Aortic Dissection: Causes, Symptoms and Treatment

Aortic dissection is a life-threatening condition where a tear in the **intimal layer** of the aorta allows blood to enter the **medial layer**, creating a **false lumen** that splits the aortic wall.

Epidemiology

- More common in **men** (M:F ratio ~2:1)
- Typically occurs between ages **40–70**
- High mortality: **1–2% increase in mortality per hour** after onset if untreated
- **Most common predisposing factor**: **chronic hypertension**

Etiology & Risk Factors

Major Causes

- **Chronic Hypertension** – most common
- **Atherosclerosis**
- **Connective Tissue Disorders**:
  - **Marfan syndrome**
  - **Ehlers-Danlos syndrome (vascular type)**
- **Congenital Cardiac Anomalies**:
  - **Bicuspid aortic valve**
  - **Coarctation of the aorta**
- **Aortitis**:
  - **Takayasu arteritis**
  - **Giant cell arteritis**
  - **Tertiary syphilis**
- **Trauma** – especially **deceleration injuries**
- **Iatrogenic** – e.g., cardiac catheterization, surgery
- **Substance Use**:
  - **Cocaine**
  - **Amphetamines**

Classification (Stanford) – High-Yield

Type	Description	Treatment Approach
A	Involves **ascending aorta** (± descending)	**Surgical emergency**
B	Involves only **descending aorta**	**Medical ± surgical**

Clinical Features

History

- **Sudden, severe chest pain**:
  - Often described as **“tearing” or “ripping”**
  - Radiates to **back**, **abdomen**, or **neck**
- Often mimics **acute myocardial infarction (AMI)**

Associated Symptoms by Branch Obstruction:

Artery Obstructed	Clinical Findings
Carotid	Stroke-like symptoms (hemiparesis)
Coronary (esp. RCA)	Chest pain, MI
Subclavian	Upper limb ischemia, hypotension
Renal	Acute kidney injury, anuria
Spinal artery	Paraplegia
Mesenteric (Celiac, SMA)	Severe abdominal pain (ischemia)

Examination Findings

- **Pulse/BP discrepancy** (>20 mmHg between arms)
- **Hypertension** or **hypotension** (if tamponade or rupture)
- **New murmur** of **aortic regurgitation** (early diastolic)
- **Collapsing/bounding pulse**
- **Unequal peripheral pulses**
- **Signs of shock** or **syncope**
- **Murmur**: Left scapular or back region
- **Widened pulse pressure**

Investigations

Laboratory

- FBC, U&E, LFTs, Troponin (to rule out MI)
- Cross-match (urgent transfusion may be needed)
- Coagulation profile

Imaging

Modality	Findings
Chest X-ray	Widened mediastinum, pleural effusion (late finding)
CT Angiography (CTA)	Gold standard – shows intimal flap & false lumen
Transesophageal Echo	Useful if unstable; bedside test
MRI Angiography	High sensitivity; for stable patients
ECG	Often normal, may show LVH or MI

Management

Initial Emergency Care

- **Oxygen**, **IV access**, **monitor vitals**
- **Pain control**: IV opioids (e.g., morphine)
- **Blood pressure control**:
  - First-line: **IV beta-blocker** (e.g., **labetalol**)
  - Add **nitroprusside** if further BP reduction needed
  - Goal: Lower **SBP <120 mmHg** and **HR <60 bpm**

Definitive Treatment

Type	Management
Type A	**Emergency surgery** – replace affected aorta ± valve
Type B	**Medical management first** (BP control); surgery/stenting if complications

Indications for Surgery in Type B:

- Persistent pain
- End-organ ischemia
- Dissection progression
- Aneurysm >5.5 cm or expanding

Complications – High-Yield

- **Aortic rupture**
- **Cardiac tamponade**
- **Acute aortic regurgitation**
- **MI** (coronary artery involvement)
- **Stroke**
- **Renal failure**
- **Paraplegia**
- **Bowel ischemia**
- **Sudden death**

High-Yield Pearls

Mnemonic – “DISSECT”:

- **D** – Difference in BP (arms)
- **I** – Intimal tear
- **S** – Sudden tearing pain
- **S** – Syncope or stroke signs

- **E** – ECG may mimic MI
- **C** – CT angiogram is diagnostic
- **T** – Type A = **Thoracic surgical emergency**

Vital to Differentiate from MI – misdiagnosis and giving thrombolytics can be fatal.

Always check **bilateral pulses** and **BP** in chest pain patients.