



ANEURYSMS AND PERIPHERAL VASCULAR ANOMALIES

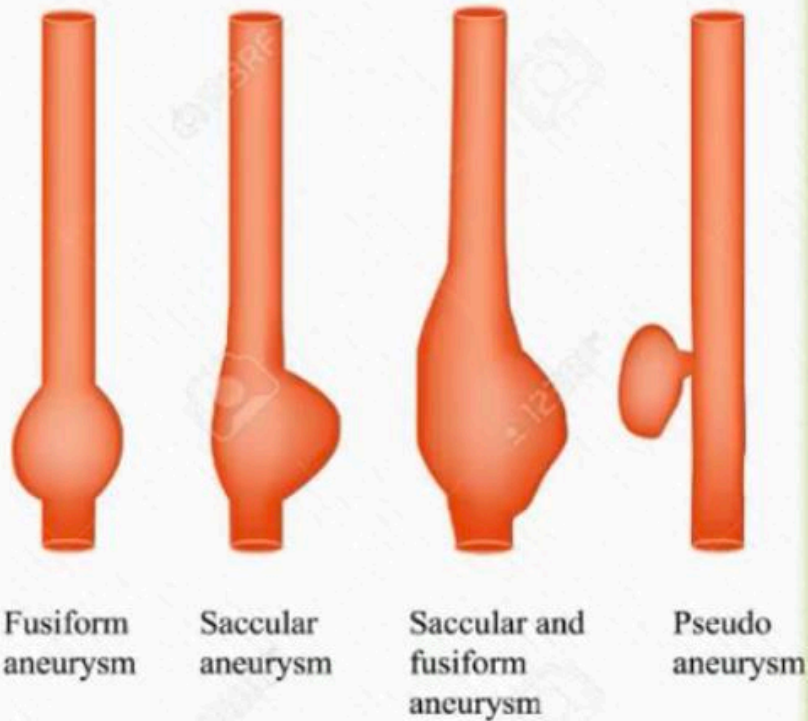
Done by:
Isra'a almathloom, Slsabeel khawaldeh
Omar tafely , Ahmad drawsha
Laith al zoubi

Aneurysms

- General Dilatations of localized segments of the arterial system are called 'aneurysms. They can either be true aneurysms, containing the three layers of the arterial wall (intima, media, adventitia) in the aneurysm sac, or false aneurysms, having a single layer of fibrous tissue as the wall of the sac, e.g. aneurysm following trauma.

- Aneurysms can also be grouped according to their shape (fusiform, Th saccular) or their etiology (atheromatous, traumatic, mycotic, etc.).
- The term 'mycotic' is a misnomer because, although it indicates infection as the cause of the aneurysm, it is due to bacteria, not fungi.
- Aneurysms may occur in the aorta, iliac, femoral, popliteal, subclavian, axillary, carotid, cerebral, mesenteric, splenic and renal arteries and their branches.
- The majority are true fusiform atherosclerotic aneurysms.

Types of aneurysm



Classification of aneurysms:

- Wall

A-True (three layers: intima, media, adventitia)

B-False (single layer of fibrous tissue)

- • Morphology

Fusiform, Saccular

- • Aetiology

Atheromatous Mycotic (bacterial rather than fungal), Collagen disease, Traumatic

Clinical features

- All aneurysms can cause symptoms, as a result of compression of surrounding structures, thrombosis, rupture or the release of emboli. The symptoms relate to the vessel affected and the tissues it supplies. Many aneurysms of clinical significance can be palpated and, typically, an expansile pulsation is felt. Transmitted pulsation through a mass lesion, cyst or abscess lying adjacent to a large artery may be mistaken for aneurysmal pulsation. Before incising a swelling believed to be an abscess, it is essential to make sure that it does not pulsate.

Abdominal aortic aneurysm

- **Abdominal aortic aneurysm** is by far the most common type of large vessel aneurysm and is found in 2% of the population at autopsy; 95 % have associated atheromatous degeneration and 95 % occur below the renal arteries.
- Most remain asymptomatic until rupture occurs; the risk of rupture increases with increasing size (diameter) of the aneurysm.
- Asymptomatic aneurysms are found incidentally on physical examination, radiography or ultrasound investigation.

- It may be appropriate to screen for abdominal aortic aneurysms with ultrasound; a national screening programme has recently started in England and offers an ultrasound scan to men in their 65th year. Symptomatic aneurysms may cause minor symptoms, such as back and abdominal discomfort, before sudden, severe back and/or abdominal pain develops from expansion and rupture.

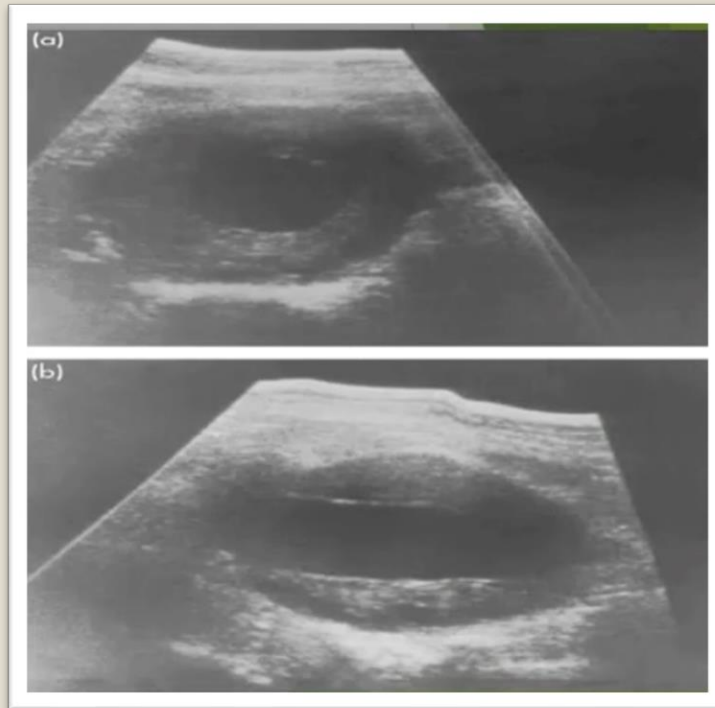


Figure (1):

- Ultrasonogram of an aortic aneurysm showing the large clot-filled sac with a small central lumen
(a) transverse and
(b) longitudinal scans.

Asymptomatic abdominal aortic aneurysm

- An asymptomatic abdominal aortic aneurysm in an otherwise fit patient should be considered for repair if >55 mm in diameter (measured by ultrasonography).
- The annual incidence of rupture rises from 1 % or less in aneurysms that are <55 mm in diameter to a significant level.
- Perhaps as high as 20 % in those that are 70 mm in diameter.

Assuming open elective surgery (transabdominal) carries a 5% mortality rate, the balance is in favour of elective operation once the diameter is >55 mm, provided there is no major comorbidity.

Regular ultrasonographic assessment is indicated for asymptomatic aneurysms <55 mm in diameter.

- Causes

- The exact cause of an aneurysm is unknown.

It occurs due to weakness in the wall of the artery.

Factors that can increase your risk of having this problem include:

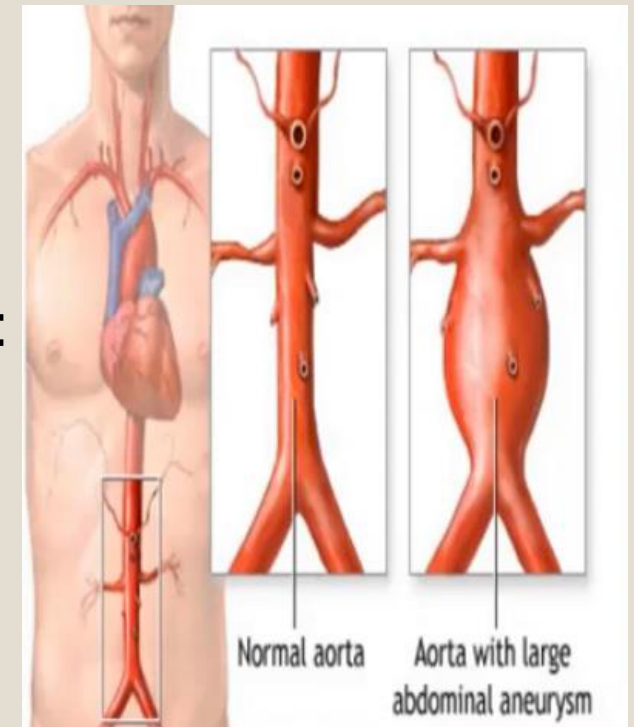
- Smoking

- High blood pressure

- Male sex

- Genetic factors

- An abdominal aortic aneurysm is most often seen in males over age 60 who have one or more risk factors. The larger the aneurysm, the more likely it is to break open or tear. This can be life threatening.



Abdominal aortic aneurysm

- They occur five times more frequently in men and in one in four male children of an affected individual.
- Aneurysms may occur secondary to atherosclerosis, infection (syphilis, Escherichia coli, Salmonella) and trauma, or may be genetic (Marfan's syndrome, Ehlers-Danlos syndrome).

Symptoms of AAA:

- Rapid expansion or rupture of an AAA may cause severe pain (epigastric pain radiating to the back).
- A ruptured AAA causes hypotension, tachycardia, profound anemia and sudden death.
- The symptoms of rupture may mimic renal colic, diverticulitis and severe lower abdominal or testicular pain. Gradual erosion of the vertebral bodies may cause nonspecific back pain. The aneurysm may embolism distally.

Figure:

A 60 year old male presented with a ruptured AAA.



- Inflammatory aneurysms can obstruct adjacent structures, e.g. ureter, duodenum and vena cava. Rarely patients with aneurysms can present with severe haematemesis secondary to an aortoduodenal fistula.

Presentation

- 90% of cases are incidental findings while 10% are symptomatic.
- Asymptomatic cases are found on routine abdominal exam or while doing an ultrasound for another reason.
- Symptoms are due to compression, thrombosis, or rupture (Very Dangerous)
- And can range from vague epigastric discomfort to back and abdominal pain.
- (Flank and Groin Pain.)
- Symptoms of a thrombus depend on which vessel is occluded. An embolus lodged into interosseus or digital arteries can cause blue toes.

1. Ask about them when taking a patient's history.
2. Atherosclerosis (Hyperlipidemia)
3. Hypertension (Uncontrolled)
4. 4-Smoking
5. Family History
6. White Male
7. Advanced age
8. Connective tissue disease

Risk Factors

Possible Physical Exam Findings

- Many aneurysms of clinical significance can be palpated and, typically, an expansile pulsation is felt. Transmitted pulsation through a mass lesion, cyst or abscess lying adjacent to a large artery may be mistaken for aneurysmal pulsation.
- Abdominal Tenderness
- Pulsatile abdominal mass
- Bruits can be heard.

Rupture

- Abdominal aortic aneurysms can rupture anteriorly into the peritoneal cavity (20 per cent) or posterolaterally into the retro- peritoneal space (80 per cent)
- Less than 50 per cent of patients with rupture survive to reach hospital.
- Anterior rupture results in free bleeding into the peritoneal cavity; very few patients reach hospital alive.
- Posterior rupture on the other hand produces a retroperitoneal hematoma.
- Rupture is a surgical emergency.

Signs of rupture:

- Consists of a triad: 1- Abdominal pain 2- Pulsatile abdominal mass 3- Hypotension.
- The pain is severe. And can be persistent or intermittent.
- Decreasing Hematocrit
- Rupture into peritoneal cavity is rapidly fatal.
- Signs of heart failure
- A loud bruit.

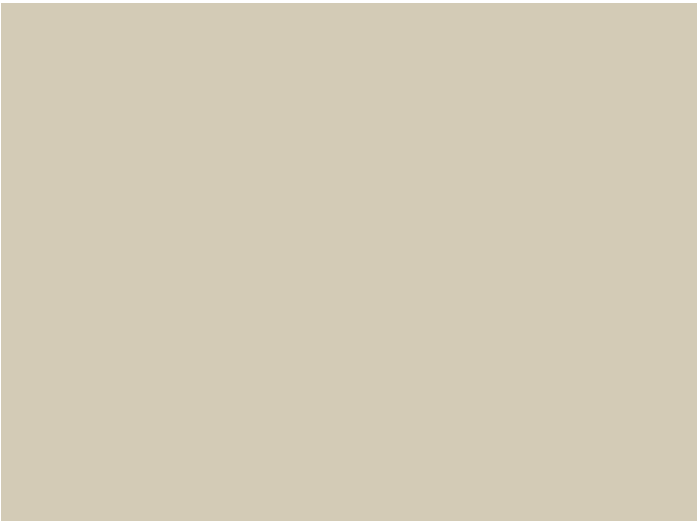
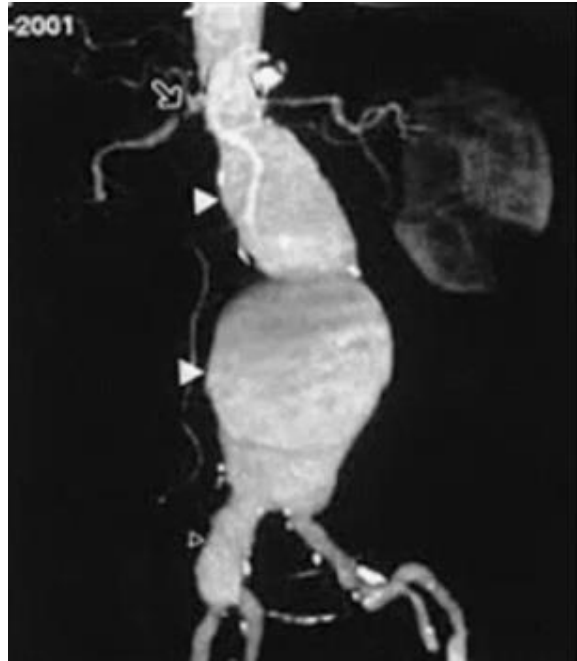
Risk of rupture:

- Risk per year based on diameter:
- Less than 5cm= 4%
- 5 to 7 cm= 7%
- More than 7 cm= 20%
- Indications for surgery: 1- if the diameter is more than 5.5 cm.
- Rupture
- Rapid growth
- Embolization of plaque.



Imaging

- CT Angiogram is quickly becoming the gold standard. As it gives exact measurements and can help decide on which surgery is needed.
- Duplex Ultrasound is the best tool for screening and to follow up clinically.

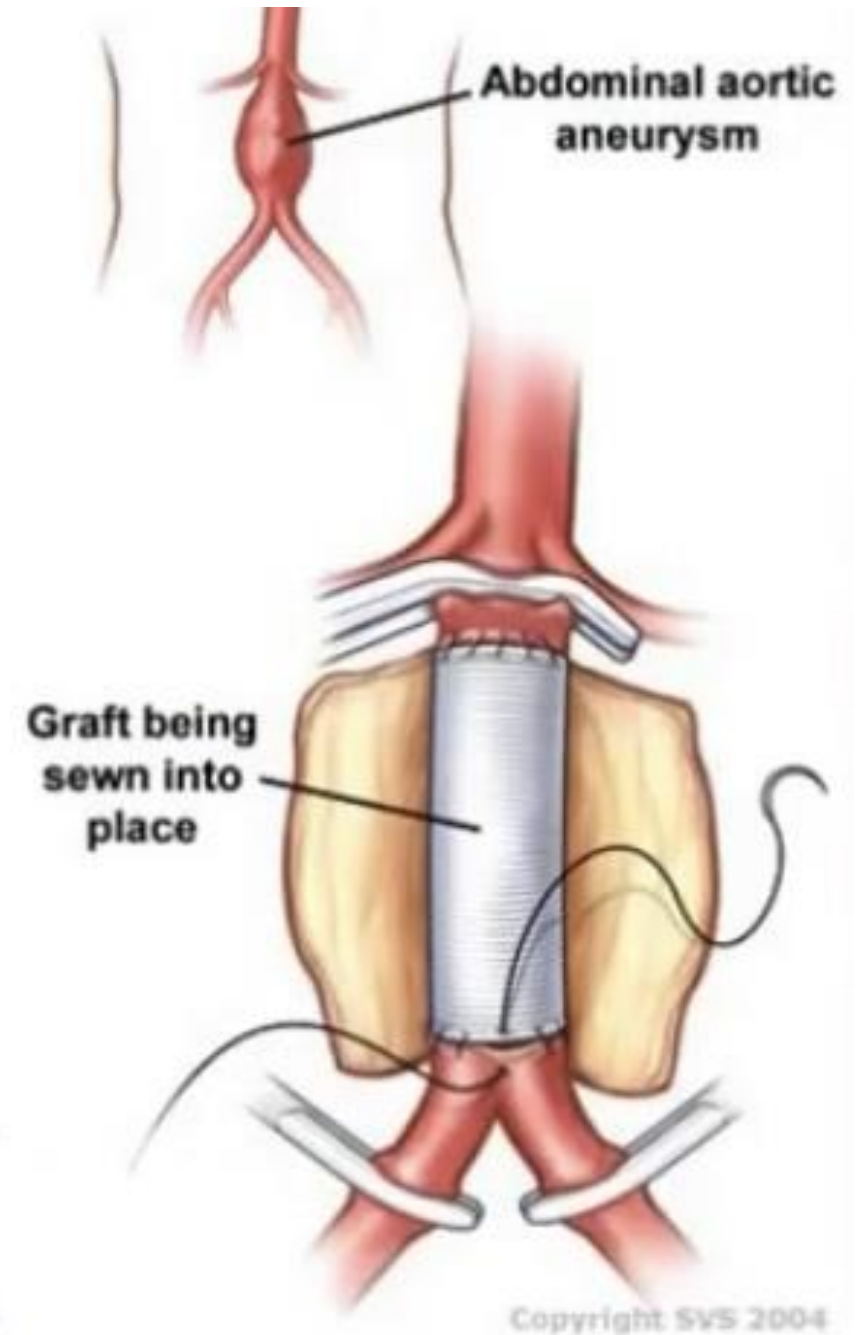


Surgical Treatment

- There are two options:
- 1- Open surgical procedure
- 2- Endovascular aneurysmal repair

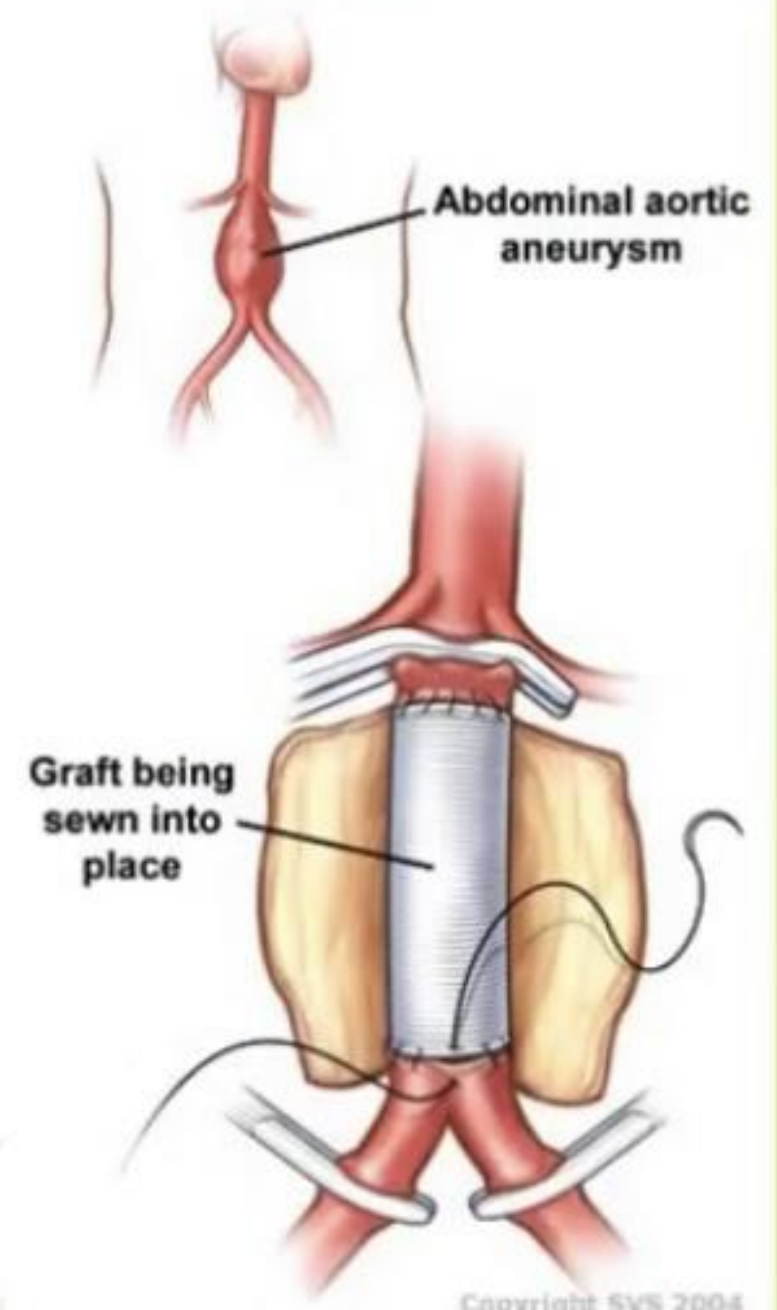
Open surgery

- Under general anesthesia, with the patient lying supine, a full length midline or supra-umbilical transverse incision is made.
- The small bowel is lifted to the patient's right and the aorta identified.
- The common iliac arteries are then exposed and clamps applied above and below the lesion. Many surgeons give systemic heparin before clamping.
- The aneurysm is opened longitudinally. Upper and lower aortic necks are prepared to which an aortic prosthesis is then sutured end to end inside the sac



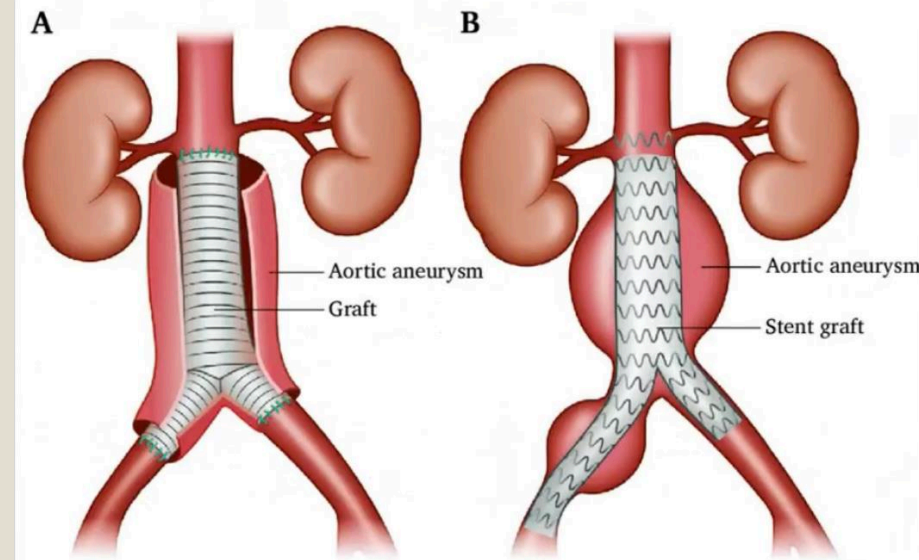
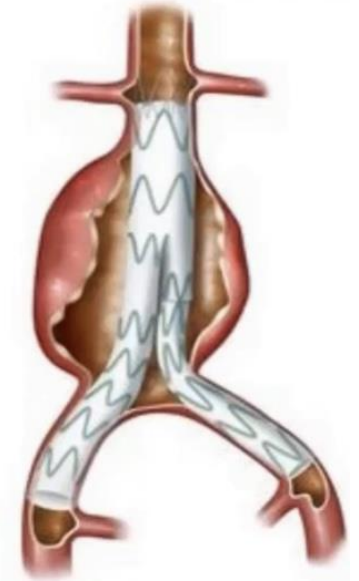
Open surgery

- Clamps are released slowly to prevent sudden hypotension.
- The aneurysm sac is closed around the prosthesis to exclude both it and the suture lines from the bowel to reduce the risk of adherence. The abdomen is then closed



Endovascular Aneurysmal Repair

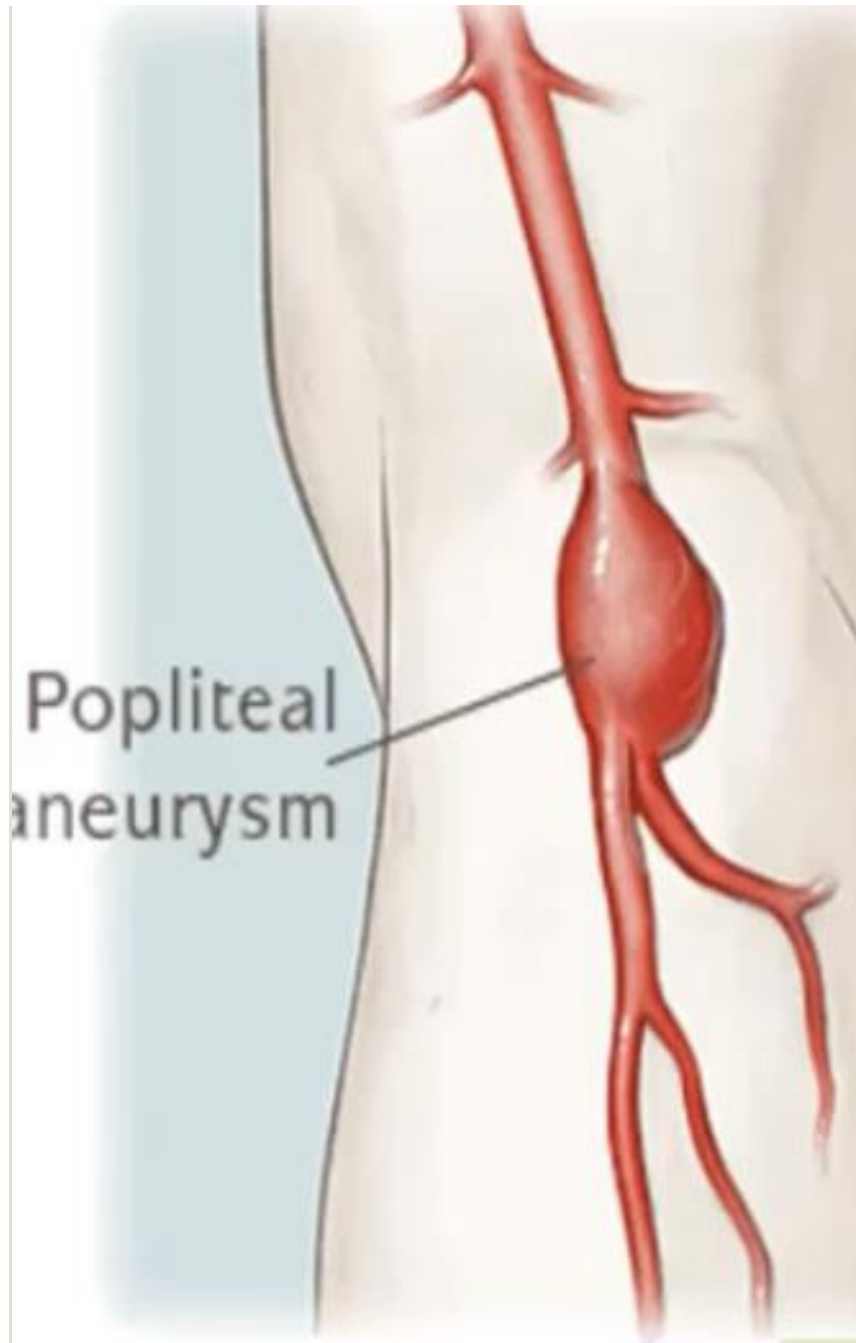
- Endovascular aneurysm repair (EVAR) is an important advance in the treatment of abdominal aortic aneurysm(AAA).
- EVAR is performed by inserting graft components that are folded and **compressed** within a delivery sheath through the lumen of an access vessel, usually the common femoral artery.
- Upon deployment, the **endograft expands**, contacting the aortic wall proximally and iliac vessels distally to exclude the aortic aneurysm sac from aortic blood flow and pressure.



Postoperative complications

- The most common complications after open repair are cardiac (ischemia and infarction) and respiratory (atelectasis and lower lobe consolidation).
- A degree of colonic ischemia (lack of a collateral blood supply).
- Renal failure may happen if there is preoperative renal impairment or considerable intraoperative blood loss.
- Neurological complications include sexual dysfunction and spinal cord ischemia.
- Cardiac, respiratory, renal and neurological complications are less common after endovascular repair. However, there are complications that are unique to EVAR such as endoleak, graft migration and graft limb occlusion.

Peripheral aneurysms



- **Popliteal artery aneurysm** accounts for 70 per cent of all peripheral aneurysms; two-thirds are bilateral.
- Examination of the abdominal aorta is indicated if a popliteal aneurysm is found because one-third are accompanied by aortic dilatation.
- Popliteal aneurysms **present as** a swelling behind the knee or with symptoms caused by complications, such as severe ischemia following thrombosis or distal ischemia as a result of emboli.
- **The diagnosis** is usually confirmed with duplex scanning, but assessment of the distal vessels (with CT, MR or DSA) is important prior to repair if the foot pulses are diminished or absent



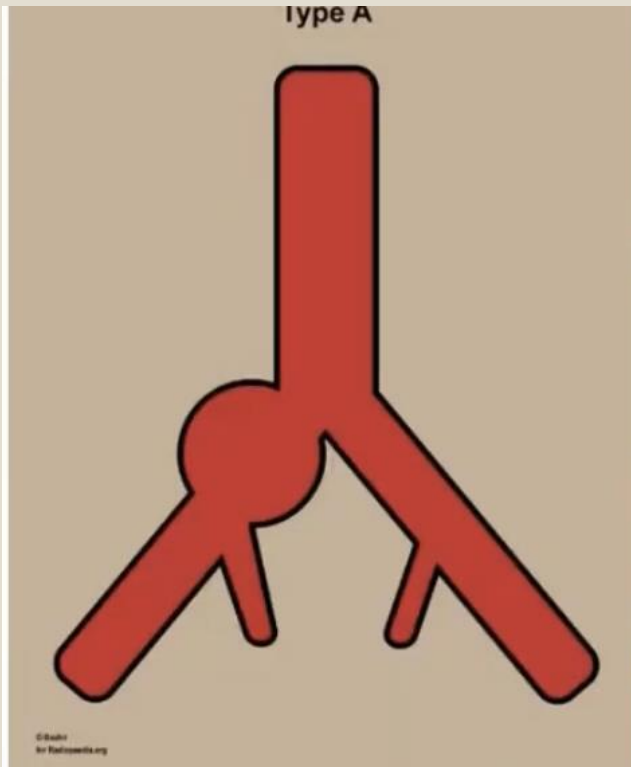
Posteriorolateral



Posterior

Popliteal artery aneurysm

Peripheral aneurysms



- Iliac aneurysm usually occurs in conjunction with aortic aneurysm and only rarely on its own. On its own, it is difficult to diagnose clinically so about half present already ruptured.
- Open surgery usually involves an inlay graft, but some iliac aneurysms may be suitable for endovascular repair.

Thank you