The VERMIFORM APPENDIX

Learning objectives: to understand:

1. The etiology & surgical anatomy of acute app.
2. The clinical signs & deferential diagnosis of acute app.
3. The investigation of suspected appendicitis
4. Management of acute appendicitis
5. Basic surgical technique, both open & laparoscopic
6. The management of postoperative problems

Anatomy:

- **Different positions of the app.**
  (continued growth of the caecum commonly …
  -Rotate the appendix……Retrocaecal position.(intraperitoneum) 75%
  -In 25% rotation of the appendix does not occur……..parac., subc., pelvic
  -Rarely the caecum does not migrate…
  - near the gall bladder.
  - situs inversus (LIF)
  - Occasionally, the tip of the appendix …extraperitoneal.

- The position of the base is constant
- The mesentery of the app. (mesoappendix)….
- It ranged from 7.5-10 cm, the lumen lined by

Acute Appendicitis:

Is the most common cause of acute abdomen in young adult

Fitz : 1886

It is relatively rare in infants & become increasingly common in childhood & early adult life reaching a peak incidence in the teens & early 20s, after middle age the risk in the future is quite small. The incidence is equal among male & female before puberty. In teenager & young adults M: F becomes 3:2, thereafter the incidence in males declines.

Aetiology:

No definitive cause , may be due to:

1. decreased dietary fiber & increased consumption of the refined carbohydrates.

No single organism responsible, a mixed growth of aerobic anaerobic organisms is usual.
The initiating event causing bacterial proliferation is controversial.

Obstruction of the lumen play important factor in developing acute app.

- Faecolith
- Stricture, tumor (ca. caecum), parasite (oxyuris vermicularis), lymphoid hyperplasia.

Peritonitis occurs as a result of

a) free migration of bact. through an ischemic app. Wall,
b) through frank perforation of a gangrenous app.
c) delayed perforation of app. abscess

& this process promoted by:

1. extreme of age.
2. immunsuppression.
3. D.M.
4. feacolith obstr. of the lumen.
5. free lying pelvic app.
6. previous abdominal surgery(prevent localization of the inf.).

Clinical diagnosis:

Symptoms: The classical features of acute app. begin:

1. Poorly localized colicky abdominal pain
2. Anorexia , nausea & vomiting (1-2 episodes).
3. H/O similar discomfort
   The classical visceral-somatic sequence of pain is present in only 50% of these patients subsequently proven to have acute appendicitis
4. A typical presentation
5. Family history

During the first 6 hrs.------ no alteration in the temp. or PR, after that, slight pyrexia (37.2 – 37.7 c*) & PR 80 or 90 is usual. In 20% of patients there is no pyrexia in the early stages.
(in children temp. more than 38.5c suggest other cause ex. Mesenteric adenitis)

Sign:

- Pyrexia.
- Limitation in the respiratory movement in the lower abd.
- Pointing sign.
- Muscle guarding.
- Localized tenderness (McBurny point).
- Rebound tenderness (cough or gentle percussion).

- Other: Rovsing sign
  Psoas sign
  Obtorator sign

Special features, according to position of appendix:

1. **Retrocaecal**:

2. **Pelvic:**

3. **Postileal:**

Special features, according to age:

1. Infants:

2. Children:

3. Elderly:

4. Obese:

5. Pregnancy:

Differential diagnoses :

Children	***Adult***	***Adult female***	***Elderly***
Gastroenteritis	Terminal ileitis	Mittelschmerz	Divrtic.
Mesenteric adenitis	Ureteric colic	Pelvic inflm. dis.	Int. obst.
Meckel's diverticulitis	Perforated peptic ulcer	Pyelonephritis	Colonic ca.
Intussusceptions'	Torsion of testis	Ectopic pregnancy	Torsion appendix epiploica
Henoch-shonlein purpura	Pancreatitis	Torsion/rupture ovarian cyst	Mesenteric infarction
Lobar pneumonia	Rectus sheath heamatoma	endometritis	Leaking aortic aneurysm

Diagnosis:
Is essentially clinical (A decision to operate based on clinical suspicious can lead to removal of normal appendix in 15- 30 % of cases). A number of scoring system have been to advised to assist diagnosis***… "Alvarado score"…***

Symptoms:

- Migratory RIF pain…….1
- Anorexia ……..1
- N/V……1

Signs:

- Tenderness……..2
- Rebound tenderness…..…..1
- Elevated temp……..….1

Lab. investig:

- Leukocytes……..2
- Shift to left……..1

= > 7…..acute app.

5-6 ……further investigation

- U/S (esp. children & thin adult)(90%)
- CT-scan abdomen(esp. elderly).

Preoperative investigations in appendicitis

- Routine
    1. Full blood count
    1. Urinalysis
- Selective
    1. Pregnancy test
    2. Urea and electrolytes
    3. Supine abdominal radiograph
    4. Ultrasound of the abdomen/pelvis
    5. Contrast-enhanced abdomen and pelvic CT- scan

Treatment:

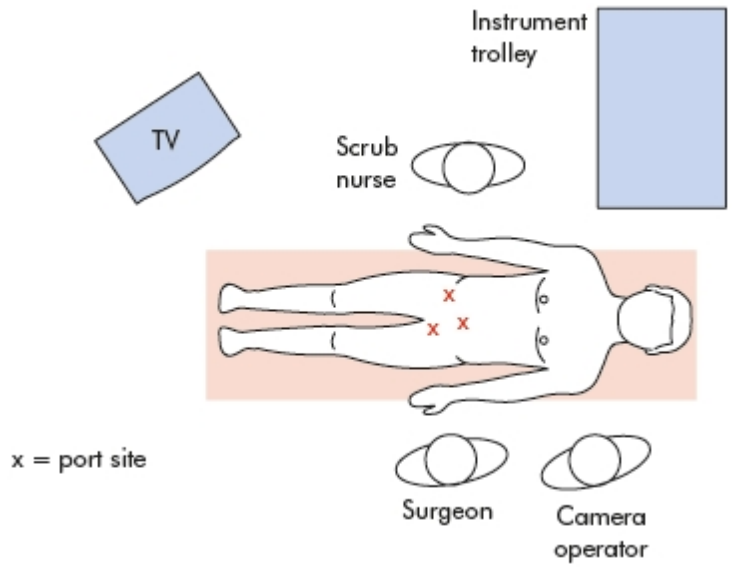
- ✓ The traditional treatment for acute appendicitis is appendicectomy.
- ✓ Literature to support a trial of conservative management

First appendicectomy (Lawson Tait 1880)…

- GA, supine position, palpation of the abdomen
- Gridiron incision.
- Rutherford Morison incision (in retrocaecal or paracaecal).
- Transverse skin crease (Lanz)..(2-cm below umb., centered on MCL or MIL)
- Lower midline incision (when the diagnosis is in doubt, int. obstr).
- Removal of the app.

Laparoscopic appendicectomy:

- ✓ As a diagnostic tool particularly in women of child bearing age, obese patient.
- ✓ Less postoperative pain
- ✓ Discharged from hospital and return to activities of daily living sooner than those who have undergone open appendicectomy.
- ✓ While the incidence of postoperative wound infection is lower after the laparoscopic technique, the incidence of postoperative intra-abdominal sepsis may be higher in patients operated on for gangrenous or perforated appendicitis.



Problems encountered during appendicectomy:

1. A normal app. is found…
2. The app. cannot be found.
3. An app. tumor is found:
4. An app. Abscess is found & the app. cannot be removed….

Other complication of appendicitis:

Appendicular mass:

If mass is present & the condition of the pt. is satisfactory, the standard treatment is the conservative ***"Oschsner – Sherren"*** regimen

1. Temp. & PR recorded 4-hrly.
2. IVF.
3. IV antibiotics .
4. The extent of the mass should be made
5. A contrast enhanced CT-examination.
6. Clinical improvement is usually evident within 24 – 48 hrs.
7. Failure of the mass to resolve should raise suspicion of a carcinoma or Crohn's disease.
8. Patients over the age of 40 should have …

Criteria for stopping cosarvative treatment:

- A rising pulse rate.
- Continued spiking pyrexia
- Increasing or spreading abd. pain (peritonitis)
- Increasing the size of the mass---app.abscess (

Pelvic abscess:

It is occasional complication of appendicitis., can occur irrespective of the position of the app.

C/F:

1. spiking pyrexia several days following appendicitis..
2. pelvic discomfort associated with loose stool or tenesmus.

3. rectal examination----boggy mass in the pelvis anterior to the rectum.
4. pelvic U/S or CT-scan will confirm
5. treatment by transrectal drainage or radiologically guided percutaneous drainage

Appendicitis complicating Crohn's disease

Occasionally, a patient undergoing surgery for acute appendicitis is found to have concomitant Crohn's disease of the ileocaecal region. If:

- The caecal wall is healthy at the base of the appendix…. appendicectomy (no risk of an enterocutaneous fistula.
- The appendix is involved with the Crohn's disease…. a conservative approach(a trial of IV corticosteroids and systemic antibiotics).

Postoperative complication:

1. **Wound infection:**
   - common , 5 – 10%
   - Pain & erythema of the wound on the 4th or 5th postop. Day (after hospital discharge).
   - Treatment …

2. **Intra abdominal abscess:**
   - Approximately 8 per cent of patients following appendectomy
   - Postop. spiking fever, malaise & anorexia developing 5-7 days after operation .
   - Interloop, paracolic, pelvic,& sub-phrenic sites should be considered.
   - U/S or CT-scan----
   - Laparotomy …

3. **Ileus :**
4. **Venous thrombosis & embolism:** rare, except in elderly & women taking contraceptive pills.
5. **Portal pyemia (pylophlebitis):**
6. **Faecal fistula:**
7. **Adhesive intestinal obstruction:**

Check list for unwell patient following appendicectomy:

pulse rate elevation & temp. elevation

1. Examine the wound & the abdominal for abscess
2. Consider pelvic abscess & perform rectal examination
3. Examine the loin for retrocaecal swelling & tenderness
4. = the leg to exclude DVT
5. = for jaundice, liver..
6. = the lung for pneumonia, collaps….
7. = the urin
8. In children-----tonsillitis, otitis media
9. Ensure that I.V. set is sterile
10. Suspect possibility of subdiaphramatic abscess

Recurrent acute appendicitis:

Several attacks, app. show fibrosis.

**** Mucocele of the app.:***

Neoplasm of the app.:

Carciniod tumor (argentaffinoma):

- It arises in argentaffine tissue & most commonly in the app.
- It found once in every 300 – 400 appendices.
- It mostly occurs in the distal third of the app.
- Rarely it metastases.
- Treatment …..Appndicectomy.

….Rt. hemicolectomy:

- Caecal wall is involved.
- The tumor is 2 cm. or more.
- Involve lymph nodes.

Mucinous cystadenoma