Acute aortic syndrome (AAS) describes the acute presentation of patients with one of several life threatening thoracic aortic pathologies. These include:

1. Aortic dissection (AD).
2. Intramural haematoma (IMH).
3. Penetrating atherosclerotic ulcer (PAU).
4. Aneurysmal leak.
5. Traumatic transection.
Thoracic aortic diseases (TADs) are usually asymptomatic and not easily detectable until an acute and often catastrophic complication occurs.

The identification and treatment of stable patients at risk for acute and catastrophic disease presentations (e.g., thoracic aortic dissection (AoD) and thoracic aneurysm rupture) prior to such an occurrence are very important to eliminating the high morbidity and mortality associated with acute presentations.

### Management of Acute Aortic Syndrome

- Marfan syndrome and other genetic disorders.
- Bicuspid aortic valve.
- Family history of thoracic aortic aneurysm or dissection.
- Known thoracic aortic aneurysm.
- Recent aortic manipulation (surgical or catheter based).
Classification of aortic dissection

De Bakey Type I  Type II  Type III

Stanford  Type A  Type B

Acute type A aortic dissection

[Images of CT scans showing acute type A aortic dissection]
Acute leaking type B aortic dissection

In the literature, acute IMH accounts for 5-20%, in IRAD 5.7%. Evangelista A, Mukherjee D, Mehta RH, et al. Circulation. 2005. Pts with IMH tended to be older (68.7 versus 61.7 years; p<0.001) and more likely to have distal aortic involvement (60.3% versus 35.3%; p<0.0001).

Intamural Hematoma (IMH)
Penetrating aortic ulcer (PAU)

Leaking Aortic Aneurysm
Traumatic Aortic Injury

- CT SCAN
- TEE
- MRI

The choice of imaging study often depends on the availability of these studies, with CT and TEE being the most commonly performed initial studies.
When acute aortic dissection is diagnosed, multidisciplinary evaluation and treatment are necessary. Time is of great importance, as the death rate in acute dissection may be as high as 1-2% per hour during the first 24 hours.

All patients with acute aortic dissection, whether type A or type B, should be transferred to a tertiary care center with a staff experienced in managing aortic dissection and its complications.

The goals of surgical treatment are:
- To excise the intimal tear
- Obliterate the false channel by oversewing the aortic edges
- And reconstitute the aorta, usually by placing a Dacron interposition graft.
Acute Type (A) Aortic Dissection

Patients with acute type A dissection require emergency surgery

- As they are at risk for life-threatening complications including:
  - cardiac tamponade from hemopericardium
  - aortic rupture
  - stroke
  - visceral ischemia
  - heart failure due to severe aortic regurgitation.
All of the aneurysmal aorta and the proximal extent of the dissection should be resected.

A partially dissected aortic root may be repaired with aortic valve resuspension.

Extensive dissection of the aortic root should be treated with aortic root replacement with a composite graft or with a valve sparing root replacement.
Acute Type (A) Aortic Dissection

- Surgical therapy is associated with a survival benefit compared with medical therapy in acute type A dissection.
- The 14-day mortality rate for acute type A dissection treated surgically is about 25% (compared to about 95% mortality in medically treated cases).
- Patients with high-risk features such as heart failure, shock, tamponade, and mesenteric ischemia have a worse prognosis compared with those without these features.

Acute Type (B) Aortic Dissection

- Acute type B aortic dissection carries a lower rate of death than type A dissection.
- The early mortality rate in those with type B dissection treated medically is about 10%.
- However, when complications such as malperfusion, shock, or requirement for surgery occur in type B dissection, the mortality rate is much higher, with rates of 25% to 50% reported.
Thus, initial medical therapy is the preferred approach to acute type B dissection, and surgery or endovascular therapy is reserved for patients with acute complications.

Typical indications for surgery or endovascular therapy in type B dissection include:
- visceral or limb ischemia
- aortic rupture
- refractory pain
- aneurysmal dilation
Endovascular grafts may cover the area of a primary intimal tear and thus eliminate the flow into the false channel and promote false-lumen thrombosis.
Acute Type (B) Aortic Dissection

Leaking descending thoracic aneurysm
Surgical replacement of the Descending Thoracic Aorta

Traumatic rupture

- Left Thoracotomy
- Single-lung ventilation
- Systemic heparinization
- Aortic cross-clamping
- Left heart bypass or CPB

Interposition tube graft
Aortic Injuries

- Aortic dissection can be easily missed. A high index of suspicion is important in patients who have predisposing risk factors.
- Stanford type A dissections require urgent surgery; type B dissections may be managed non-surgically under most conditions.
- Multiple diagnostic imaging modalities can be used to complement each other depending upon the availability of facilities and patient condition.
- Chances of survival are improved with prompt diagnosis, blood pressure and heart rate control, and early surgical or endovascular repair if indicated.

Points to remember
Thank you