

## **Appendicitis – Djerić – 09/09/03**

### **PAIN AND PRINCIPLES**

There are two types of pain systems: autonomic & somatic. Autonomic pain travels with the sympathetic + parasympathetic nerves, while somatic pain travels with the spinal nerves.

### **GUT: PAIN DISTRIBUTION**

Foregut: epigastrium, Midgut: umbilical (paraumbilical), Hindgut: hypogastric

### **WHAT DO YOU DO, WHEN SOMEONE PRESENTS WITH PAIN?**

Take a complete history, and work out which organ/s may be involved. Then work out whether the peritoneum is involved or not (i.e.: for epigastric pain due to cholelithiasis). If peritoneum is involved: then pain is sharp and localised. If visceral structures are only involved: then pain is diffuse and uncomfortable.

### **APPENDICITIS (Essential Surgery 2<sup>nd</sup> Ed., pp 281)**

#### **Anatomy**

The appendix usually lies in the pelvic position, close to the rectum and bladder in males / bladder, uterus, and fallopian tubes in females. Sometimes the appendix lies retrocaecally, therefore pain is felt in the back. The appendix is supplied by the appendicular artery, coming from the ileocolic artery (SMA). This artery runs along the free edge of the mesoappendix. Histologically, it has a glandular mucosa, submucosa, muscularis mucosa and serosa (visceral layer of the peritoneum).

McBurney's point is of relevance: this is where the base of the appendix lies. McBurney's point is 2/3 of the way along a straight line drawn from the umbilicus to the ASIS.

### **PATHOPHYSIOLOGY (Essential Surgery 2<sup>nd</sup> Ed., pp 282)**

Epidemiological studies have shown that appendicitis is associated with a low dietary fibre intake. Fibre helps in bowel movements. Therefore, infrequent bowel movements causes impacted faeces to obstruct the lumen of the appendix.

This causes the mucosa to become inflamed → extending to the submucosa → muscular mucosa → serosal layers. A fibropurulent exudate forms on the serosal surface and this can spread to adjacent structures (i.e.: visceral peritoneum → visceral peritonitis). By this stage, the mucosa becomes necrotic and sloughs off into the lumen → the appendix becomes distended with pus → the end veins and arteries become compressed → further distension occurs. Decreased arterial supply will cause → ischaemia → necrosis → gangrene. Perforation of the appendix occurs and the contents spills into the peritoneal cavity → causing emergency peritonitis.

In older patients, the perforated appendix and the faecal contents may be walled off by the omentum. The pus and necrotic material is contained → abscess formation.

### **PATHOPHYSIOLOGY VS CLASSICAL CLINICAL FEATURES (Essential Surgery 2<sup>nd</sup> Ed., pp 282)**

- Inflammation of the appendix mucosa → submucosa → muscle layer → Poorly localised colicky pain in the umbilical area (lasts few hours)
- Involvement of the serosal layer → continuous umbilical pain with associated nausea & vomiting
- Fibropurulent exudate from serosal surface spreads to adjacent areas → parietal peritoneum involved → localised pain in right iliac fossa, guarding, rebound tenderness (stretching of the parietal peritoneum), fever, facial flush, tachycardia, leukocytosis (WBC).
- Perforation of appendix wall → whole abdomen is extremely tender, extremely rigid and signs of toxicity (systemic unwellness)
- If omentum comes down to wall off the contents → palpable abdominal mass in right iliac fossa or nearby.

The whole process can take anywhere between 12-24 hours.

### **OTHER PRESENTATIONS OF ACUTE APPENDICITIS (Essential Surgery 2<sup>nd</sup> Ed. Pp 284)**

- Appendix lies near the rectum: diarrhoea
- Appendix lies near the bladder/ureter: urinary symptoms of dysuria, haematuria, frequency
- Retrocaecal position: irritation of psoas muscle → involuntary right hip flexion, pain on extension
- Appendix in high retro-caecal position → simulate gall bladder symptoms in right costal margin
- Appendix near the fallopian tubes → pelvic pain

### **CARDINAL FEATURES OF ACUTE APPENDICITIS (Essential Surgery 2<sup>nd</sup> Ed., pp 285)**

- Tenderness in RIF
- Abdominal pain for less than 72 hours
- Vomiting 1-3 times
- Facial flush
- Fever between 37.3-38.5C
- No UTI on urine microscopy

### **DIFFERENTIAL DIAGNOSIS (Essential Surgery 2<sup>nd</sup> Ed., pp 286)**

- RENAL: Cystitis/UTI – urine microscopy should show evidence of hematuria
- ABDOMINAL: Mesenteric adenitis – usually in the young and associated with a viral illness of the respiratory tract (sore throat etc). Dx can only be made at laparotomy, Meckel's diverticulum – embryological remnant of the vitello-intestinal duct which joined the fetal midgut and yolk sac.
- GYNAECOLOGICAL: Mittelschmerz (pain of ovulation) – mid menstrual cycle, salpingitis- vaginal discharge present, torsion of an ovarian cyst – tender mass may be palpable or will show up in ultrasound.

IN FEMALES, ALWAYS ASK ABOUT MENTRUAL HISTORY, ARE THEY PREGNANT?, URINE SAMPLE – BETA –HCG TEST, IF +VE → ULTRASOUND.