Appendectomy in children/adolescents

兒童及青少年的盲腸/闌尾切除手術

What is appendicitis?

Appendicitis means inflammation of the appendix. The appendix is a closed-ended, narrow tube that attaches to the first part of the large bowel with little function in a normal individual. It is thought that appendicitis begins when the appendix becomes blocked. The blockage may be due to a build-up of mucus or stool, or sometimes due to swelling of the lymphatic tissue in the appendix. After the blockage occurs, bacteria within the appendix cause infection and inflammation. If the inflammation and infection spread through the wall of the appendix, the appendix can rupture. After rupture, infection can spread throughout the abdomen or become confined to an area surrounding the appendix forming an abscess, both of which can lead to life-threatening generalized infection.

Acute appendicitis is one of the commonest causes of acute abdominal pains in older children and adolescents but in younger children it is less common and sometimes difficult to diagnose.

Diagnosis is based on history of symptoms and physical examination backed by blood tests. Atypical histories and equivocal physical signs may require a period of observation with serial reassessment and/or further investigations with x-rays, ultrasound and/or CT scanning. None of these tests can be 100% accurate in diagnosing or excluding appendicitis. When the clinical picture is doubtful and equivocal despite elaborate clinical evaluations and investigations, sometimes it is best to proceed with surgical exploration and removal of the appendix**.**

Appendectomy

The surgical procedure for the removal of the appendix is called an Appendectomy (also known as an Appendicectomy). It is one of the most commonly performed operations in children and adolescents world-wide.

Laparoscopic/Minimal access surgery approach

Nowadays this is often the operation of choice, performed using one to three small incisions with a camera to visualize the abdominal cavity.

In general, a small incision is made around the belly-button and the abdomen is inflated with carbon dioxide. A laparoscopic camera is inserted to visualize the abdominal cavity. Laparoscopic instruments are then inserted via two small wounds to remove the appendix.

If the findings reveal severe infection with complications such as appendix rupture, abscess, extensive abdominal adhesions, conversion to conventional open operation may be necessary. An open Appendectomy then requires a larger abdominal incision, most commonly made in the right lower quadrant transversely or diagonally.

The clinical diagnosis of appendicitis is usually verified at operation. But if the appendicitis appears mild at operation, the appendix is usually removed for formal laboratory diagnosis while other abdominal organs are inspected to exclude any other acute abdominal conditions that require immediate surgery in the same setting. Rarely more complicated conditions are encountered requiring a major open operation and large abdominal incisions.

Open Appendectomy

This is a traditional operation. If the clinical diagnosis is certain, especially when backed by a positive ultrasound or CT scan or when complicated and severe infection is evident, it remains the discretion of the operating surgeon in charge to sometimes decide for an open operation without laparoscopy. A single larger right-sided abdominal incision would be made to carry out the surgical exploration and Appendectomy.

Non-operative treatment

Although usually appendicitis is treated by Appendectomy in the emergency setting, there are occasions, as listed below, when initial non-operative management is considered. But usually after the acute infection has subsided, the completion treatment includes an 'interval Appendectomy', usually after a few months:

1. Complicated infection with 'appendix mass' or abscess that may be treatable by initial antibiotic course with or without image-guided needle drainage of pus
2. Under research protocol/on clinical trial basis approved by official bodies and consented by individual patient

Open or Laparoscopic Appendectomy?

According to a research-analysis comparing laparoscopic and open procedures, laparoscopic procedures may have some advantages over the open procedure.

After laparoscopic Appendectomy, wound infections were less likely, pain after surgery was less, and for older children the hospital stay may be shorter with earlier return to normal activity and sport compared with after open procedures. Particularly adolescent girls and obese patients seem to benefit from the laparoscopic procedure more than other groups. But overall the incidence of persistent intra-abdominal infection and abscesses was higher and the duration of surgery is usually slightly longer for laparoscopic procedures.

Preparation before surgery

Once decided for emergency operation, the patient should not eat or drink. It is important to follow fasting instruction otherwise the operation may need to be postponed. The surgeon will explain the operation including the risks and a consent form will be signed. Parents have to make sure that they fully understand the explanation before signing the consent. An anaesthetist will also see the patient and explain the risks of general anaesthesia. If the patient has any medical problems or drug allergies, the doctors must be informed. Antibiotics, usually intravenous, will be given at or before surgery depending on the severity of the infection.

Timing for surgery

When an emergency Appendectomy is decided, it will take place at the next available vacant session in the emergency operating room. The waiting time for surgery may last for 6-8 hours subject to the severity of the appendicitis. The Surgery may last from 30 minutes in typical appendicitis to several hours in complicated cases.

Care after surgery

The patient usually has to continue fasting during the first day after surgery. Diet may gradually be resumed over the next few days depending on the severity of the appendicitis and recovery of the gut function. Painkillers in the form of oral tablets/syrups, rectal suppositories or injections are prescribed according to the extent of surgery. Intravenous antibiotics may be continued for a few days for typical appendicitis, or up to 10-14 days if infection is severe. Ambulation is encouraged after the first few days according to the extent of surgery and wound pain.

Timing for discharge from the hospital depends on the speed of recovery from operation, which vary. It may be a few days after typical appendectomy to a few weeks if there are complications arising after severe infections.

Complications

Overall, appendicectomies in children and adolescents are safe operations and serious complications are uncommon. Nevertheless, a number of potential complications may occur, with chances varying between minimal access surgery and open operations. Parents should discuss with their surgeons should these complications arise:

General -

1. Bleeding
2. Urinary retention
3. Wound infection and gaping
4. Late hypertropic wound scar

Specific -

1. Intra-abdominal abscess
2. Late intra-abdominal and pelvic adhesions that may in future cause bowel colic, obstruction, fallopian tube obstruction and infertility in girls.

Rare but significant (if any) -

1. Injury to major blood vessels, bowels, ovary, fallopian tube, urinary bladder
2. Torrential bleeding

Things to take note on discharge

1. Contact doctor at the Accident & Emergency Department if increase pain or redness around the wounds
2. Take the analgesics and /or antibiotics prescribed by your doctor if required
3. Resume your daily activity gradually and avoid vigorous physical exercise in the first 4 weeks (according to individual situation)
4. Remember the dates of taking off stitches/clips (if any) in the clinic, and follow-up in the specialist clinic.

Remarks

This is general information only and the list of complications is not exhaustive. Other unforeseen complications may occasionally occur. In special patient groups, the actual risk may be different. For further information, please contact your doctor.