is particularly likely to obstruct and strangulate, and therefore surgical intervention is indicated. As with inguinal hernia, repair can be carried out under local or general anaesthesia.

#### MANAGEMENT OF COMPLICATED HERNIA

- Irreducibility
- Obstruction
- Strangulation

If the onset of symptoms was less than 6 hours prior to presentation, a gentle attempt to reduce a hernia can be made, if the patient is unable to reduce it themselves.

Urgent operation is indicated for all obstructed hernias, as one can never be certain that strangulation is not present. The hernial sac is opened and the contents are inspected carefully. If they are viable, they can be returned to the abdominal cavity and the hernia repaired. If there is doubt about the viability of a loop of bowel or omentum, the devitalized tissue must be resected before proceeding to repair.

5. Summarise the key findings of the Cochrane review that compared outcomes of hernia repair comparing mesh versus non-mesh repairs.

See suggested reading for reference (Cochrane review 2018) The authors conclude, “Compared to non-mesh repairs, mesh repairs probably reduce the rate of hernia recurrence, and reduce visceral or neurovascular injuries, making mesh repair a common repair approach. Mesh repairs may result in a reduced length of hospital stay and time to return to activities of daily living, but these results are uncertain due to variation in the results of the studies. Non-mesh repair is less likely to cause seroma formation and has been favoured in low-income countries due to low cost and reduced availability of mesh materials. Risk of bias in the included studies was low to moderate and generally handled well by study authors, with attention to details of allocation, blinding, attrition and reporting”.

6. Summarise the evidence for laparoscopic compared to open hernia repairs.

Cochrane review (see suggested reading for reference):

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 is totally extra peritoneal (TEP) repair. 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.

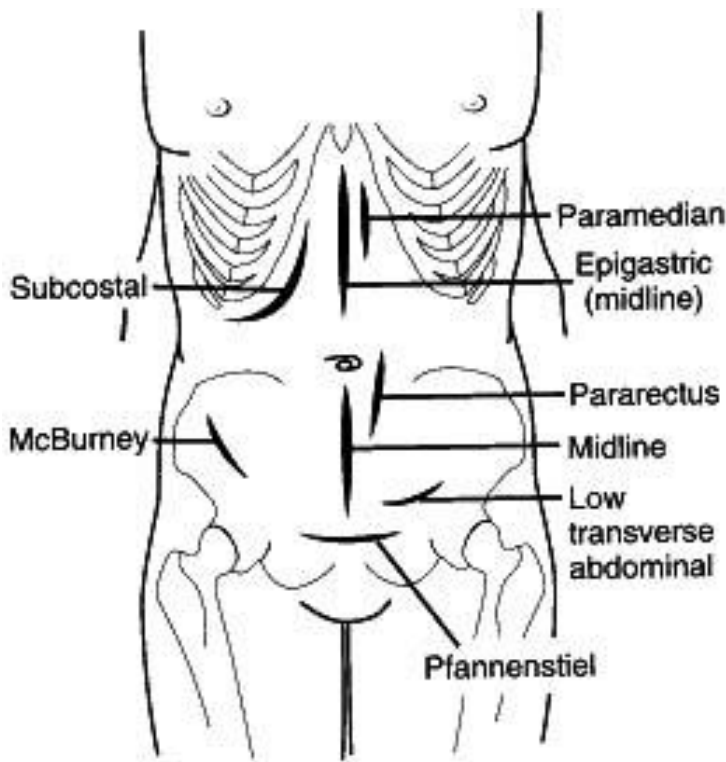
The review authors identified 41 eligible controlled trials in which a total of 7161 participants were randomized to laparoscopic or open surgery repair. The mean or median duration of follow up of patients ranged from 6 - 36 months.

Return to usual activities was faster for laparoscopic repair, by about 7 days, and there was less persisting pain and numbness than with open surgery. However, operation times were some 15 minutes longer 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).

7. In a table summarise the relative incidence of direct, indirect and femoral hernias in men, women and children.

	Men	Women	Children
Direct			
Indirect	10x more common in males, indirect 4x more common than direct		Almost all inguinal hernias are indirect, 90% occur in males
Femoral		4 x more common in women	Rare

8. Briefly describe the following surgical incisions: midline, paramedian, transverse, McBurney, subcostal, Pfannenstiel and kidney transplant incision (donor).

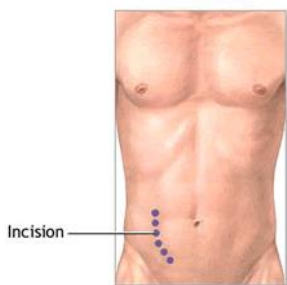


#### McBurneys

Abdominal incision parallel to the fibres of the external oblique muscle, about 1/3 of the distance along a line from ASIS to umbilicus, half the incision being above and the remainder below this point. The skin and subcutaneous fat are incised down to the external oblique muscle, the fibres of which are split; the underlying oblique and transversus abdominis muscles are then split and separated.

#### Pfannenstiel

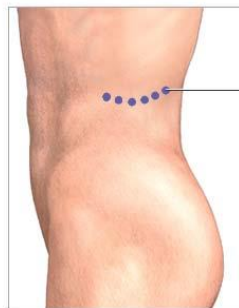
A curved abdominal incision, the convexity being directed downward just above the symphysis, passing through skin, superficial fascia, and aponeurosis, exposing the pyramidalis and rectus muscles, which are separated from each other in the midline, the peritoneum being opened vertically.



Incision

ADAM

Recipient kidney, donor kidney



Incision

ADAM