



Appendectomy

The appendix is a small finger-like projection that comes off the cecum of the large intestine and has no apparent function humans. When the opening in the sac is blocked, it leads to an inflammation of the appendix called appendicitis. This condition occurs most commonly in the young, between childhood and young adulthood. Appendicitis is an emergency condition and requires urgent surgical removal of the appendix.

Tests:

Laboratory:

- White blood cell count: The white blood cells are cells that fight off infection in the blood stream. An increase in the white blood cells, particularly neutrophils, is indicative of an infection within the body.
- An analysis of the urine is helpful to rule out a urinary tract infection, which may give symptoms similar to appendicitis. However, a person can have blood present in the urine when the inflamed appendix is located adjacent to the ureter, the tube that runs from the kidney to the bladder. A urinary infection also shows additional chemical finding such as glucocyte esterase or nitrate which are not present with appendicitis.

X-ray tests:

- Flat plate (plain film) of the abdomen. An abdominal X-ray is rarely useful for diagnosing appendicitis. On rare occasion, a hardened piece of stool with calcification, called an appendicolith, may show up on a plain X-ray. The plain X-ray, however, may rule out other reasons for the abdominal pain, such as a dilated bowel with a bowel obstruction. If the appendix has ruptured there may be evidence of air in the abdomen.
- Occasionally an ultrasound of the abdomen (a picture of the inside of the abdomen using sound waves) may be useful when the appendix is dilated. In females, this test gives helpful information regarding the state of the uterus, tubes, ovaries, and pelvis.
- A CT (Computerized Tomography) scan of the abdomen has been increasingly used for the diagnosis of appendicitis.
- It can detect either a distended appendix or inflammation around the appendix, which can be indicative of appendicitis.
- A newer technique places X-ray contrast material up the rectum to fill the large bowel. It also normally fills the inside of the appendix. If the opening in the appendix is blocked, then no contrast fills the appendix. This is highly suggestive of acute appendicitis.
- A CAT scan is also useful for finding other diseases which may be causing abdominal pain.

- A barium-containing enema may be used in a manner similar to the CT scan with the rectal contrast. If the appendix fills with the contrast as seen on an X-ray of the abdomen then there is no appendicitis. This has largely been replaced by the CT scan with rectal contrast.

Indications and Contraindications for Surgery:

- Allowing the appendix to rupture greatly increases the complications and risk of death, therefore, a surgeon must proceed with removal of the appendix if a high suspicion for appendicitis exists.
- Therefore, it is better to remove a normal appendix than to allow an inflamed appendix go on to rupture.
- Approximately 20% of appendices are normal.
- The only contraindication to removing the appendix is a situation where perforation has occurred and the abdomen is so inflamed that the appendix is not recognizable. In this situation the infection needs to be drained out but the infection is not removed.
- In a situation where the diagnosis is in question, a laparoscopy may be carried out.
 - The laparoscope is a long tube containing fiber optics with a lens at one end and a small television camera at the other. It is placed through a small opening in the abdomen just below the umbilicus called a port.
 - With laparoscopy, the appendix can be seen. If disease other than acute appendicitis is causing the pain, this can be discovered, and if the appendix is found to be diseased, it can be removed.
 - If a normal appendix is found and there is no evidence of other abdominal disease, the appendix is still removed. This will prevent the patient from coming back with pain that could possibly be appendicitis in the future.

The procedure:

Using a Laparoscope:

- In addition to the port below the umbilicus, extra ports are placed in the abdomen to allow removal of the appendix using instruments placed through the small ports.
- This technique does take longer than a standard open appendectomy and costs slightly more because of the instruments required for surgery.

Open appendectomy remains the standard of care for appendicitis.

- An incision is made in the skin over the area of the appendix in the right lower abdomen,
- The muscles are spread and the abdomen is entered.
- The large bowel or cecum is located and followed to its end where the appendix is found.
- The appendix is pulled up through the incision.
- The mesoappendix is separated off of the appendix, clamped, and tied off.
- The appendix is then tied off at its base next to the cecum.
- The remainder of the appendix is clamped, cut, and removed.
- Care is taken to prevent spillage of bacteria from the cut end.

- The muscle layers are then sutured back together over the stump of the appendix.
- If the appendix has ruptured, a drain is placed in the region of the appendix to allow bacteria to drain out and the skin is left open and packed with gauze. The gauze and drain are removed when the infection is cleared.

Complications:

- Wound infections
- Abdominal abscess due to spillage of bacteria after ruptured appendicitis
- Bowel obstruction
- Urinary tract infection
- Hemorrhage
- Injury to the large or small bowel, ovary, or other abdominal organs requiring removal.

Postoperative Care:

Unruptured appendix:

- The patient is started on a liquid diet the morning after the surgery and progressed to soft and then regular diet.
- Additional antibiotics are also given to prevent wound infection.
- Often the patient can leave the hospital in 1-2 days after the surgery.

Ruptured appendix:

- The hospital stay is usually at least 4 days and possible longer.
- If there was spilling of bacteria from the appendix, recurrent abdominal abscesses and infections may occur.
- The bowel frequently stops normal function (ileus), causing bowel fluid and gas to distend the bowel. This distention is relieved by placing a tube through the nose and into the stomach for approximately 2-3 days. Once there is evidence that the intestines are active again, such as the passing of gas or stool, the tube is removed.
- The patient is then started on a liquid diet which is advanced to a regular diet as tolerated.
- If the appendix has ruptured, a drain is placed in the region of the appendix to allow bacteria to drain out and the skin is left open and packed with gauze. The gauze and drain are removed when the infection is cleared.
- Antibiotics are continued for approximately one week after surgery. Initially, this will be through a vein while in the hospital and then typically by pill after being sent home.