

■ Abdominal Aortic Aneurysm (AAA)

Define an abdominal aortic aneurysm

It is an abnormal permanent localised dilatation of the aorta having at least a 50% increase in diameter compared with the expected normal diameter. It is usually regarded as a diameter >3 cm.

What is the aetiology of AAA?

- Hypertension
- Peripheral vascular disease
- Hyperlipidaemia
- Diabetes mellitus
- Increasing age
- Sex (M : F = 4 : 1)
- Family history

What are the clinical features of AAA?

- Asymptomatic (75%)
- Symptomatic:
 - pain: epigastric or back
 - rupture
 - distal embolus
 - fistula: aorto-caval; aorto-intestinal
 - systemic illness (inflammatory aneurysms)

How are AAAs diagnosed?

- Clinically: pulsatile expandable abdominal mass
- Ultrasound
- CT

What is the natural history of AAA?

The risk of rupture increases as aneurysm expands. Growth is usually at 10%/yr. The 5-year risk of rupture is 15% for aneurysms <4 cm, this increases to >75% for aneurysms >7 cm. Overall, only about 15% of all AAA ever rupture, the remainder die from unrelated causes. The overall mortality from a rupture is 80%–90%.

What is the role of screening in AAA?

Pilot schemes have shown that screening for asymptomatic AAA can reduce the rate of rupture by almost 50%. High risk patients, e.g. hypertensive males >65 could be targeted for such screening programmes. Patients with small aneurysms could undergo regular USS surveillance. A multicentre screening programme study is currently under way to determine the feasibility of a national screening programme.

Briefly describe the UK small aneurysm trial

This trial randomised 1090 asymptomatic infra-renal small aneurysms (4.0–5.5 cm) in patients aged between 60 and 76 to operate or be kept under regular ultrasound surveillance. There was no difference in mortality rates from early surgical repair compared with 6-monthly ultrasound surveillance. Annual rupture rate in this study was 1%. Surgical intervention was used when one of the following three criteria was met.

- Rate of expansion >1 cm/yr
- Aneurysm diameter expansion >5.5 cm
- Aneurysm became symptomatic or tender on palpation

What are the indications for surgery in patients with AAA?

Emergency repair:

- Rupture
- Rapidly expanding (>1 cm/yr) aneurysm that is symptomatic or clinically tender

Elective repair:

- Aneurysms >5.5 cm in diameter
- Symptomatic aneurysm
- Rate of expansion > 1 cm/yr that is asymptomatic and non-tender

How should patients with smaller aneurysms be managed?

- Aneurysm <4 cm: yearly USS surveillance
- Aneurysm 4–5.5 cm: 6-monthly USS surveillance

What are the surgical options in the treatment of AAAs?

- Endoluminal repair: trans-femoral or trans-iliac placement of prosthetic graft under fluoroscopic guidance. The three main types of graft are: aorto-aorto, aortobi-iliac and aortouni-iliac with a femoral-femoral crossover. Requires CT or IADSA to evaluate the morphology of the aneurysm prior to the procedure. About 1–1.5 cm of healthy aorta distal to the renal arteries and 1 cm in the common iliac arteries required for sufficient clearance, therefore only about 40% of aneurysms suitable for this type of repair. Successful stenting associated with reduced aneurysm expansion. Patients require post-procedure CT to detect for endoleaks, which can cause ruptures. Other complications include graft migration and displacement, graft occlusion, infection, embolisation and graft kinking.
- Open repair: durable synthetic materials, e.g. Dacron[®] used for repair. Mortality rate between 2% and 5% and rises to 10% for patients with associated co-morbidity. Specific complications include:
 - immediate: bleeding, embolism, arterial thrombosis
 - early: acute renal failure, CVA, MI, mesenteric infarction, spinal cord ischaemia
 - late: graft infection, false aneurysm, aorto-enteric fistula

■ Abdominal Pain

What are the common causes of acute abdominal pain?

- Non-specific abdominal pain
- Appendicitis
- Intestinal obstruction
- Biliary tract disease: cholelithiasis, choledocholithiasis, calculus, cholecystitis, ascending cholangitis and gallstone ileus
- Diverticular disease: painful diverticula, diverticulitis, perforated diverticula
- Peptic ulcer disease
- Pancreatitis
- Constipation
- Inflammatory bowel disease
- Irritable bowel syndrome
- Bacterial/viral gastroenteritis
- Irritable bowel syndrome
- Abdominal aortic aneurysm: seen mainly in elderly patients
- Malignancy: high incidence in elderly
- Mesenteric ischemia
- Urological causes: UTI, calculi, testicular torsion
- Medical cause:
 - myocardial infarction
 - pneumonia
- Gynaecological causes of abdominal pain
 - ectopic pregnancy
 - pelvic inflammatory disease
 - endometriosis
 - ruptured ovarian cyst

Which investigations may be useful in the diagnosis of abdominal pain/masses?

- CXR: helpful in excluding pneumonia and free intraperitoneal air under the diaphragm in patients with ruptured viscus
- AXR: it is of limited use in the young patient but may show air within an abscess or as a result of intestinal obstruction or perforation; calcium deposition may be seen in chronic pancreatitis and calculi (renal or biliary); late findings of mesenteric ischaemia occasionally observed (i.e. pneumatosis intestinalis)
- Ultrasound: does not involve radiation but limitations to use include: obesity, poor images in the presence of gas and is operator dependent. Can be used to:
 - identify nature of lesion: cystic or solid
 - determine vascularity of a mass (Doppler)
 - guide biopsy of a mass
 - identify liver metastases
- CT: significant radiation but rapid results, not operator dependent and not influenced by presence of gas. Uses include:
 - differentiating cysts from abscesses
 - staging of cancers
 - diagnosing intra-abdominal lymphadenopathy
 - high sensitivity for diverticulitis
 - in stable patients with suspected AAA
 - CT with angiography: for suspected mesenteric ischaemia
- Double contrast barium enema: indicated if a mass is thought to arise from the large bowel, e.g. cancers, polyps, diverticular disease, inflammatory bowel disease ('cobblestoning' or skip lesions)
- Instant enema: indicated for acute large bowel obstruction

- Barium meal and small bowel enema: for masses arising from the stomach or small bowel
- IVU: for some urological causes of abdominal pain
- Radioisotope imaging: used when other modalities have not confirmed diagnosis.
- MRI: used in pelvic masses and liver lesions

■ Abscesses

What is an abscess?

An abscess is a loculated or localised collection of pus surrounded by granulation tissue. It usually contains bacteria or other pathogens, inflammatory cells, necrotic tissue and protein exudates. It can be superficial (e.g. pilonidal, breast) or deep (e.g. diverticular, subphrenic).

What are the clinical features of an abscess?

- Localised inflammation
- 'Pointing' (the tracking of an abscess to an external surface)
- Discharge of pus (purulent) or pus mixed with blood (haemopurulent)
- On examination:
 - locally: swelling, central tenderness, fluctuant mass
 - generally: pyrexia, tachycardia, sepsis

Which group of patients are at particular risk of abscess formation?

- Immunocompromised patients
- Sick cell
- Peripheral vascular disease
- Inflammatory bowel disease
- Severe trauma

What is the role of antibiotics in the treatment of abscesses?

Abscess cavities are impervious to antibiotics and in fact prolonged antibiotic treatment can result in a chronic

inflammatory mass (an ‘antibioma’). All abscesses should therefore be drained.

How can abscesses be drained?

- Aspiration: abscesses filled with fluid can be aspirated with a large bore needle and the process repeated if necessary. This method should only be used if there is no continuing cause found
- Open drainage: superficial abscesses can usually be drained through a cruciate incision; the pus sent for microbiology; loculi broken down and necrotic tissue excised. The wound should be left open and packed with an appropriate dressing
- Percutaneous drainage: deep abscess can be drained by fluoroscopic, ultrasound or CT guided aspiration. A tube can be left *in situ* to allow drainage of fluid

■ Alcohol and Surgery

Which surgical specialities might be involved in the management of patients with excessive alcohol consumption?

- General surgery:
 - Mallory–Weiss tear
 - oesophageal varices
 - oesophageal carcinoma
 - gastritis, gastric erosions and ulcers
 - gastric carcinoma
 - acute and chronic pancreatitis
 - pancreatic carcinoma
 - liver cirrhosis
 - hepatomegaly
 - splenomegaly, hypersplenism
 - hepatocellular carcinoma
- Trauma and orthopaedics:
 - road traffic accidents
 - fragility fractures: altered calcium metabolism causes osteoporosis thus increasing the risk of fractures
 - alcoholic myopathy: characterised by painful and swollen muscles
- ENT:
 - laryngeal carcinoma
 - pharyngeal carcinoma
- Neurosurgery:
 - head injury with intracranial bleeding
- Urology:
 - impotence
 - testicular atrophy

- Obstetrics and Gynaecology:
 - irregular menses
 - fetal alcohol syndrome

What are the potential problems of surgery in patients with excessive alcohol consumption?

Pre-operatively:

- Obtaining a detailed history may be difficult due to memory loss, confabulations, cerebellar degeneration, Korsakov's psychosis or Wernicke's encephalopathy
- Nutritional deficiencies are common even in well-nourished alcoholics:
 - vitamins: thiamine, folate, pyridoxine, nicotinic acid, vitamin A
 - electrolyte imbalance: low serum levels of potassium, magnesium, zinc, calcium, phosphorus
- Patients are more likely to have alcohol-induced medical problems:
 - cardiovascular: hypertension, arrhythmias (especially atrial fibrillation), cardiomyopathy, heart failure, mural thrombus formation, cerebrovascular accidents
 - respiratory: blood flow to the lungs may be impeded in chronic alcoholics with cirrhosis of the liver who can have up to 30% of their cardiac output shunting right to left, thereby decreasing oxygenation; alcoholics frequently have pulmonary aspiration due to central nervous system depression when intoxicated, leading to aspiration pneumonitis
 - renal: alcohol exerts a diuretic effect by inhibiting the secretion of ADH; serum sodium may be increased and potassium decreased in chronic alcoholics with increased total body water content
 - endocrine: glucose intolerance, transient hypoglycaemia