

CASE TWO

Short case number: 3_3_2

Category: Gastrointestinal & Hepatobiliary

Discipline: Surgery

Setting: Hospital

Topic: Appendicitis

Case:

Lisa Chan, aged 17 years presents with a 4 hour history of central abdominal pain that has recently localised to right lower abdomen. She feels nauseous but has not vomited. Her bowels have not opened for a day and she feels hot and sweaty.

Questions

1. What is your differential diagnosis (list only 5 options)?
2. If on examination Lisa was found to have a temperature of 37.8⁰ C, halitosis, clinical dehydration, and tenderness (with rebound) over the right iliac fossa, what laboratory investigations would you order to support a diagnosis of acute appendicitis?
3. What is the pathophysiology of acute appendicitis?
4. What structures are encountered with the following surgical incisions: at McBurney's point, midline (upper and lower) abdominal, Pfannenstiel.
5. Discuss the indications for open as compared to laparoscopic appendicectomy and the risks and benefits of each approach.
6. Discuss the key steps in the post operative management of a person following an open appendicectomy

Suggested reading:

1. Henry MM, Thompson JN, editors. Clinical Surgery. 3rd edition. Edinburgh: Saunders; 2012. Chapter 23.
2. Garden OJ, Bradbury AW, Forsythe JLR, Parks RW, editors. Davidson's Principles and Practice of Surgery. 6th edition. Philadelphia: Churchill Livingstone Elsevier; 2012.

1. Differential diagnoses

- acute appendicitis
- gastroenteritis/mesenteric adenitis/inflammatory bowel disease/Meckel's diverticulitis /acute ileitis
- pelvic inflammatory disease (PID)
- pyelonephritis/urinary tract infection or stones
- hepatitis/ cholecystitis
- right lower lobe pneumonia
- endometriosis/ovulatory pain (Mittelschmerz)/ruptured or haemorrhagic ovarian cyst/ectopic pregnancy

2. Laboratory investigations

If on examination Lisa was found to have a temperature of 37.8⁰ C, halitosis, clinical dehydration, and tenderness (with guarding & rebound) over the right iliac fossa appropriate investigations would include:

- FBC including differential + CRP +UEC, CMP
- BHCG
- Urinalysis – dipstick and MSU
- Urinary & gynaecological evaluation (history & examination)
- Abdominal/pelvic ultrasound

3. Pathophysiology of acute appendicitis

- obstruction of the appendiceal lumen – being an unpaired midgut structure pain is characteristically felt in the umbilical region (in the midline)
- lymphoid hyperplasia (60% of cases) is the most common aetiology of luminal obstruction; faecolith (seen in 35%) of cases
- viral illnesses that elicit lymphoid hyperplasia are a frequent prodrome to onset of appendicitis in the young (children)
- oedema and distension in the appendix itself leads to outflow obstruction, continued inflammation, mucous production and compromise of venous then arterial supply leading to ischaemia and possibly necrosis
- bacterial proliferation & toxins
- transmural spread, serosal inflammation and involvement of parietal peritoneum typically leads to localized right iliac fossa pain
- as swelling, infection & ischaemia progress gangrene & perforation is possible
- resultant peritonitis may or may not be walled off by greater omentum or other adjacent visceral structure
- diffuse widespread peritonitis may occur especially in young patients (who lack well developed omentum)

4. Structures at risk with surgical incisions:

McBurney's point (2/3rds down from line drawn from umbilicus to ASIS)

- intercostal nerves (but direction of cut avoids this)
- inferior epigastric vessels

Midline (upper and lower) abdominal

- linea alba therefore minimal risk to vessels or nerves

Pfannensteil

- inferior epigastric vessels

5. Indications for open as compared to laparoscopic appendicectomy - risks & benefits of each approach

open approach

- direction of incision at McBurney's point avoids inferior epigastric vessels and helps avoid dividing lower intercostal and abdominal wall nerves
- relatively cost efficient

laparoscopic - standard of care

- less chance of wound infection in routine cases but possibly increased risk of abscess formation in perforated cases
- useful in cases of diagnostic uncertainty
- less post-op pain
- increased cost due to equipment required

Shorter length of stay (1 night in uncomplicated cases vs 2-3)

6. Key steps in the post operative management following open appendicectomy

- IV fluids continued. DVT prophylaxis, chest physiotherapy and early immobilisation
- Cease IV antibiotics post op unless the appendix is perforated or gangrenous or there is an associated abscess
- If frank peritoneal perforation and contamination or abscess found then antibiotics until patient afebrile and regained GIT function. Some will need 3-5 days of antibiotics.
- Most common post-op complication is wound infection
- be aware of rare but important complications such as abscess, bleeding, injury to surrounding structures e.g. bowel and ureter. An ileus may result if there was significant peritoneal contamination.
- Histopathology report must be formally followed up – beware of coincident appendiceal tumours