

DISEASES OF THE AORTA: A Comprehensive Review from Aneurysms to Ulcers



COURSE OBJECTIVES

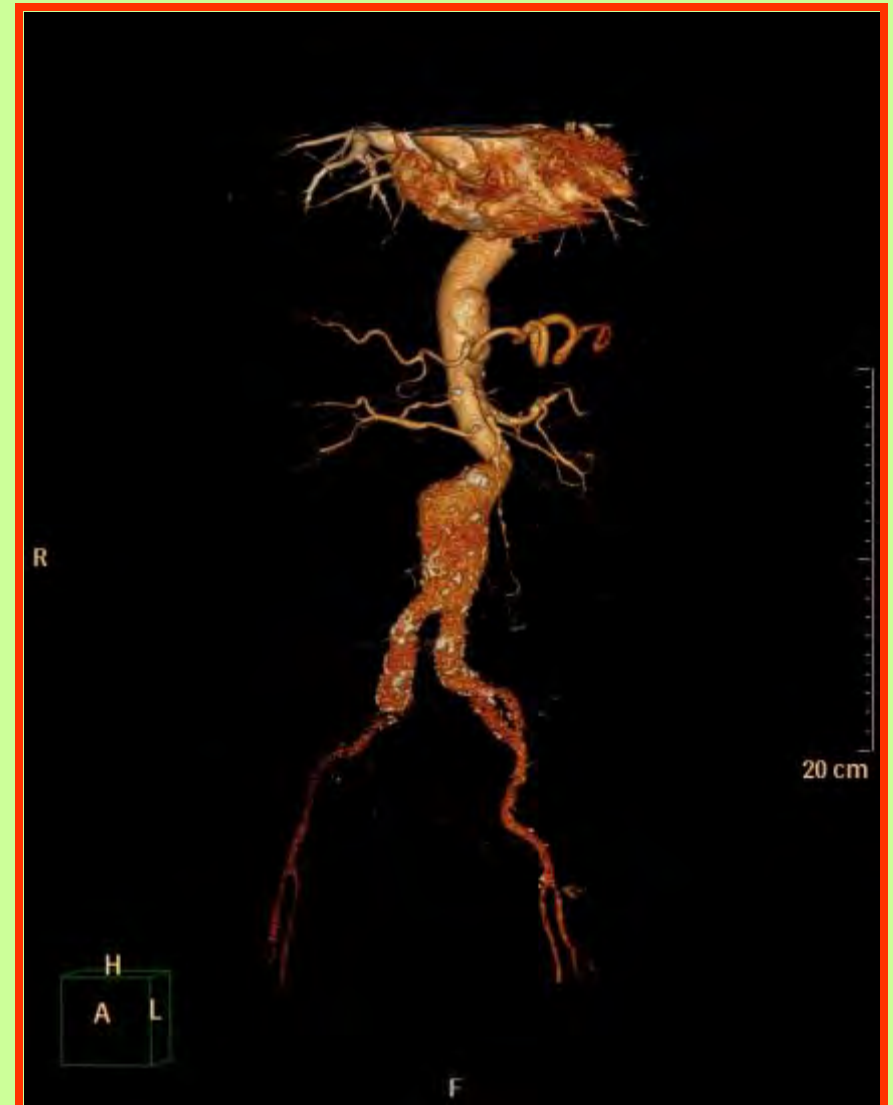


- Discuss disorders that affect the integrity of the aorta
- Describe how to evaluate for aortic abnormalities
- Differentiate between medical, pharmacological, and surgical treatment options available for aortic disorders

PREVALENCE



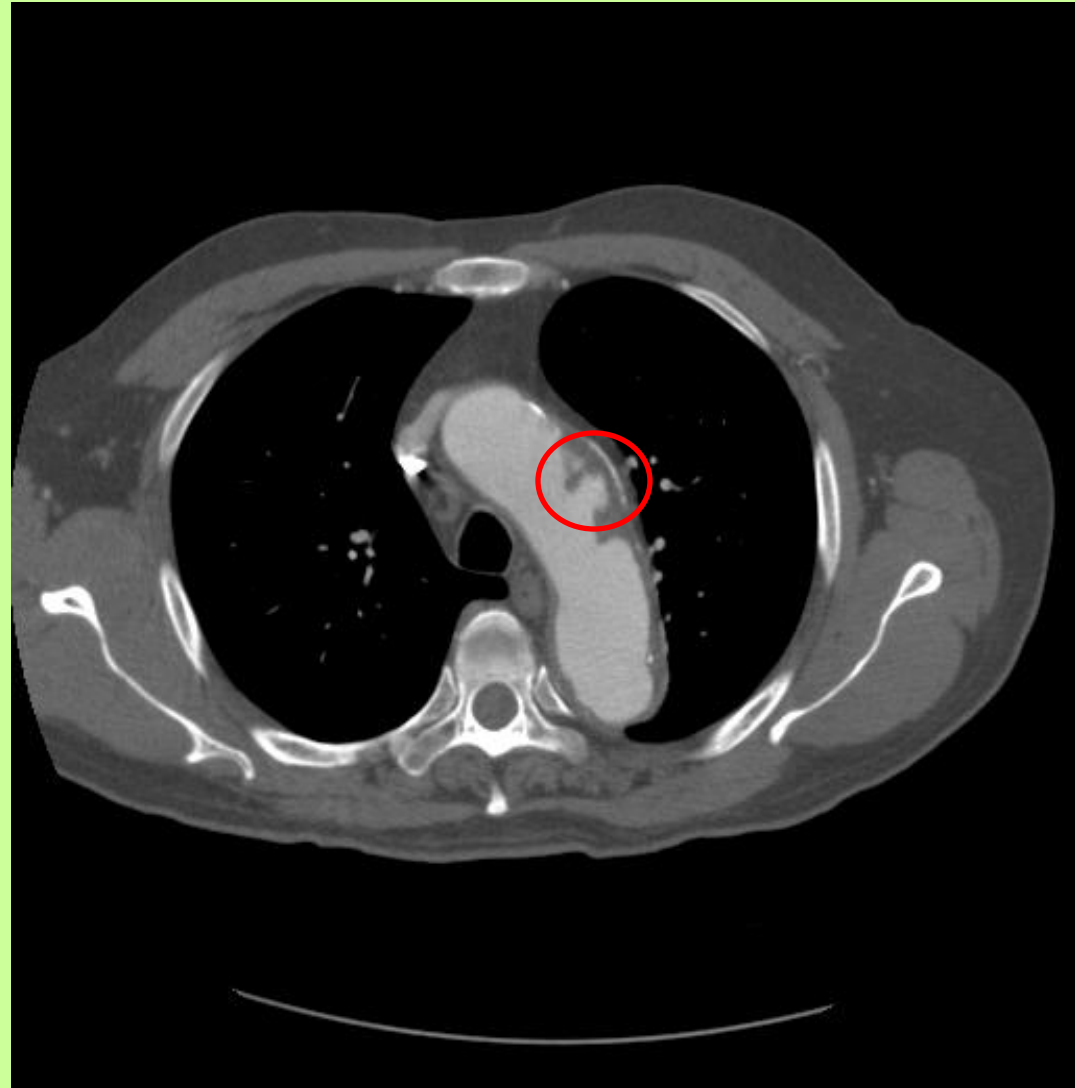
- Aortic disorders affect more than 45,000 Americans every year
- Aneurysms
- Dissections



PREVALENCE



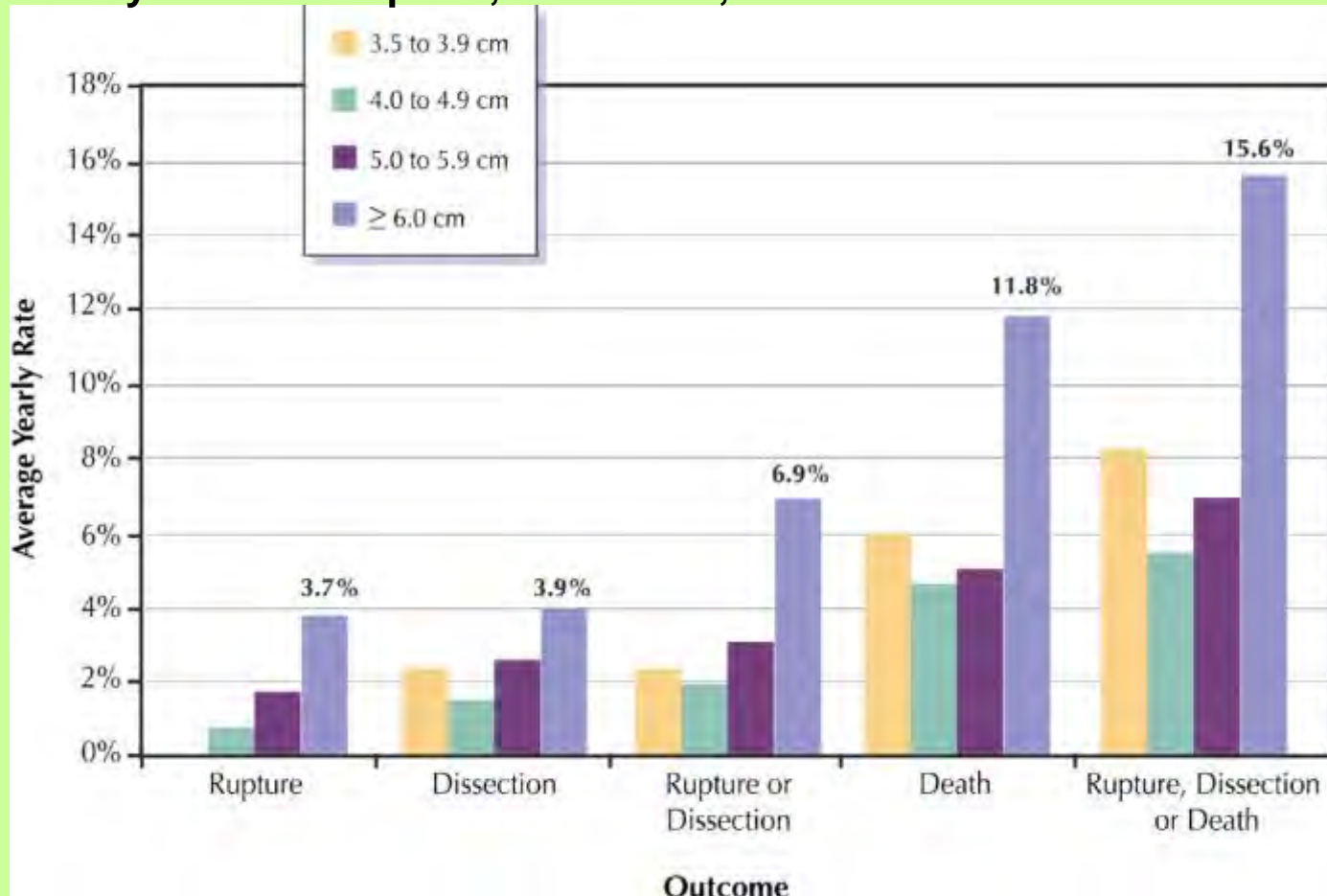
- Genetic disorders
- Infections
- Intramural Hematoma
- Ulcers



STATISTICS



Yearly Rates of Rupture, Dissection, or Death Related to Aortic Size



Elefteriades, J. A. et al. J Am Coll Cardiol 2010;55:841-857

STATISTICS

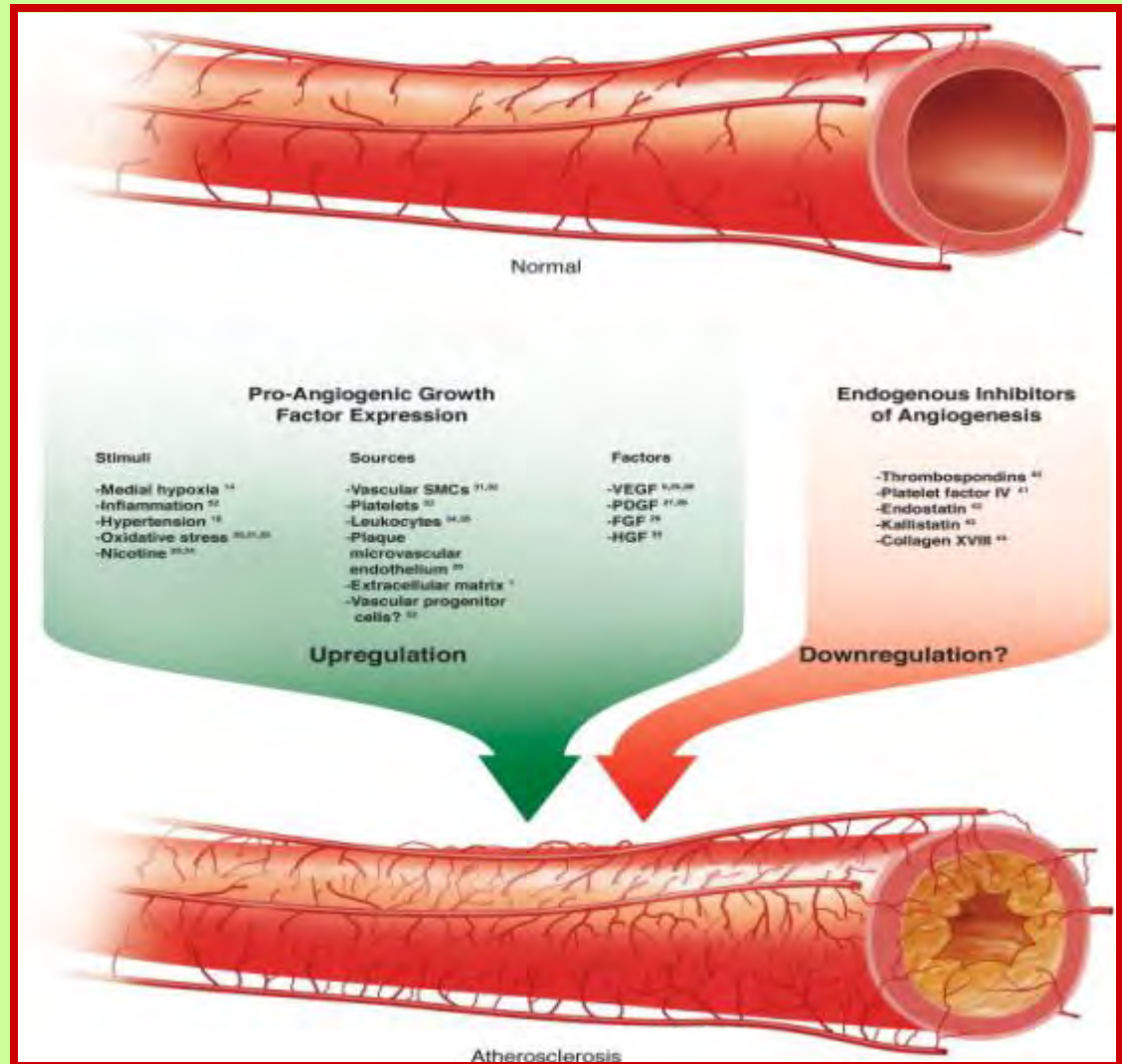


- Effects **men** more than women
- Men
 - 60 to 70 years of age
- Women
 - 40 to 50 years of age
 - Pregnancy

RISK FACTORS



- Hypertension
 - Uncontrolled
- Atherosclerosis
- Diabetes
- Tobacco Use



RISK FACTORS



- Age
- High Risk Behaviors
 - Trauma
 - Illicit drug use
- Infection
- Family



RISK FACTORS



- Congenital
 - Bicuspid Aortic Valve
- Connective Tissue Disorders
 - Marfan & Ehlers-Danlos syndromes

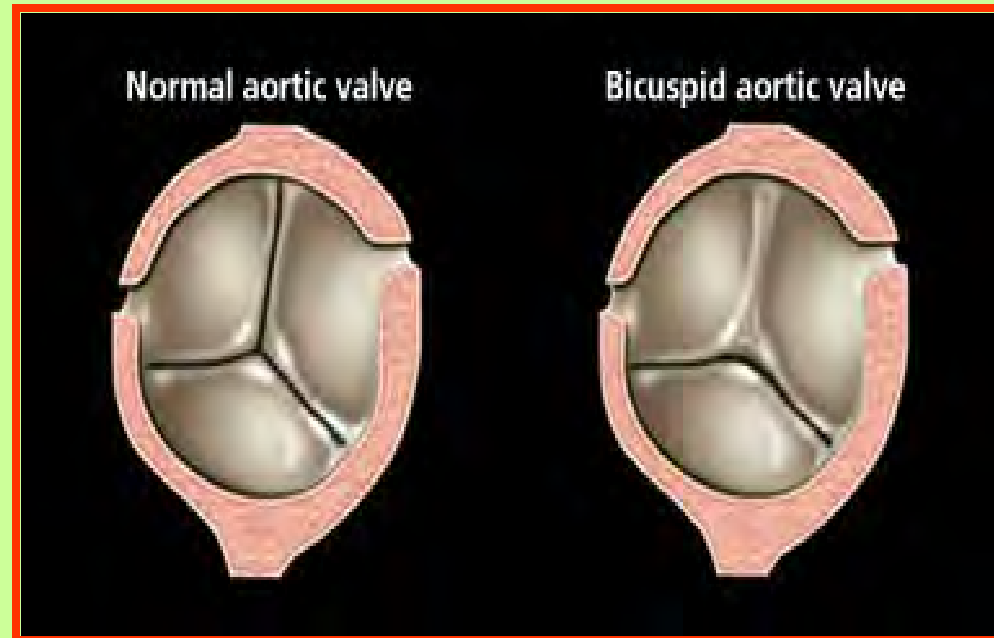
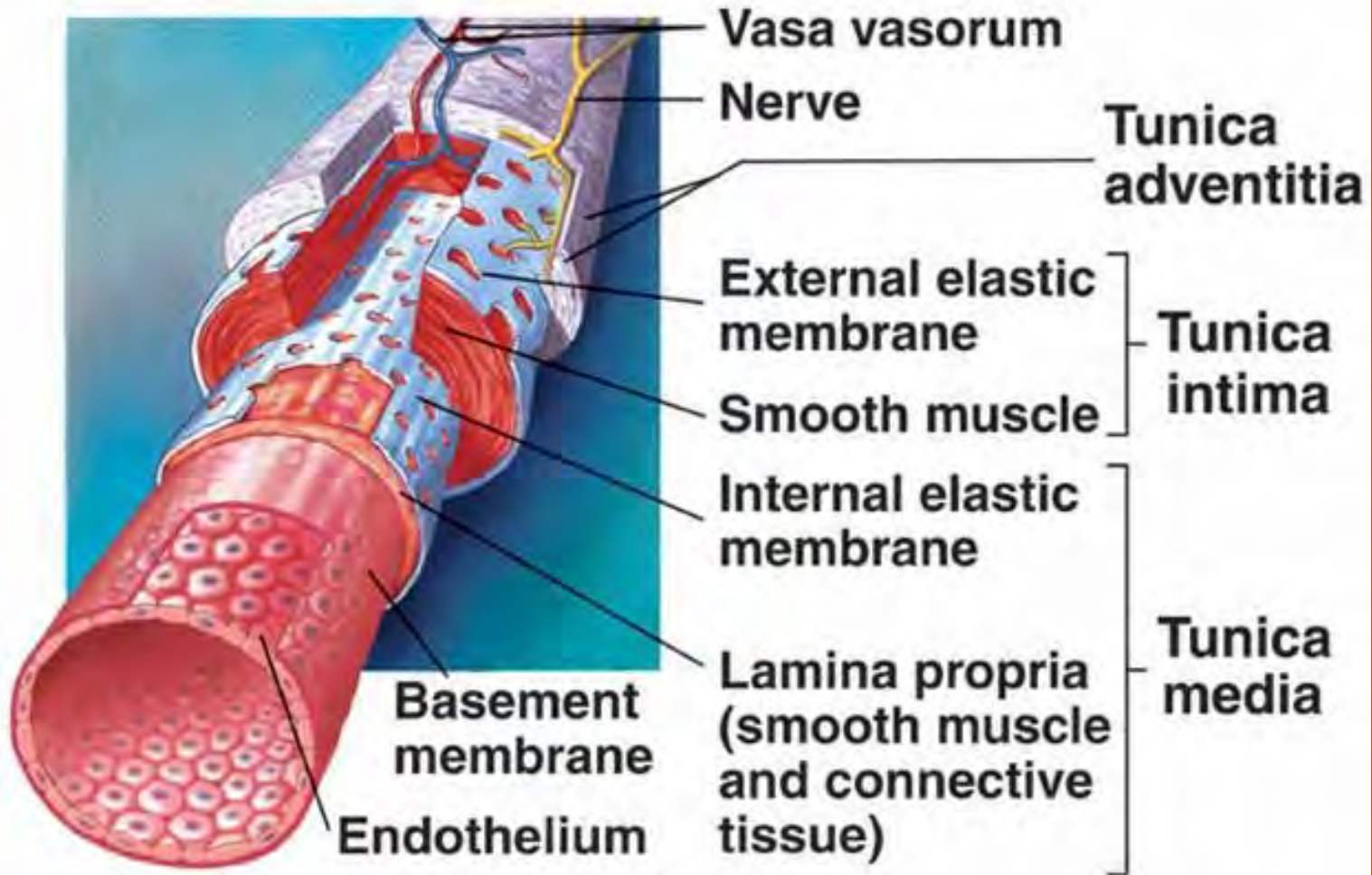


Image Source: Patrick J. Lynch; illustrator

ANATOMY



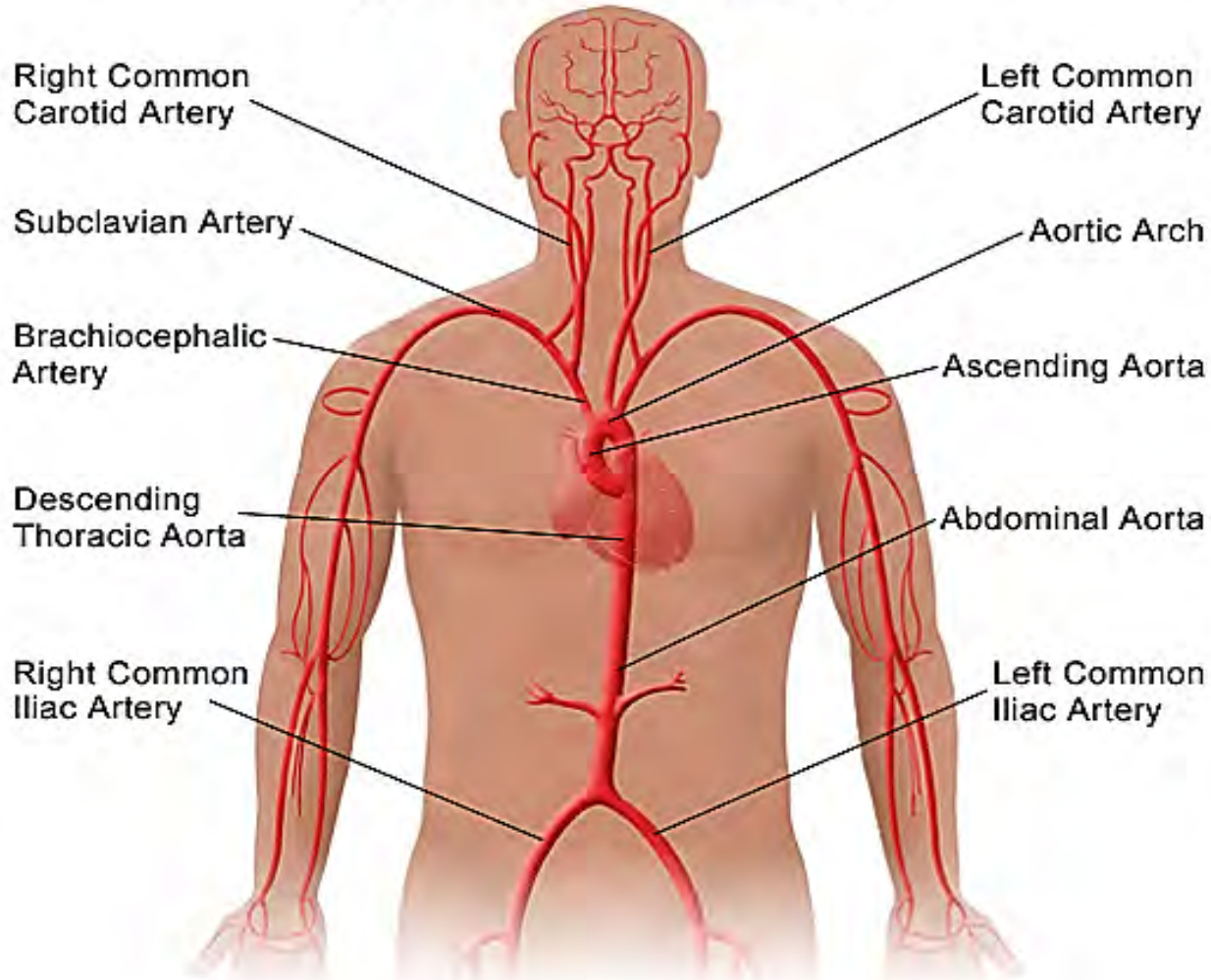
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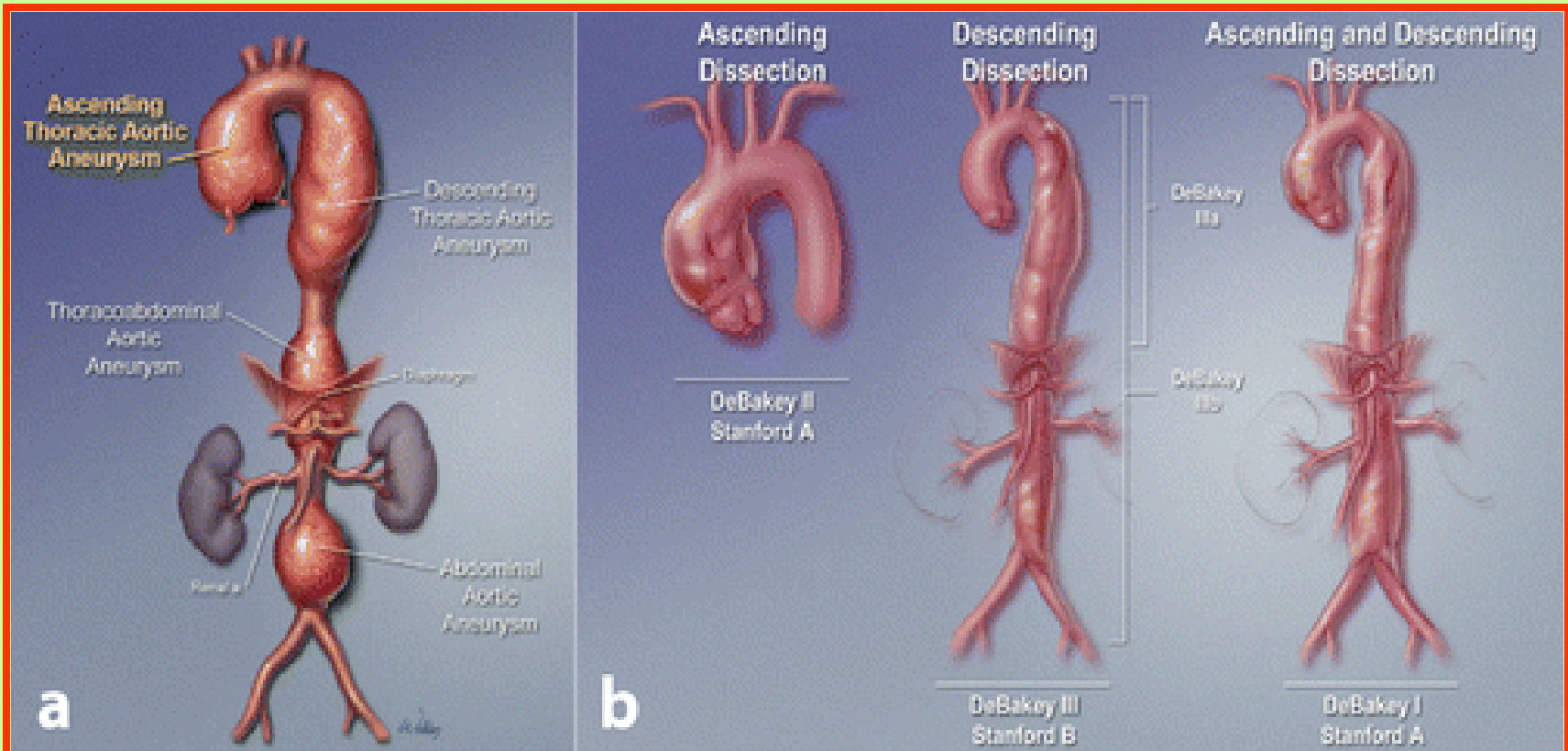
ANATOMY



Anatomy of the Aorta



ANATOMY



Milewicz DM, et al. 2008.

Annu. Rev. Genomics Hum. Genet. 9:283–302

PATHOPHYSIOLOGY

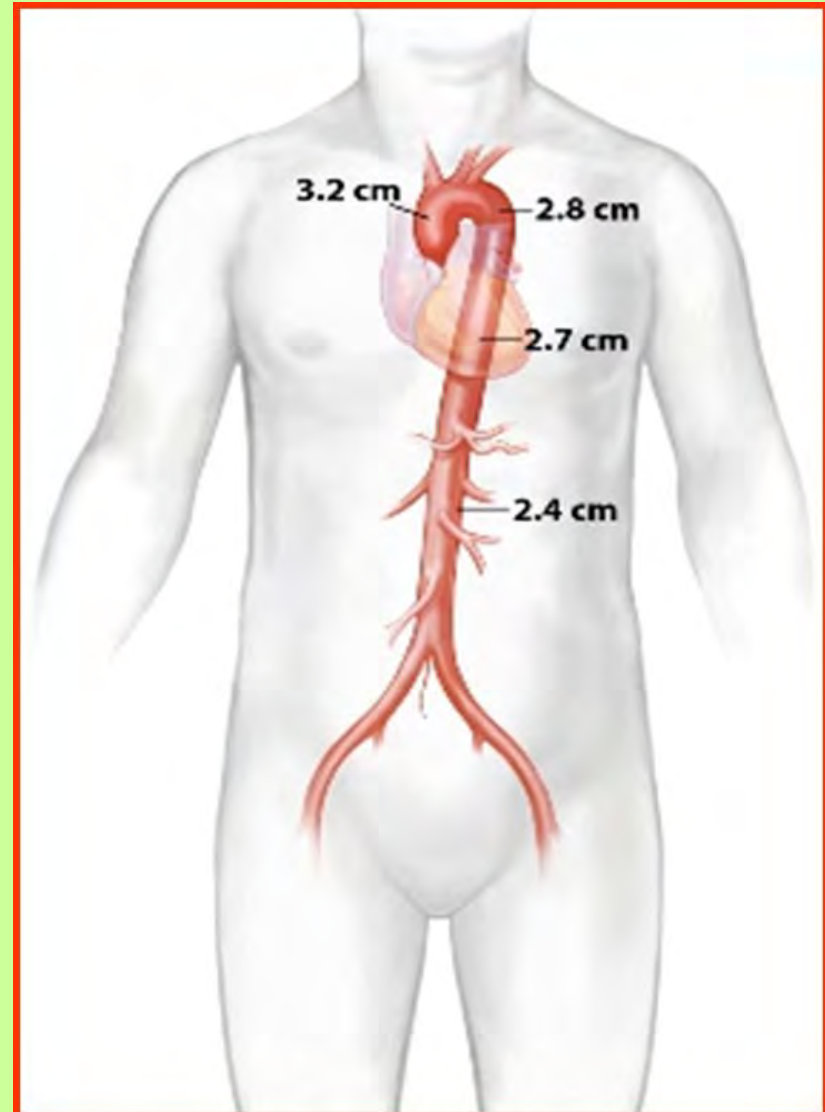


- Stress of pulsatile flow
- Atherosclerosis
- Genetic disposition of collagen
- Infection
- Trauma

AORTIC ANEURYSMS



- Normal size
- Dilation
 - AKA enlargement
- True
- Pseudo



AORTIC ANEURYSMS



normal



ascending
aorta
aneurysm



aortic
arch
aneurysm



descending
aorta
aneurysm



abdominal
aorta
aneurysm

K. Onikoshi

Various aortic aneurysms

www.aorticdissection.com

AORTIC ANEURYSMS

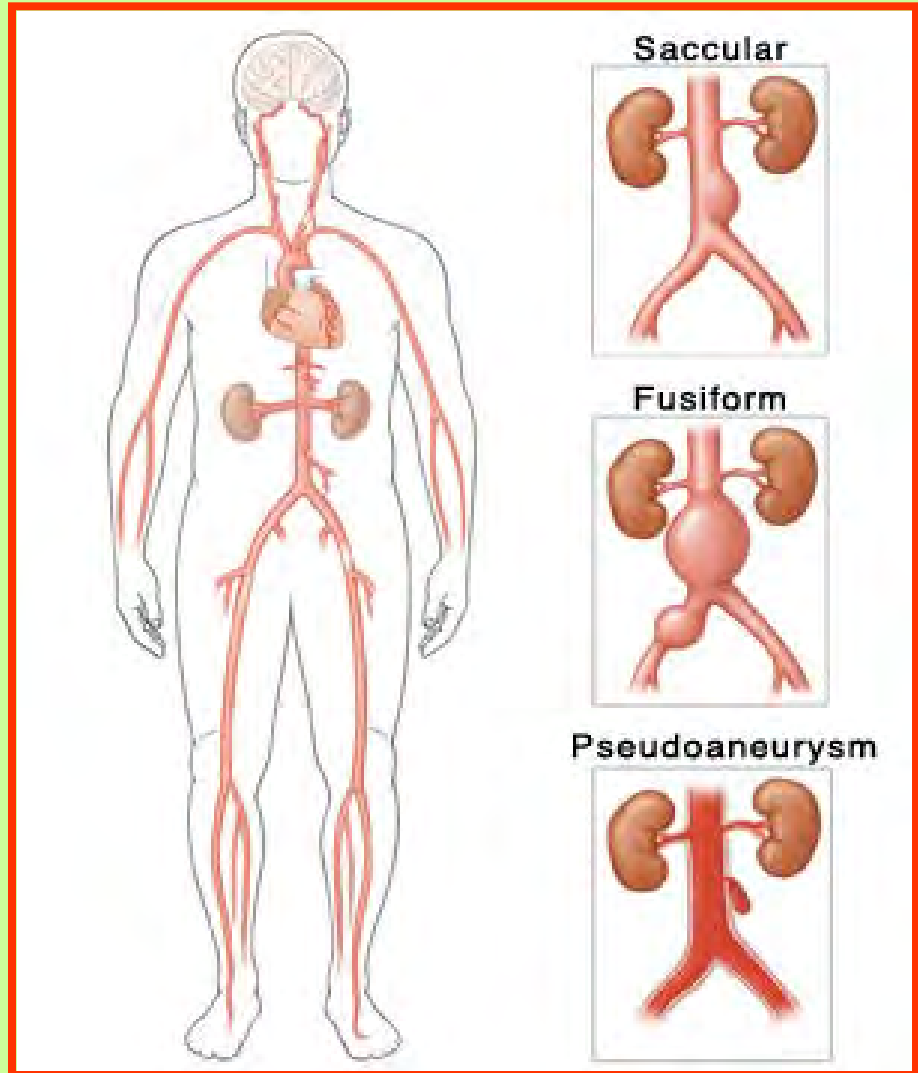


- Types

- Saccular

- Fusiform

- Pseudoaneurysm



AORTIC ANEURYSMS



Extent I



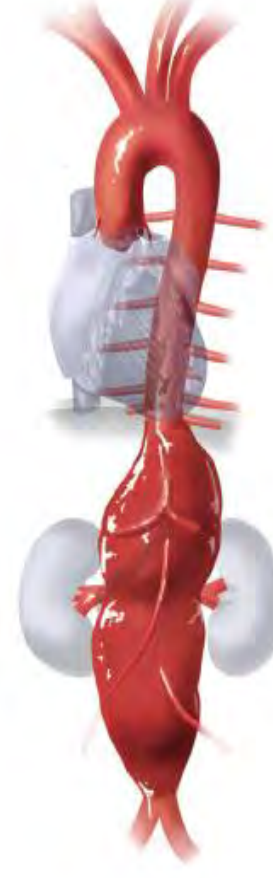
Extent II



Extent III



Extent IV



Extent V



1
6
1
0
lr

P
2
A
A

PR



Aorta and Left Iliac

CONTRAST
KVP
mA

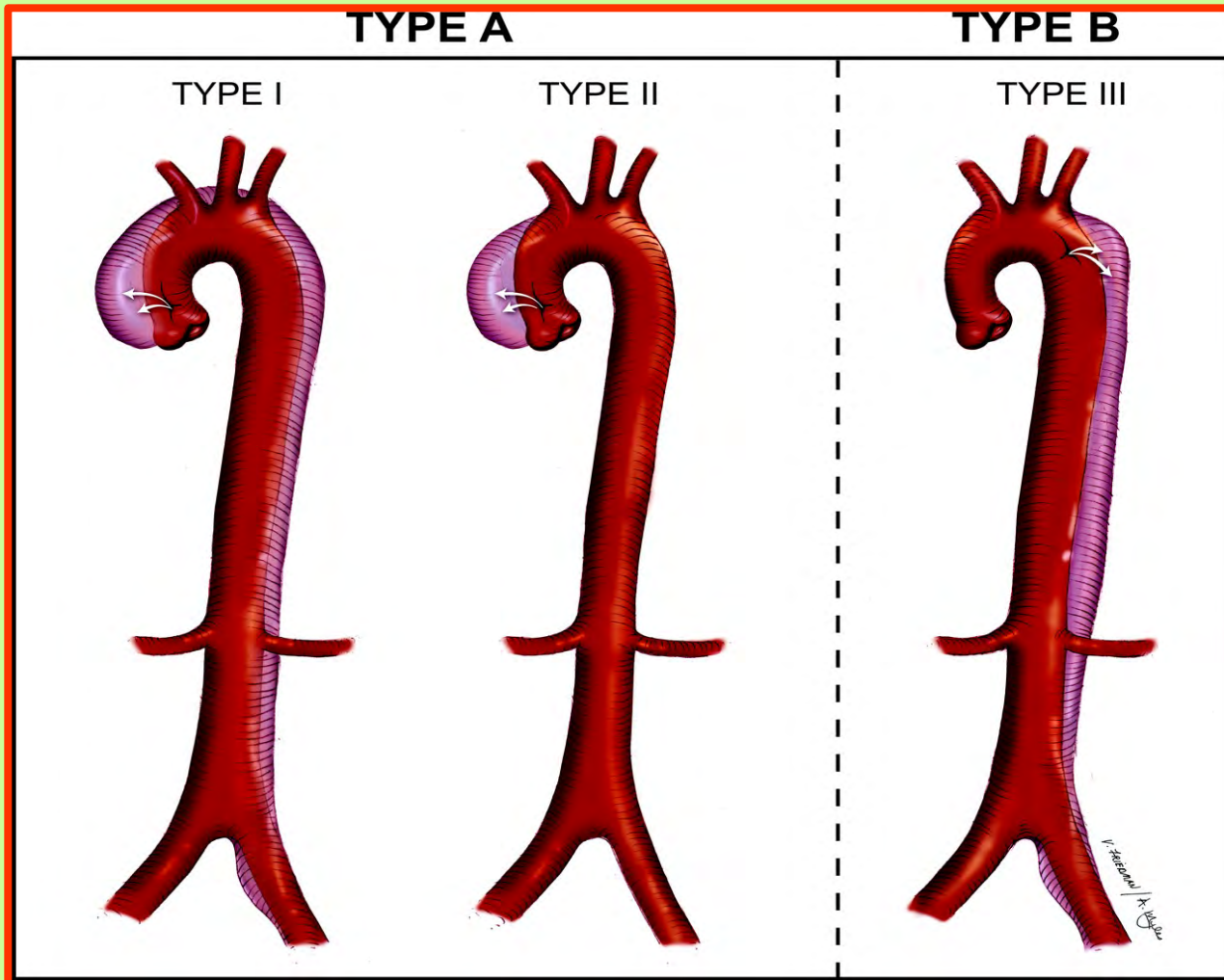
Slice Location
www.fwi456177

iCT 256
Tech: MMS
Zoom: 139.8%

DERIVED/SECONDARY/CURVED



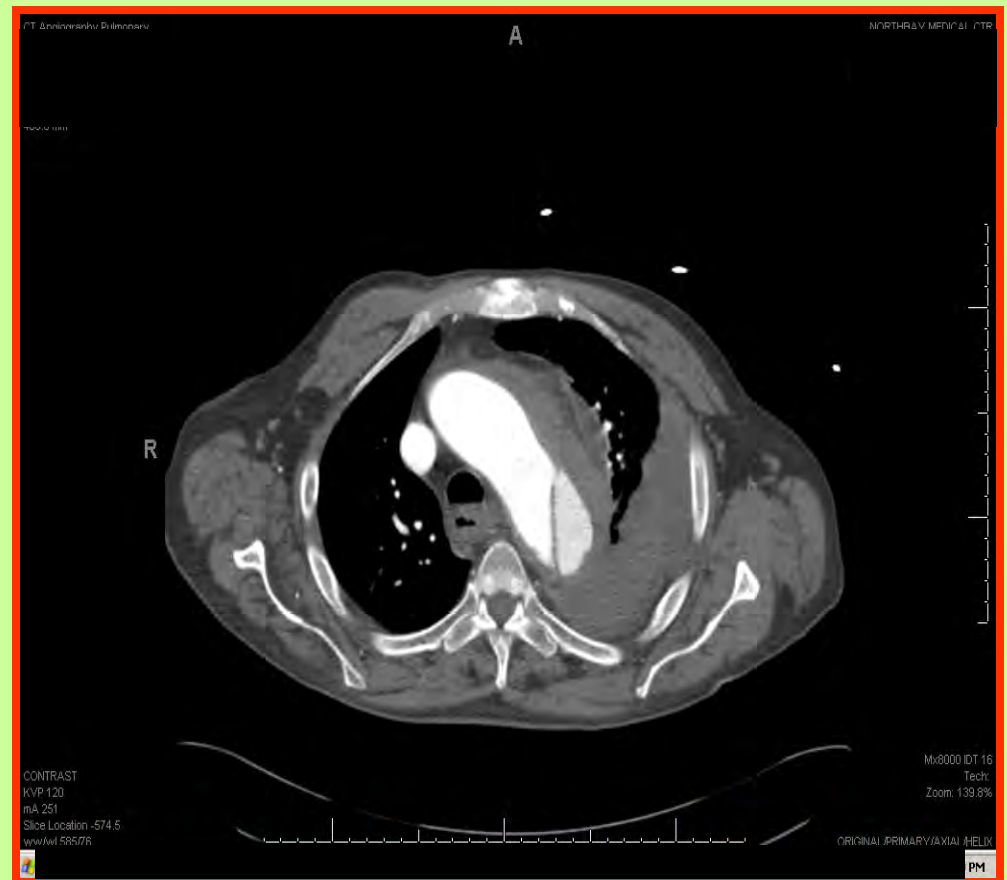
AORTIC DISSECTIONS



AORTIC DISSECTIONS



- High Mortality
- Classifications
- Effusion
- Lumen
- Malperfusion

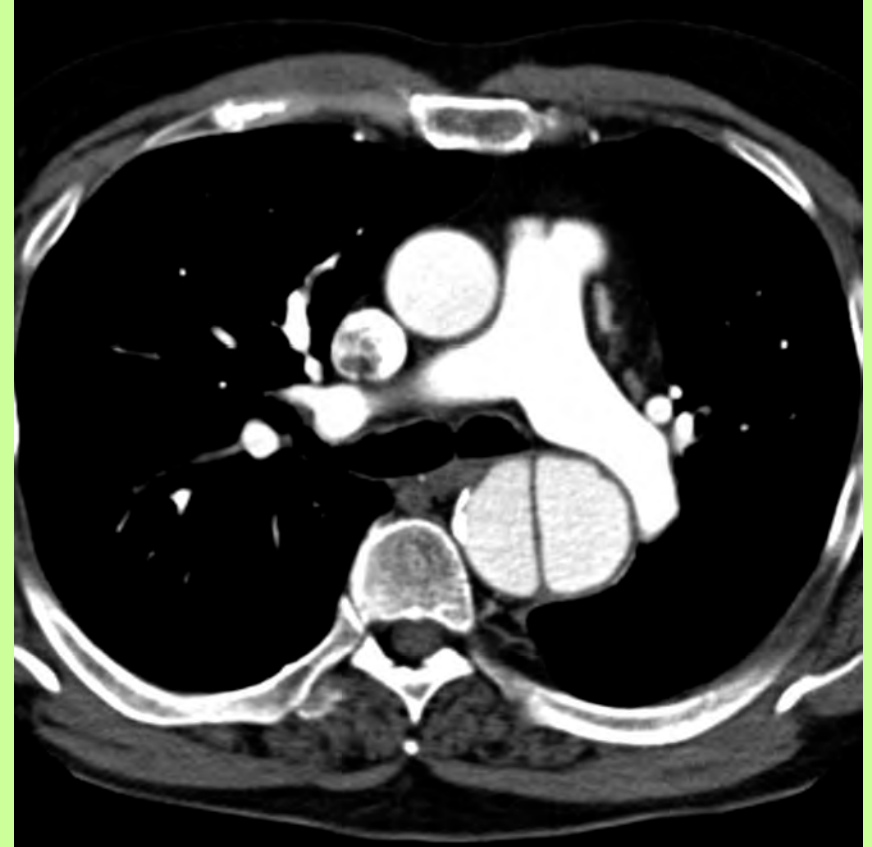


CONGENITAL ANOMALIES



- Congenital
 - Bicuspid Aortic Valve

- Connective tissue disorders
 - Marfan
 - Ehlers-Danlos Syndrome



Chu L C et al. AJR 2012;198:482-487

INFECTIONS



- Mycotic Aortic Aneurysms
- Infected Aneurysms
- Infected pseudoaneurysms

INFECTIONS



- Gram-positive
 - Staphylococcus - aureus
- Gram-negative
 - Pseudomonas aeruginosa
 - Salmonella

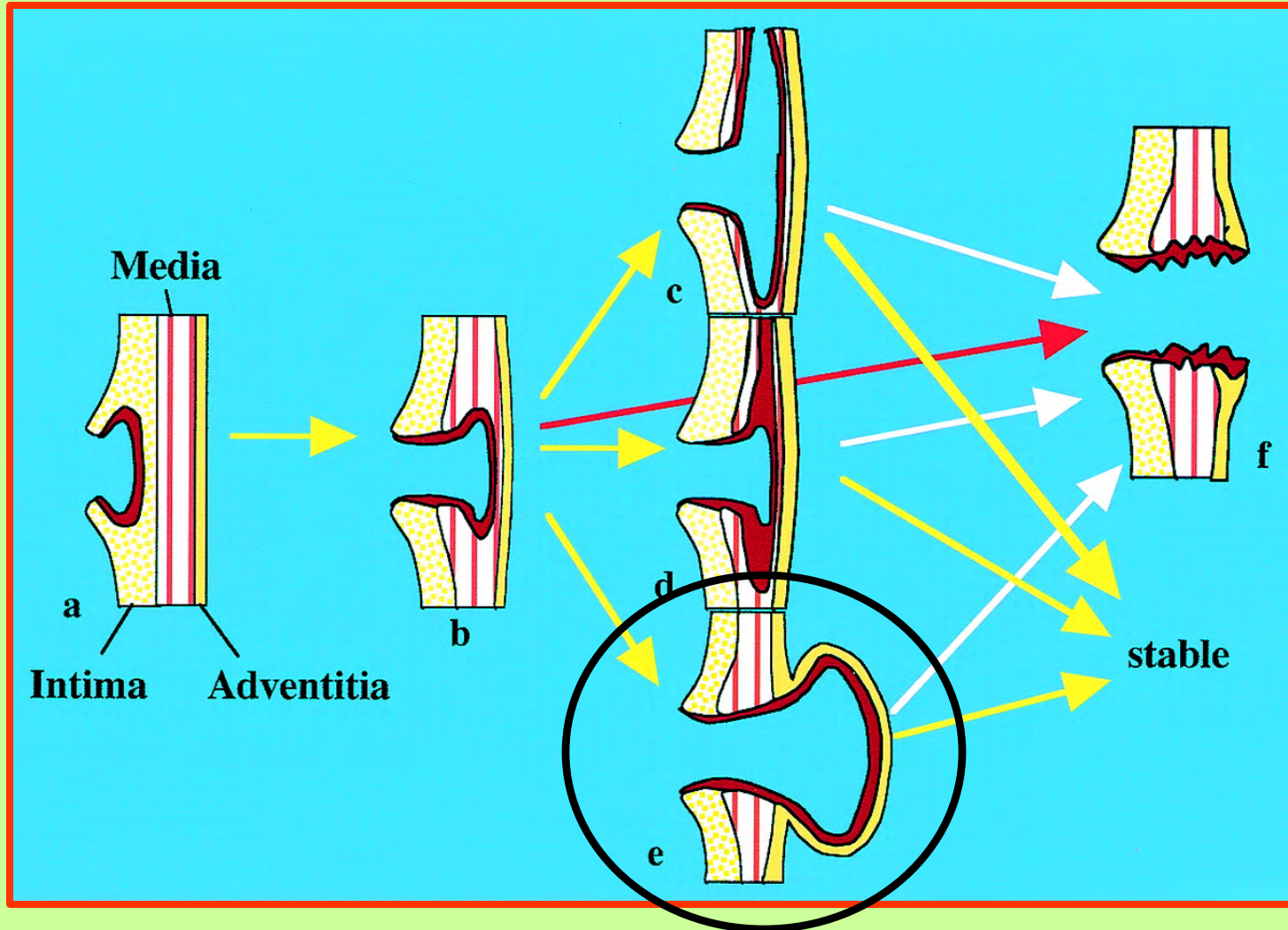
INTRAMURAL HEMATOMA



- Variant of dissection
- Rupture of the Vasovasorum



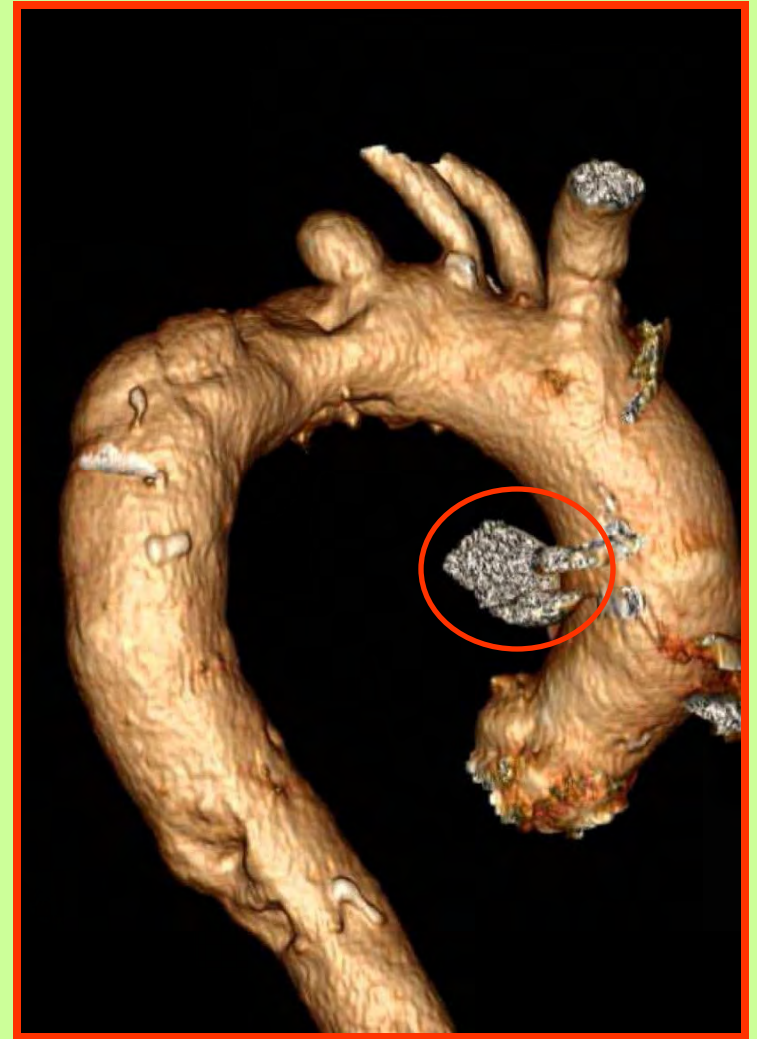
PENETRATING AORTIC ULCERS



PENETRATING AORTIC ULCERS



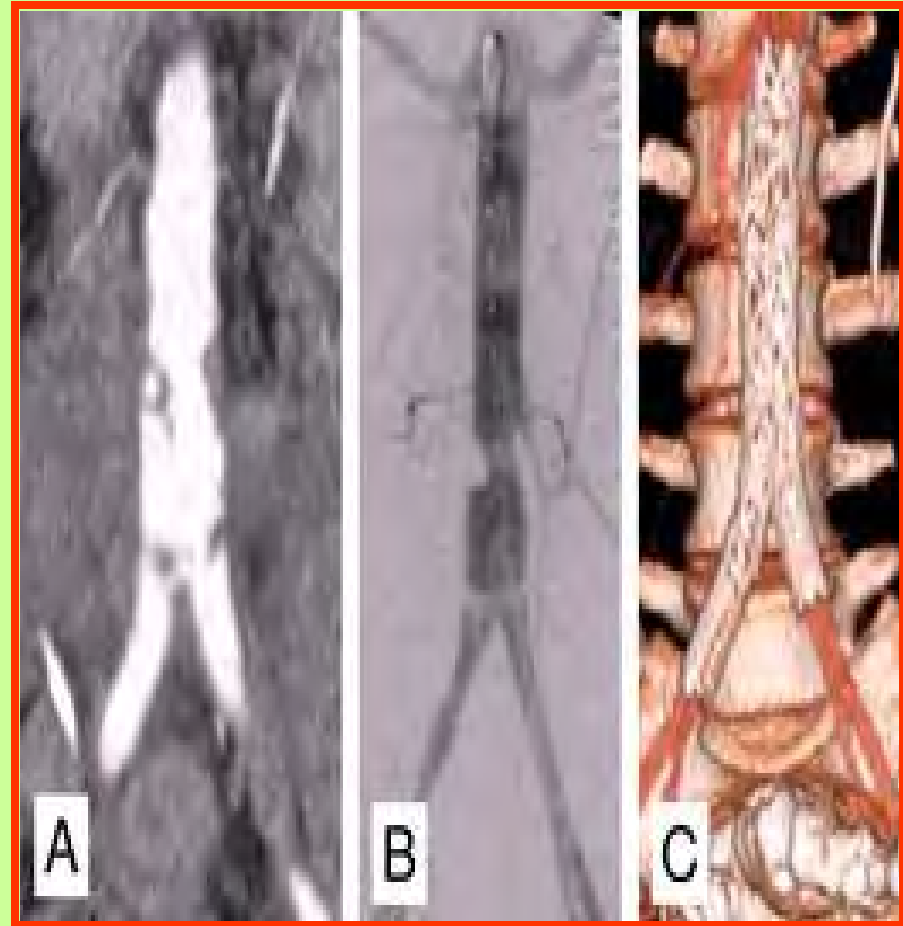
- Ulceration of plaque
- Elderly
- Atherosclerosis
- Hypertension



TRAUMA



- Usually thoracic
- High mortality rate
- Widened mediastinum
- Left hemothorax



PRESENTATION



- Chest Pain
- Abdominal Pain
- Back Pain
- Paralysis

PRESENTATION



- Differential Diagnosis
 - Myocardial Infarction
 - Pulmonary Embolism
 - Mesenteric Ischemia
 - ***Aortic Dissection***
 - Diverticulitis
 - Sprain
 - Trauma

IMAGING MODALITIES



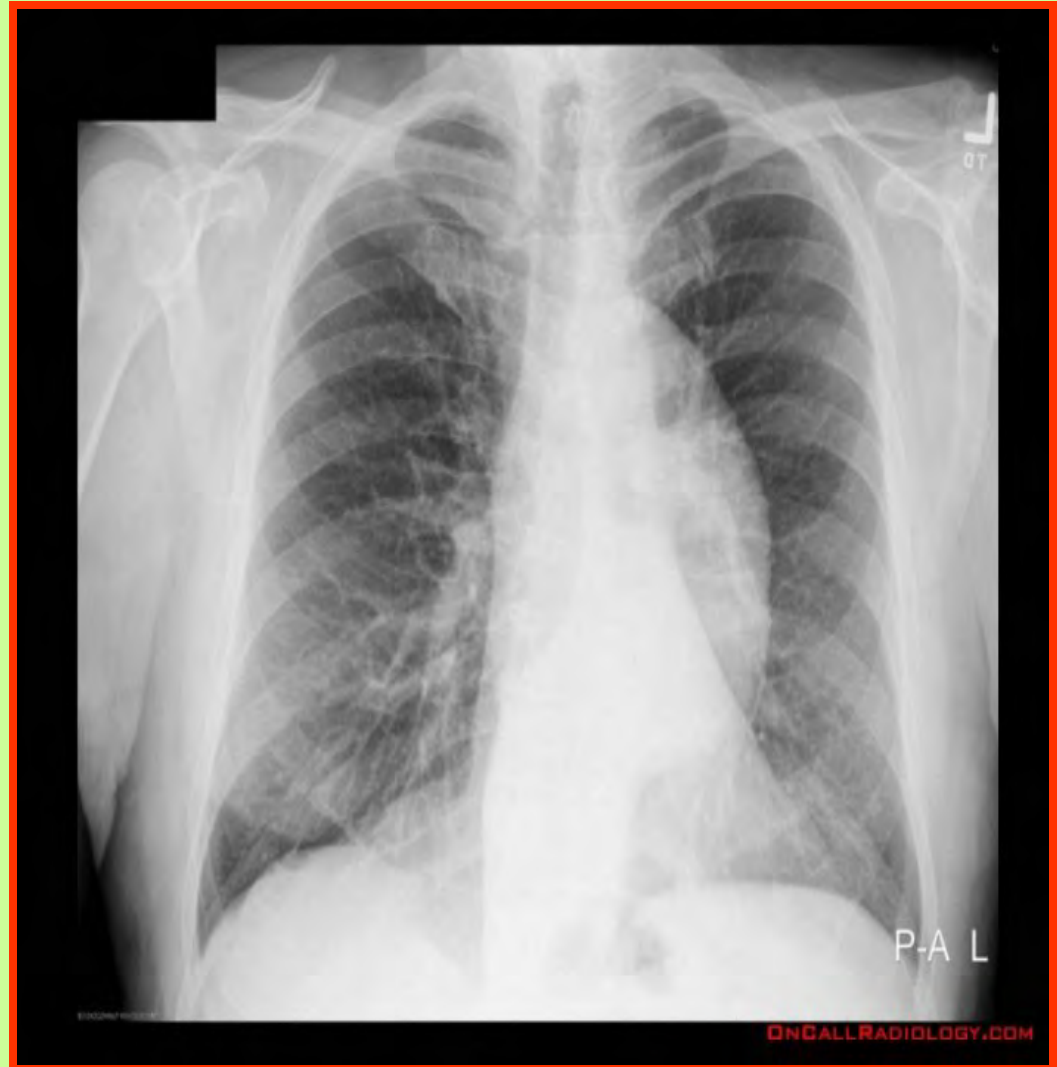
- Chest X-ray
- Ultrasound
- CT scan
- MRI/MRA
- Echo/TEE



IMAGING MODALITIES



- Chest Radiology
 - Routine
 - Quick
 - Non invasive



IMAGING MODALITIES



- Ultrasound
 - Recommended
 - Non invasive
 - Follow up



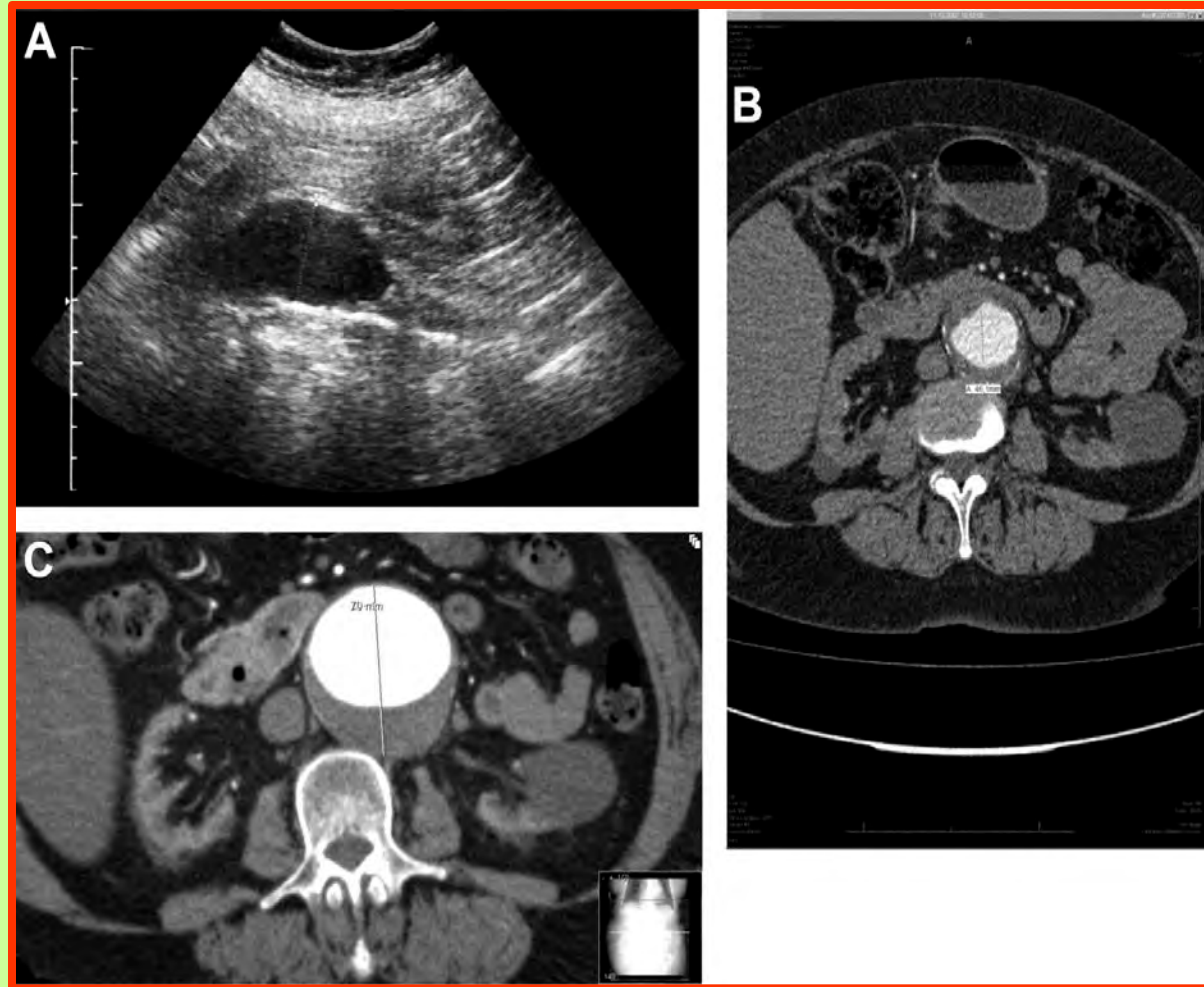
IMAGING MODALITIES



- Computerized Tomography

- Minimally invasive

- Contrast load



IMAGING MODALITIES



- Magnetic Resonance Imaging
 - Non invasive
 - Contrast load
 - Surgical plan



IMAGING MODALITIES



- Trans Esophageal Echocardiogram
 - Invasive
 - Airway/Sedation



MANAGEMENT



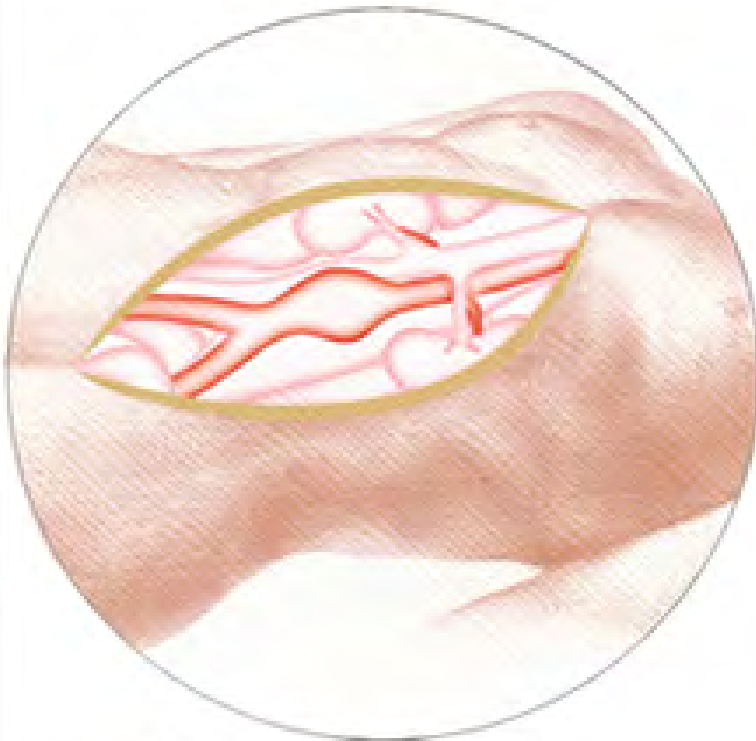
- Medical
- Surgical
 - Open
 - Endovascular
- End of Life

MEDICAL MANAGEMENT



- Risk factors
- Pharmacological
- Monitoring
- Timing of intervention

SURGICAL MANAGEMENT



Open Surgery



Endovascular Stent Grafting

OPEN SURGICAL



- Incision
- Ventilator
 - Single lung
- Operating Room Time
- Blood loss
- Length of Stay

ENDOASCULAR

- Groin incision
- Conscious Sedation
- Minimal blood loss
- Short ICU and overall Length of Stay

ENDOVASCULAR



END of LIFE



- High rate of mortality
- Advanced age
- Minimal reserve
- Co-morbid conditions

SUMMARY



- Risk factor
 - Cessation
 - Reduction/modification
 - Monitoring
- Screening
 - Routine
 - Follow up
- Management
- End of Life

RESOURCES



[http://www.uspreventiveservicestaskforce.org/uspstf/uspsaneu.
htm](http://www.uspreventiveservicestaskforce.org/uspstf/uspsaneu.htm)

www.vascularweb.org

www.hearthealthywomen.org

THANK YOU



www.montereybayaquarium.org
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