

Open appendicectomy . . . How I do it

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Introduction

This article is meant for medical officers and surgeons in training who might be called upon to perform this procedure in the absence of a trained general surgeon. The techniques described here are the ones used by the author for this procedure and might differ from those used by other surgeons. However, the principles of the operation are universal. This procedure is predominantly performed laparoscopically in the author's practice as is the case in most modern hospitals with the necessary equipment and expertise. The open procedure is the standard in many hospitals in developing countries and when there is a need to convert to open during difficult laparoscopic procedures.

Indications

- Confirmed or suspected acute appendicitis.
- Interval Appendicectomy, 2-4 months after treating an appendicular mass or abscess conservatively.
- Appendicectomy during an unrelated abdominal operation.

Operative Technique

- Supine position and general anaesthesia with intubation. Spinal or epidural anaesthesia can be given by the medical officer cum surgeon in the absence of an anaesthetist or anaesthetic assistant. You will need an assistant who could be a nurse or a technician besides the scrub nurse for better exposure. An abdominal general set of instruments and good lighting are mandatory.
- Skin incision

I prefer the Lanz incision to the McBurney's incision as it leaves a better cosmetic result. Ideally a size 10 surgical blade is used but can vary with age and size and what is available in your hospital. A new razor blade can do the trick in the absence of a surgical blade. Both incisions are centered at the McBurney's point at the junction of the middle and lateral thirds of a line from the umbilicus to the anterior superior iliac spine. For a standard open appendicectomy, a 3-8 cm skin incision is adequate depending on the age and body habitus of the patient (see Figure 1).

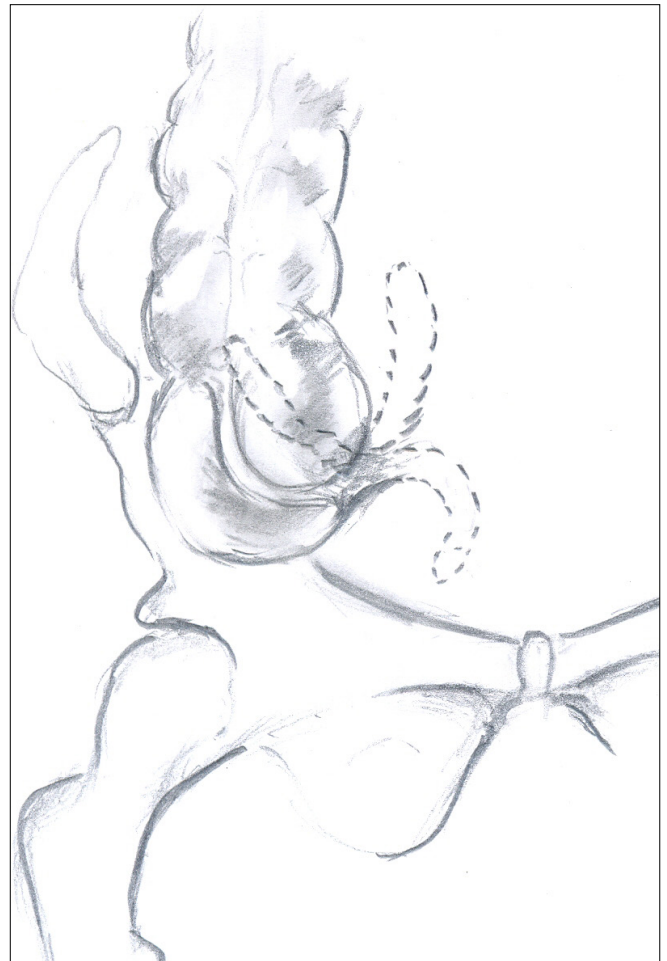


Figure 1. Common anatomical positions of the appendix.

- The incision may be extended up to the edge of the rectus muscle medially in difficult cases when the appendix is in the retrocaecal or sub hepatic position (see Figure 2). In case extending the incision does not provide the required exposure, a new vertical incision suitable to the pathology should be made and the McBurney incision closed. A midline incision is best suited for difficult cases when the need arises. Struggling to perform a difficult operation through a small incision could lead to gut lacerations with catastrophic consequences.

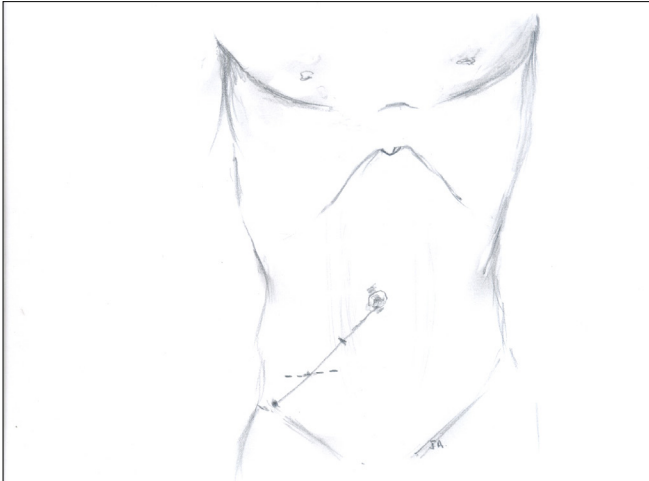


Figure 2. Skin incision (s).

- The subcutaneous tissues can be spread out bluntly with the fingers and a gauze swab up to the external oblique fascia. Branches of the superficial inferior epigastric blood vessels are tied with 3/0 absorbable sutures as they appear in the wound and small vessels cauterized with electrocautery, if available at your facility.
- The external oblique aponeurosis is split in the line of its fibres running obliquely downwards from lateral to medial using a combination of blunt and sharp dissection (see Figure 3).

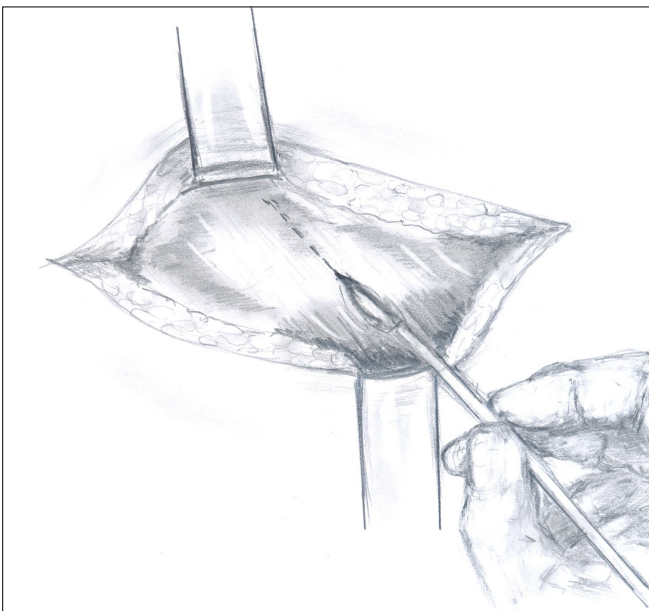


Figure 3. Division of the external oblique aponeurosis

The fibres are then retracted horizontally using a pair of flat retractors like the Kenny-Riles or Roux to expose the shiny upper surface of the internal oblique muscle fibres running obliquely laterally to medially in an upward direction.

- A long curved artery forceps like a Kelly Haemostatic forceps or the fingers are inserted through both the internal oblique and transversus abdominis muscles separating them up to the transversalis fascia and peritoneal layer using gentle spreading motions. It is important here not to use any sharp dissection which is unnecessary and could lead to excessive bleeding. This will also maintain the grid iron configuration of the muscle anatomy that will spring into place on closure with no or little need for sutures (see Figure 4).

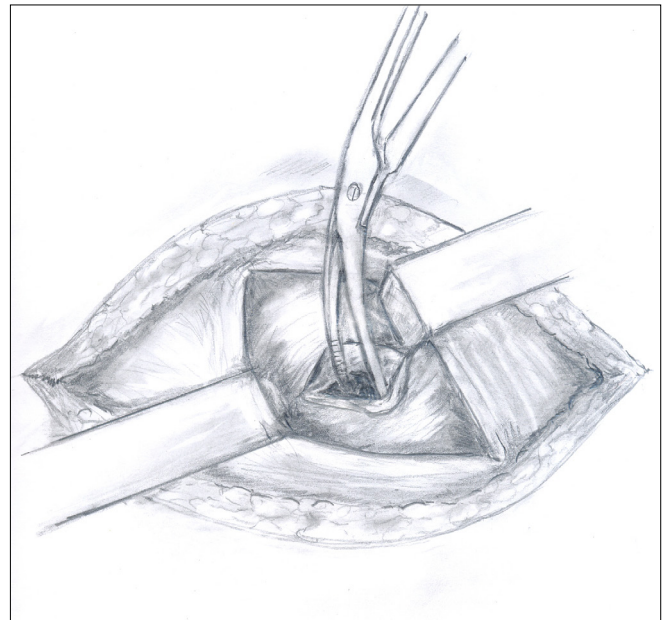


Figure 4. Splitting the internal oblique and transversus abdominis muscles

- The assistant changes to a pair of langenbeck retractors or similar with long narrow blades and retracts the muscle fibres in a horizontal manner to open up the space over the peritoneum. The peritoneum is then carefully lifted up and opened between two artery forceps with a Mayo or Metzenbaum scissors to avoid injury to underlying gut which maybe adherent to it because of the inflammatory reaction (See Figure 5).
- The retractors are then repositioned to include all the abdominal wall layers and firm horizontal retraction is applied by the assistant to open up the operative space and expose the contents of the right iliac fossa. Any fluid encountered at this stage is collected and sent immediately to the laboratory for gram stain and culture/sensitivity test. The caecum, if it is not

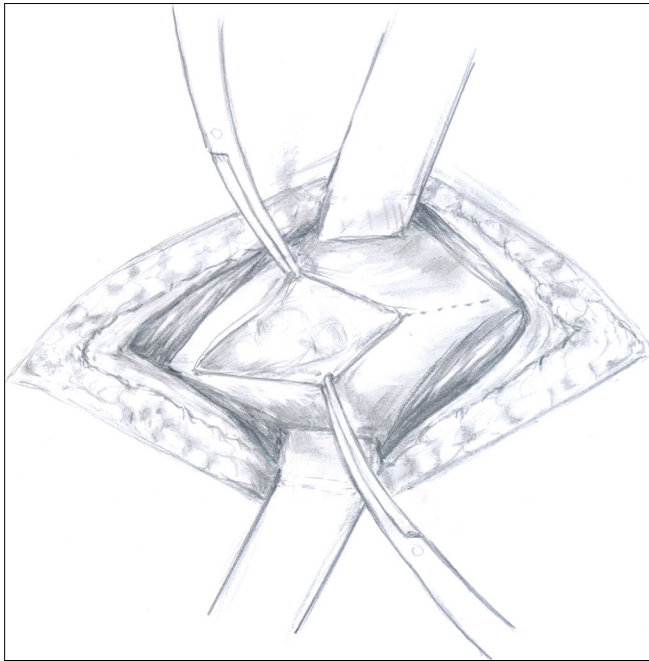


Figure 5. Opening the transversalis fascia and the peritoneum.

immediately visible, is located and delivered into the wound by sliding the fingers along the lateral abdominal wall. The base of the appendix is then identified by simply following one of the taeniae coli downwards on the surface of the caecum. The caecum and the appendix are then delivered into the wound if possible. Care is taken to minimise the extrusion of dilated loops of bowel or even a dilated floating caecum out of the peritoneal cavity as it can be extremely difficult to return it through the small incision (see Figure 6).

- Grasp the appendix with a Babcock or similar tissue forceps at the distal end on the mesoappendix. Skeletise the appendix by dividing the mesoappendix between serially applied artery forceps and ligate each with 2/0 or 3/0 absorbable sutures until its junction with the caecum. Be careful when clamping the appendicular artery when the mesoappendix is oedematous as it can slip and cause troublesome bleeding from the appendicular vessels (Fig. 7). Another pitfall and danger at this stage of the operation is an inadvertent laceration of the caecum during dissection and manipulation.
- Crush the base of the appendix with an artery forceps close to the caecum and insert two other forceps distal to it close to one another and divide between them with a knife. Ligate the stump of the appendix with a 2/0 absorbable tie. Anchoring the suture to the appendicular serosa minimizes the chances of a slipped tie that could lead to abscess formation and peritonitis in the post-operative period (Fig. 8). Touch the stump with a disinfectant swab (e.g. betadine). The author



Figure 6. Localisation and delivery of the appendix

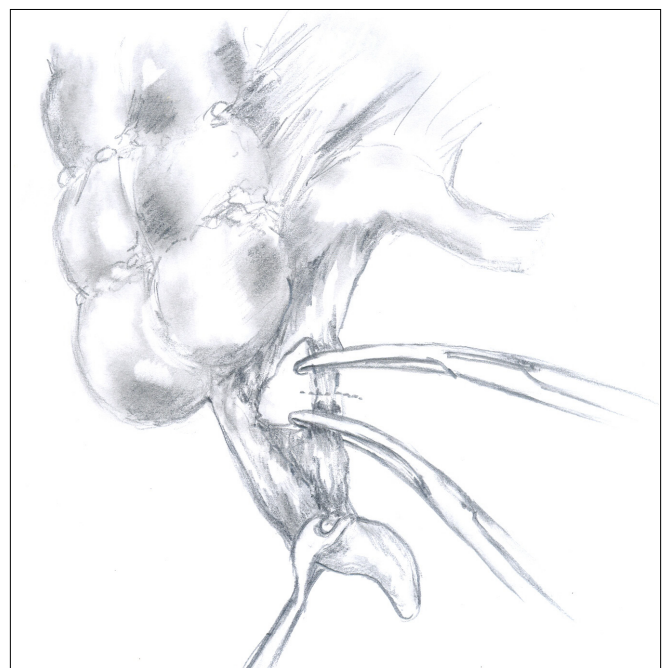


Figure 7. Division of the mesoappendix.

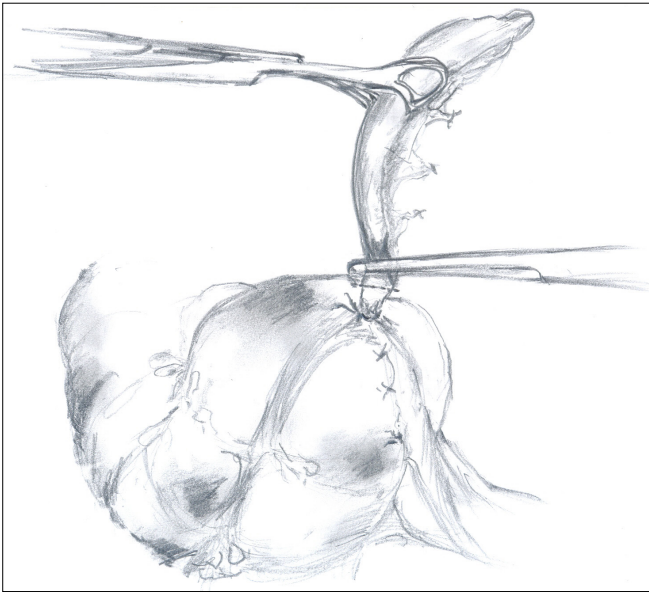


Figure 8. Ligation of the stump of the appendix.

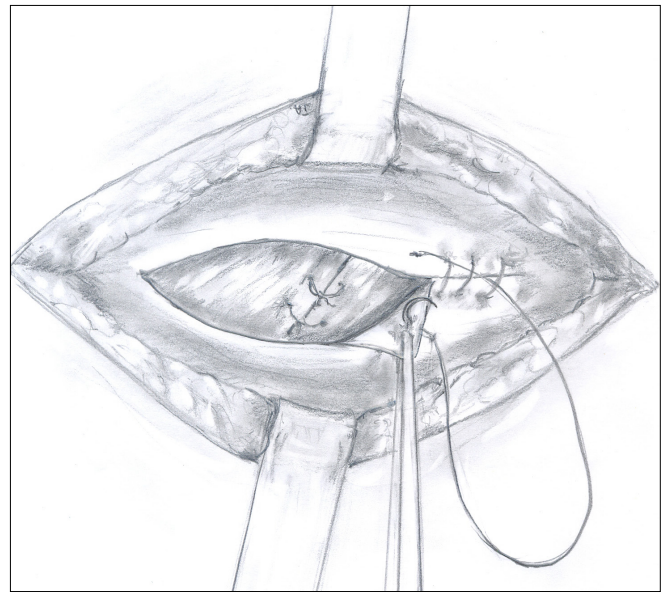


Figure 9: Closure of the incision

does not routinely bury the stump with a purse string stitch.

- Wash out the operation site with warm normal saline especially if an abscess or localized peritonitis had developed. A corrugated rubber drain inserted through a separate stab incision or a vacuum drain (can be improvised in the absence of the costly portovac by using a 20 cc syringe) is recommended in patients with abscess formation and localized peritonitis.
- Close the abdomen in layers. I use 2/0 or 3/0 synthetic absorbable running suture material to close the peritoneum after carefully elevating the edges off the intestines with 4 artery forceps. The muscle layers are allowed to fall into place as they were only separated on entry into the peritoneal cavity. Occasionally two or three loosely placed 3/0 absorbable sutures could be inserted on the internal oblique to ensure no gaps persist between the muscles. The external oblique muscle is then closed with a running 2/0 absorbable suture (see Figure 9). The subcutaneous tissues are approximated with a few absorbable sutures in obese patients.
- Skin closure depends on the degree of contamination observed at surgery. After elective or interval appendicectomies, a 3/0 subcuticular absorbable synthetic stitch gives the best cosmetic results. In case

of severe contamination it is often best to leave the skin open for 2-3 days with daily irrigations followed by a secondary suture of the skin. When the contamination is mild and well contained at surgery, skin clips or interrupted non-absorbable simple or mattress stitches can be inserted immediately after surgery. When in doubt, leave the skin open, sometimes with the sutures in place but not tied. Secondary suture is usually done easily under local anaesthesia in adults after 2-3 days of daily wound irrigation and packing.

- Postoperative:
 - o Normal diet after 24 hours or when patient passes flatus.
 - o Continue antibiotics if there was perforation and localised peritonitis.
 - o Remove any drain after 2 days
 - o Most patients are discharged after 48 hours on observed clinical improvement and stable vital signs. Inflammatory markers like WBC and CRP could be checked before discharge if available at your institution.
 - o Stitches are removed 7-10 days after surgery in the outpatient clinic.

All illustrations prepared by John Adwok.