ABDOMINAL AORTIC ANEURYSM RUPTURE
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Vascular emergency/crisis - ↑↑ morbidity
- ↑↑ mortality > 50%

Rupture
   (i) Retroperitoneal space
   (ii) Intraperitoneal cavity
   (iii) Adjoining structures

1. Pathophysiology of rupture
   1.1. Retroperitoneal rupture:
       • Severe pain
       • ↓ Blood Pressure
       • Tamponade effect of the retroperitoneum → temporary cessation of haemorrhage
       • Further rupture → bleeding → death

   1.2. Intraperitoneal rupture:
       • No tamponade effect
       • Free haemorrhage → death

   1.3. Into adjoining structures:
       • Duodenum → aorta-enteric fistula with massive haematemesis and haematochezia
       • IVC → aorta-caval fistula with ↑output heart failure, venous congestion of lower limbs, priapism

2. Clinical presentation of AAA rupture
   2.1. Symptoms:
       • 50% Of patients unaware of AAA – rupture first indication of AAA
       • Sudden onset of acute abdominal pain
       • Pain radiates to back and down to: Left flank
       Left groin

   2.2. Signs:
       • May initially be haemodynamically stable due to tamponade effect
       Beware of these deceptive signs:
       “Normal” blood pressure in an otherwise hypertensive patient
       “Normal” pulse rate in a patient on β-blocker treatment
       “Normal” haematocrit in an otherwise polycythemic patient
• Shocked patient:
  o ↓ Blood pressure
  o ↑ Pulse
  o ↓ Haematocrit
  o ↓ Urine output
• Pulsating abdominal mass

3. **Diagnosis of AAA rupture**
   **Clinical Diagnosis:**
   Any acute abdominal pain that radiates to the back in an elderly patient, should be regarded as a ruptured AAA until proven otherwise

4. **Differential diagnosis of AAA rupture**
   • Inflammatory AAA
   • Rapidly expanding AAA, impending rupture
   • Renal calculi
   • Other causes of acute abdomen, e.g. mesenteric ischaemia, acute pancreatitis
   • Acute back conditions

5. **Special investigations**
   *Only indicated in haemodynamically stable patients where the diagnosis is unclear.*
   • Ultrasound
     o Confirms the presence of an AAA
     o ? Retroperitoneal haematoma
   • CT
     o Confirms retroperitoneal haematoma
     o Contrast enhancement in haematoma = haemorrhage
     o CT indicated in stable patients to evaluate anatomical suitability for EVAR

6. **Management of AAA rupture – general principles**
   • High index of suspicion → early diagnosis
   • **Urgent referral to Specialist Vascular Unit**
   • Do not delay surgery for special investigations
   • Avoid unnecessary movement
   • Effective resuscitation
   • Urgent surgery
   • Post surgical monitoring and treatment in ICU

7. **Resuscitation of AAA rupture**
   • Initiate in ER → Continue into OR
   • Maintain airway and oxygenation – intubate and ventilate if required
   • 2 Large caliber peripheral lines - Crystalloid infusion
• **Hypotensive resuscitation**: maintain systolic blood pressure of 70 – 90 mmHg (> 100) to preserve renal and cerebral perfusion. Attempts at reaching a normal blood pressure could lead to loss of tamponade → haemorrhage

• Order 4–6 units of blood for OR. This is administered only after the aorta has been cross-clamped

• Arrange for intra-operative autotransfusion (“cell saving techniques”) where available

• Blood investigations: FBC, platelets, UKE, glucose, LFT, bloodgas

  *Surgery should not be delayed! Have the results sent to OR*

• If the patient is stable:
  - CXR
  - ECG

• Place urinary catheter, nasogastric tube, CVP, arterial line, and central venous line in OR

8. **Treatment of AAA rupture**

• Open surgical repair:
  - Replace aneurismal aorta with a prosthesis
  - Use intra-operative autotransfusion (“cell saver”)  

• Endovascular repair

• Post surgical management in ICU
  - Ventilatory support
  - Cardiac support
  - Renal perfusion (? dialysis)
  - Fluid and electrolyte balance
  - Blood and blood products
  - Nutritional support (enteral or parenteral)
  - Antibiotics

9. **Prognosis**

• 70% of patients have concomitant co-morbidities:
  - IHD, COPD, impaired renal function, diabetes, etc.

• Surgical mortality due to:
  - Respiratory failure
  - Myocardial infarction
  - Renal failure
  - Stroke
  - Sepsis

  Overall mortality > 50%
  Surgical mortality 20 - 30%

*Repair aneurysms electively*
REMEMBER:

- Aneurysms occur commonly
- Look for AAA’s in all high-risk patients
- Repair AAA’s electively before they rupture
- Acute abdominal pain radiating to the back in an elderly patient should be regarded as a ruptured AAA until proven otherwise