Appendectomy Overview

AMPATH Surgical App

Procedure Introduction

- Preop Patient Preparation
- Safe Entry Into the Abdomen
- Identify the Appendix
- Appendectomy
- Abdominal Closure

Overview of the Procedure

Take a few minutes to review the steps of the open appendectomy procedure. Each step will be explored in more details in this section.

Open Appendectomy Procedure Steps

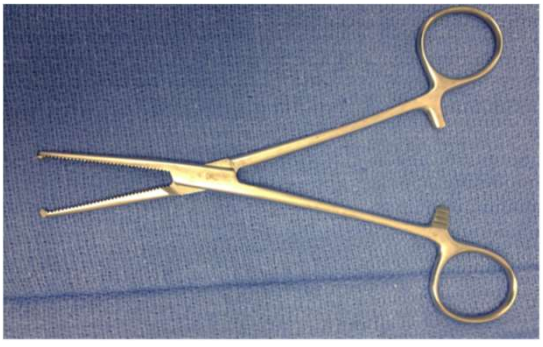
Instruments Needed

Scalpel

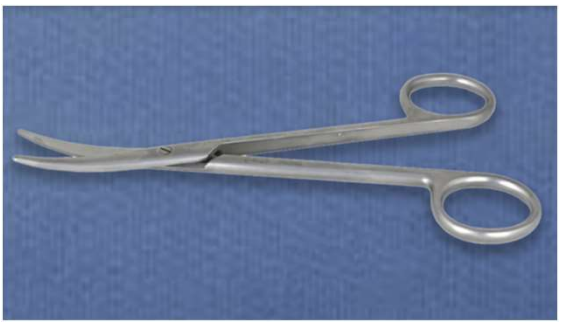
Babcock Clamp

Hemostat

Needle Holder



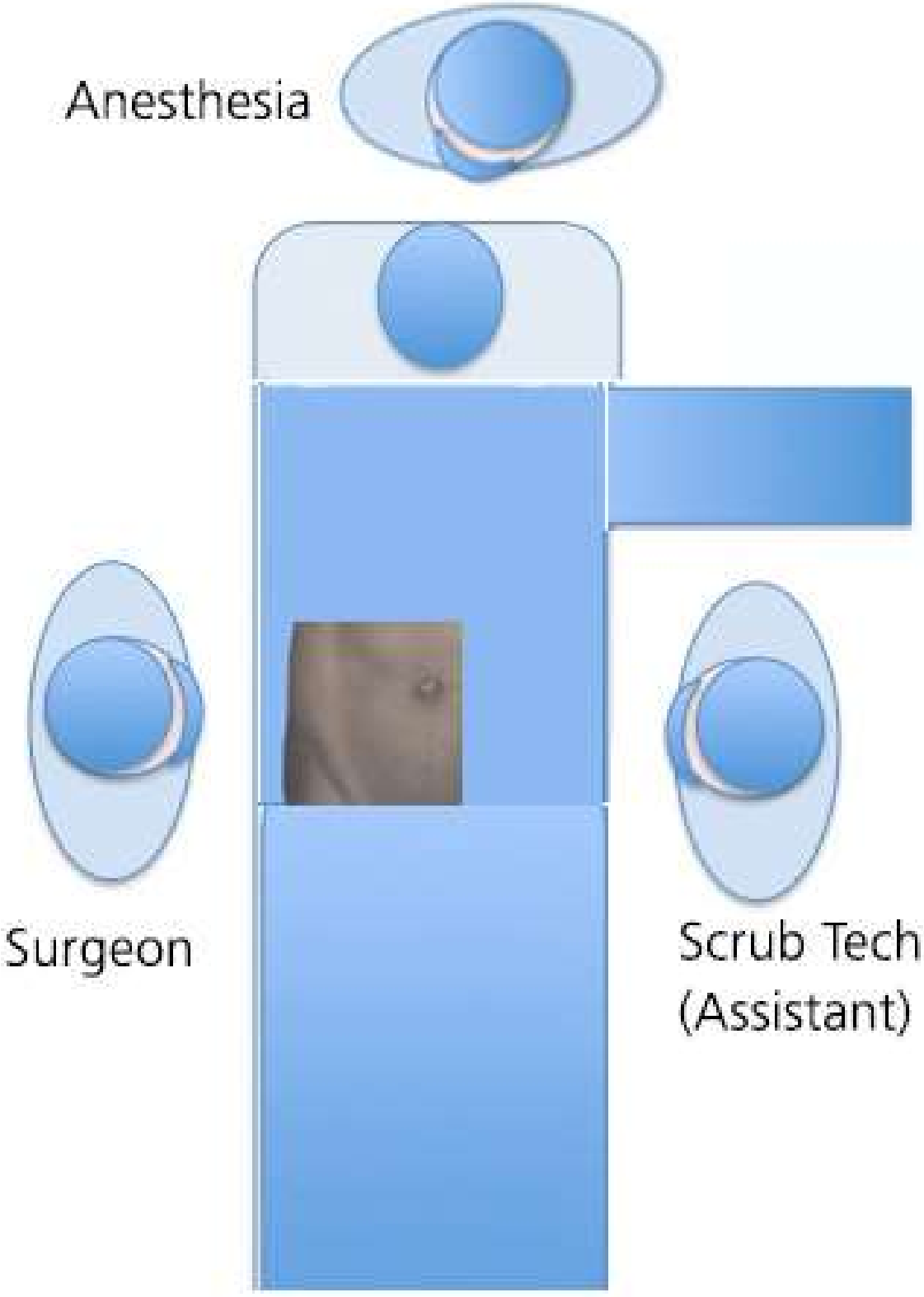
Kocher Clamp



Scissors

Sutures

Room Setup



Preoperative Patient Preparation

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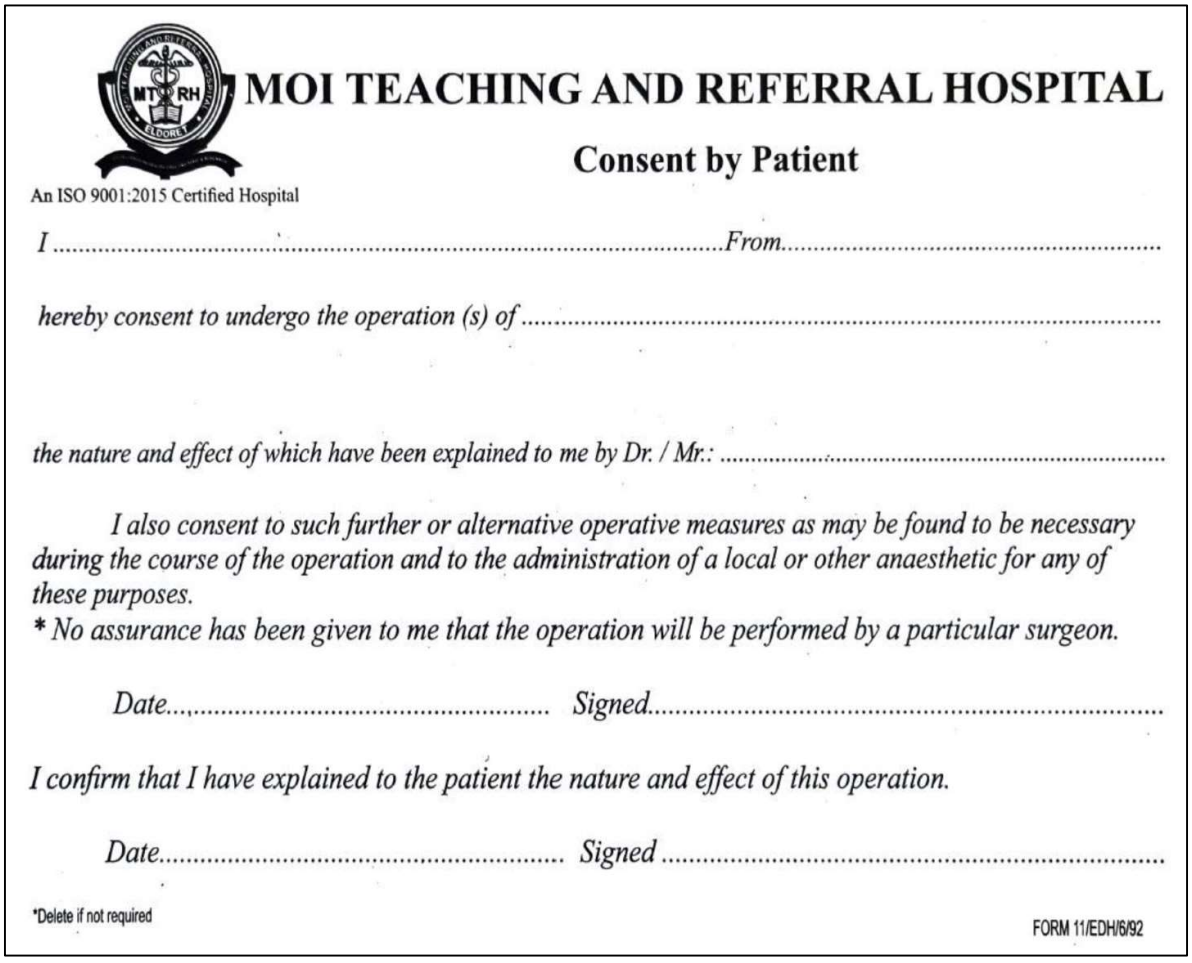
1 Informed Consent

All patients must give consent for the procedure and declaring understanding of its risks.



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An ISO 9001:2015 Certified Hospital

Consent by Patient

I .....*From*.....

hereby consent to undergo the operation (s) of .....

the nature and effect of which have been explained to me by Dr. / Mr.: .....

I also consent to such further or alternative operative measures as may be found to be necessary during the course of the operation and to the administration of a local or other anaesthetic for any of these purposes.

** No assurance has been given to me that the operation will be performed by a particular surgeon.*

Date..... *Signed*.....

I confirm that I have explained to the patient the nature and effect of this operation.

Date..... *Signed* .....

*Delete if not required

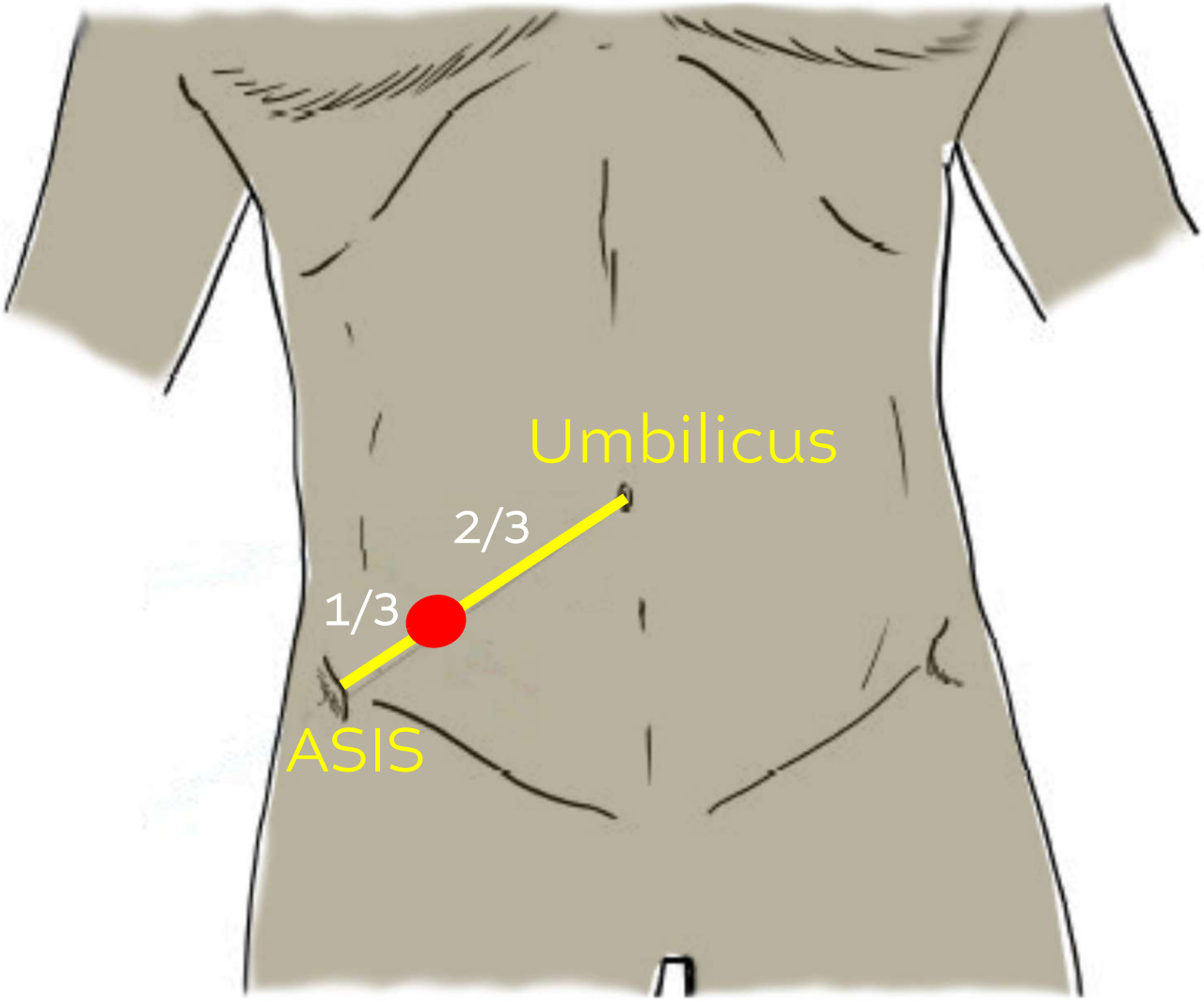
FORM 11/EDH/6/92

2 | Mark Point of Maximum Tenderness

McBurney's point (in red)

- McBurney's point is the point that is 1/3rd the distance from the ASIS to the umbilicus

This point roughly corresponds to the most common location of the base of the appendix. Severe tenderness at McBurney's point suggests later stages of an acute appendicitis and increased likelihood of rupture.

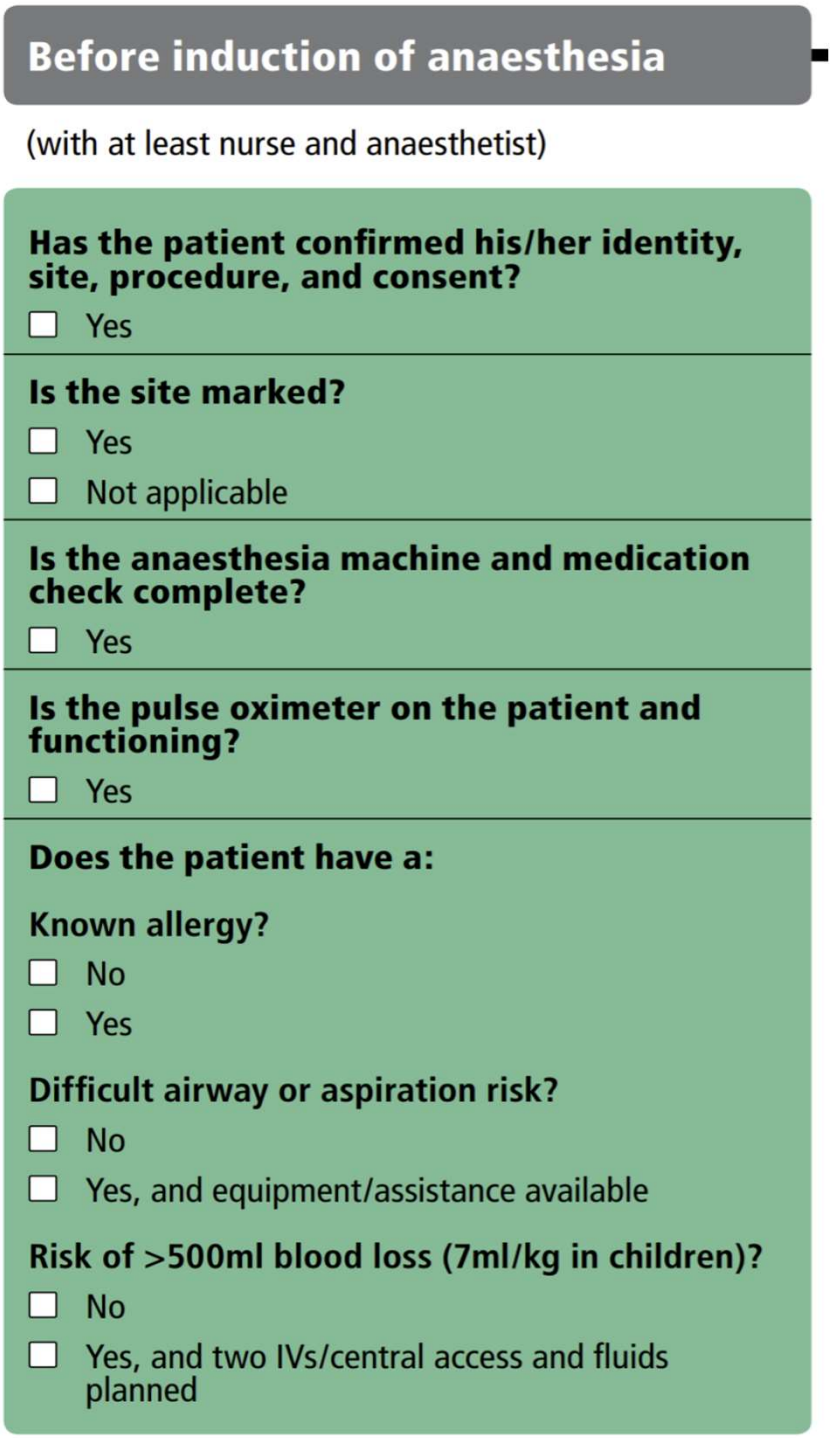


WHO Checklist

AMPATH Surgical App

3 | WHO Checklist Prior to Anesthesia

- The tool is designed to improve surgical safety by incorporating all operating room team members to complete safety checks as a group.



Before induction of anaesthesia

(with at least nurse and anaesthetist)

Has the patient confirmed his/her identity, site, procedure, and consent?

☐ Yes

Is the site marked?

☐ Yes

☐ Not applicable

Is the anaesthesia machine and medication check complete?

☐ Yes

Is the pulse oximeter on the patient and functioning?

☐ Yes

Does the patient have a:

Known allergy?

☐ No

☐ Yes

Difficult airway or aspiration risk?

☐ No

☐ Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

☐ No

☐ Yes, and two IVs/central access and fluids planned

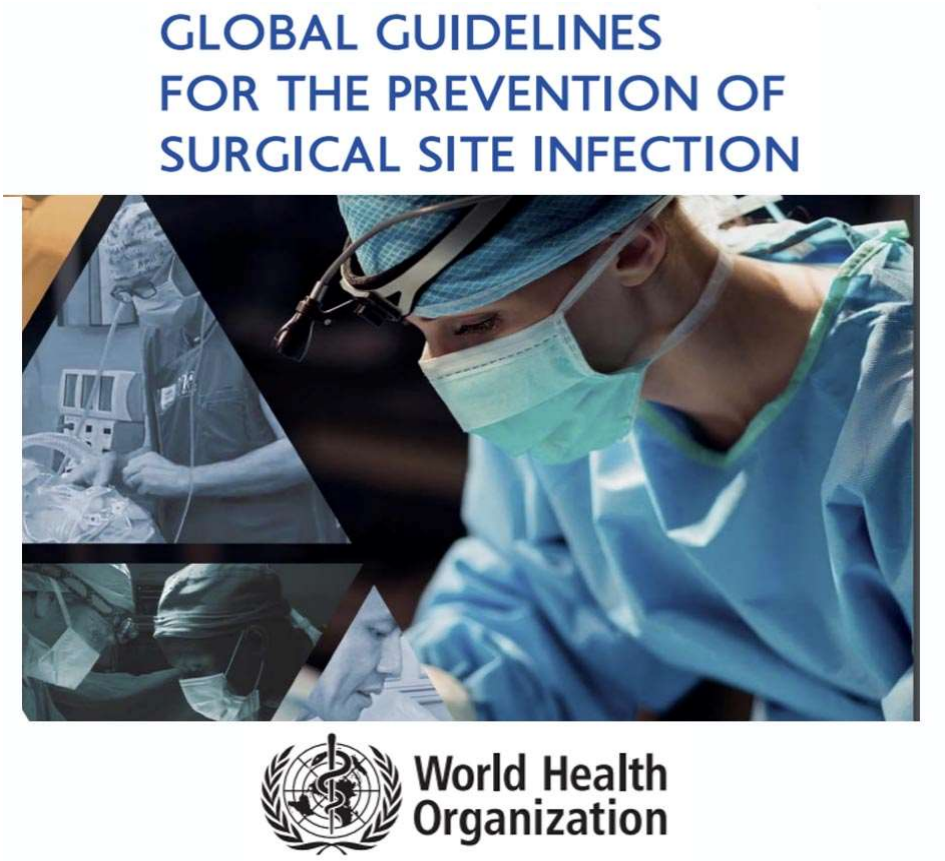
Link to the WHO Checklist

4 Anaesthesia

- General anaesthesia is preferred to promote complete muscle relaxation.
  - If general anaesthesia is not available or the anaesthesia provider is uncomfortable with general anaesthesia, spinal anaesthesia may be used.
  - Consider transferring the patient if you believe the anaesthesia available is not adequate for the procedure.

5 Antibiotics

- Antibiotics should be dosed within 120 minutes before surgical incision, while considering the half-life of the antibiotic.



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WHO Guidelines for Antibiotics PDF

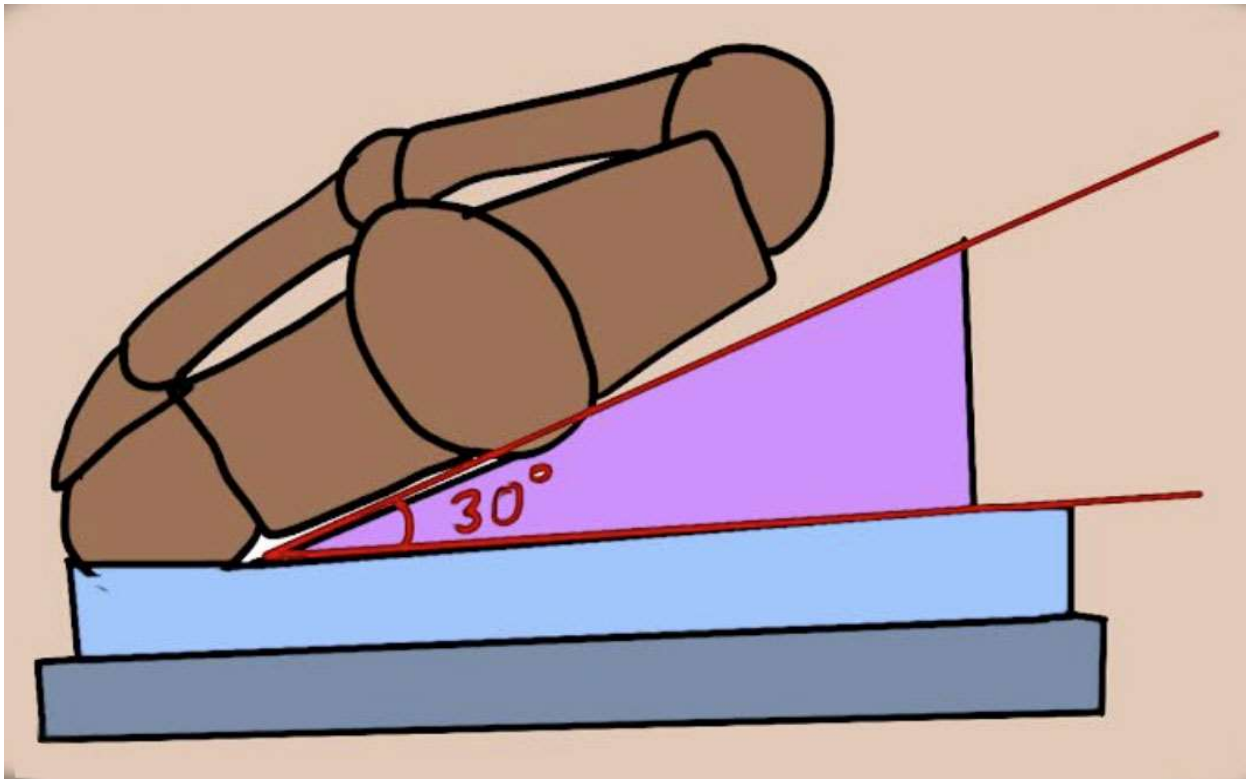
- Consider 2nd generation cephalosporin (cefotetan, cefoxitin, cefuroxime) OR 3rd generation cephalosporin (ceftriaxone, cefotaxime, ceftazidime) if available.

Slide 78

JL [2]17 Line the PDF. If you need the URL, it is https://www.who.int/gpsc/global-guidelines-web.pdf
Jeffrey Levy, 8/2/2021

6 Patient Positioning

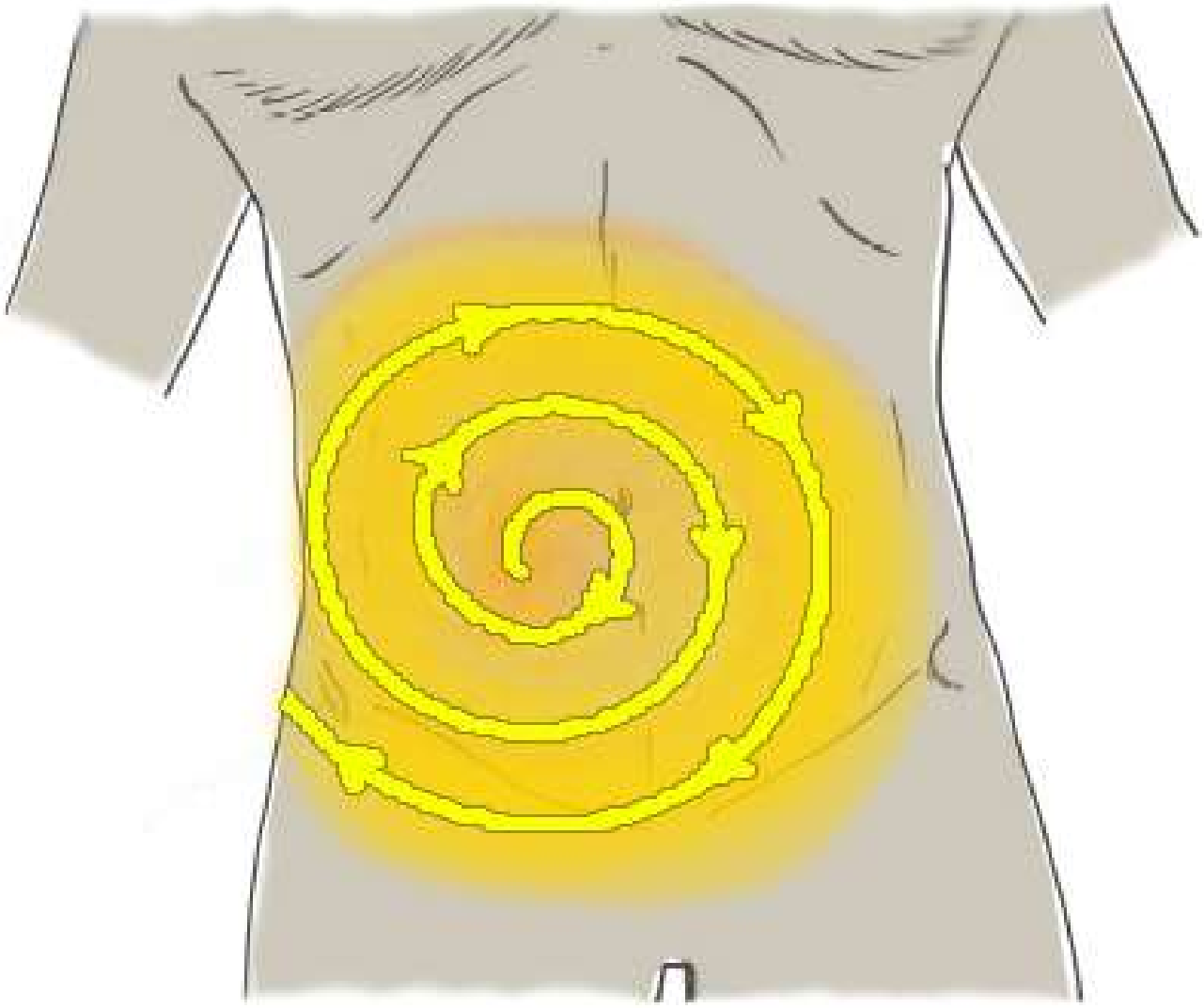
Place patient supine on the operative table and tilt bed 30 degrees to the left with the right side up. This will move the small bowel to the left of the abdomen. This can also be accomplished with a wedge or towels under the right side of the patient.



7 Prepare the Adbomen

Prepare the abdomen with sanitizing solution from the xiphoid process to 2 cm below the pubic symphysis and from the right to the left of the ASIS

- Solution options – 70% alcohol, chlorohexidine, betadine



8 Drape the Abdomen

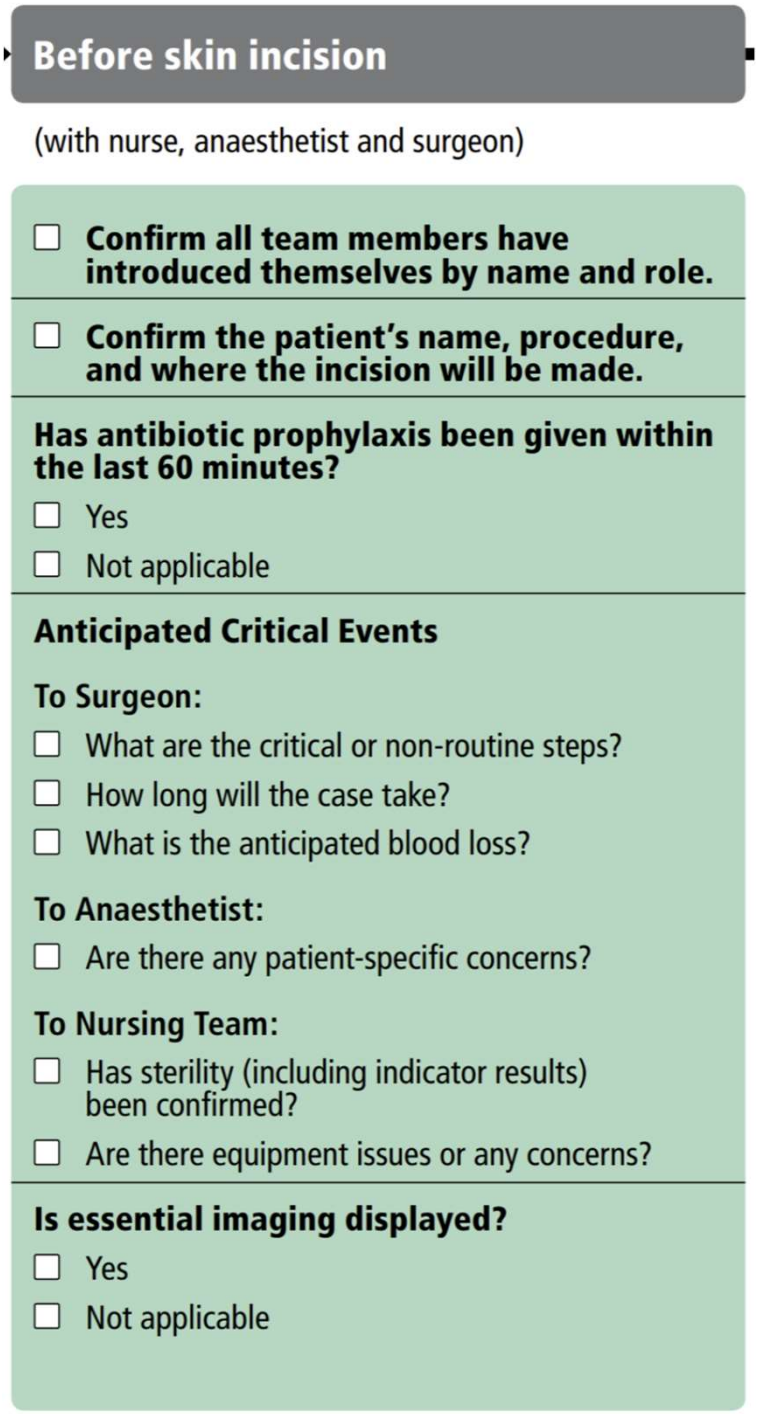
Ensure the umbilicus, pubic symphysis and right anterior superior iliac spine are exposed

WHO Checklist

AMPATH Surgical App

9 | WHO Checklist Before Skin Incision

- The tool is designed to improve surgical safety by incorporating all operating room team members to complete safety checks as a group.



Before skin incision

(with nurse, anaesthetist and surgeon)

☐ **Confirm all team members have introduced themselves by name and role.**

☐ **Confirm the patient's name, procedure, and where the incision will be made.**

Has antibiotic prophylaxis been given within the last 60 minutes?

☐ Yes

☐ Not applicable

Anticipated Critical Events

To Surgeon:

☐ What are the critical or non-routine steps?

☐ How long will the case take?

☐ What is the anticipated blood loss?

To Anaesthetist:

☐ Are there any patient-specific concerns?

To Nursing Team:

☐ Has sterility (including indicator results) been confirmed?

☐ Are there equipment issues or any concerns?

Is essential imaging displayed?

☐ Yes

☐ Not applicable

Link to the WHO Checklist

Mental Rehearsal

Preoperative/Preincision Steps

- Informed Consent
- Mark Point of Maximum Tenderness
- WHO Checklist – Prior to Anesthesia
- Anesthesia
- Antibiotics
- Patient Positioning
- Prepare the Abdomen
- Drape the Abdomen
- WHO Checklist – Prior to Skin Incision

Safe Abdominal Entry

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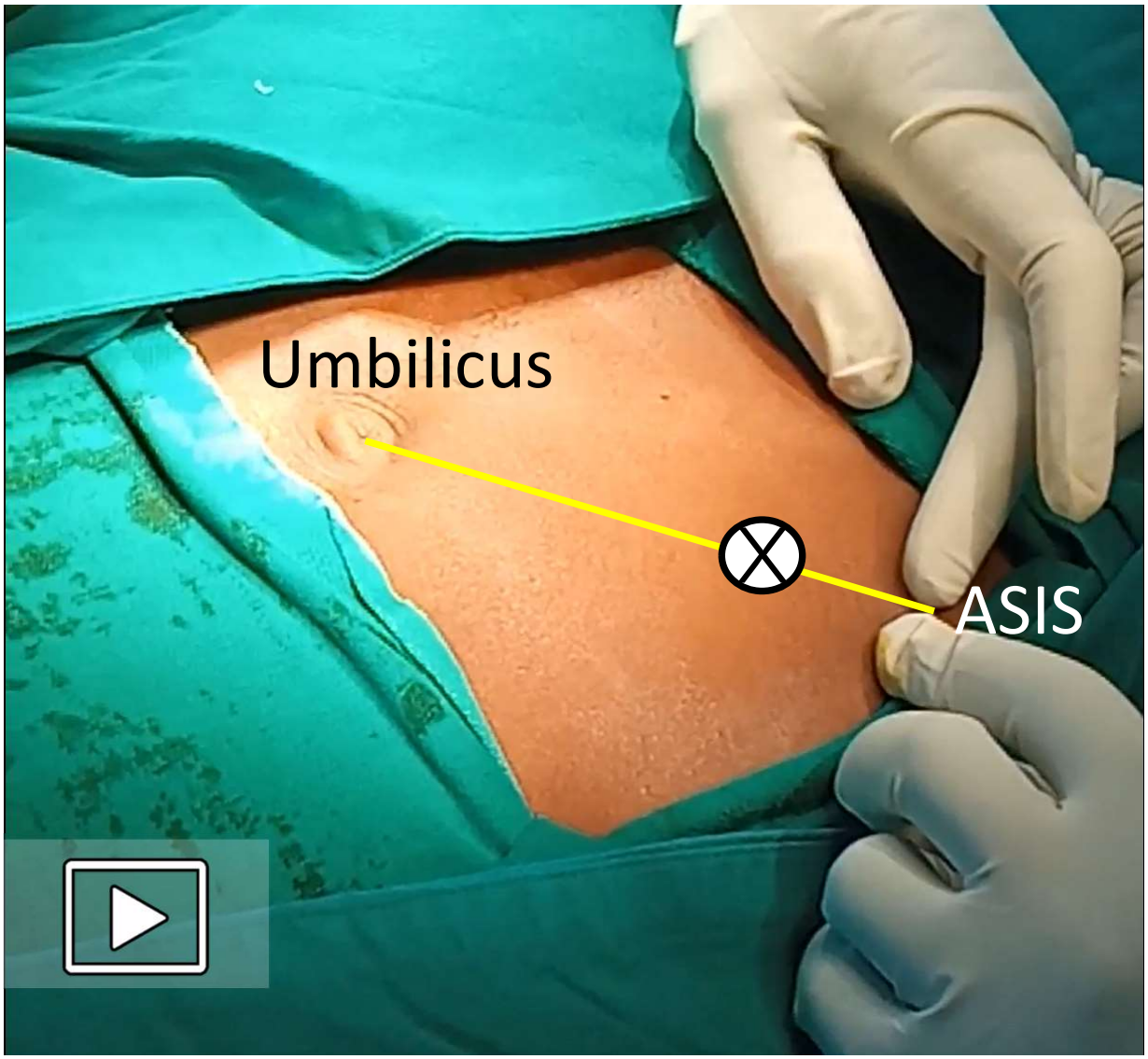
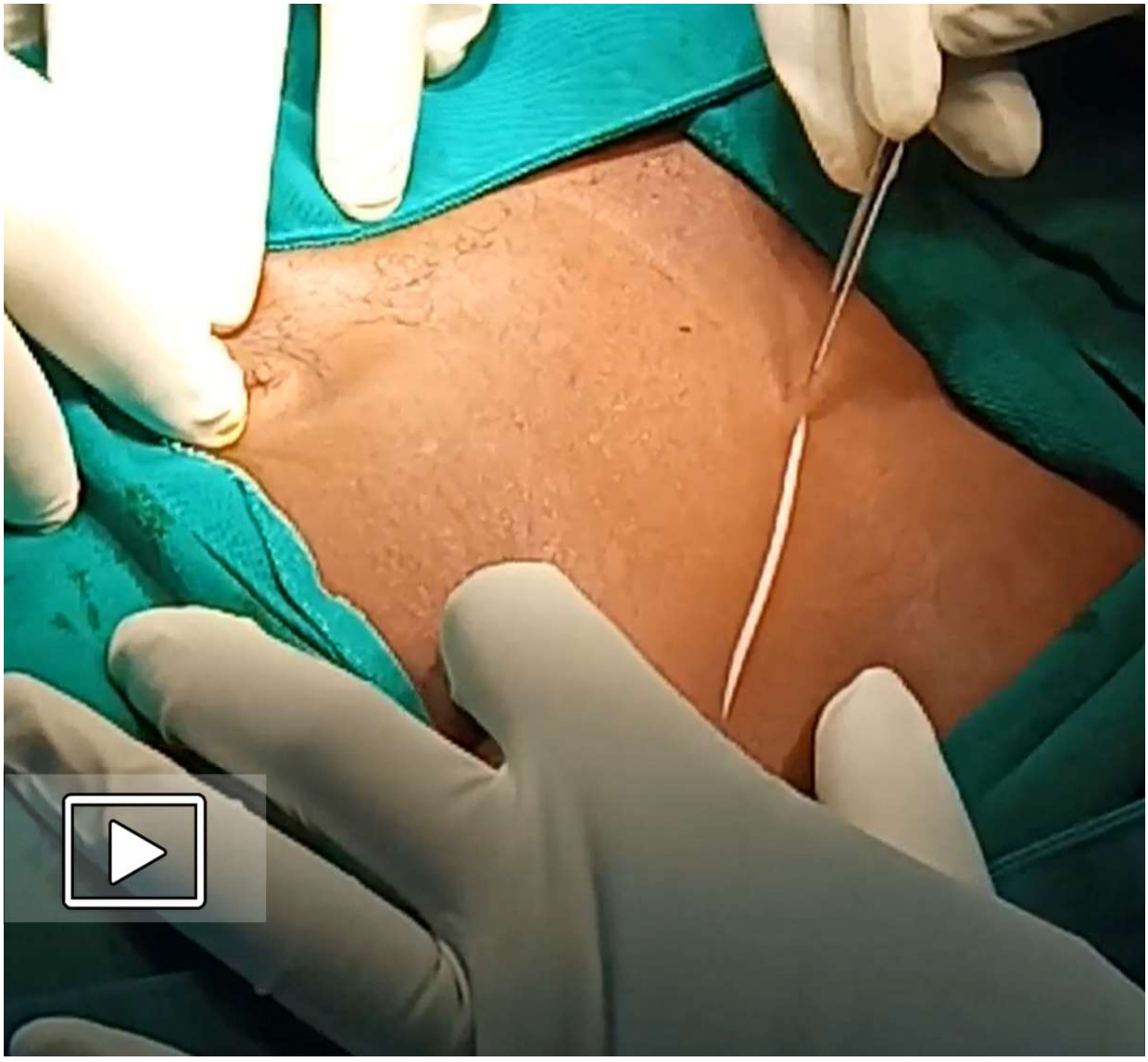
2 | Identify McBurney's Point

A. Draw the line from the right anterior superior iliac spine (ASIS) to the umbilicus.
B. Identify the point of max tenderness (or McBurney's point).



1 Skin Incision

Using a scalpel make a 4-6 cm incision along lines of Langer that is bisected by the point of interest.

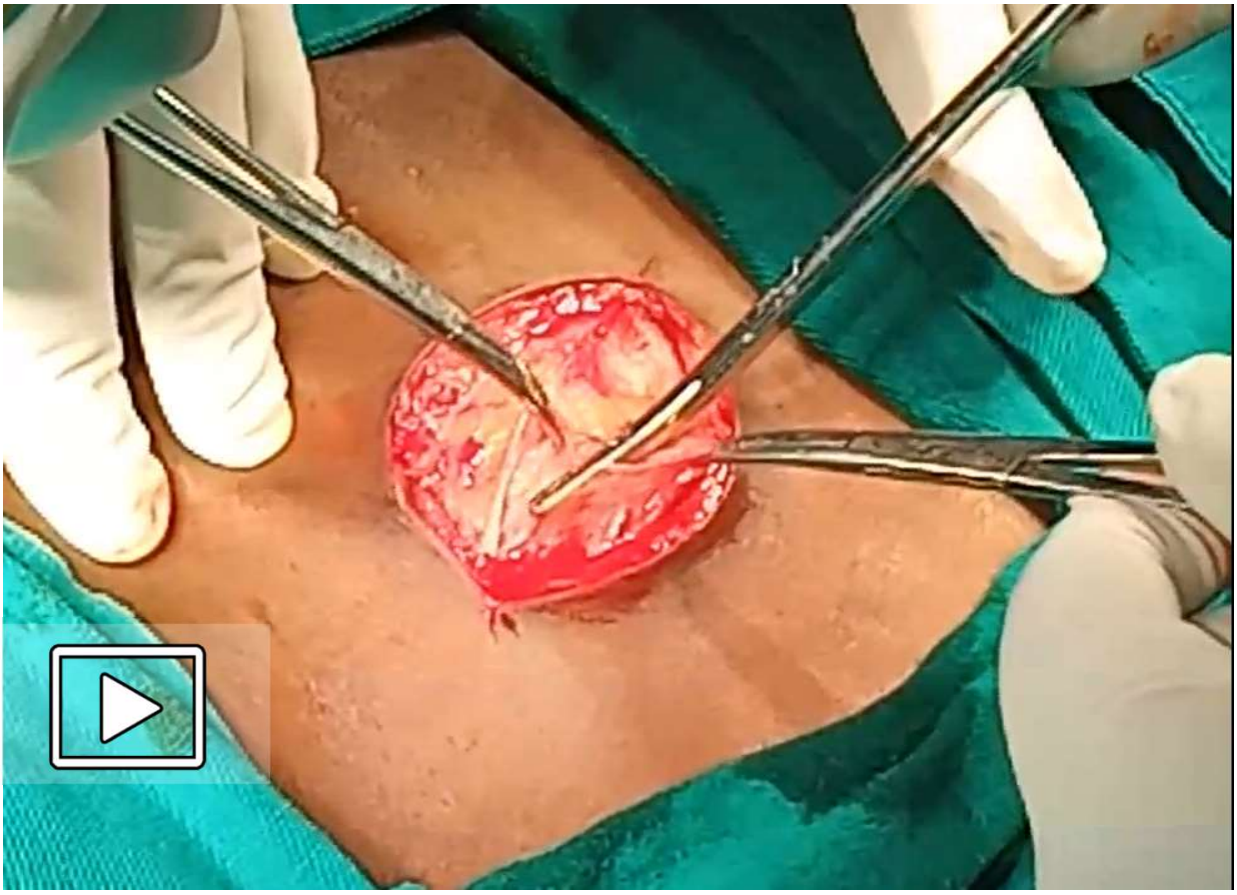


3 Soft Tissue Dissection

Use sharp dissection with diathermy. There will be two layers including a fatty layer and then a membranous layer (Scarpa's). There may also be a small layer of fat below the membranous layer.

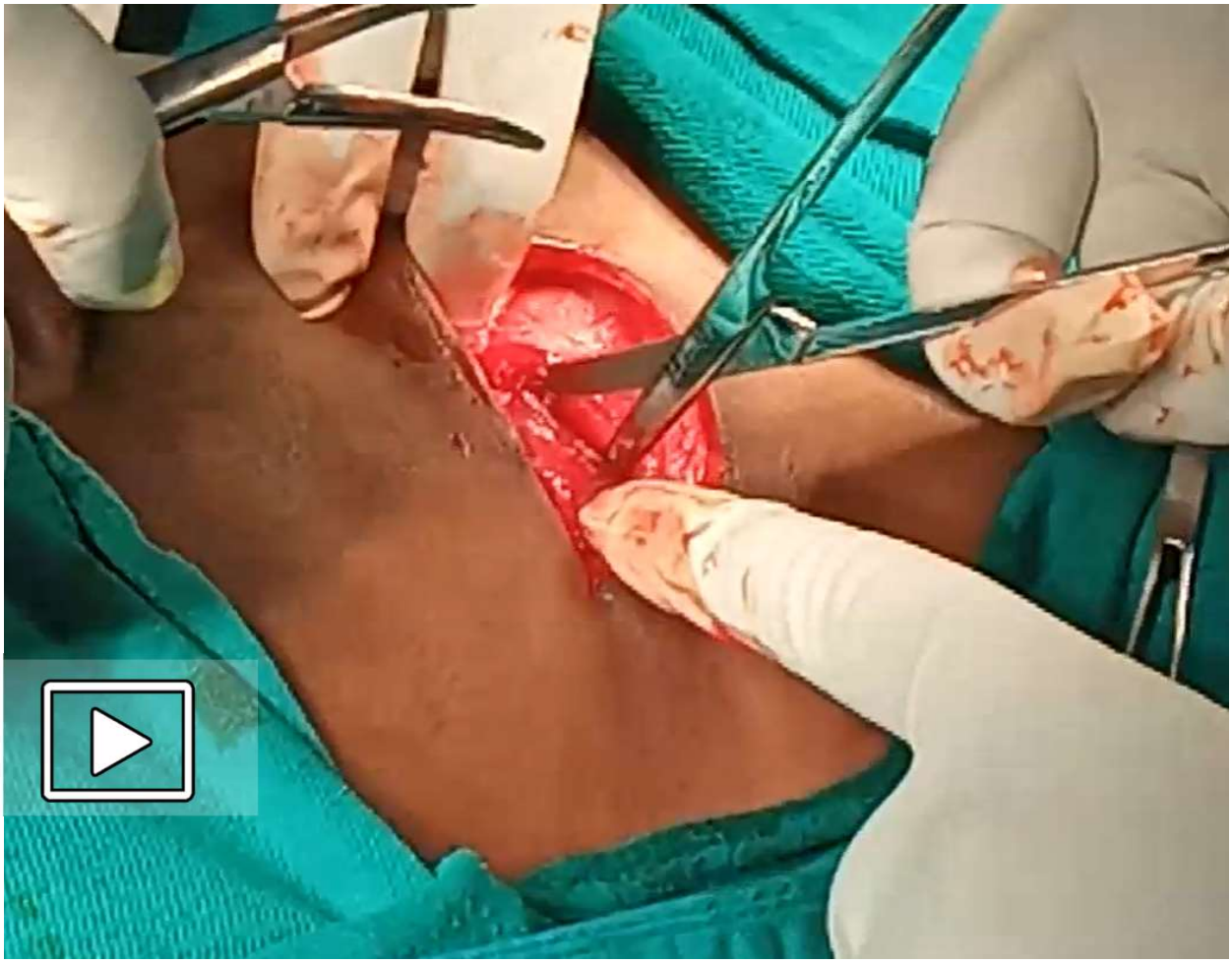
4 Aponeurosis Layer

Grasp the external oblique aponeurosis with a haemostat and incise with Metzenbaum scissors. The fibers point medially to inferiorly.



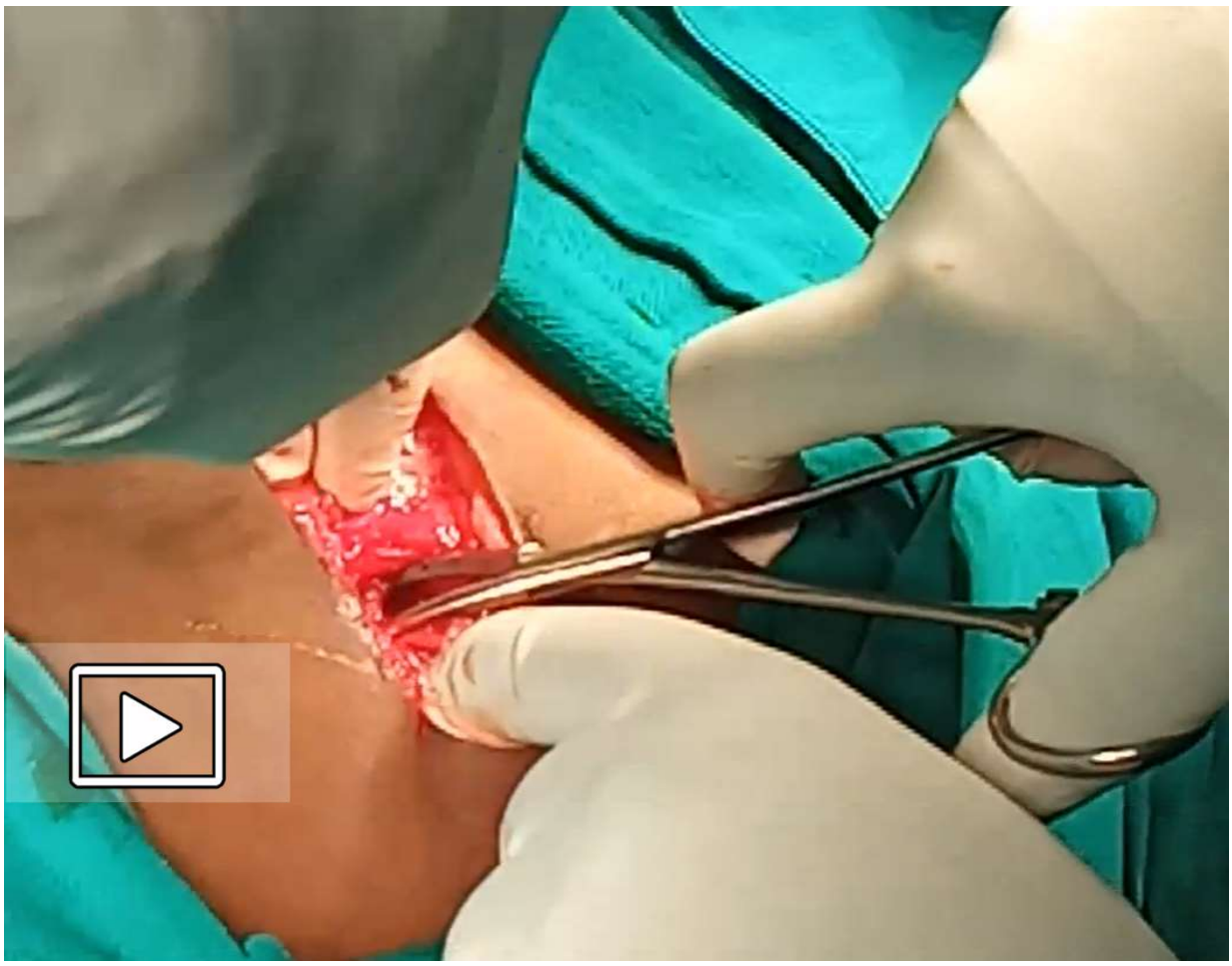
5 Muscle Dissection

The first layer of the muscle to be dissected is the **external oblique**. Its fibers run parallel to the incision. To dissect through the muscle, you will put a haemostat into the muscle and bluntly spread it along the pattern of the muscle fibers to create an opening wide enough to fit two army-navy retractors. You will then place the retractors into the opening and pull to continue to spread the opening along the length of the muscle.



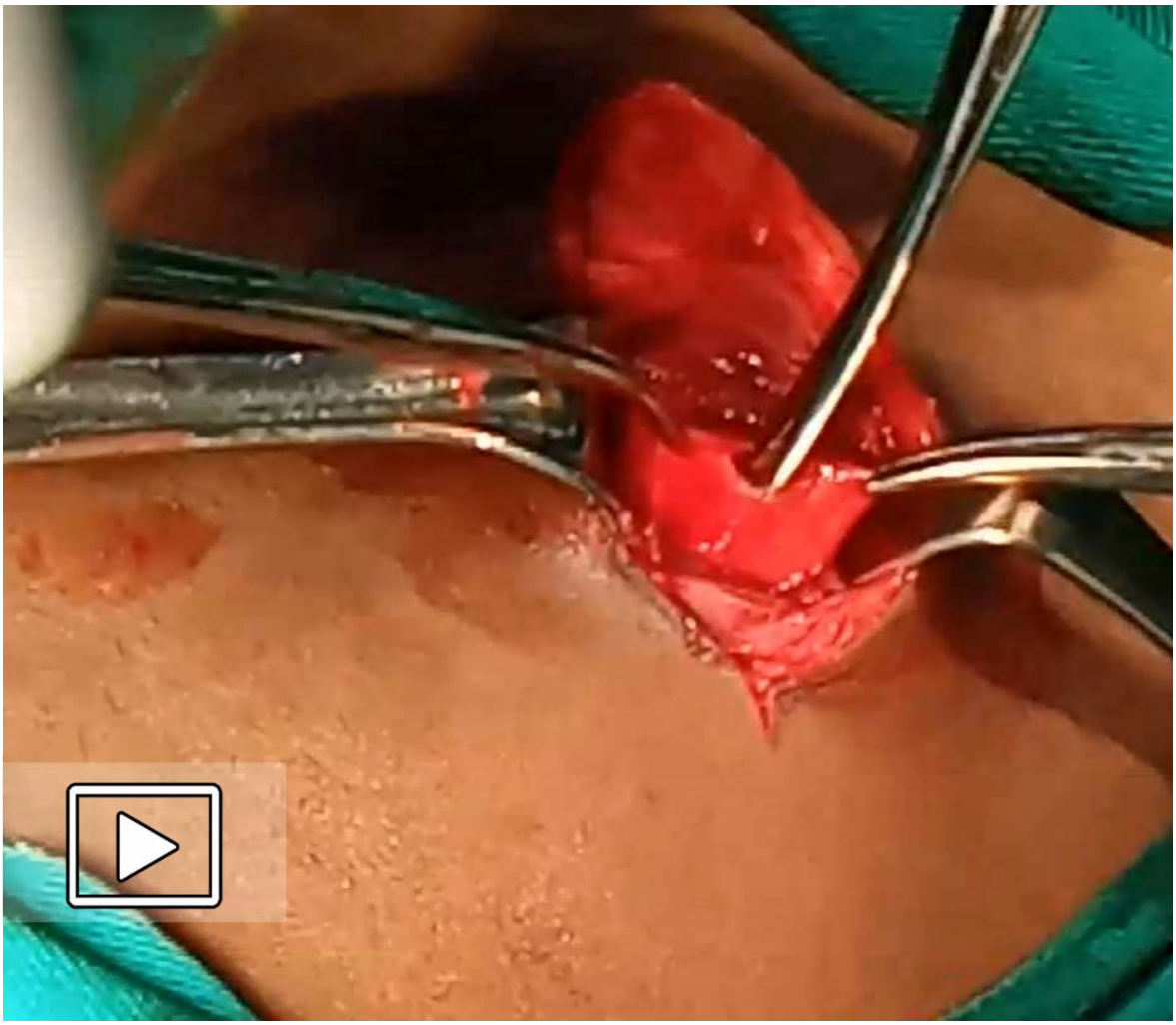
6 | Muscle Dissection Continued

The second layer of the muscle to be dissected is the **internal oblique**. Its fibers point medially and superiorly, or perpendicular to the incision toward the left shoulder. put a haemostat into the muscle and bluntly spread it along the pattern of the muscle fibers to create an opening wide enough to fit two army-navy retractors. You will then place the retractors into the opening and pull to continue to spread the opening along the length of the muscle.



7 Peritoneum

The last layer you will encounter before entering the abdominal cavity is the peritoneum. You will grasp the edge of the peritoneum with a haemostat and elevate it and place a second haemostat 5 mm away from the original. Then palpate the elevated peritoneum to ensure there is no bowel or omentum within the contents and then sharply incise it.



Cognitive Task

What do you do if you encounter some purulent fluid upon entering the abdomen?

A. You don't need to do anything
B. Suction the fluid only
C. Aspirate the fluid and send it for culture
D. Dissect out any tissues touching the fluid.

Cognitive Task

The Correct answer is C, aspirate the fluid and send for culture.

- Serous fluid - suction
- Murky fluid – obtain culture
- Purulent fluid – obtain culture
- Abscess – gently attempt to bluntly dissect away from the anterior and lateral abdominal walls, obtain culture if purulent
- Omentum – gently attempt to bluntly dissect away from the anterior and lateral abdominal wall

for culture

D. Dissect out any tissues touching the fluid.

Identification of the Appendix

AMPATH Surgical App

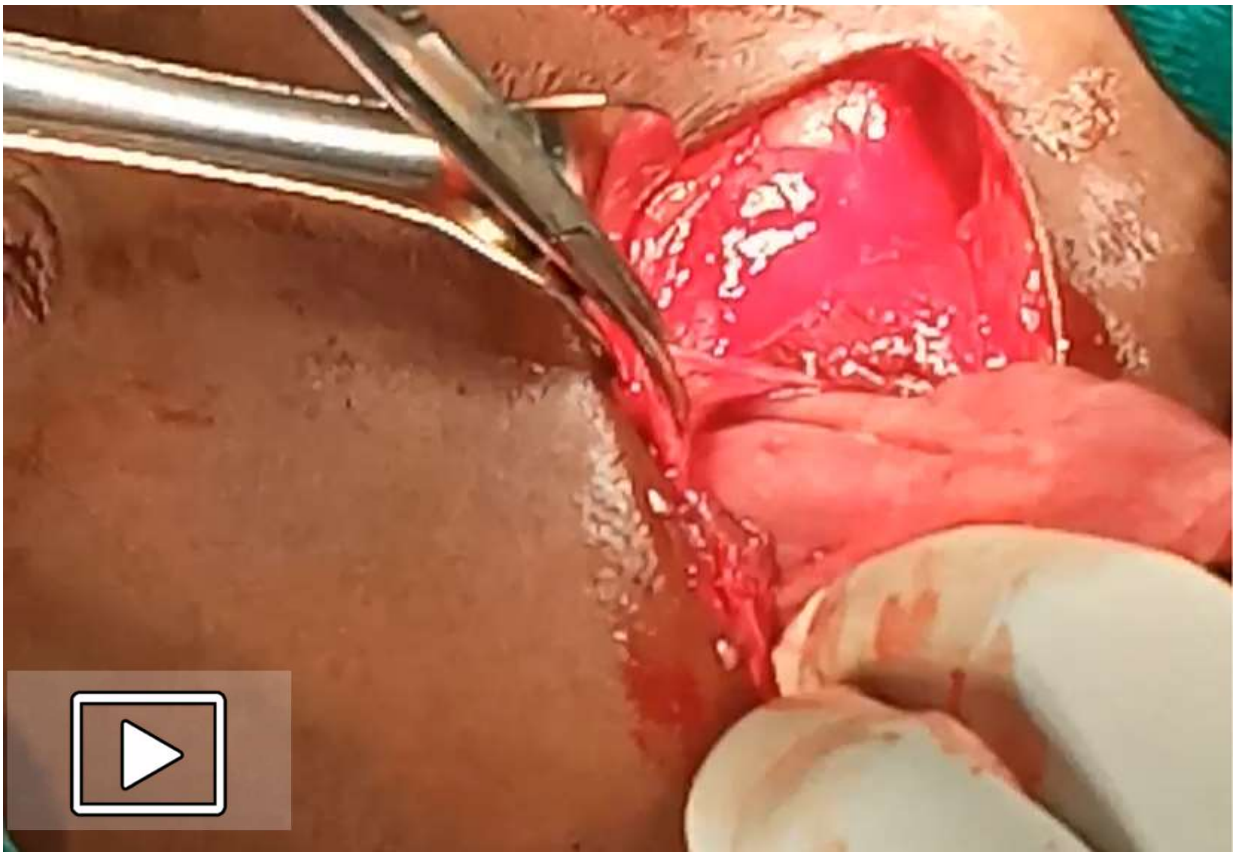
1 Obtaining Proper Visualization

Ensure the light is appropriately positioned to visualize the cecum.
Retract the muscles with two army-navy retractors by tucking in the retractor under the peritoneum and elevating the muscle
Use a sponge stick to tuck the small bowel to the left of the abdominal cavity

- If the small bowel does not stay out of the field, place a wet abdominal mop to tuck away the bowel

2 Identify the Cecum

Visualize the anterior taenia coli. Follow the taenia coli inferiorly to the base of the appendix. The cecum appears a lighter pink than the redder small bowel.

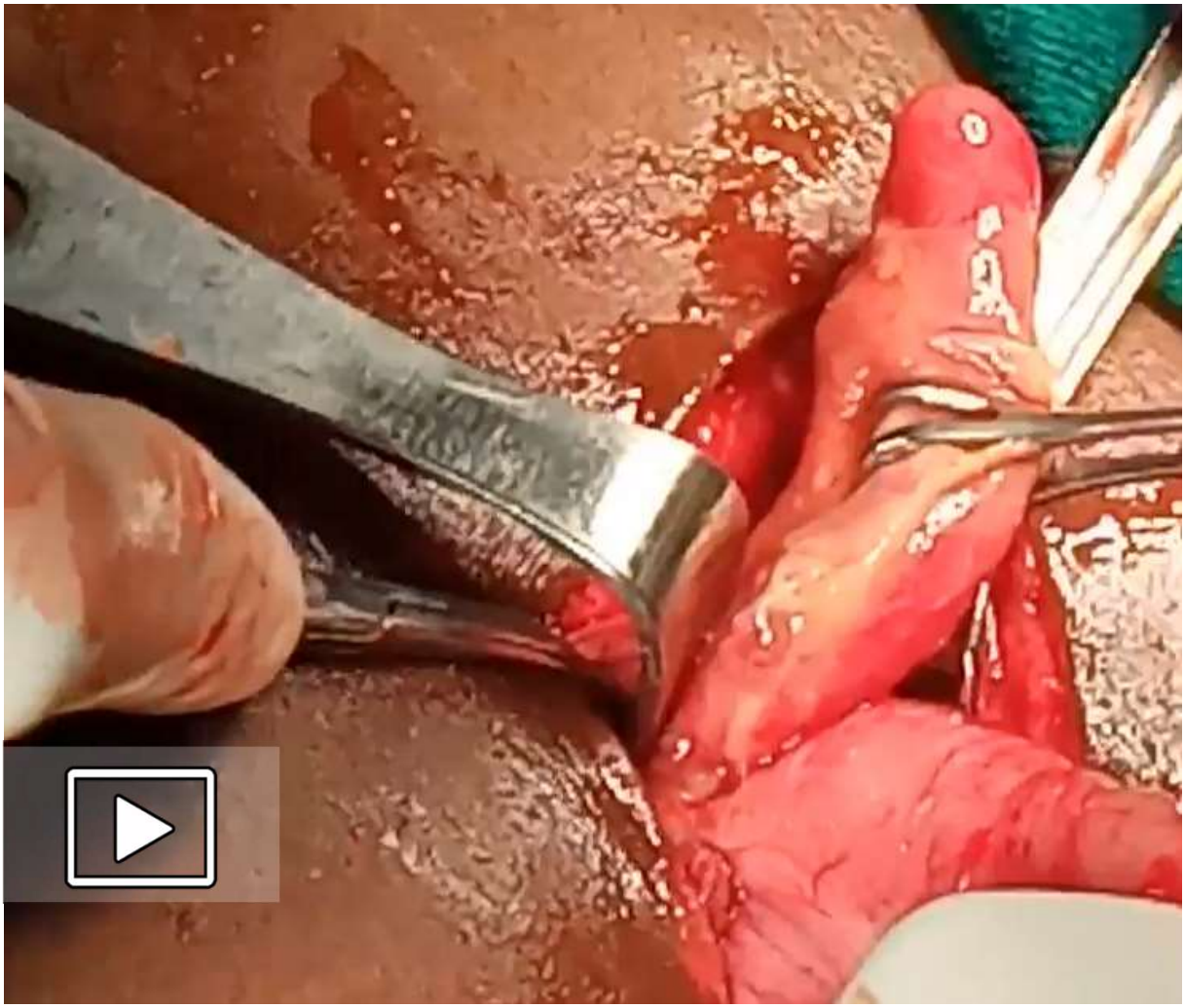


3 Deliver the Cecum

Grasp the cecum with a Babcock and using the Babcock in the left hand and the thumb and index in the right hand deliver the superior aspect first by retracting inferiorly and then the inferior portion by retracting superiorly.

4 Identify the Appendix

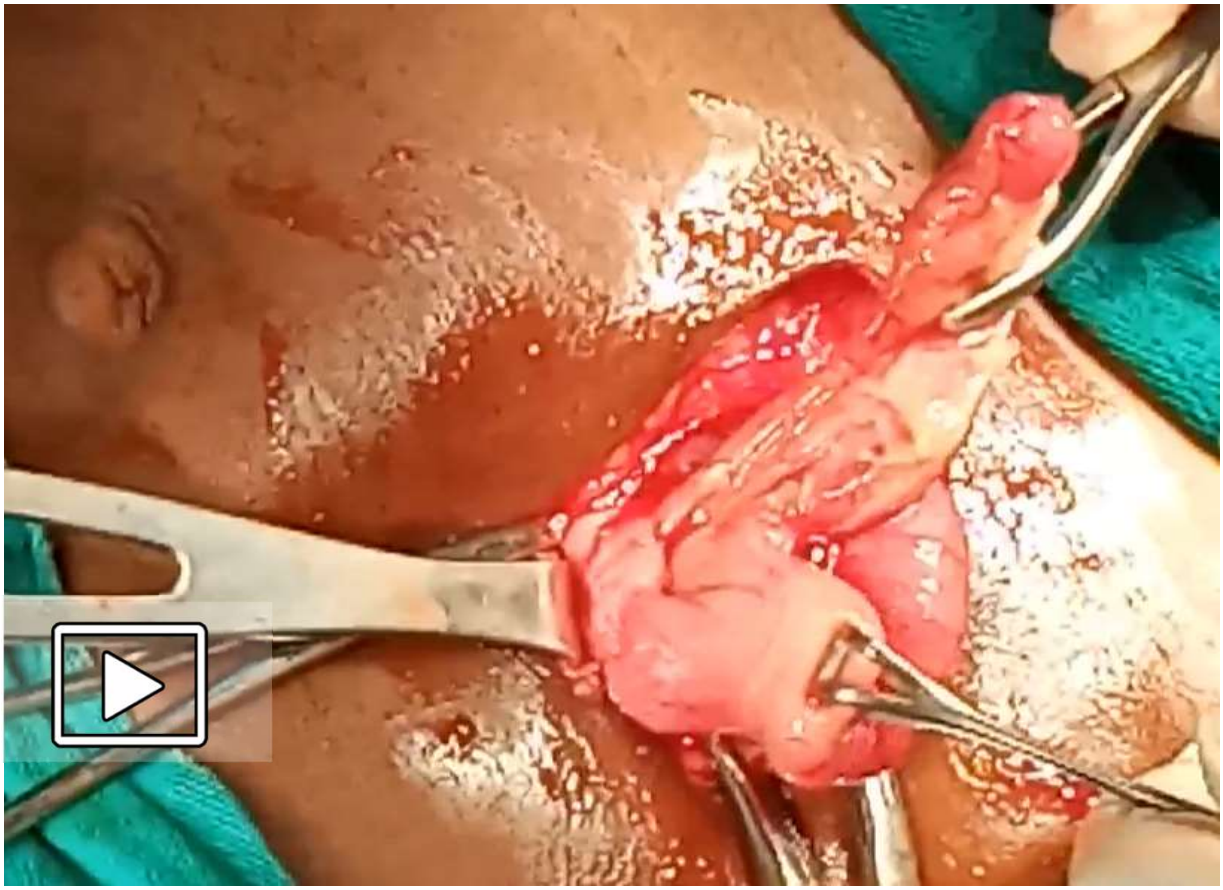
Follow the taenia coli where all 3 converge at the base of the appendix and atraumatically grasp the appendix within the Babcock such that it encases the appendix. Confirm the identity of the appendix by identifying attachment to the cecum and identification of the terminal ileum.



5 | Assess the Appendix

Determine the extent of pathology of the appendix to determine next steps of the procedure.

- Inflamed Appendix: Complete the appendectomy
- Gangrenous Base: Assess if there is enough healthy cecum. If not, consider closing and sending the patient to the referral center.
- Caecal tumour: Close the patient and write your operative note. Send the patient and the operative note to the referral centre for oncologic resection.

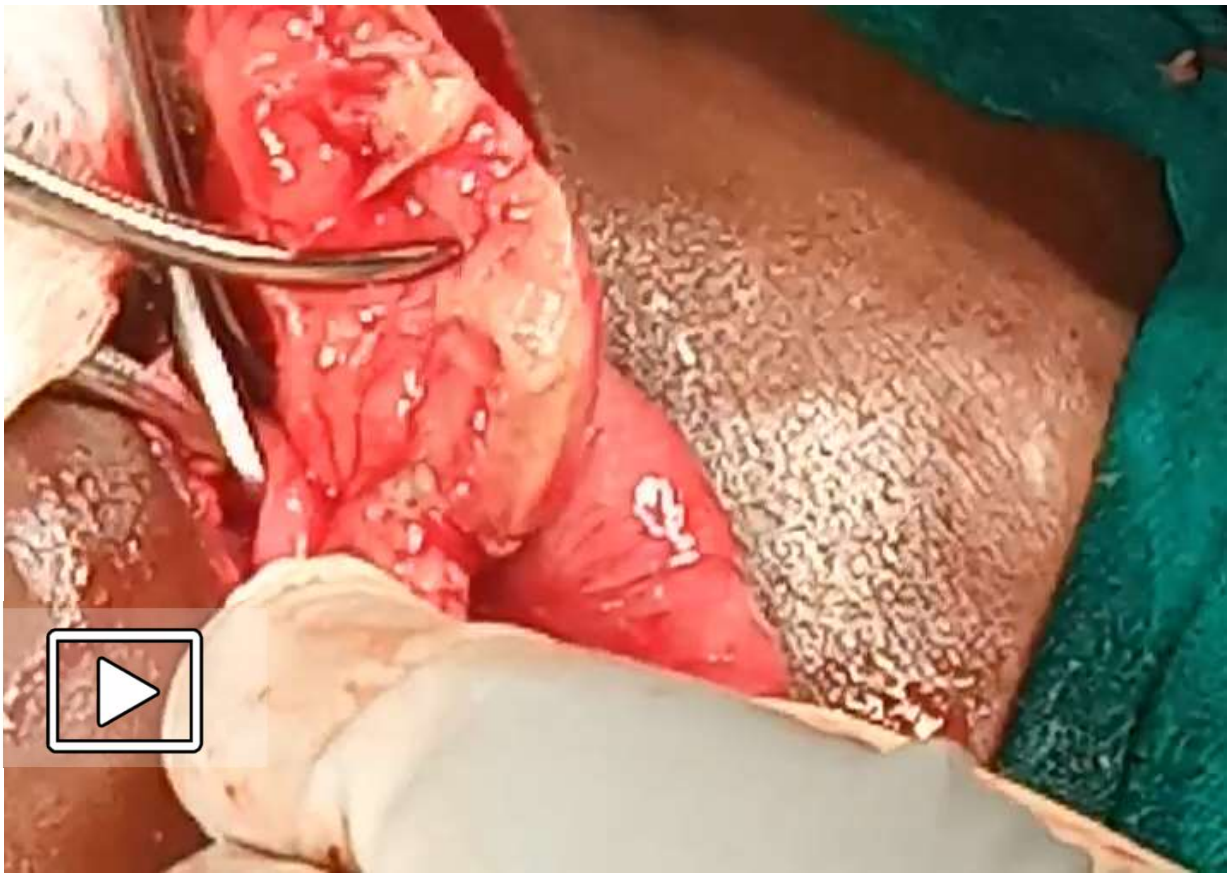


Appendectomy

AMPATH Surgical App

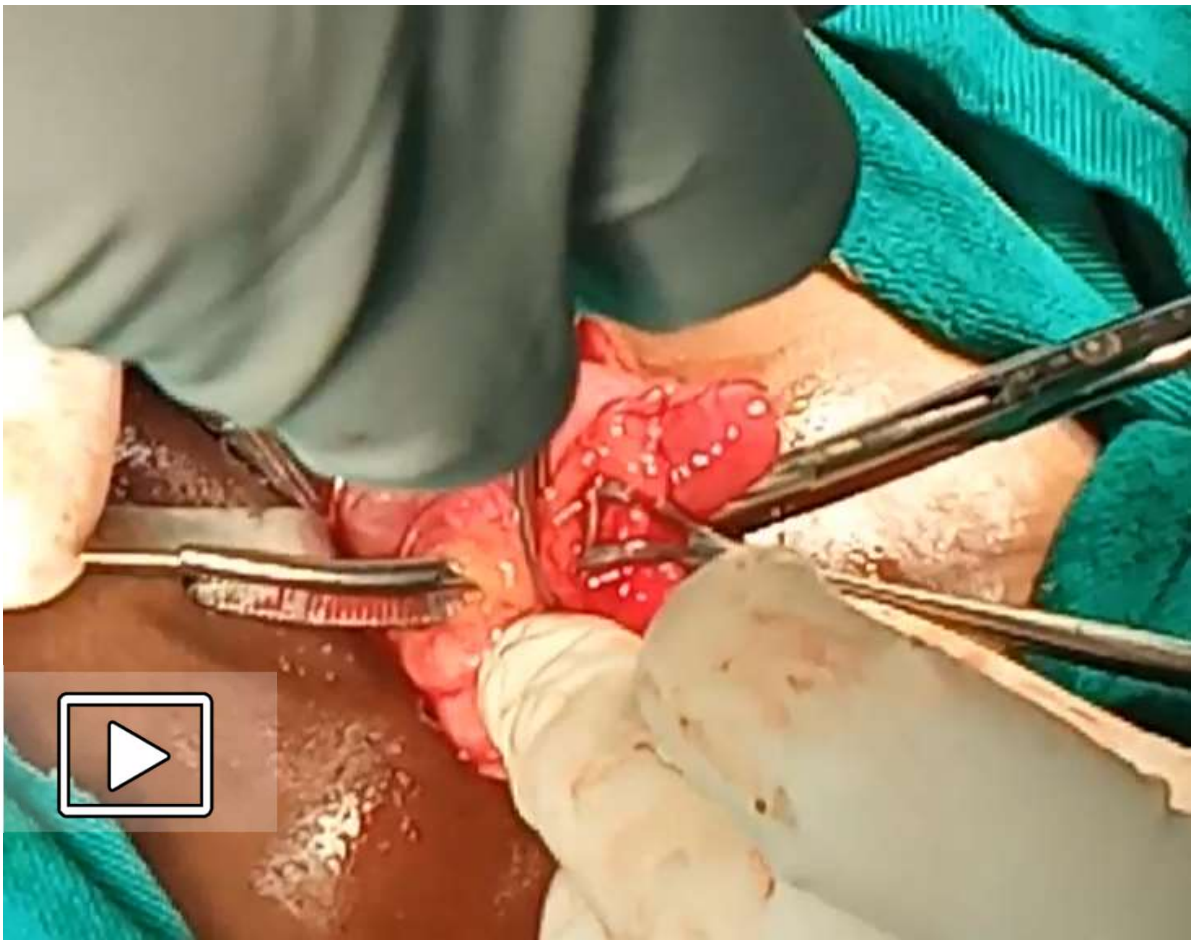
1 | Identify the Mesoappendix

Identify the mesoappendix. The mesoappendix contains the appendiceal artery.



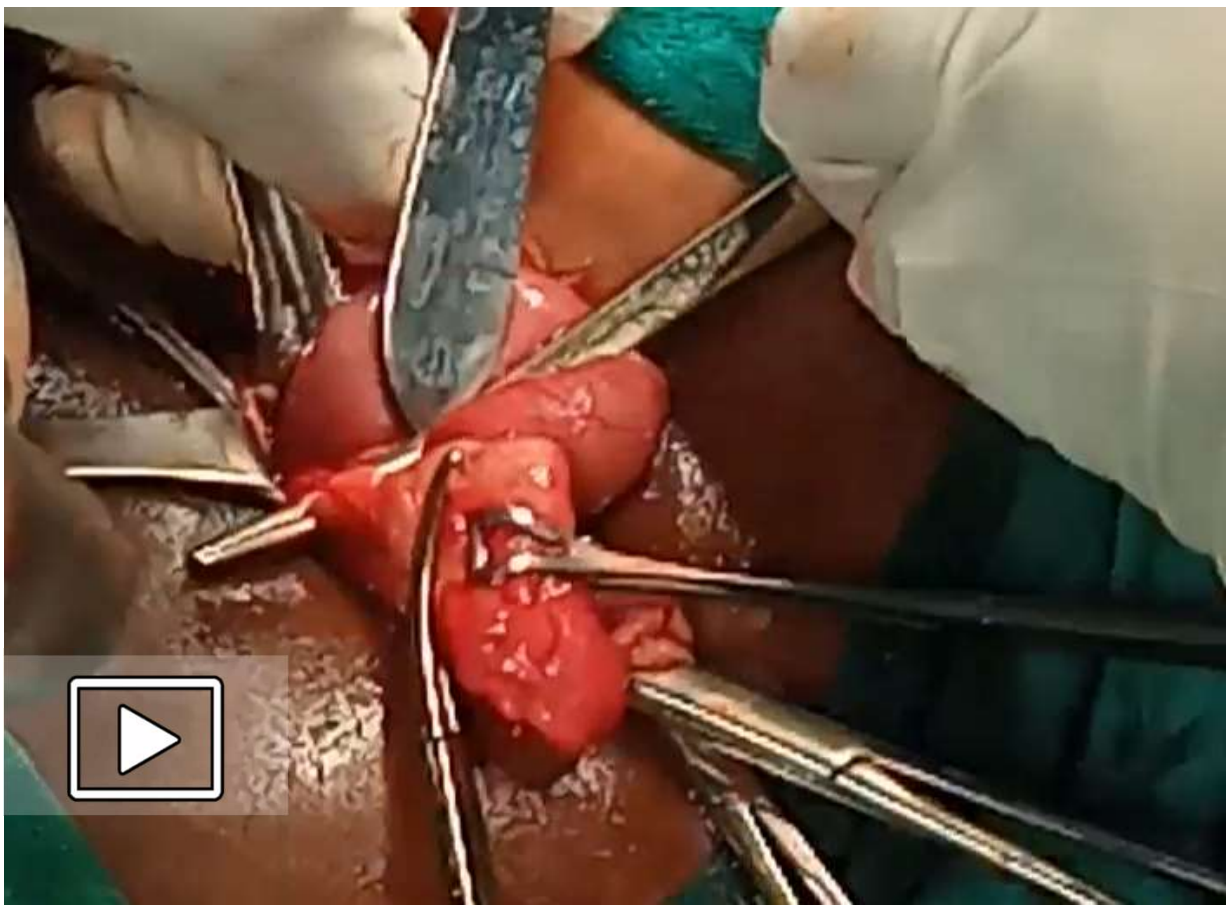
2 Create a Window

Create a small window within the mesoappendix near the base of the appendix by using a haemostat with the curve of the haemostat follows the curve of the appendix. Gently insert the haemostat tips into the mesoappendix near the base of the appendix and slowly spread, remove the haemostats while they are still open and repeat until you have created a window within the mesoappendix.



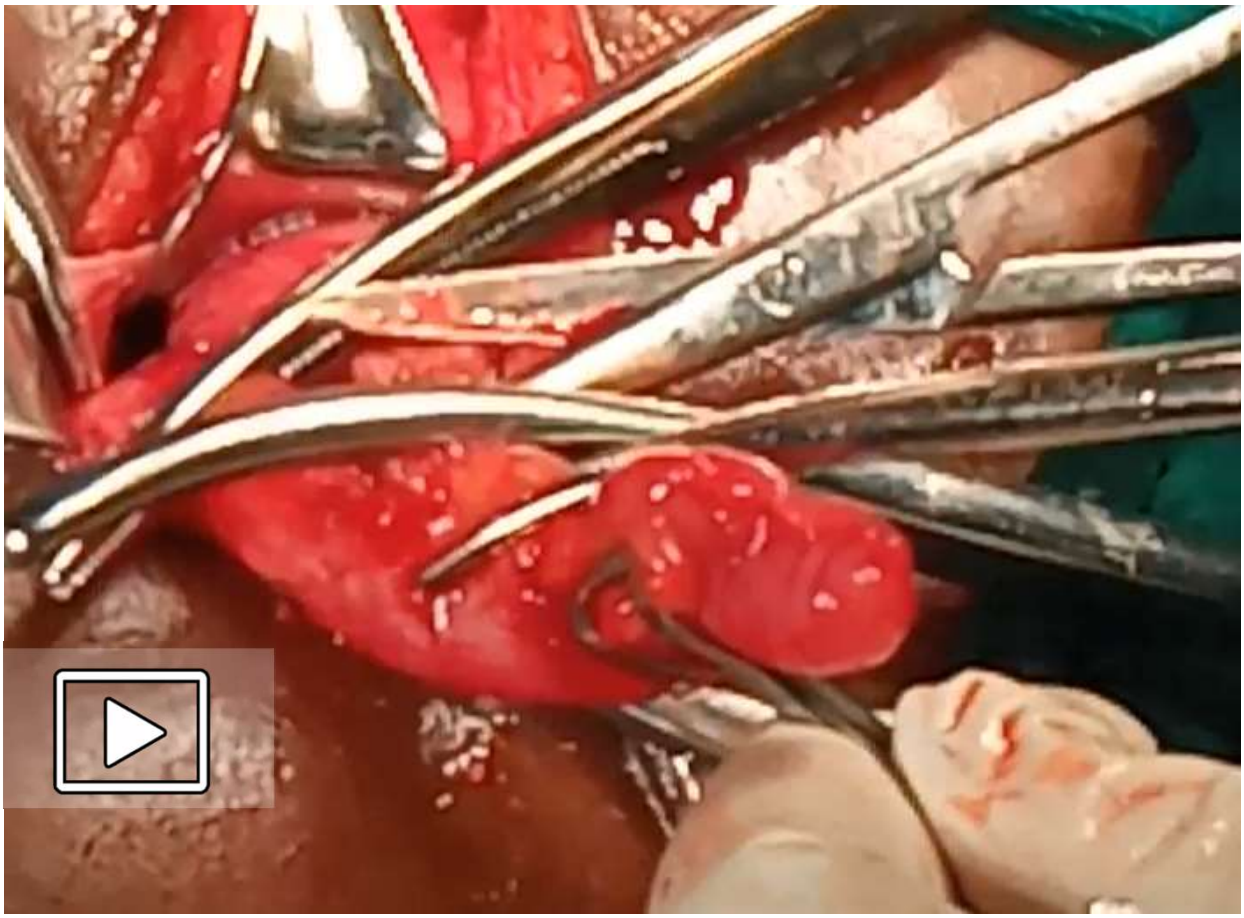
3 Clamp the Mesoappendix

Clamp the portion of the mesoappendix (that is now detached from the appendix) proximally near the base of the appendix with a haemostat. Clamp the portion of the mesoappendix (that is now detached from the appendix) distally near the end of the window with another haemostat.



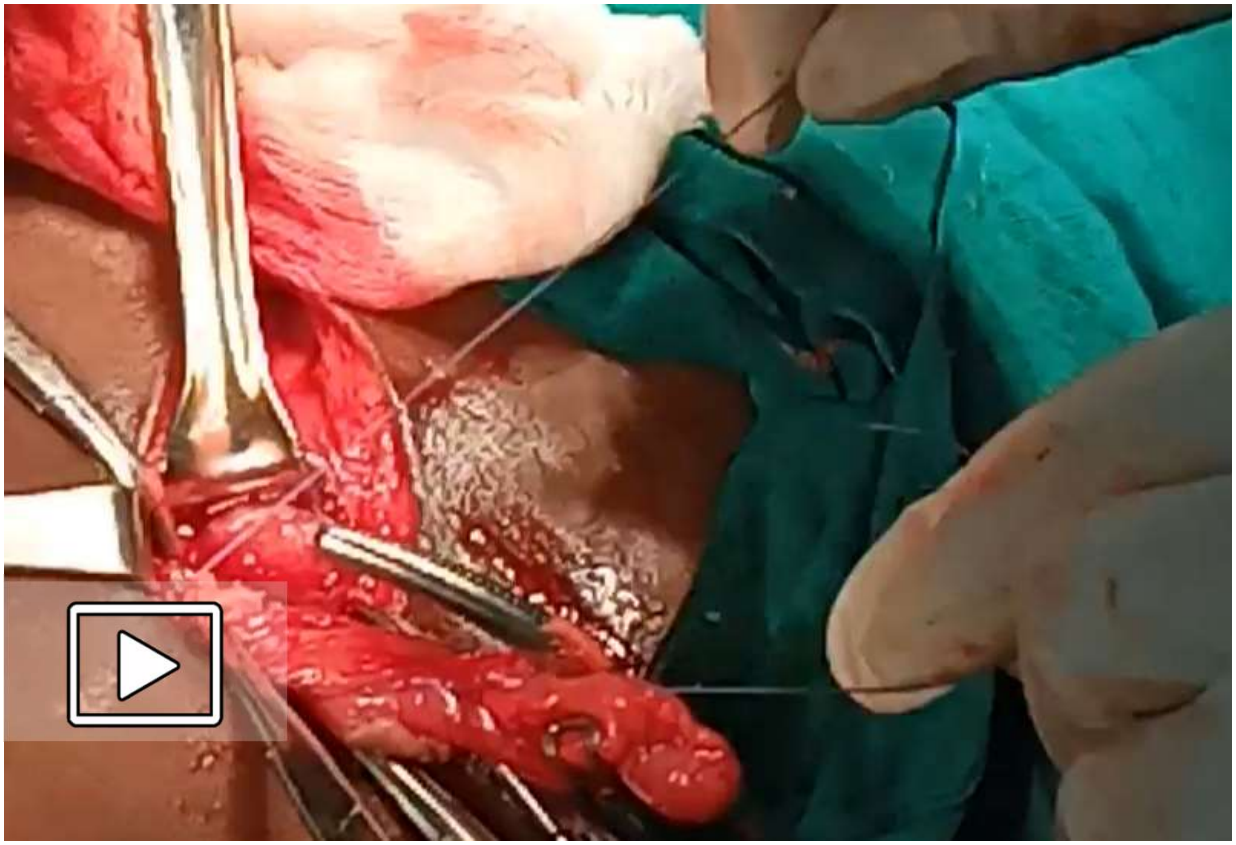
4 Cut the Mesoappendix

Using Metzenbaum scissors, divide the mesoappendix between the haemostats but leave the haemostats in place.



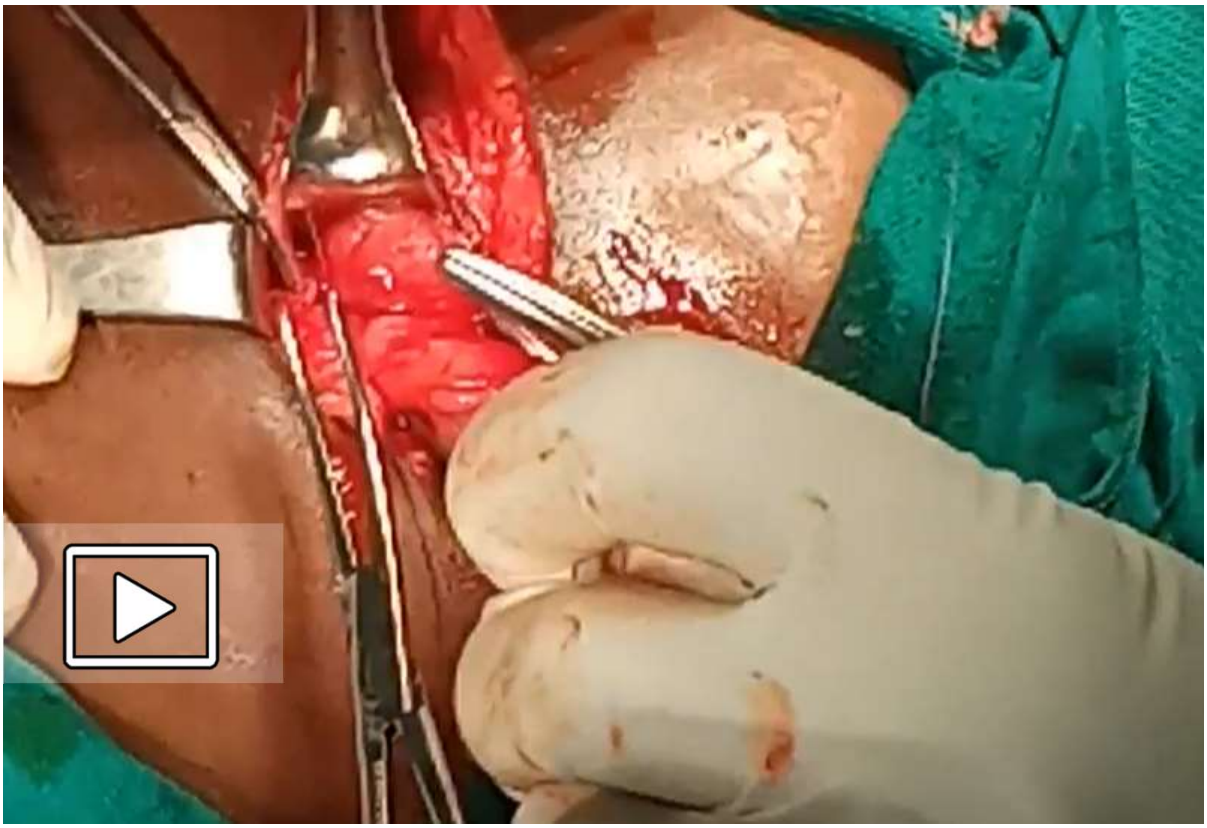
5 | Ligate the Mesoappendix

Using the end of your 2-0 vircyl, pass the suture around the haemostat, bring the suture down to the clamp in a tip-to-tip fashion which will allow the suture to be hooked under the clamp and throw your first knot.



6 | Remove Proximal Clamp

After your knot has been tightened, ask your assistant to slowly remove the haemostat from the vessel to ensure haemostasis; complete a total of 3 knots for vicryl.



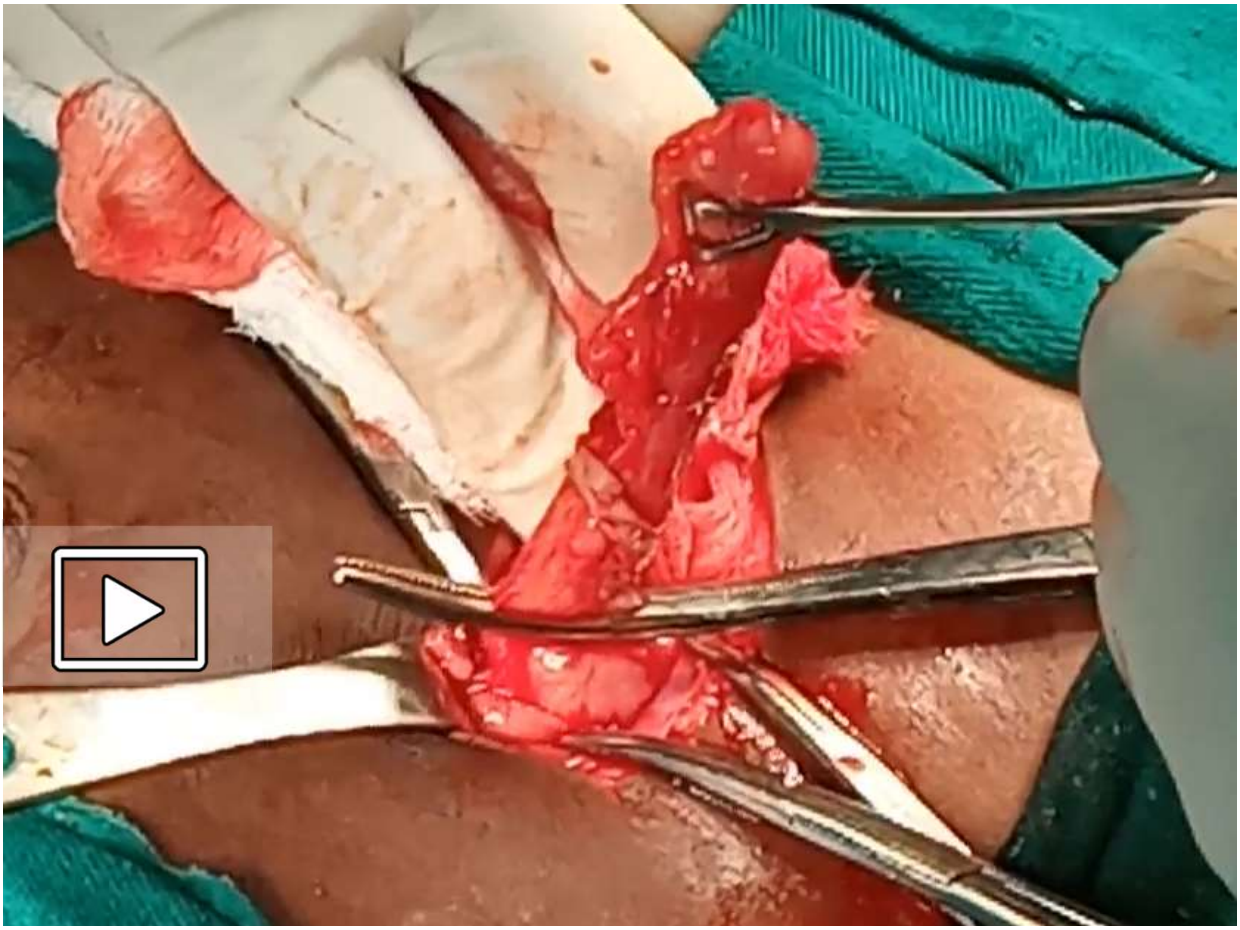
7 | Skeletonize Base of Appendix

Skeletonize the base of the appendix using blunt dissection.

8 | Place a Distal Clamp on the Appendix

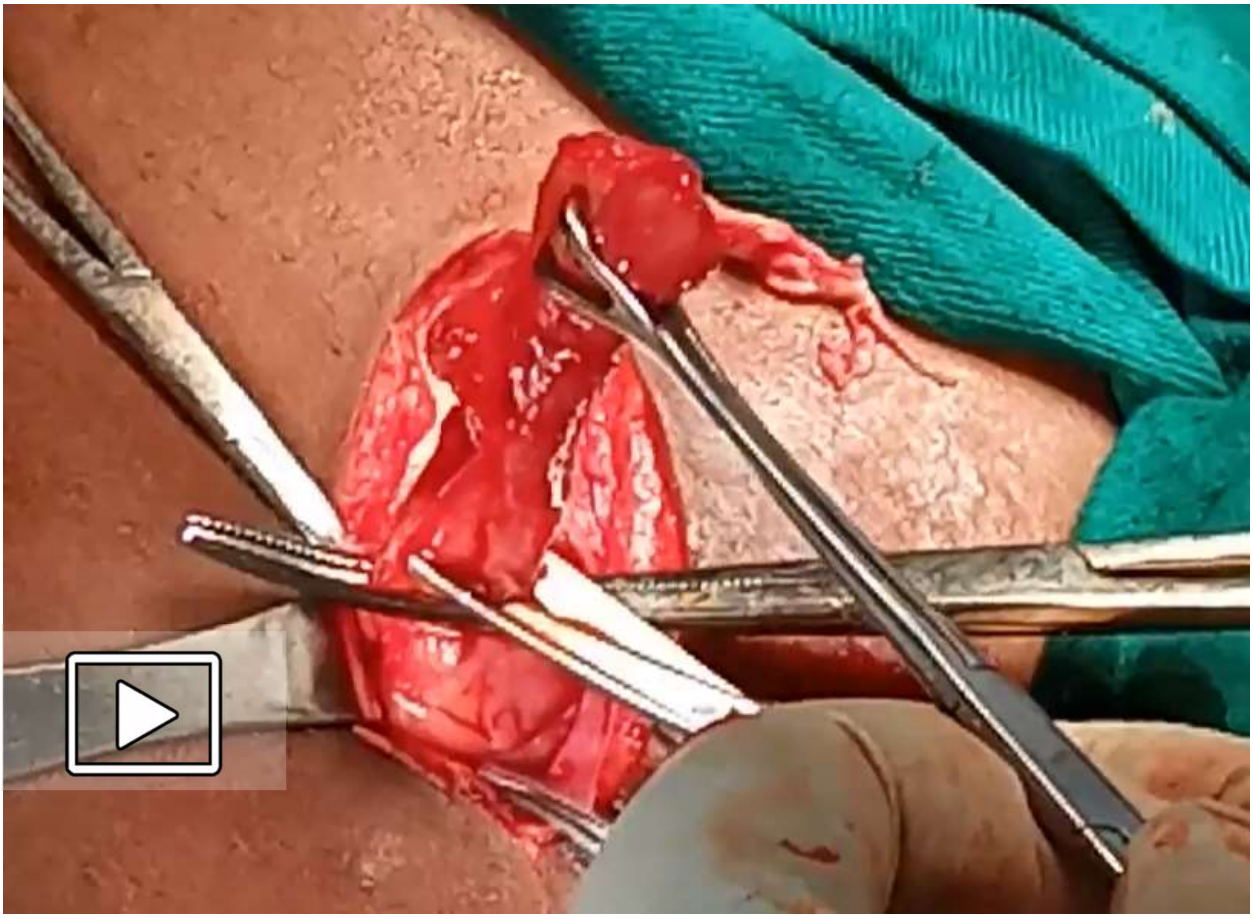
Once clearly visualized, clamp the appendix 5 mm from the base with a Kelly clamp (or haemostat if that's what you have available)

Now, place another Kelly clamp 3-5 mm distally along the appendix with enough space to fit a scalpel in between the two clamps



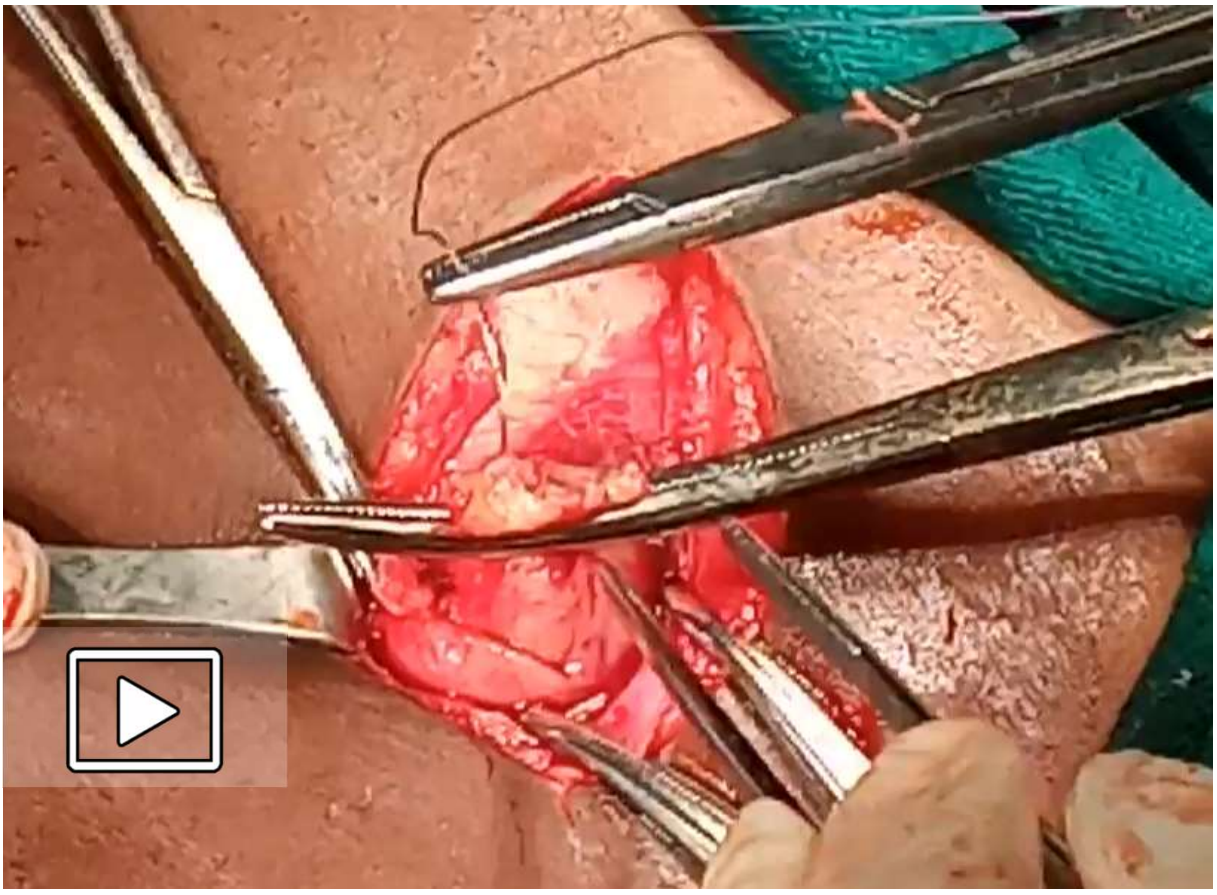
9 Excise the Appendix

Excise the appendix in between the clamps with a scalpel or scissors. Remove the specimen from the abdomen.



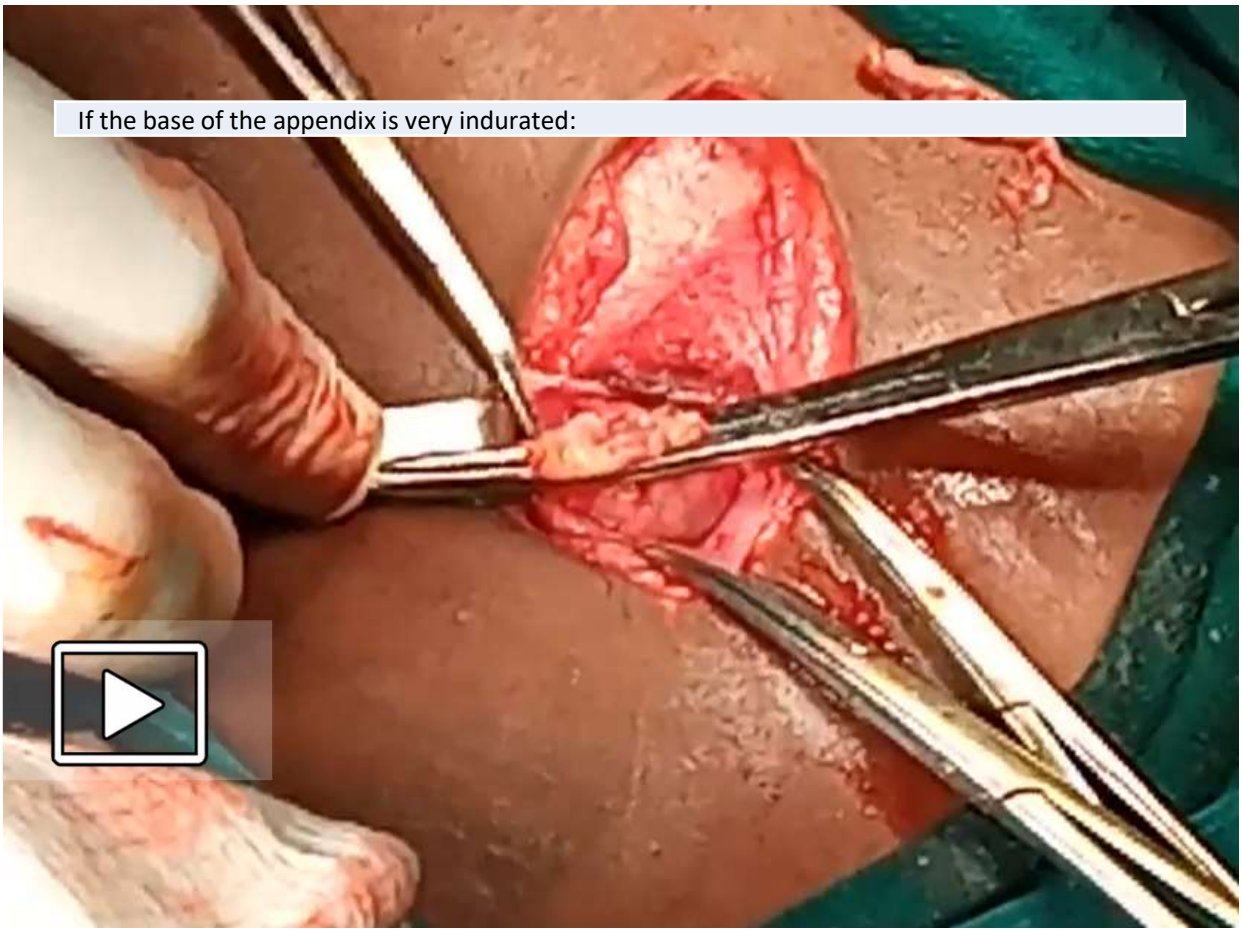
10 Suture Ligate Base of the Appendix

Suture ligate the base of the appendix. If cecum appears to friable, you may have to run a suture through healthy cecum to prevent fistula formation.



11 Inspect the Appendiceal Stump

Inspect the appendiceal stump. If stump appears intact, no further steps are necessary. If the base of the appendix is very indurated: Bury the stump using the remaining 2-0 vicryl, place a purse string around the base of the appendix.

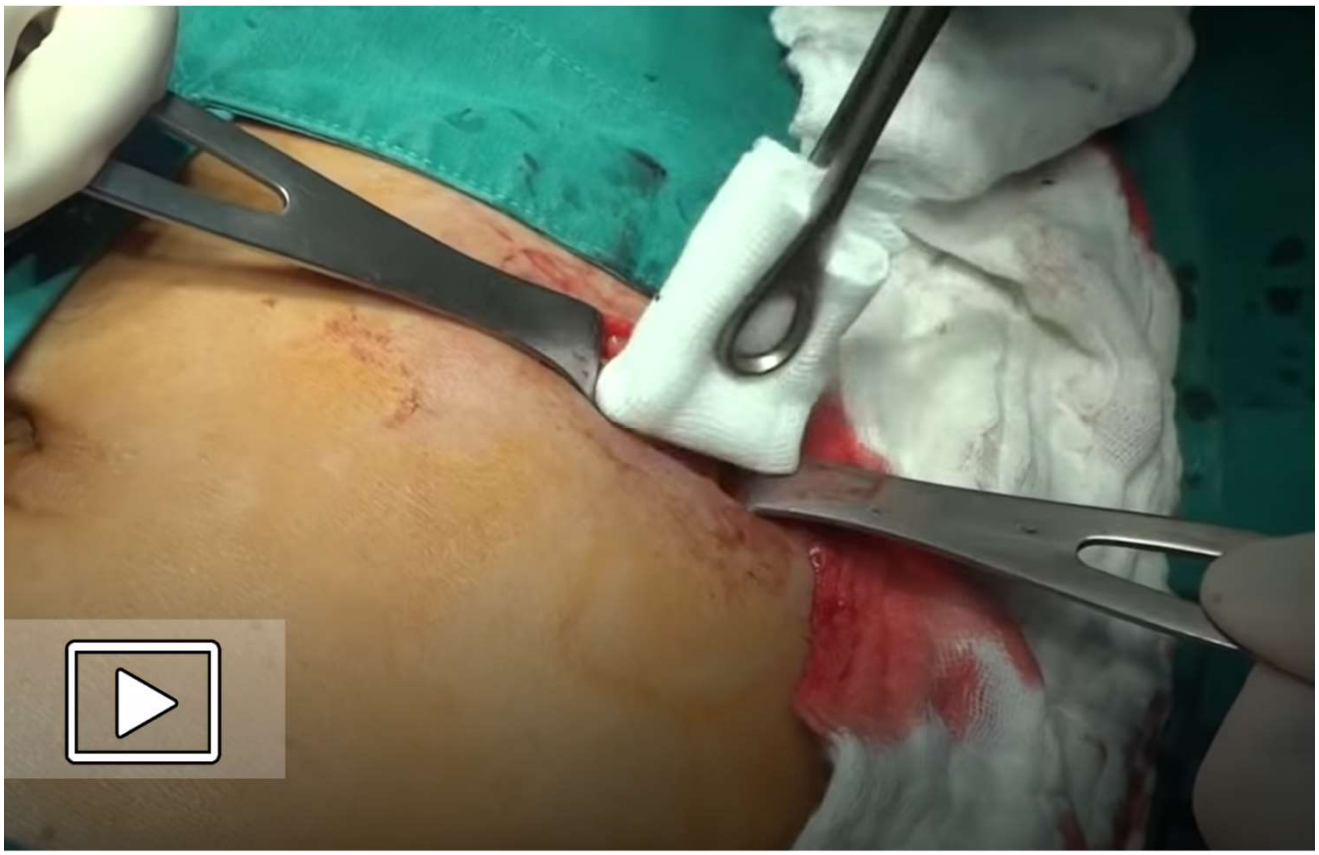


Abdominal Closure

AMPATH Surgical App

2 Final Abdominal Inspection

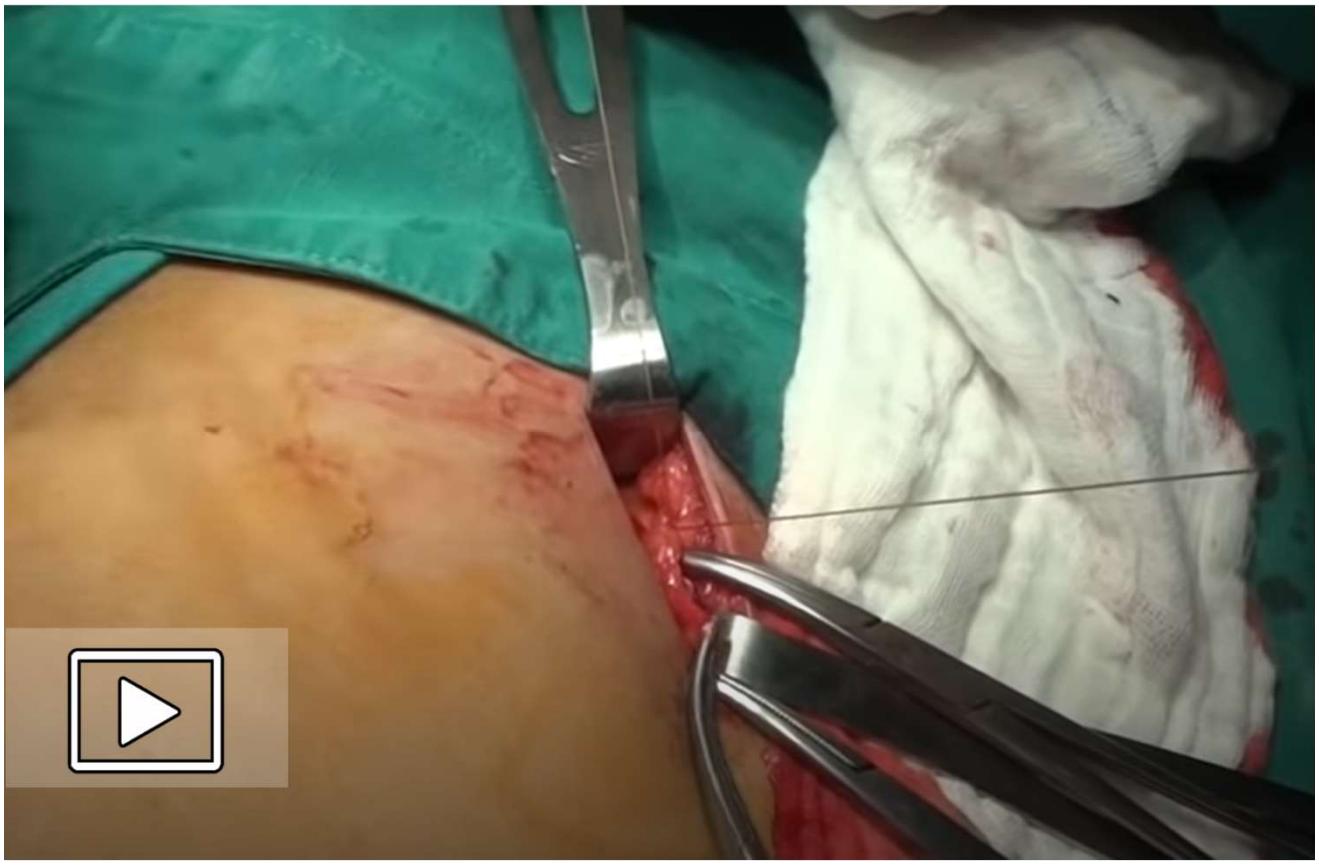
Ensure haemostasis of the mesoappendix prior to placing the cecum and ileum back into the abdomen. Inspect the pelvis by placing a suction into the pelvis to ensure no purulence.



3 Closure of External Oblique Aponeurosis

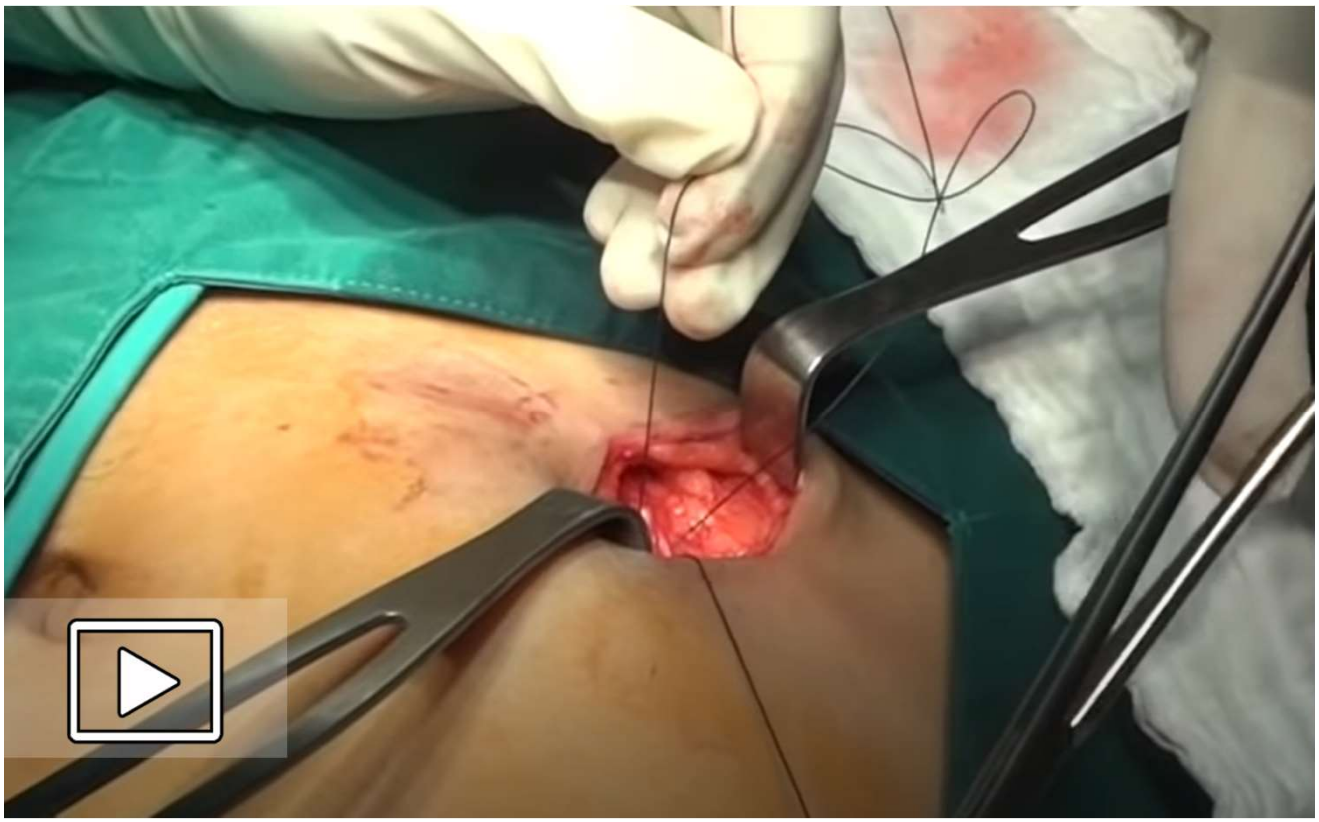
Remove retractors slowly, inspecting for haemostasis within the muscles. If there is bleeding, temporize with diathermy.

Close the external oblique aponeurosis with a 0-vicry running suture.



3 Close Scarpa's Layer

Close the membranous layer (Scarpa's) with the remaining 0-vicryl suture.



4 Close Skin Incision

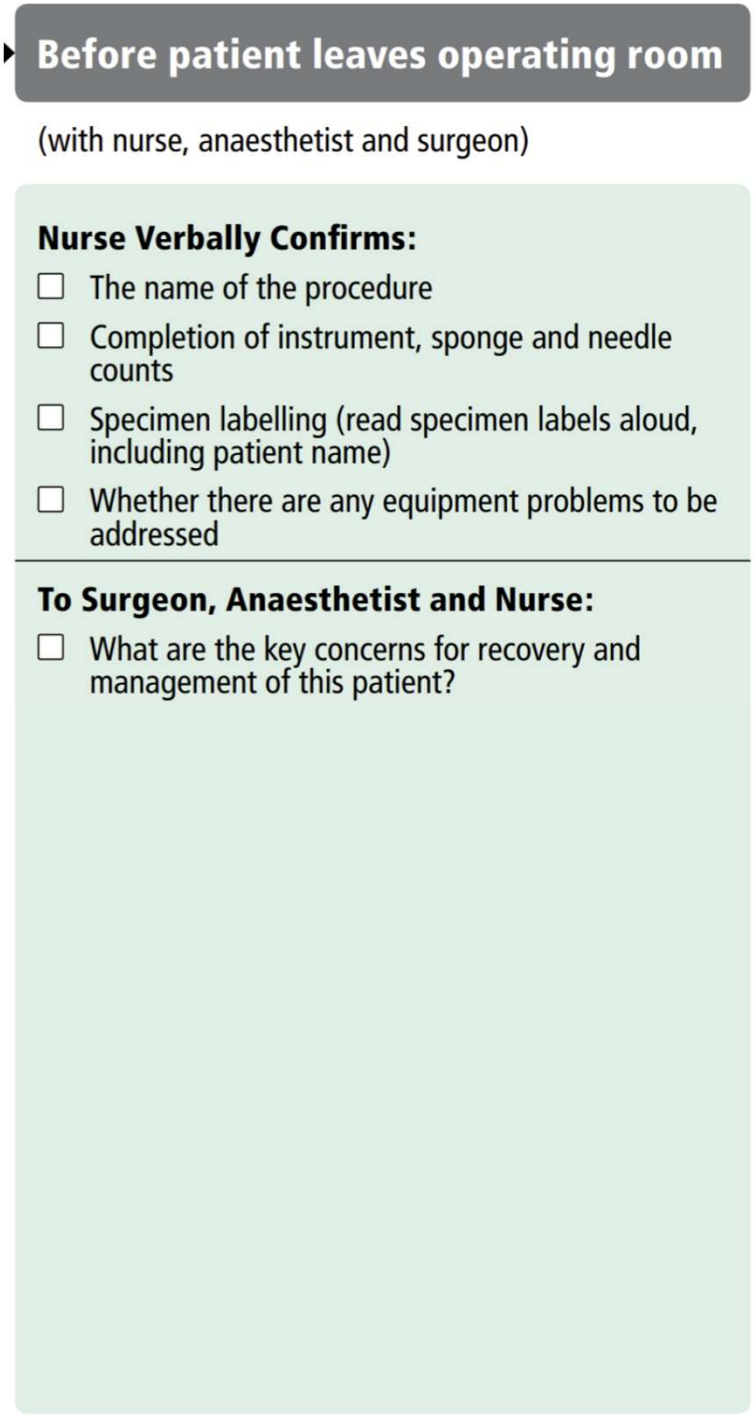
Use interrupted sutures if the appendix was grossly purulent. Space sutures approximately 1 cm apart.

WHO Checklist

AMPATH Surgical App

1 | WHO Checklist Before Leaving OR

- The tool is designed to improve surgical safety by incorporating all operating room team members to complete safety checks as a group.



Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:

- ☐ The name of the procedure
- ☐ Completion of instrument, sponge and needle counts
- ☐ Specimen labelling (read specimen labels aloud, including patient name)
- ☐ Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:

- ☐ What are the key concerns for recovery and management of this patient?

Link to the WHO Checklist