Emergency Medicine
Dr. D. Y. Patil Medical College,
Hospital & Research Center

When the Heart Speaks in Code

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Jr 2

Under The Guidance Of -

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Case Report

- A 38 year old male patient who had complaint of severe chest pain presented to an outside hospital, was diagnosed with STEMI and thrombolysed with STK and referred to our emergency department for further management.

On examination :

- **Airway - Patent**
- **Breathing-**

  Spo2- 88% room air , after which he maintained a 98% on 5l O2 via an O2 mask

  Respiratory Rate – 25/min

  BLAE +, No adventitious sound
- **Circulation**

  BP – On the right arm – 58/30 mm Hg On the left arm – 40/20 mm Hg

  Heart Rate – 120 / min
- For which patient was started on inj Norad

- GCS – E4V5M6 (15/15)

  Pupils B/L equally reactive

  Blood sugar levels – 167mg/dl

- ABG findings

  pH – 7.44

  pO2 - 131

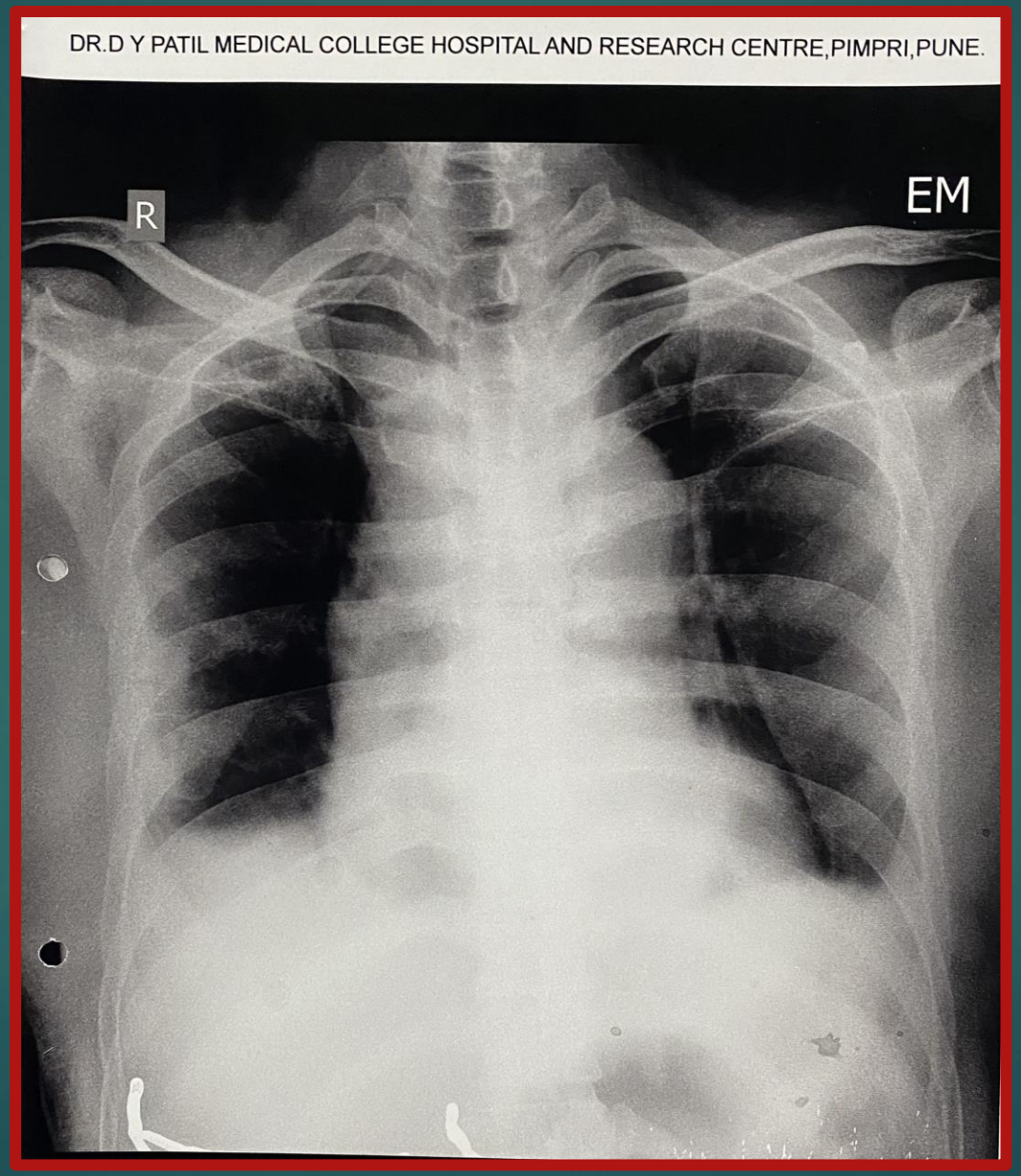
  pCO2 – 36 mmHg

  Lactate – 1.8 mmol/L

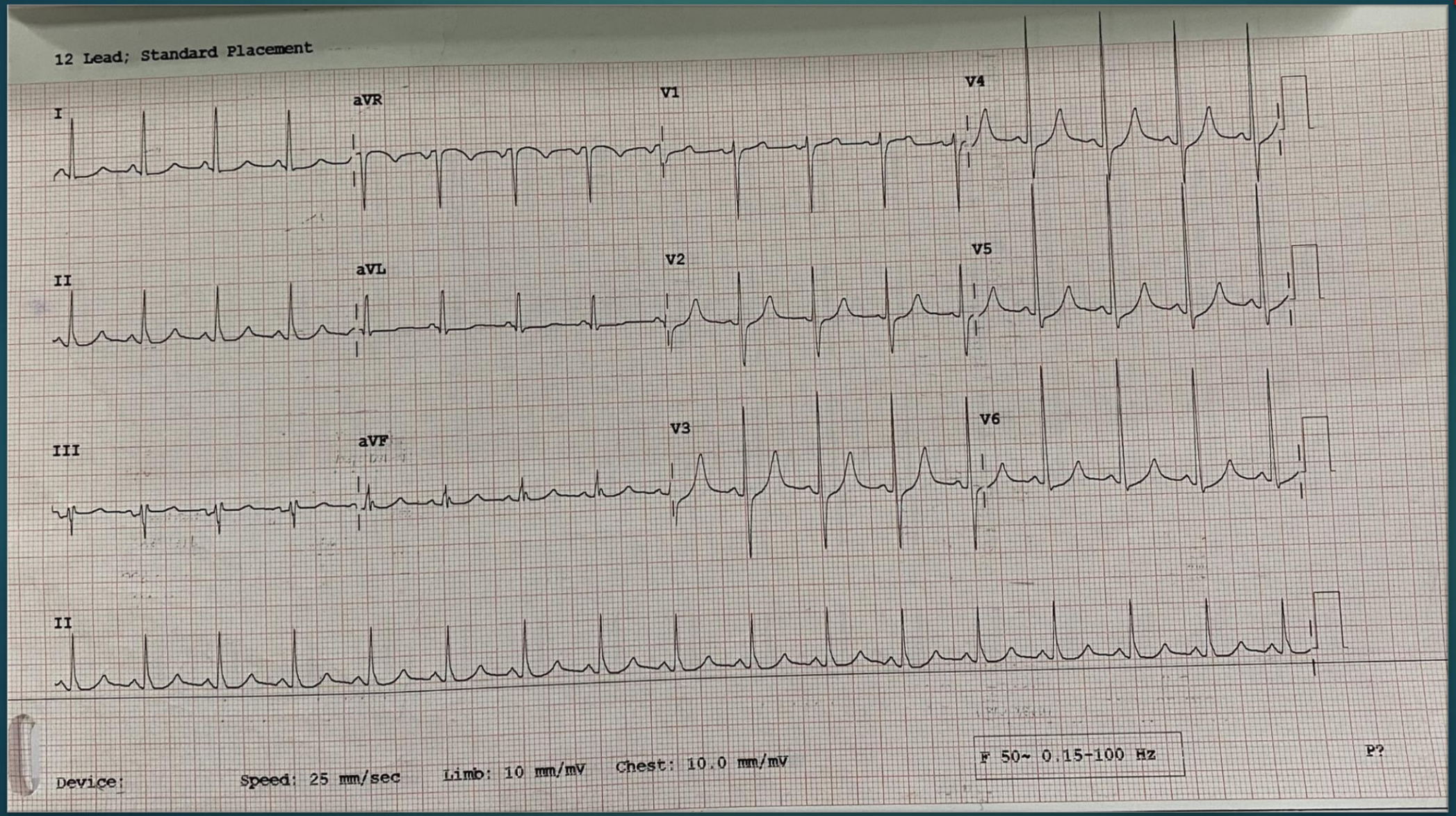
  HCO3 – 24.5 mmol/L

- No history of hypertension, diabetes , coronary artery disease , smoking or addiction of alcohol.

His chest x-ray on arrival



ECG - Sinus tachycardia and LVH



2 days back …..

- He had sudden onset chest pain, radiating to his left arm and back for which he was taken to an outside hospital .
- On arrival to that hospital – he was conscious, oriented , with stable vitals.
- His ECG was suggestive of – ST elevation in inferior leads with ? WPW syndrome.
- He was given the cardiac loading dose , and after cardiology opinion thrombolysed with Inj Streptokinase.

- He was then shifted to their ICU , where the next day he developed a hematoma over his right flank and thigh .

- They performed a 2D echo –

Mild concentric LVH

Dilated ascending aorta (42 mm)

Flap noted in ascending aorta , DTA flow +

Normal biventricular systolic function , LVEF = 60-65 %

He was then referred to our hospital for further management.

- Mild concentric LVH
- Flap noted in ascending aorta
- Bicuspid aortic valve
- LVEF – 55 %

- No MR / MS / AR / AS
- Trivial TR
- No PAH
- No clot / vegetation / pericardial effusion
- RA / RV normal


DR DY PATIL HOSPITAL
[redacted]
12/05/23
MI 0.7
TIs 0.1
3Sc
Male
Adult
FR 68
AO% 90
CHI
Frq 3.5
Gn 77
S/A 4/1
Map H/0
D 9.0
DR 66
0
2
4
6
8

CT ANGIOGRAPHY

- A CT Aortogram and CT Thorax (plain + contrast) was performed which was suggestive of –

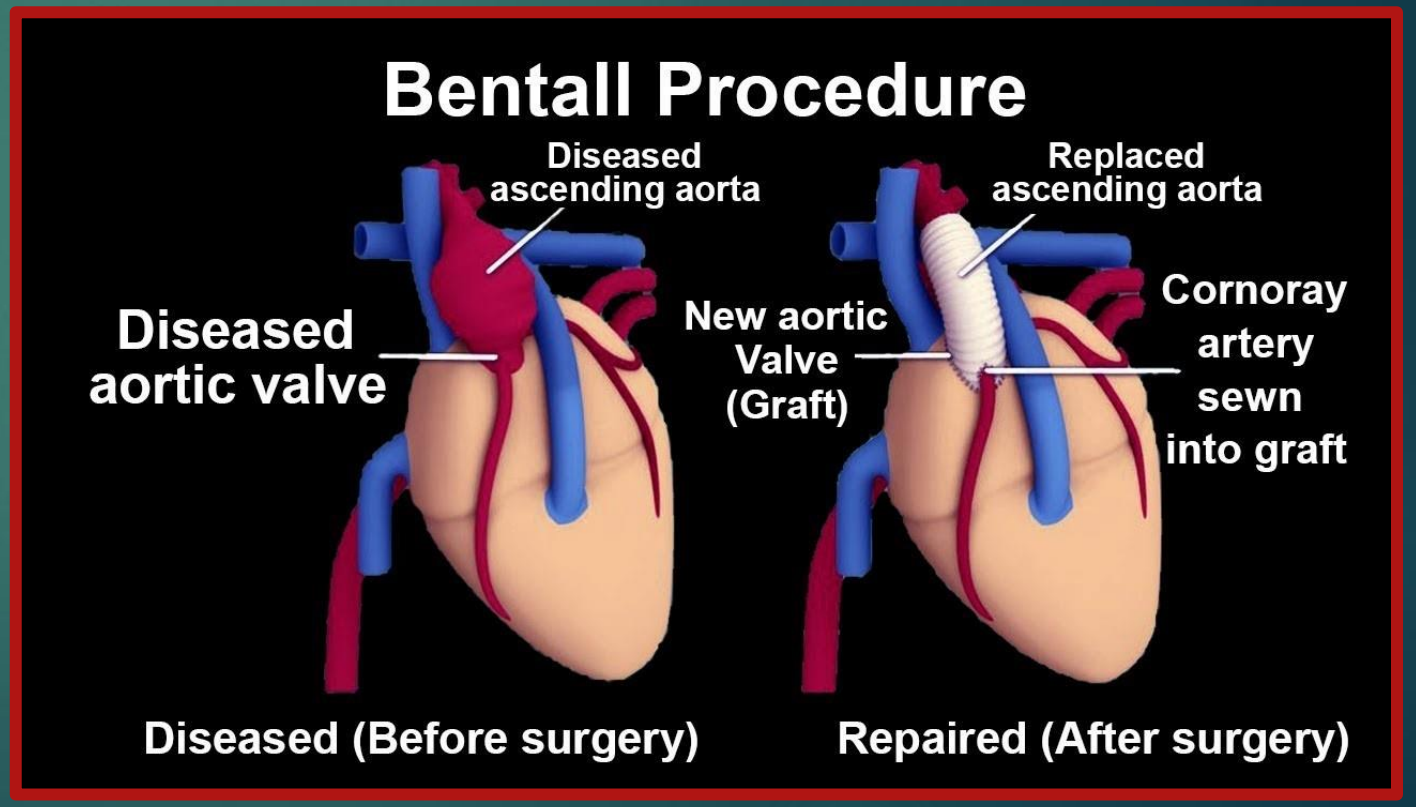
- **STANFORD TYPE A / DEBAKEY TYPE** 1 aortic dissection involving the ascending aorta, aortic arch, descending thoracic aorta and abdominal aorta and extending to bilateral common and bilateral proximal internal and external iliac arteries.

- An urgent CVTS reference was given.
- Patient was transfused with 1 PCV
- No evidence of thromboses noted in false / true lumen.
- Bilateral (R>L) mild pleural effusion with collapse – consolidation of underlying lower lobes of bilateral lungs.
- Diffuse edema with fat stranding and subtle hyperdense areas within the mediastinum , and also extending along the aorta with mildly hyperdense pericardial effusion (average attenuation 40 HU) possible pneumomediastinum , and pneumopericardium needs consideration.

Laboratory investigation

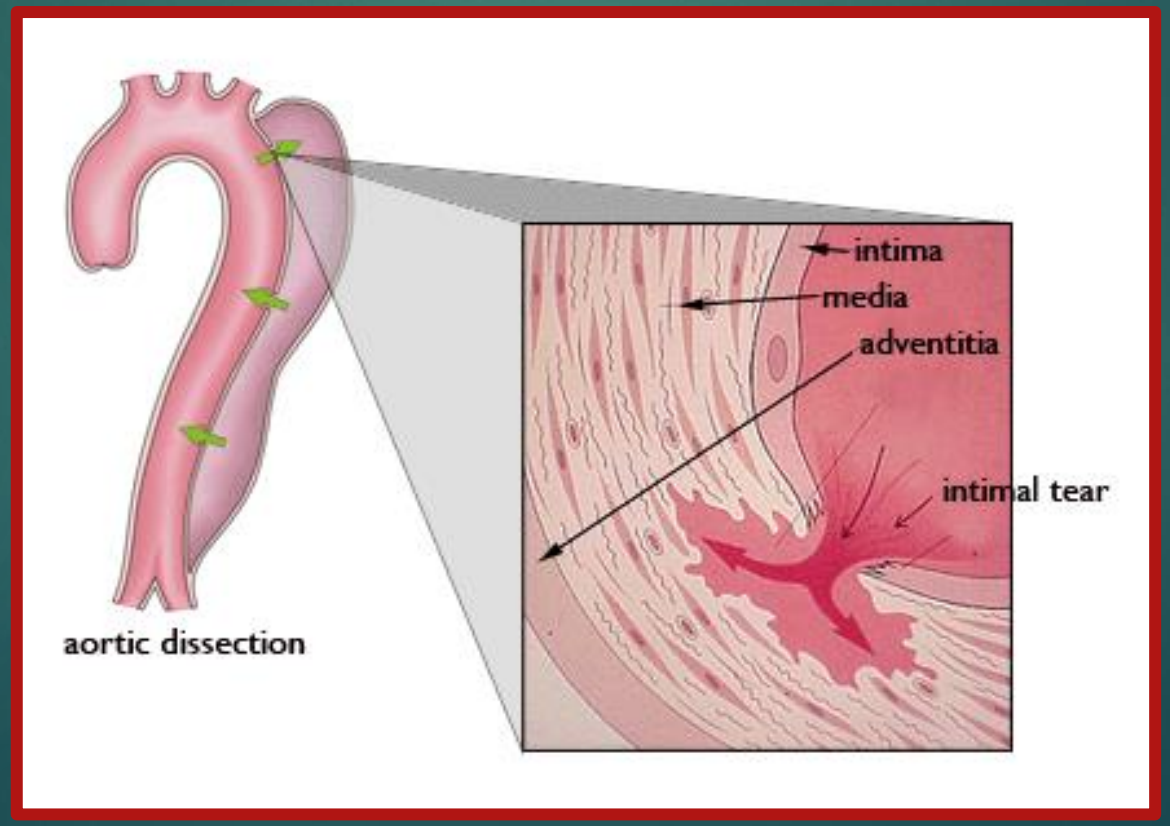
- Hb -7.50 mg/dl
- TLC -17,000 mg/dl
- Platelets – 195000
- Trop I – 316.30 ug/L
- CKMB – 59 U/L
- Albumin -2.90 mg/dl
- D Dimer – 9468 ng/ml

- Patient was taken to the operation theatre by the CVTS surgeons and a **Bentall procedure** was performed with the procedure being uneventful and was weaned off from all inotrope supports by Post Op day 4 and was shifted to the CVTS ward by day 8.



Discussion

- Aortic dissection is an acute process in which a tear in the internal face of the aorta leads to dissection through the laminas and formation of a new lumen (false lumen) and acute drop in systemic blood pressure, potentially leading to hemopericardium and cardiac tamponade with sudden death.



Etiology

Predisposing high-risk factors for non-traumatic aortic dissection include:

- Hypertension
- Genetic conditions including Marfan syndrome, Ehlers-Danlos syndrome.
- Atherosclerosis
- Pregnancy and delivery
- Family history
- Aortic instrumentation or surgery
- Inflammatory or infectious diseases that cause vasculitis (syphilis, cocaine use)

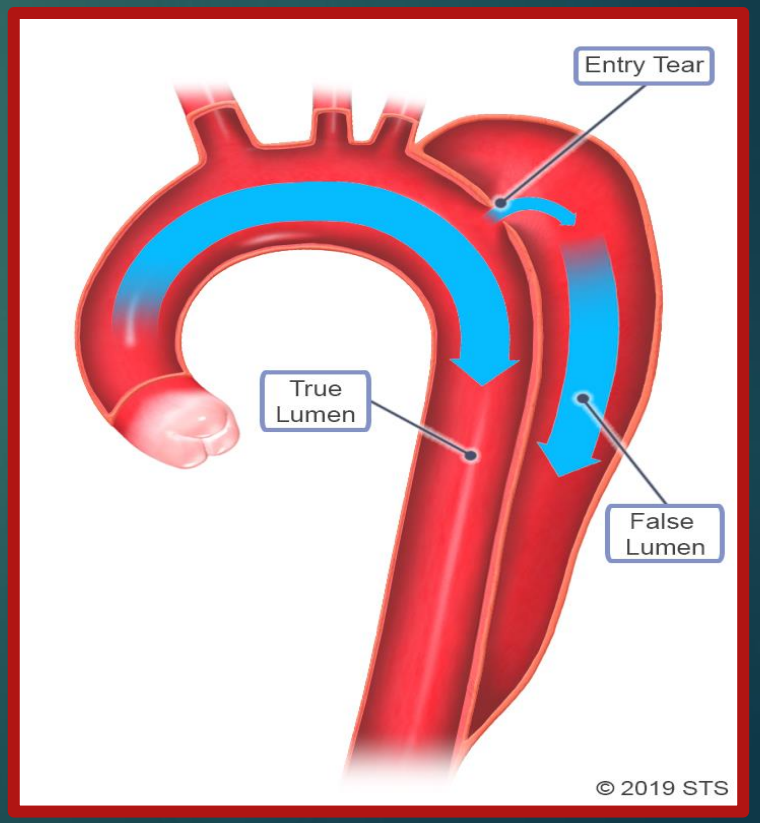
- The incidence of aortic dissection is reported to be 5 to 30 cases per 1 million people per year (compared to the much more common condition of acute myocardial infarction, which affects approximately 4400 cases per 1,000,000 person-years)

- Our Emergency Medicine department has seen 12 cases of aortic dissection from Nov 2022- till June 2024.

- Age is a risk factor for approximately 75% of aortic dissections occurring in patients who are ages 40 to 70 years, with the majority occurring between the ages of 50 and 65 years.

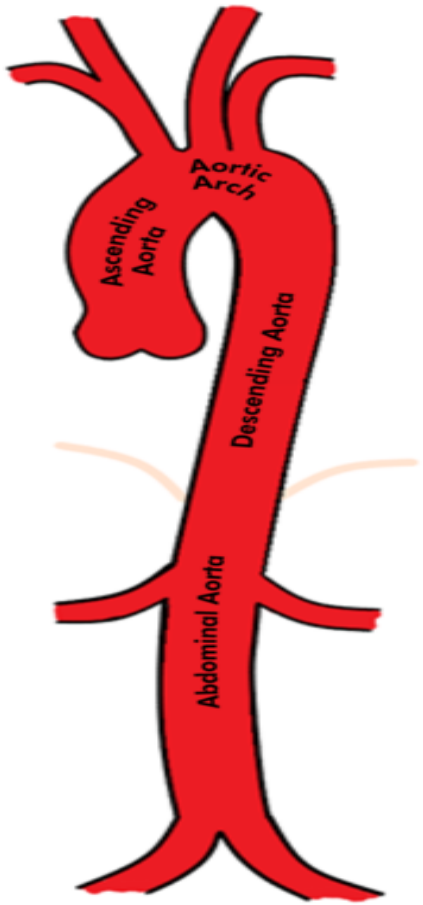
Pathophysiology

- In an AAD, the true lumen is lined by the intima whereas the false lumen is within the media. In most cases, the true lumen is smaller than the false lumen. Overtimes, the blood flowing through the false lumen leads to the development of an aneurysm with the potential for rupture. The three common sites for AAD are as follows:
- Nearly 2-2.5 cm above the aortic root (mc)
- Just distal to the origin of the left subclavian artery
- In the aortic arch



Classification

STANFORD	TYPE A		TYPE B
DE BAKEY	TYPE I	TYPE II	TYPE III



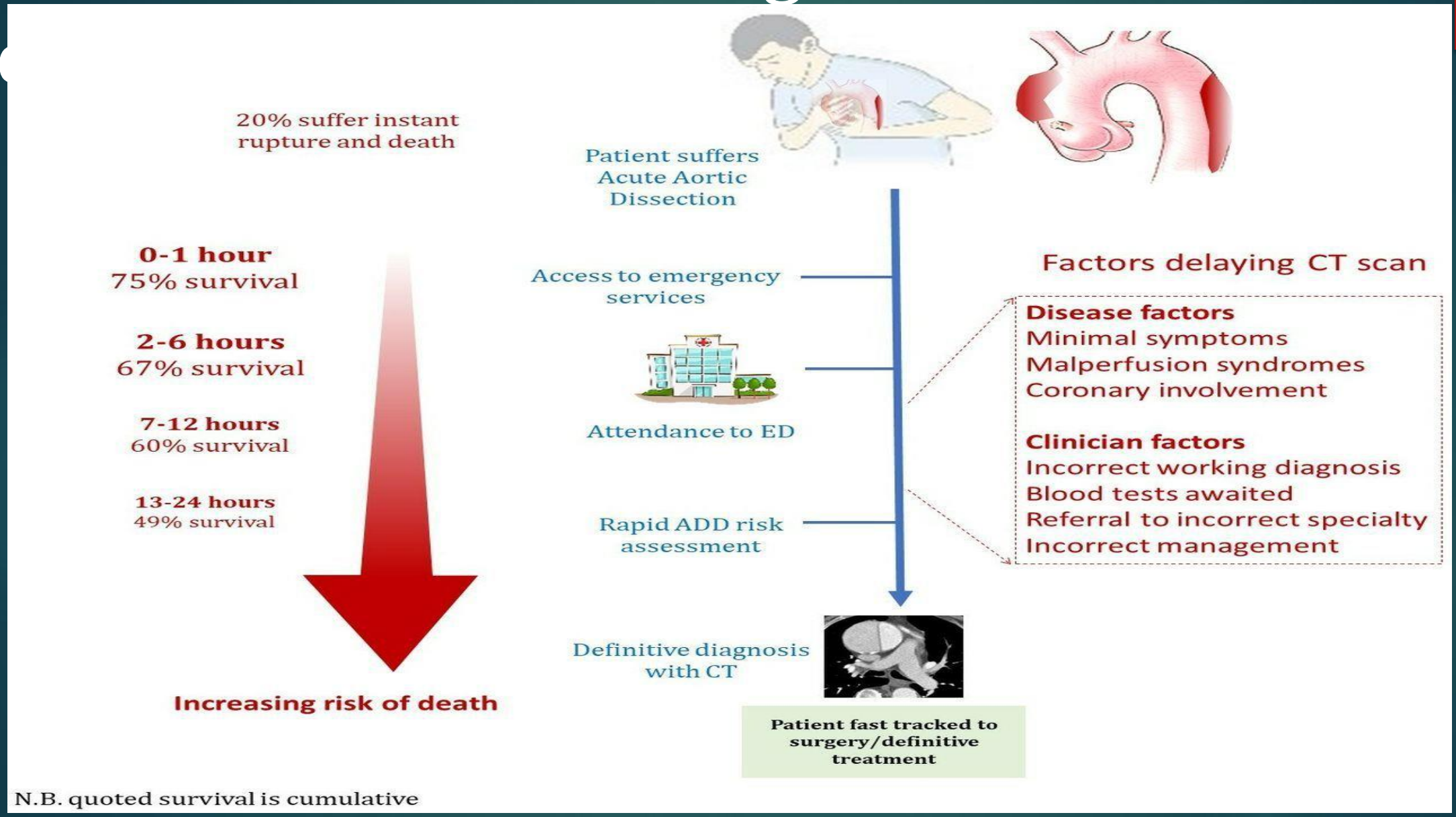
NORMAL

DE BAKEY CLASSIFICATION	
Type I	involves the ascending and descending aorta
Type II	involves only the ascending aorta
Type III	involves only the descending aorta

Illustration by Dr Sandeep Singh Awal

STANFORD CLASSIFICATION	
Type A	involves the aorta proximal to the origin of left subclavian artery
Type B	involves the aorta distal to the origin of left subclavian artery

Risk factors for misdiagnosis in aortic



https://heart.bmj.com/content/106/12/867

Differentials

- Myocardial infarction or acute coronary syndromes
- Pericardial disease
- Stroke
- Musculoskeletal disease of the extremity
- Spinal cord injuries and disorders
- Intra abdominal disorders
- Pulmonary disorders, including PE, pneumonia ,pleurisy, pneumothorax

Treatment / Management

- Once the diagnosis of AAD is confirmed or highly suspected, urgent cardiothoracic or vascular surgery consultation should be obtained, regardless of the dissection location

- Concurrently commence medical therapy including providing adequate analgesia and administering a short-acting IV beta-blockers aiming for a heart rate of ~60 bpm.

- If the patient presents in hypotension early administration of blood and blood products is advisable .
- Vasopressors can be added, if needed, to maintain adequate perfusion but may cause further false lumen propagation.
- Surgical therapy for type A AAD involves excision of the intimal tear, obliteration of entry into the false lumen proximally, and reconstitution of the aorta with the interposition of a synthetic vascular graft.

Enhancing Healthcare Team Outcomes

- Aortic dissection is a medical emergency with very high mortality if it is undiagnosed. The majority of patients present to the emergency department and hence an interprofessional team is the key.

- Several studies show that patient outcomes are improved when managed by an interprofessional team of healthcare professionals that include a emergency physician, cardiologist, intensivist, pulmonologist, cardiac surgeon, interventional radiologist.

- Special thanks to Cardiology department and CVTS team led by ***Dr Anurag Garg*** who showed courage to operate on such a challenging patient with successful outcome.

Kim JH, Choi JB Simplified surgical approach to improve surgical outcomes in the center with a small volume of acute type A aortic dissection surgery. Technol Health Care. 2018;26(4):675-685. [PMC free article] [PubMed] [Reference list]

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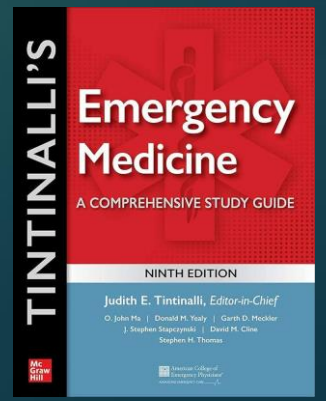
- **Imaging and Surveillance of Chronic Aortic Dissection: A Scientific Statement From the American Heart Association**

- Dominik Fleischmann, MD, FAHA, Chair, Rana O. Afifi, MD, Ana I. Casanegra, MD, MS, John A. Elefteriades, MD, Thomas G. Gleason, MD, Kate Hanneman, MD, MPH, Eric E. Roselli, MD, Martin J. Willemink, MD, PhD, and Michael P. Fischbein, MD, PhD, FAHA, Vice Chair on behalf of the American Heart Association Council on Cardiovascular Radiology and Intervention; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Clinical Cardiology; and Council on Cardiovascular Surgery and Anesthesia**AUTHOR INFO & AFFILIATIONS**



Thank you