

Open Inguinal Hernia Repair

Inguinal hernia repair remains one of the commonest performed surgical procedures around the world. It is an operation that encompasses many aspects of general surgery, including dissection in the anatomical planes and reconstruction. Therefore as a surgical trainee you should aim to master this operation, as it gives a tension-free training opportunity, providing you with a collection of fine skills to be utilised throughout your surgical career. Laparoscopic inguinal hernia repair has gained popularity in recent years, but there is still a substantive role for open repair especially because it can be safely performed under a local anaesthetic. This chapter will describe the most commonly used method for inguinal hernia repair, called the Lichtenstein tension-free mesh repair.

Pre-operative considerations

- Make sure you see the patient pre-operatively and mark the site
- Antibiotics : not routinely required
- Patient's position: supine
- Surgeon's position: on the same side as the hernia

Exposing the canal

- Make an oblique incision (figure 1) parallel and superior to the inguinal ligament, which extends from the palpable pubic tubercle and anterior superior iliac spine. The incision should be made 2 cm above this line from the deep ring (midpoint of inguinal ligament) to the superficial ring (pubic tubercle).
- Using electrocautery deepen the incision through Camper's and Scarpa's fascia until reaching the external oblique aponeurosis.
- Expose the external oblique aponeurosis using a combination of blunt and sharp dissection.
- Identify the triangular shaped superficial inguinal ring as this helps you to open the canal in the correct position.
- Make a small nick using a blade over the external oblique aponeurosis in the direction of its fibres through the superficial ring.

- Pick up each end of the external oblique aponeurosis with mosquito clips and hold up in the air.
- Extend the incision beyond its length laterally and medially to open the superficial ring using dissecting scissors to enter the inguinal canal. This can be achieved safely by placing scissors under the fibres of the external oblique aponeurosis, ensuring there is no damage to underlying structures.
- Attempt to identify the ilioinguinal nerve and record whether it is protected from injury or divided.
- Expose the inguinal floor using blunt dissection with finger or dry gauze, creating sufficient space for the placement of mesh.
- Insert a self-retaining retractor at this stage to keep the canal exposed.

Exposing the canal

Identify the cord and sac

- Identify the spermatic cord/round ligament and mobilize it at the pubic tubercle medially and at the inguinal ligament inferiorly, dissecting the cremasteric fibres from the cord. This is best done by gentle dissection with the index finger and thumb in an avascular medial plane around the cord structures.

Separating the cord from the sac: easier said than done!

Direct inguinal hernia sacs come through the posterior wall, therefore they are easier to identify and separate. Indirect sacs don't show themselves that easily, therefore a number of sharp and blunt techniques are needed for this step. It is important to understand that unless you divide the cremaster muscle it isn't easy to identify the cord and an indirect inguinal sac.

- Using scissors dissect and divide the cremaster muscle in the direction of the canal. You will now be able to identify the edge of an indirect hernia sac, which appears as a free white layer. Once found, hold it up with a pair of atraumatic forceps, being careful not to clip any of the contents as you might injure bowel!
- Keep the sac up and apply forceps to its free edge to facilitate retraction.
- Get the light to shine through the sac as this will enable you to identify the plane and to dissect it freely from the cord structures all the way down to the deep ring.

Handling the sac and its contents

- Once the sac is free, make a small cut into it using the tip of scissors, ensuring there are no contents where the cut is made.
- Open the sac, examine the contents and reduce into the peritoneal cavity.
- In emergency cases handle the contents of the sac appropriately. This might mean a bowel resection and anastomosis.
- Lichtenstein states that the sac can be excised or simply reduced into the abdominal cavity. It is our preference to excise the redundant sac, which is done by twisting and transfixing it with 2/0 vicryl.
- Excise the sac and check any remnant sac for haemostasis prior to allowing it to retract into the abdomen.
- If there is evidence of a direct hernia (a defect on the conjoint tendon), it can be plicated using 2/0 vicryl interrupted sutures with the help of an assistant using forceps to keep the hernia sac retracted.

Mesh repair

- Fashion a piece of prolene mesh by cutting and trimming it to size with a longitudinal opening, creating two tails which allow the cord structures to be positioned comfortably in between.
- Identify and expose the pubic tubercle by placing a retractor along the inferior edge of the external aponeurosis whilst pulling the spermatic cord in the opposite direction.
- Adjust the mesh in the correct position ensuring there is adequate coverage medial to the pubic tubercle.
- Secure the mesh using 2/0 prolene starting at the inguinal ligament just above the pubic tubercle (without taking the periosteum in the suture), then carry on with the same suture continuously along the edge of the mesh, securing it to the inguinal ligament inferiorly. Be sure not to injure the femoral vessels lying just posterior to the inguinal ligament. Continue until you reach a point lateral to the internal ring, finishing off by tying this stitch.
- Then secure the superior and medial aspect of the mesh with a couple of interrupted prolene sutures to the posterior wall (transversalis fascia and internal oblique aponeurosis) and conjoint tendon medially.
- Close the internal ring by placing an interrupted suture at the ends of the two tails of the mesh around the cord structures at the level of the ring to avoid recurrence of an indirect hernia without strangulating the spermatic cord by placing a fingertip in the space.
- The mesh should be tension-free.
- Ensure haemostasis.

Wound closure

- External oblique aponeurosis: use 2/0 vicryl continuous suture
- Scarpa's fascia: use 3/0 vicryl interrupted sutures
- Skin: use 3/0 subcuticular continuous suture
- In men ensure the testes are gently pulled down into their anatomical position in the scrotum

Hints, tips and anecdotes

- Do not make your incision too low on the skin.
- In emergency cases avoid using mesh in the presence of contamination.
- Identify the superficial inguinal ring before you open the external oblique aponeurosis to avoid making a low/high incision.
- A self-retaining retractor can be inserted and adjusted throughout dissection down to the inguinal canal to help separate structures.
- Get the light right.
- When fixing the mesh to the inguinal ligament, take superficial bites at various distances from the edge of the inguinal ligament, otherwise the fibres will just tear.
- Ensure the mesh is placed along the inferior aspect of the inguinal ligament, otherwise closing the external oblique aponeurosis will be very difficult.
- If you are performing a repair under local anaesthesia, employ a sharp dissection technique, as blunt dissection tends to cause pain.

Pitfalls

- Most inguinal hernia recurrences occur medially, hence the first suture (whereby mesh is attached just medial to the pubic tubercle) is critical.
- The superficial inferior epigastric vein is indeed relatively superficial and if encountered it should be ligated and divided.
- The femoral vessels are closer than you think, so pay great attention to the depth of your sutures on the inguinal ligament.
- Be careful not to compromise the blood supply to the testis.
- Large and recurrent inguinoscrotal hernias are not to be left to the junior member of the team as they are quite challenging.

Post-operative care

- This is generally performed as a day-case, so the patient should be allowed to go home if well and able to pass urine.
- Generally driving should be avoided for the first week. Also clarify to the patient that an attempt at an emergency stop should be made prior to re-commencing driving.
- Strenuous activity and heavy lifting should be avoided for up to 6 weeks.
- No routine follow up is required.

Illustration

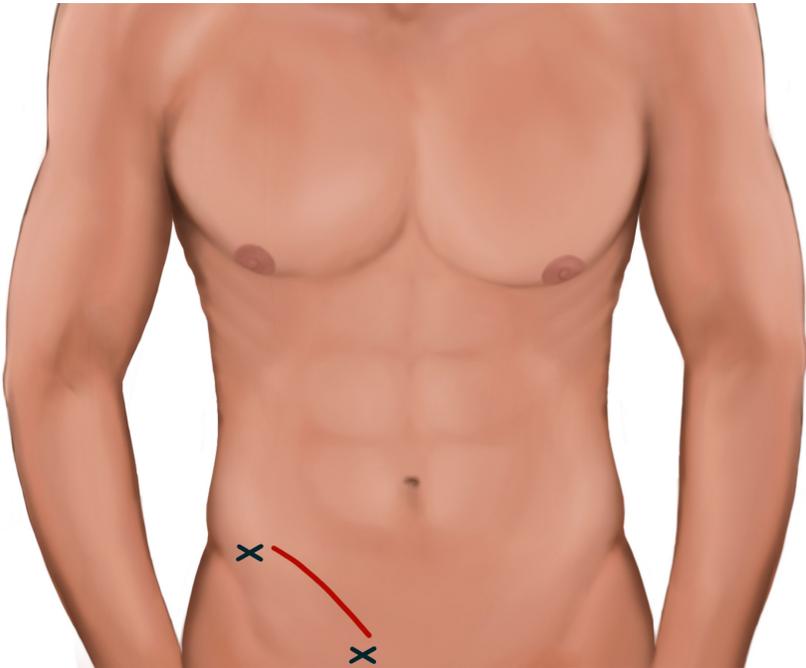


Figure 1: Inguinal hernia incision