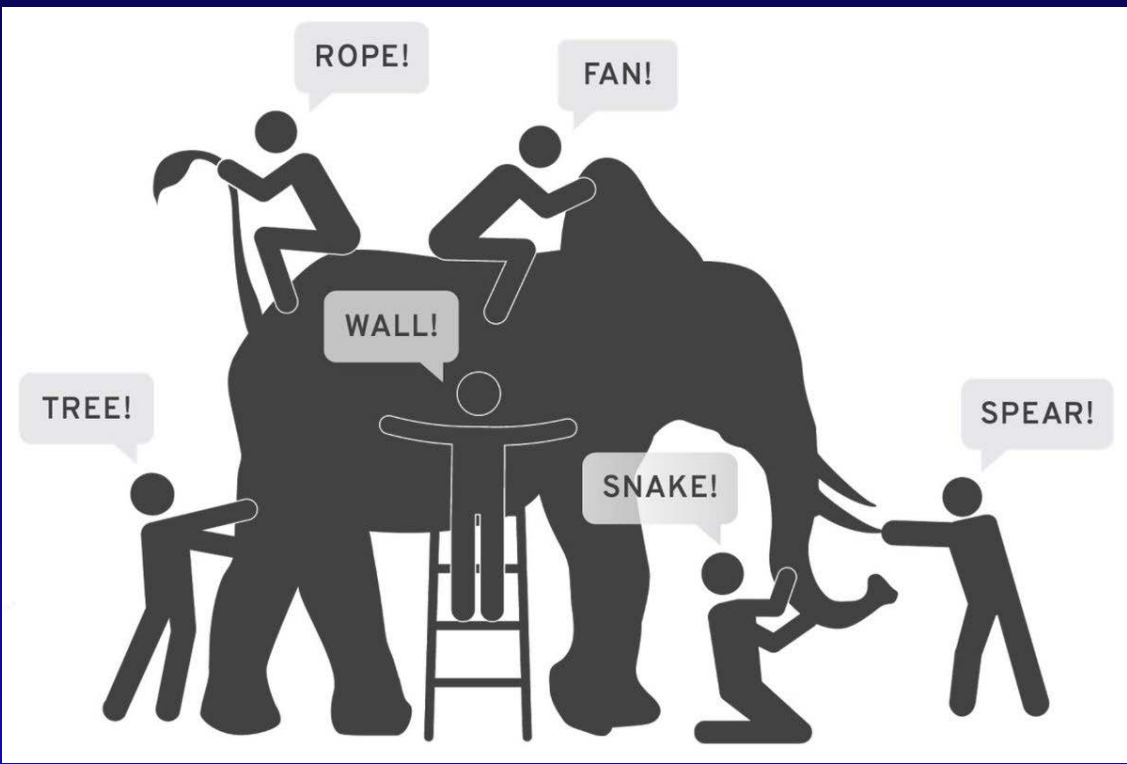


A Multidisciplinary Approach to Thoracic Aortic Disease



Ahmad Y. Sheikh, MD, FACS



“Multidisciplinary teams are how you prevent the blind men and the elephant scenario....”

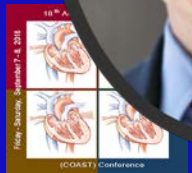
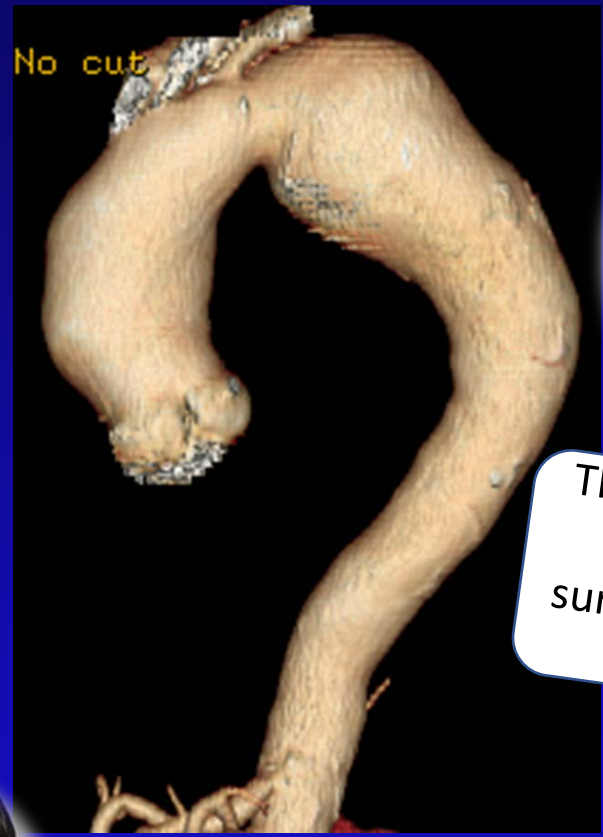
-Jacob Mishell, MD

That’s an ascending aneurysm I can fix with a sternotomy

That’s a proximal descending aneurysm – needs a stent graft

This patient needs genetic screening with BP management

That patient needs scans and surveillance- where do I refer?



Overview

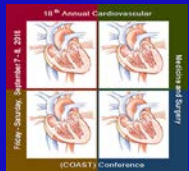
Review of aortic anatomy and pathophysiology

Scope of problem

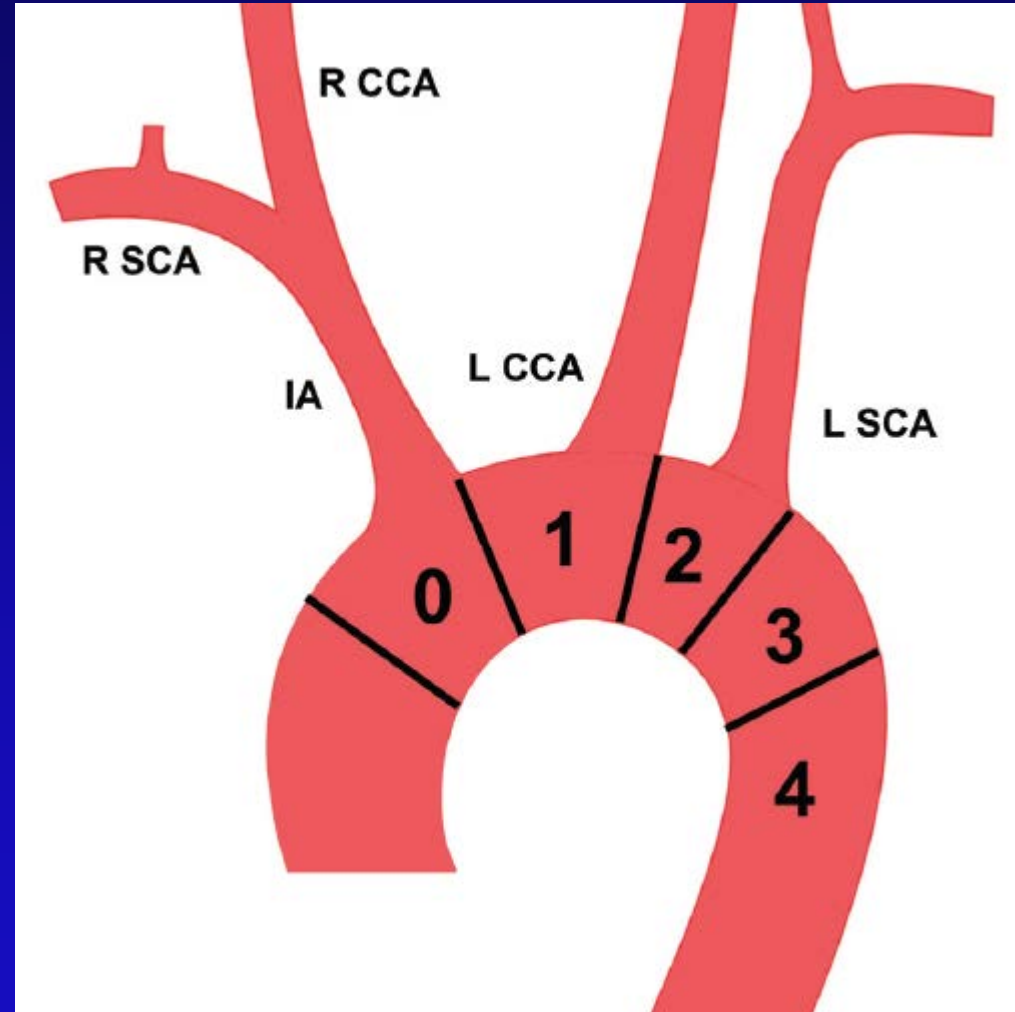
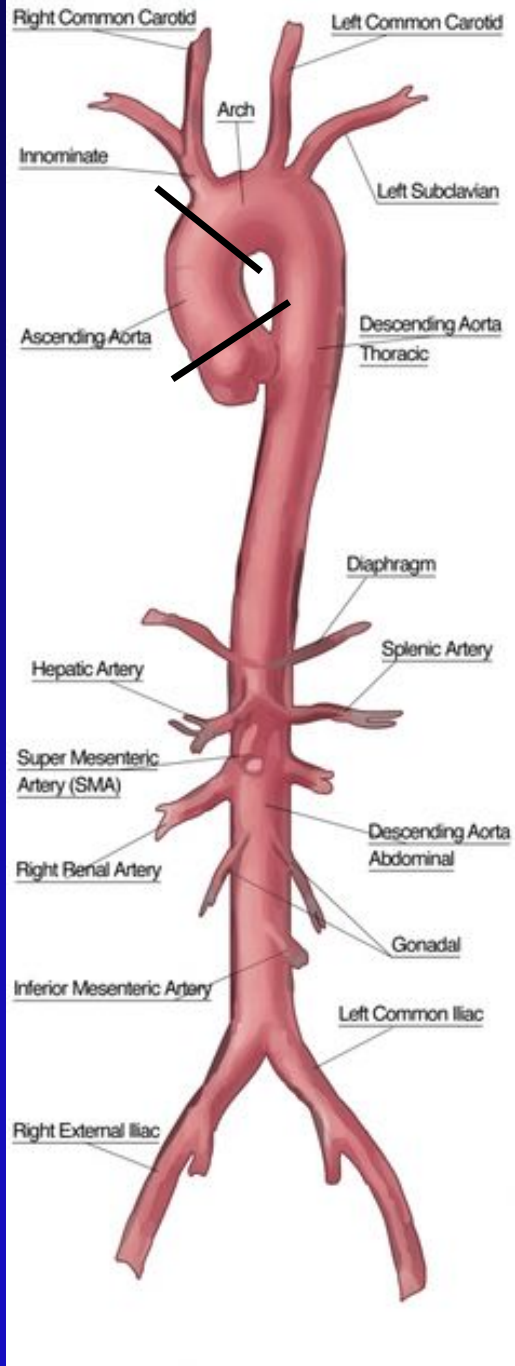
Illustrative cases (imaging review)

Implementation of the multidisciplinary aortic clinic

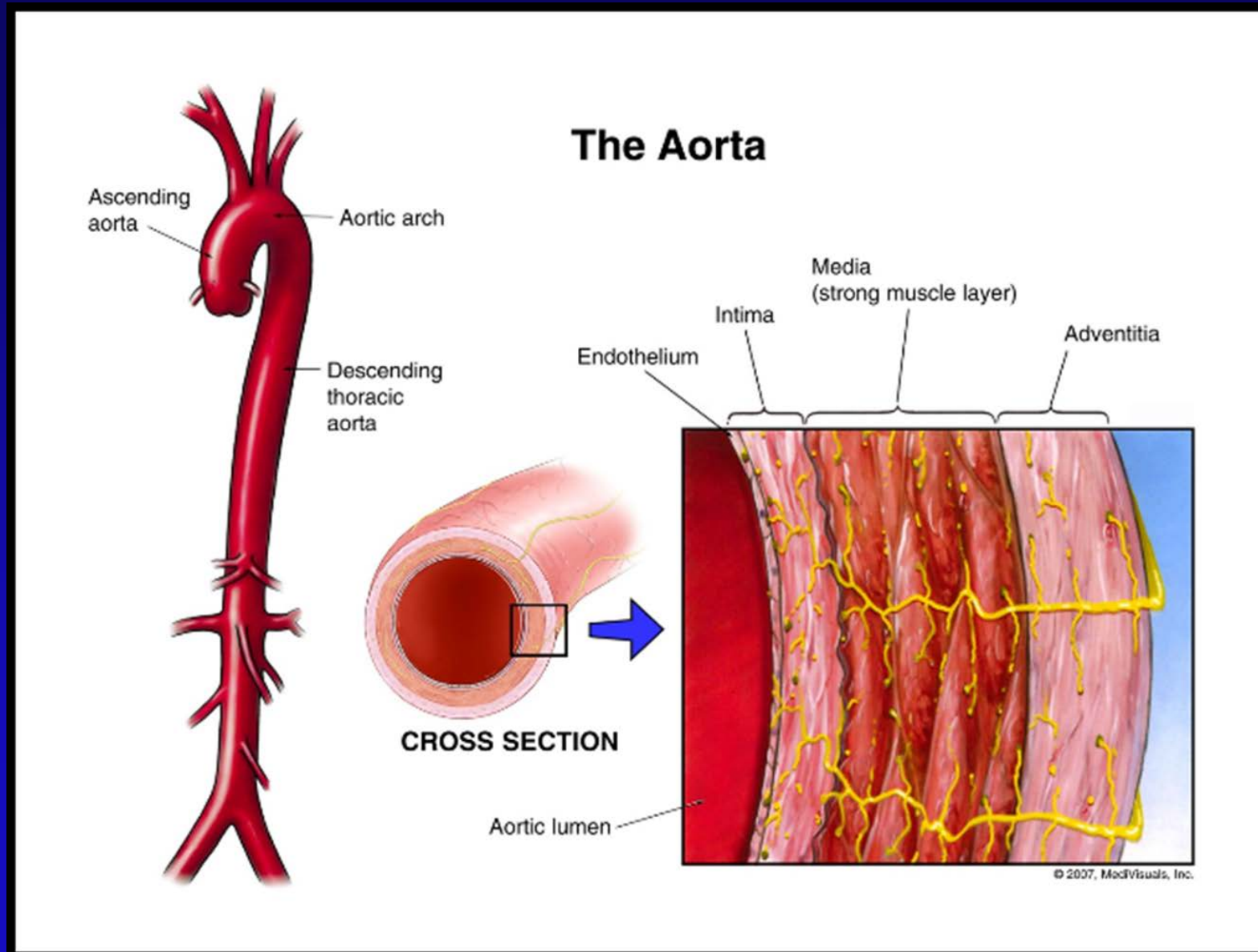
Future directions



Anatomy and Definitions



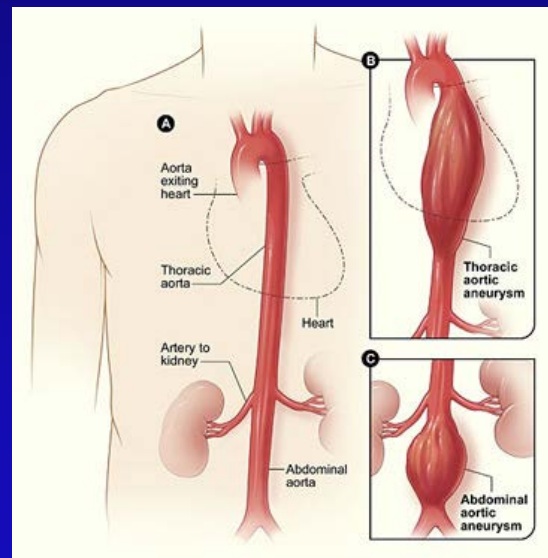
Anatomy and Definitions



Anatomy and Definitions

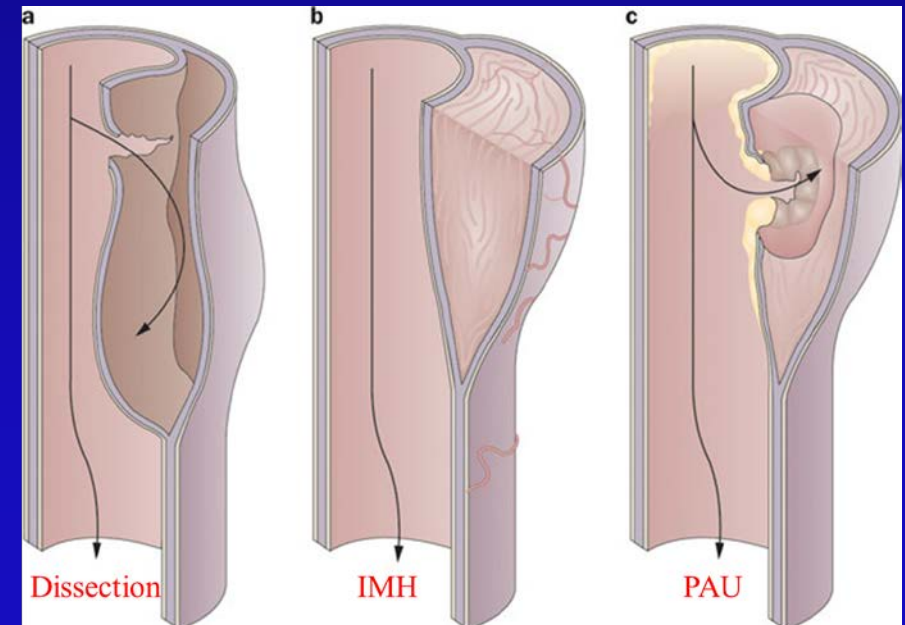
Aneurysm

Dilation of an artery due to weakening of the wall,



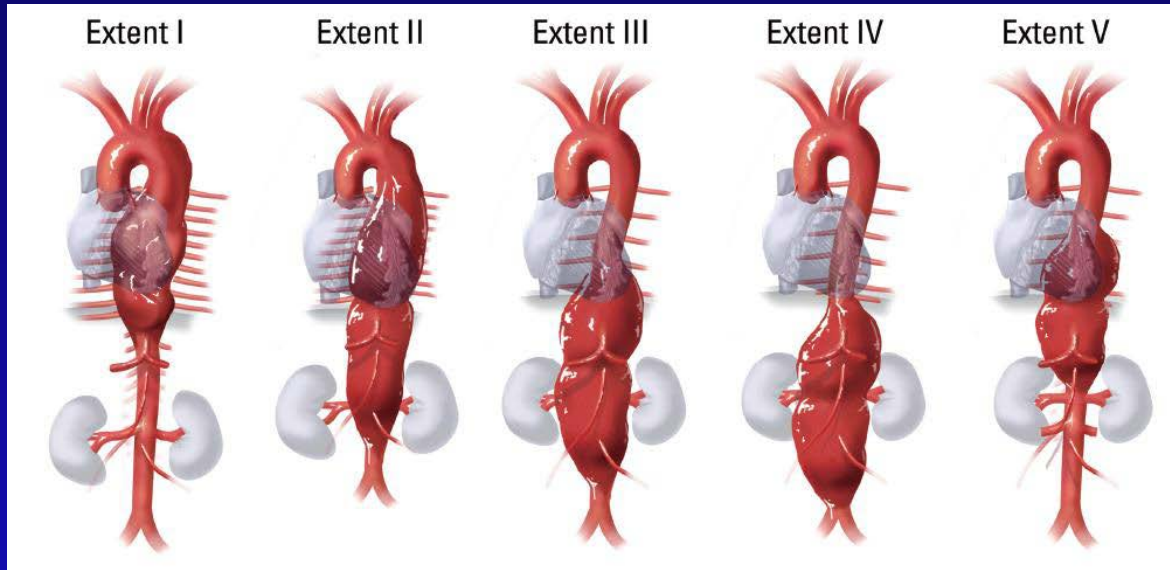
Dissection

Spectrum (IMH-PAU-Dissection)
Separation of the layers of the artery with creation of a false channel



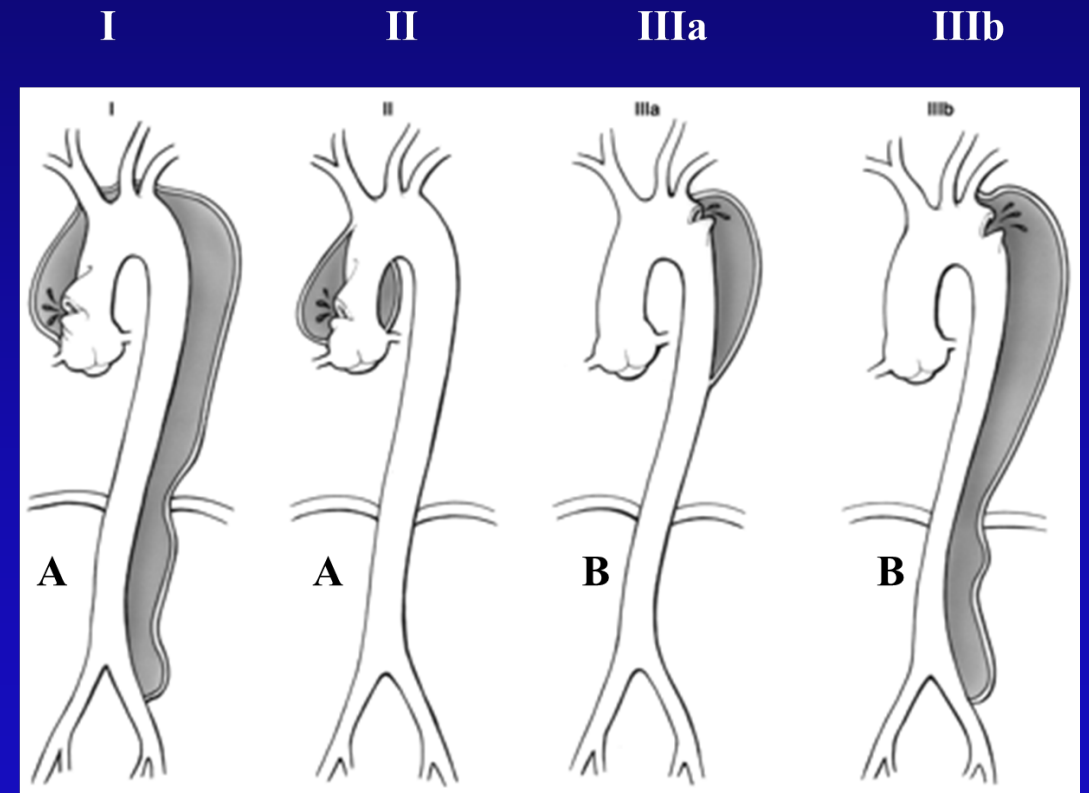
Anatomy and Definitions

Aneurysm



For proximal aorta- Can be root, ascending, and/or arch

Dissection DeBakey and Stanford



Pathophysiology

Progressive disease- dilation leads to further dilation and risk of dissection and/or rupture

Genetic predisposing for weakening of the medial layer- otherwise known as connective tissue disorders (Marfan's, Ehlers-Danlos, Loeys-Dietz)

Atherosclerosis – “Degenerative” aneurysms

Inflammatory- Infectious (e.g. Syphilis) vs non-infection (arteritis)

Risk factors – smoking, hypertension, obesity, hyperlipidemia, chronic obstructive pulmonary disease (COPD), and family history

CAD – Associated with AAA, less so with TAAA

Management- Aneurysms

Identification of patients –Aneurysms are largely asymptomatic

Minimize vascular wall stress (law of Laplace)

dp/dt- BP/HR management

Lifestyle management

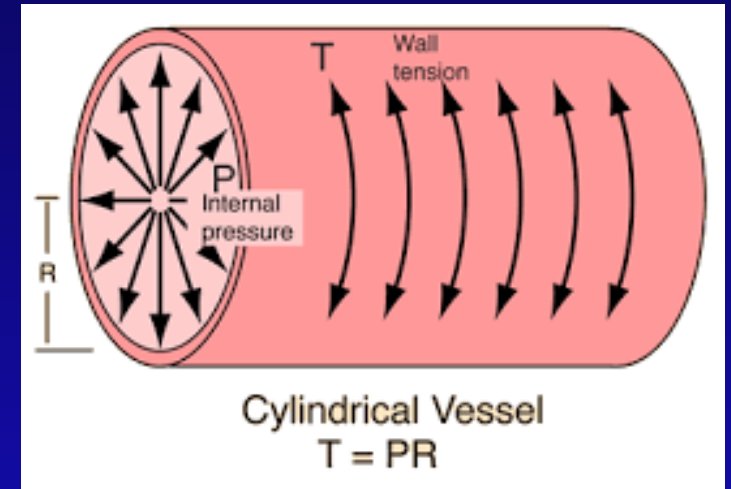
Genetic screening

Surveillance

Serial imaging (normal aorta 2-3cm; rupture risk at over 5.5 – 6.0 cm)

Appropriately timed structural management

Cardiac Surgery, Vascular Surgery, combination?



Management- Dissection

Acute type A- Operative emergency, falls under realm of cardiac surgery

Acute type B- Medical management with potential need for stent-based therapy. Usually vascular or IR support

Chronic dissections- Stable process. Treated as aneurysms with similar management and thresholds for elective repair



Scope

Abdominal aortic aneurysms

Incidence 55-112 per 100,000 persons per year

Thoracic aortic aneurysm

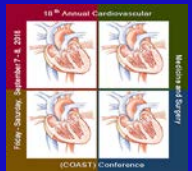
Incidence 6-10 per 100,000 persons per year

Rupture in 3.5 per 100,000 persons per year

Prevalence 4.2% of the general population

Dissection

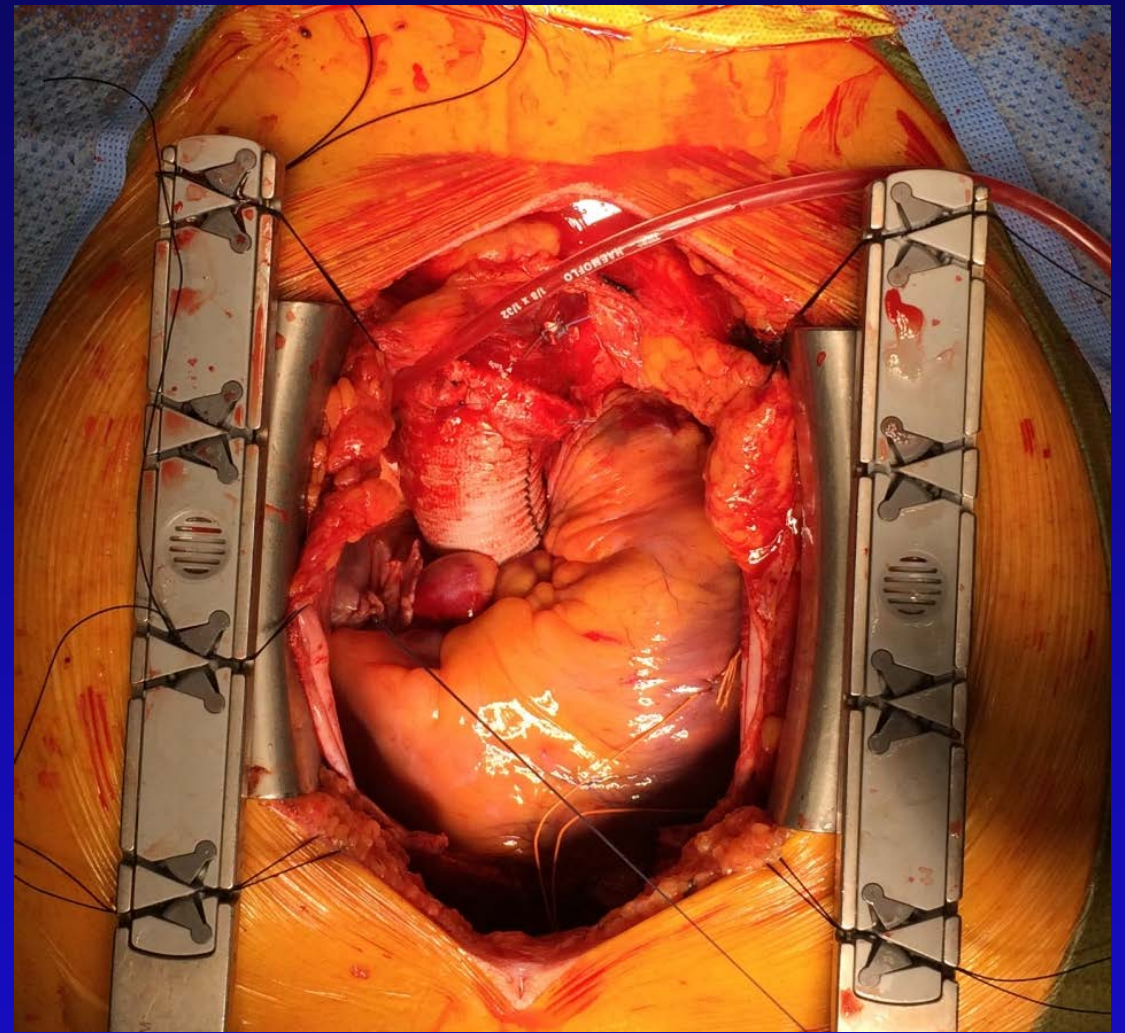
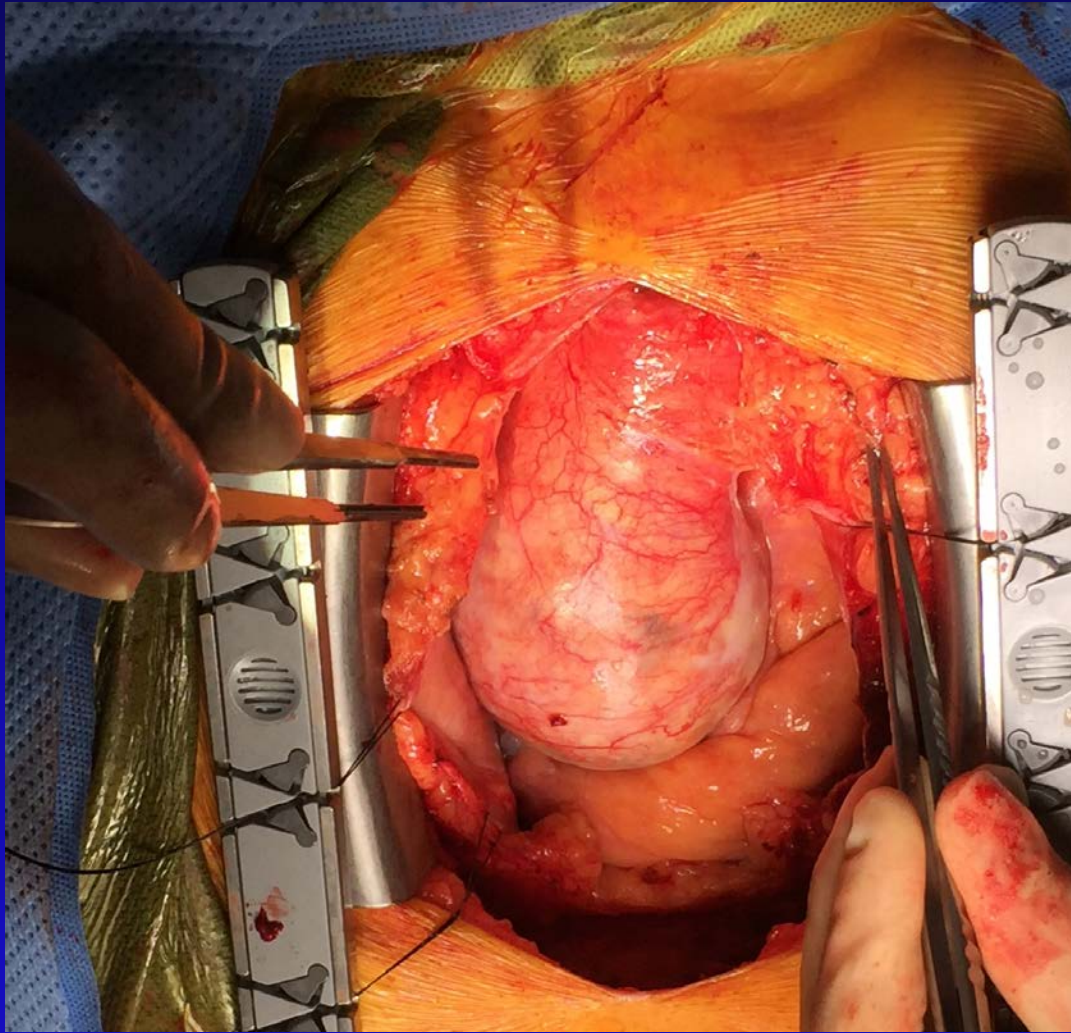
Incidence 3-4 per 100,000 persons per year



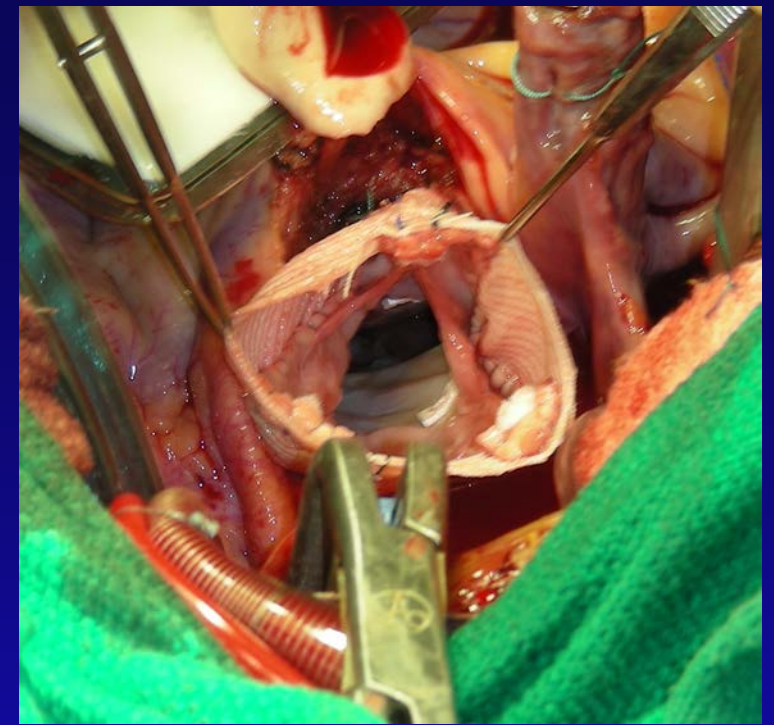
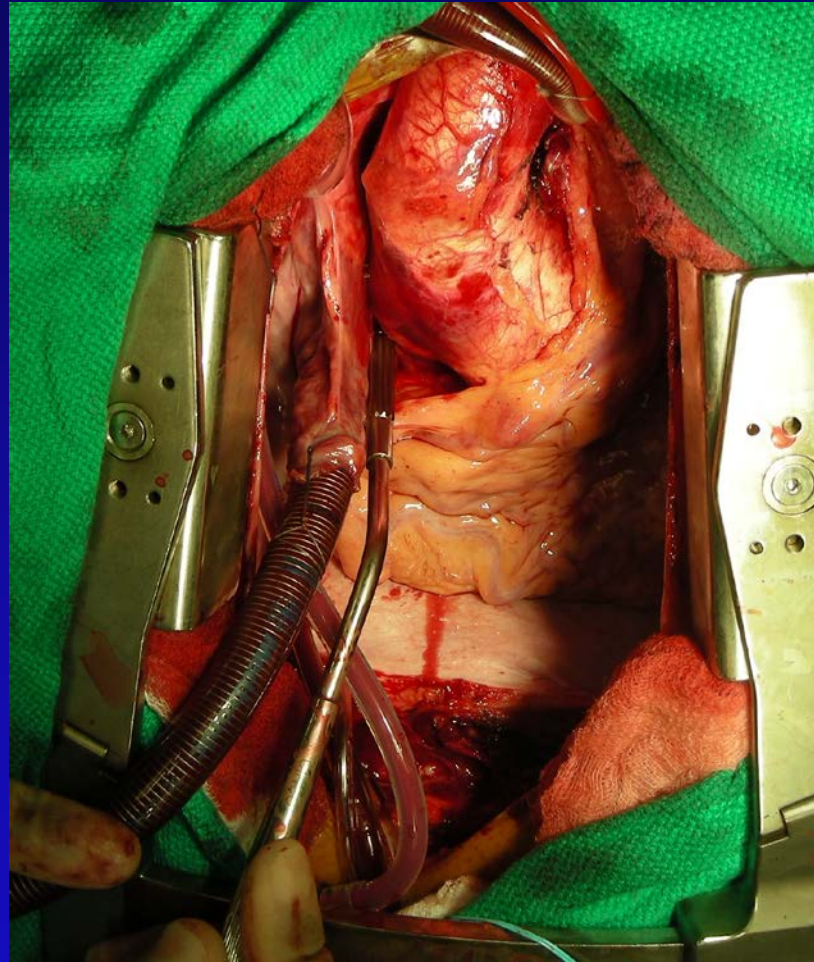
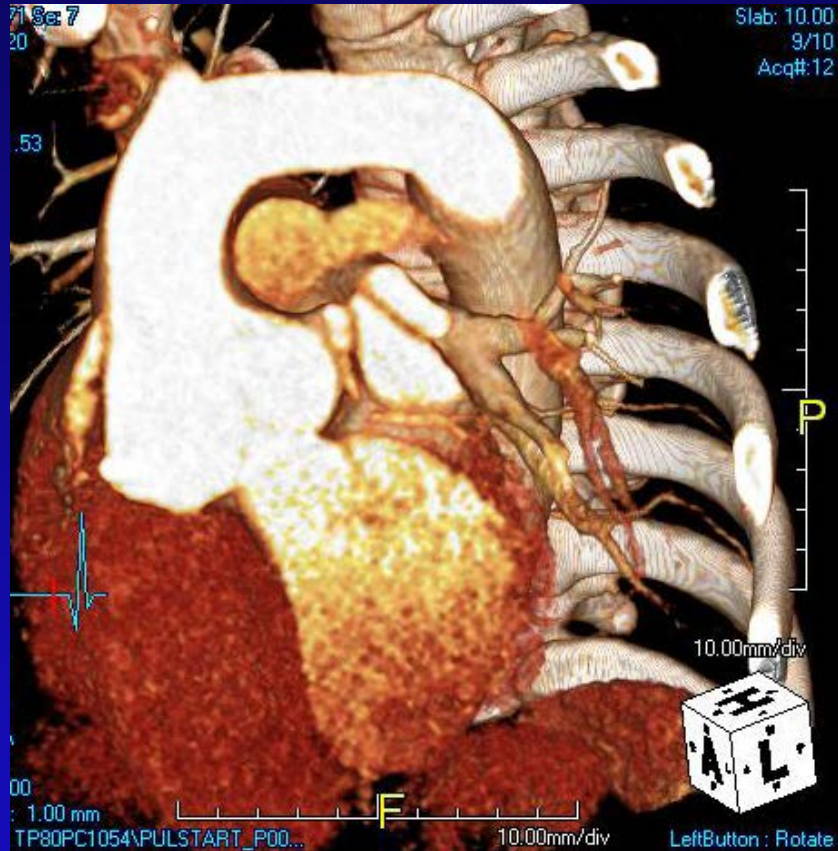
Booher, AM, Eagle, KA. "Diagnosis and management issues in thoracic aortic aneurysm". *Am Heart J*. vol. 162. 2011. pp. 38-46.

[Howard DP, Banerjee A, Fairhead JF, et al. Population-Based Study of Incidence of Acute Abdominal Aortic Aneurysms With Projected Impact of Screening Strategy. *J Am Heart Assoc* 2015; 4:e001926.](#)

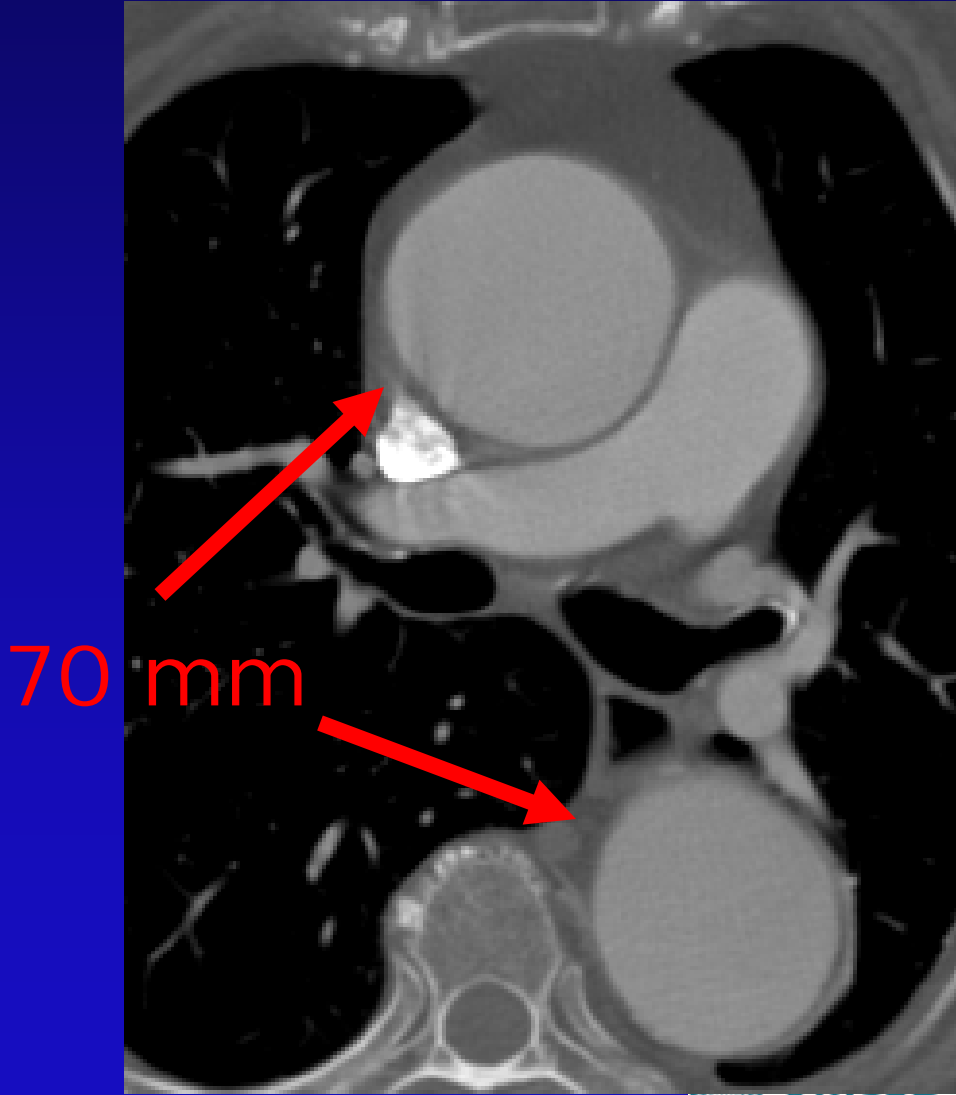
Surgical Repair



Surgical Repair



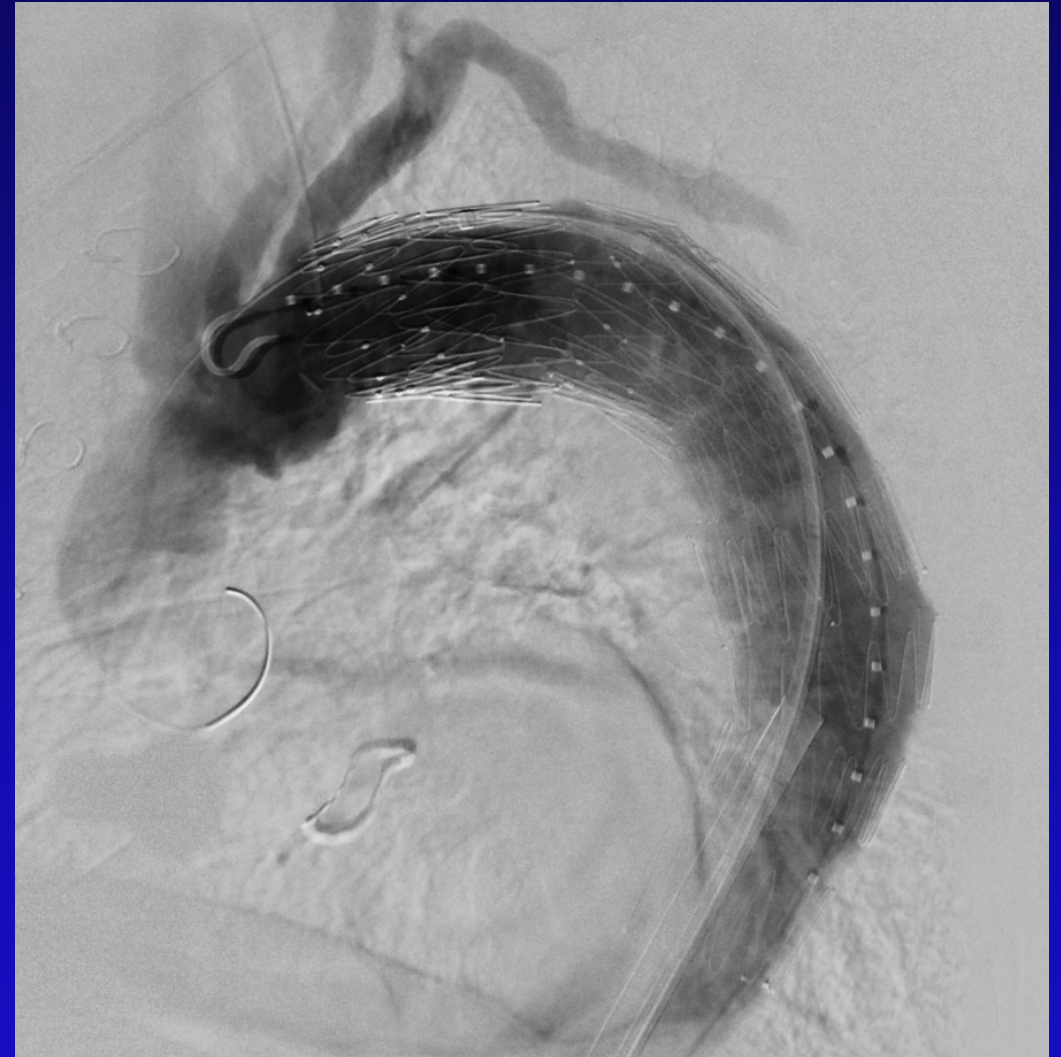
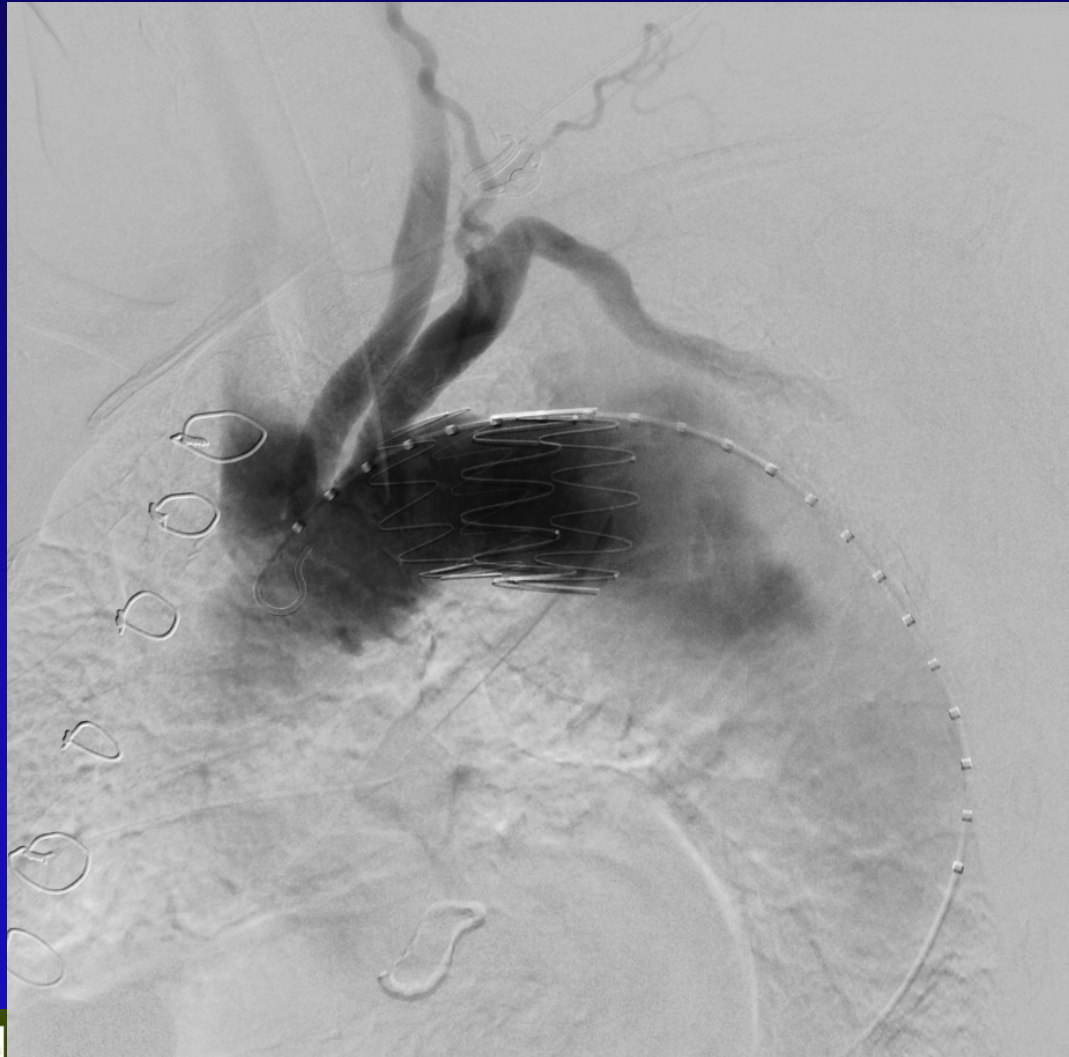
Hybrid Approach



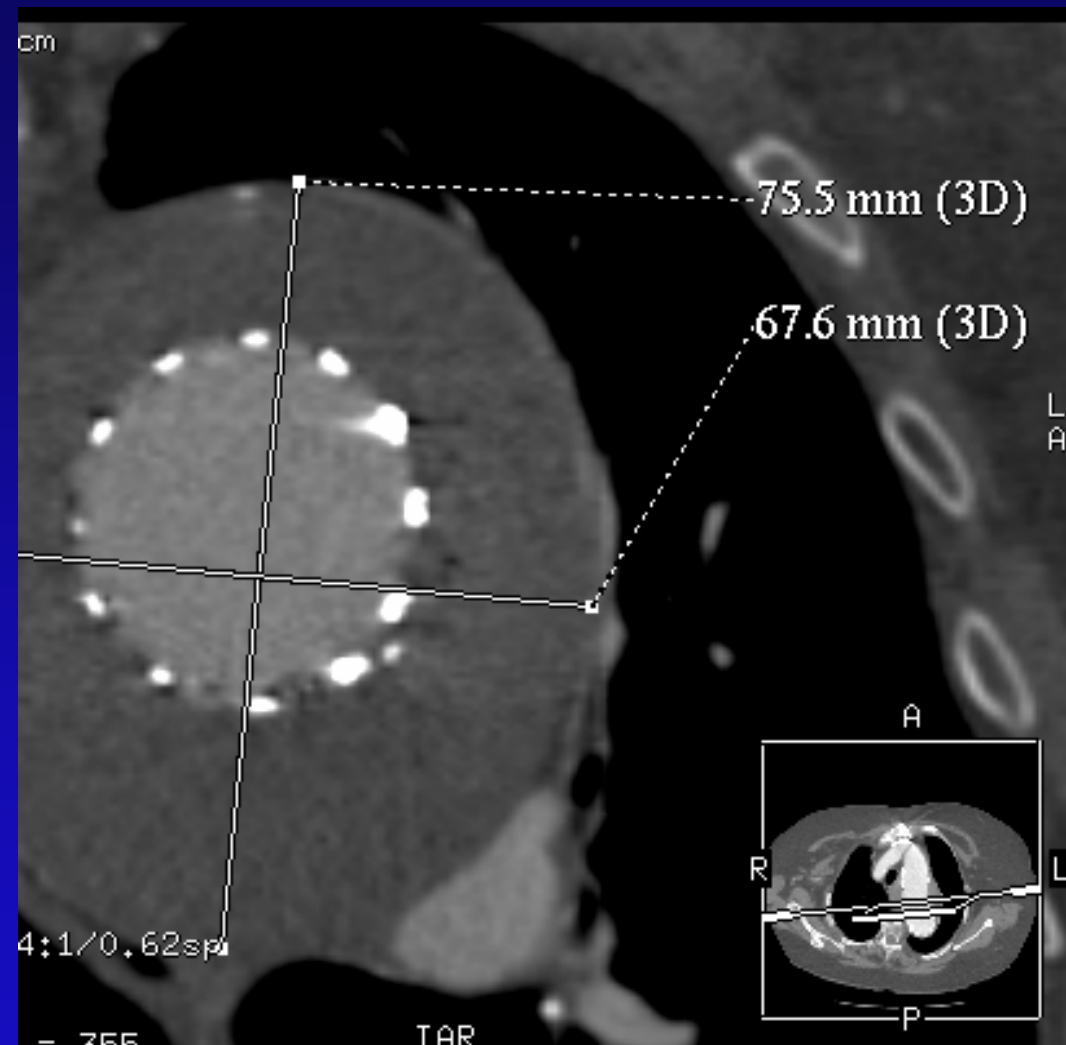
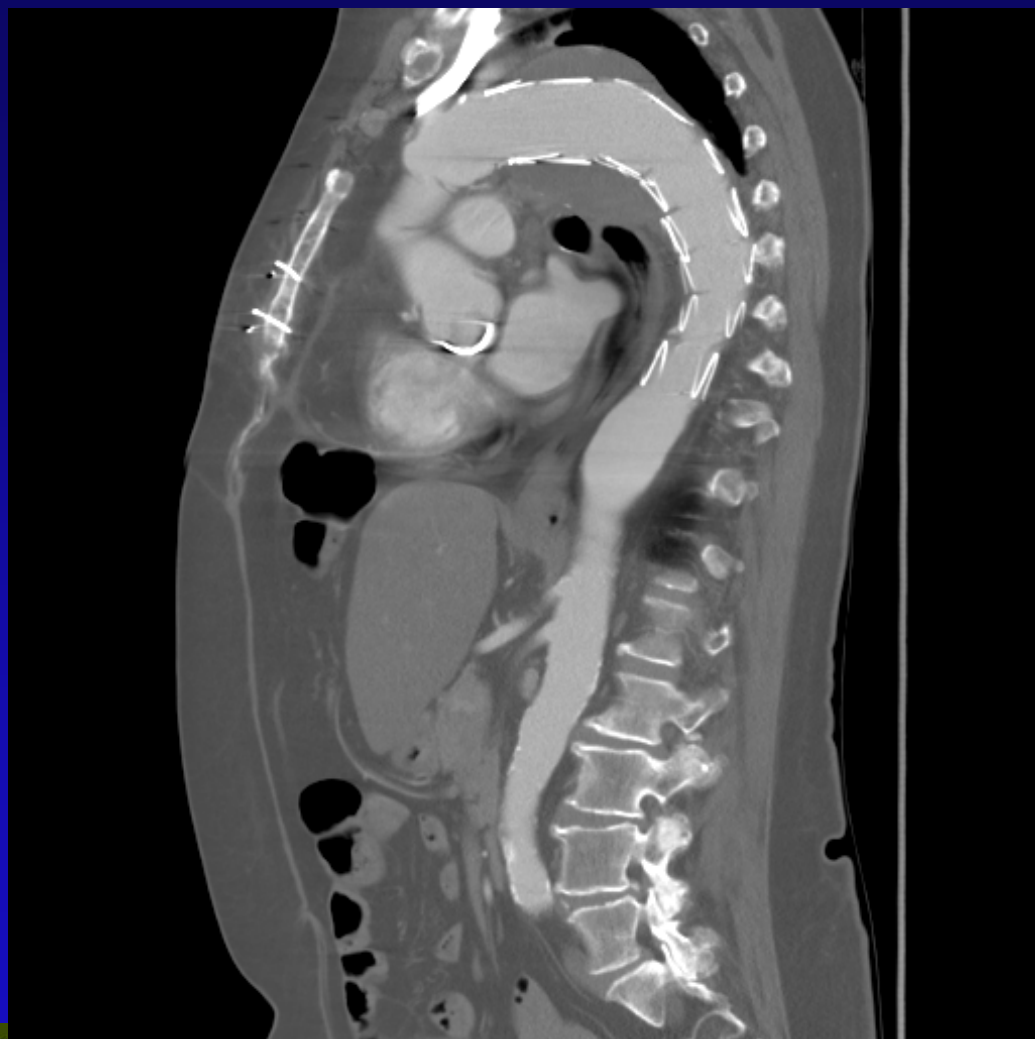
Post-op CT - Frozen Elephant trunk



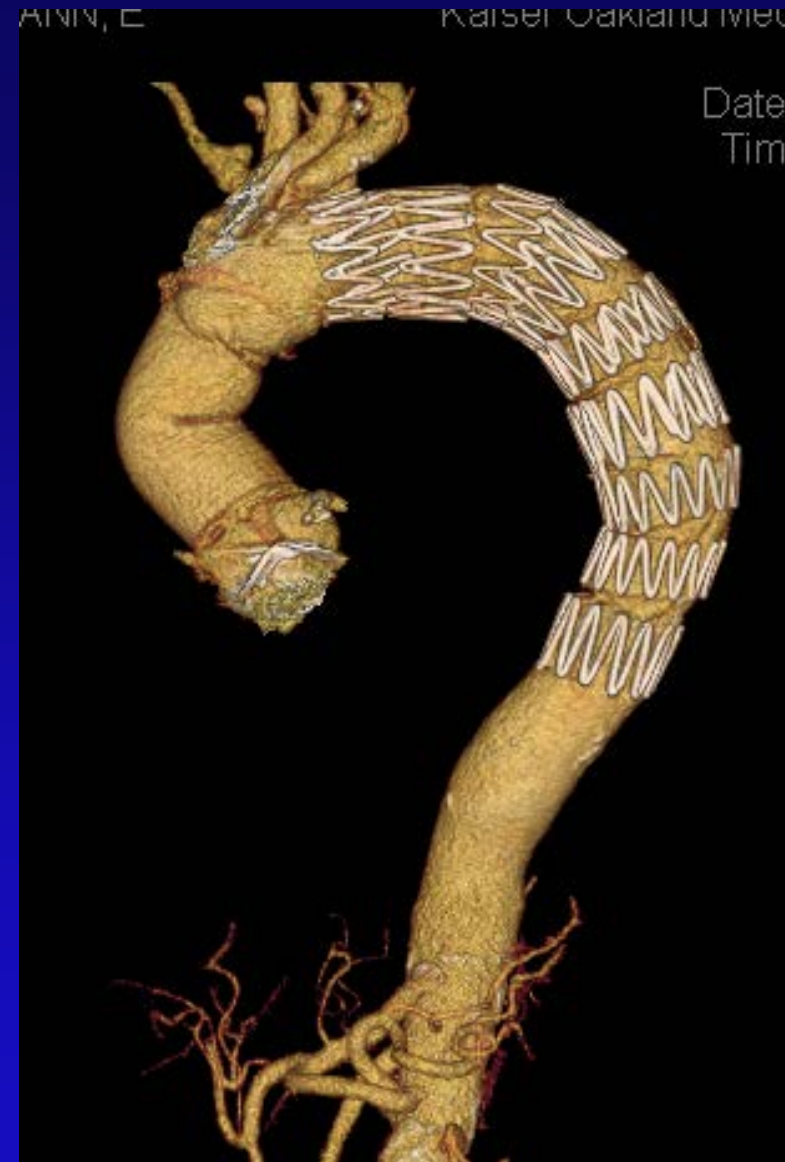
2nd stage frozen elephant trunk

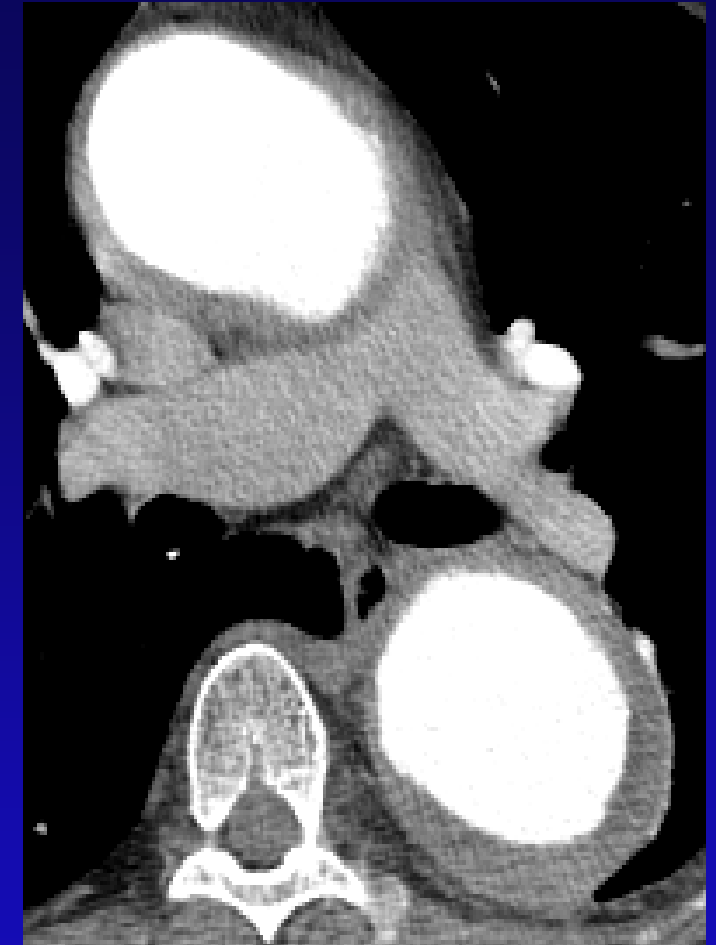
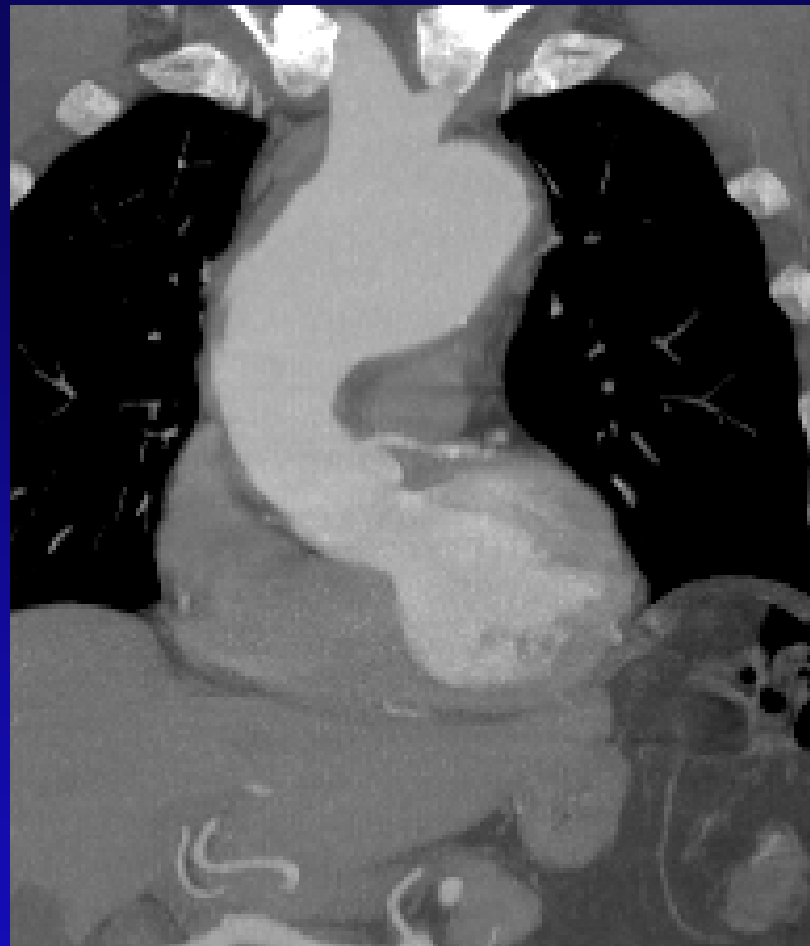


Post-Repair

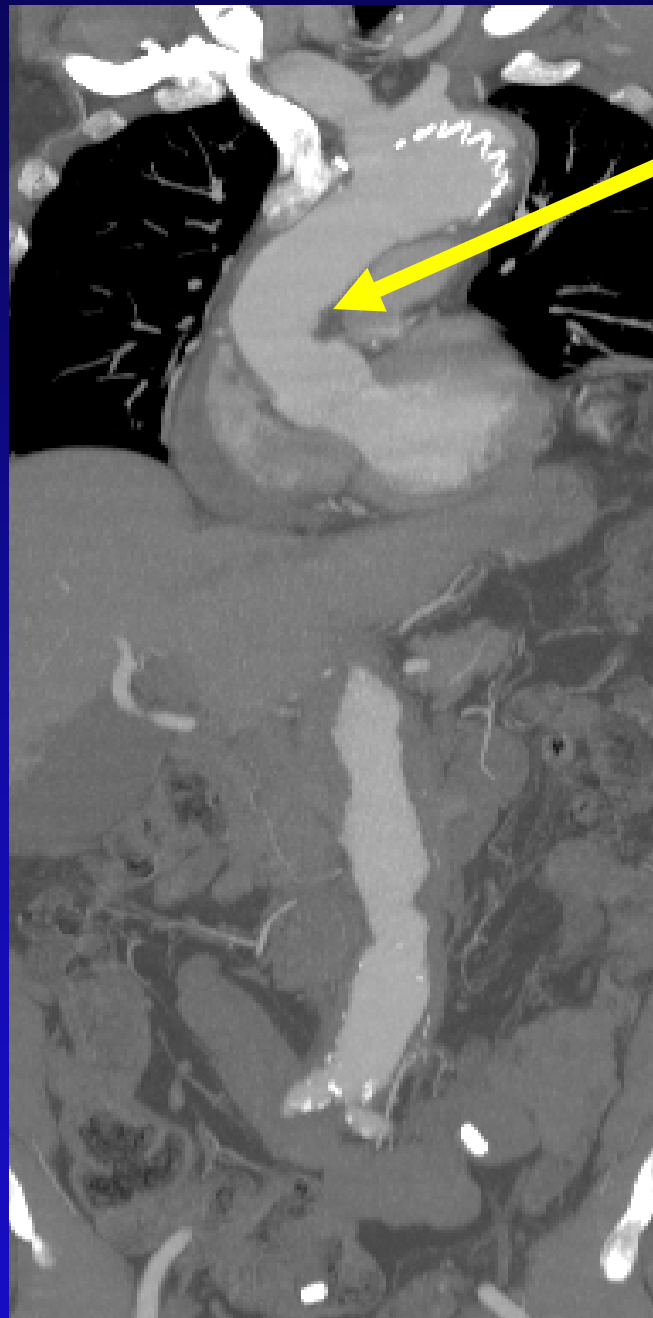


Pre- and Post-repair





72 yo man arch/ascending AA with descending extension

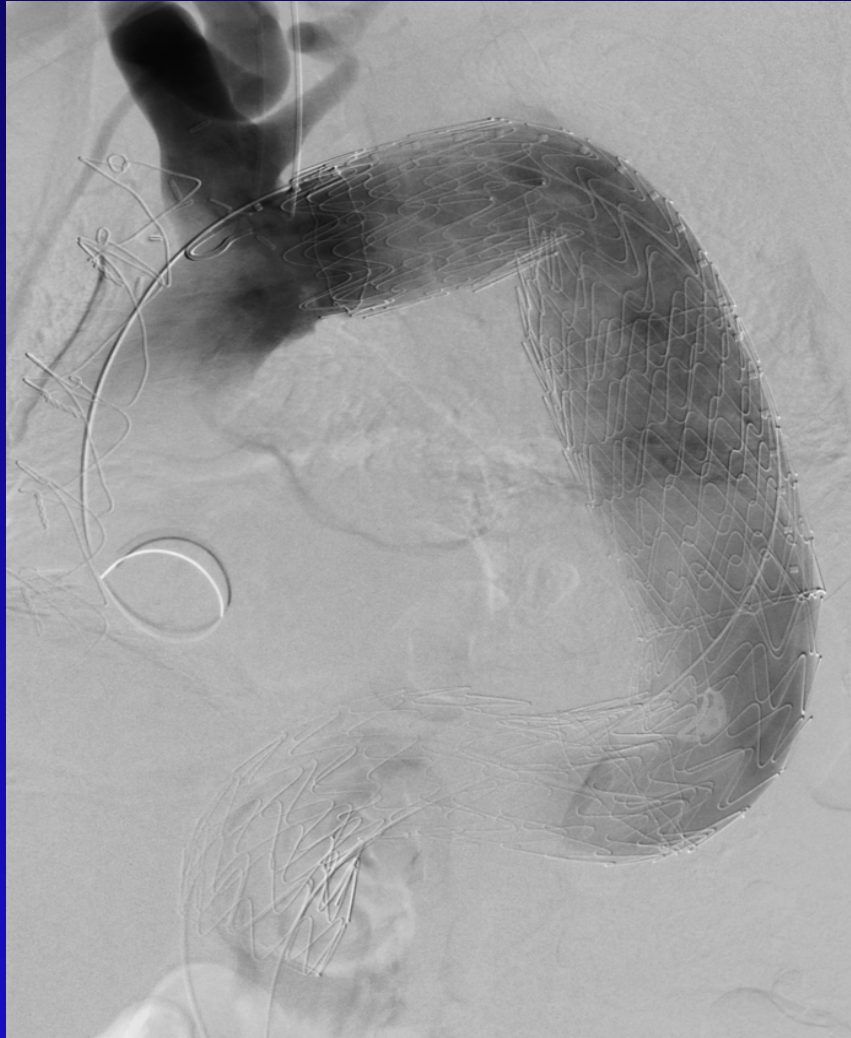


Ascending/arch Rx

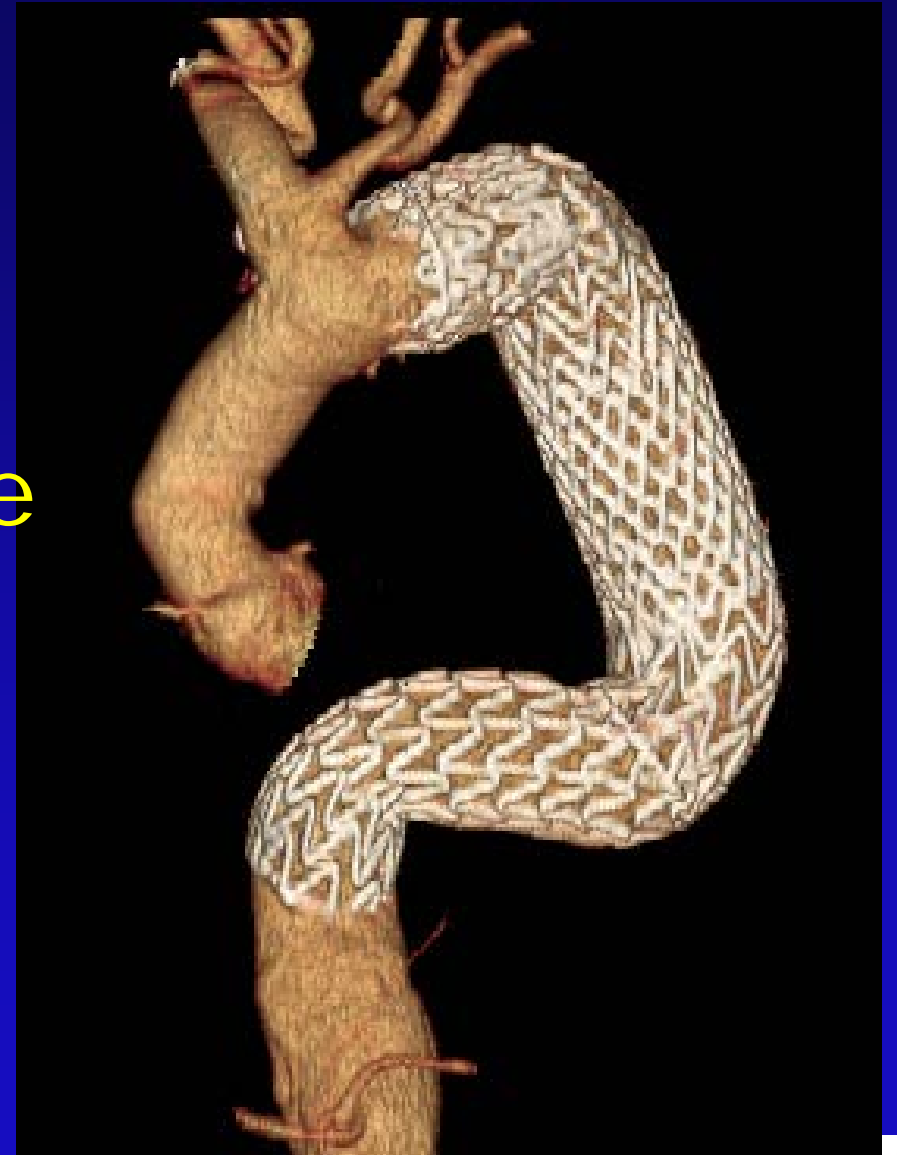


Frozen elephant trunk

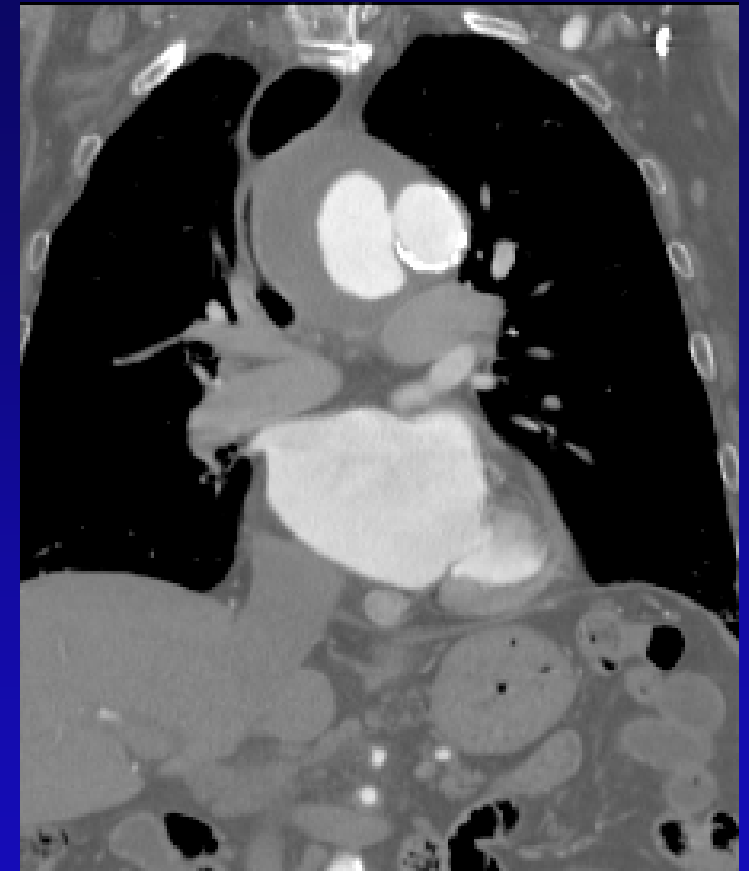
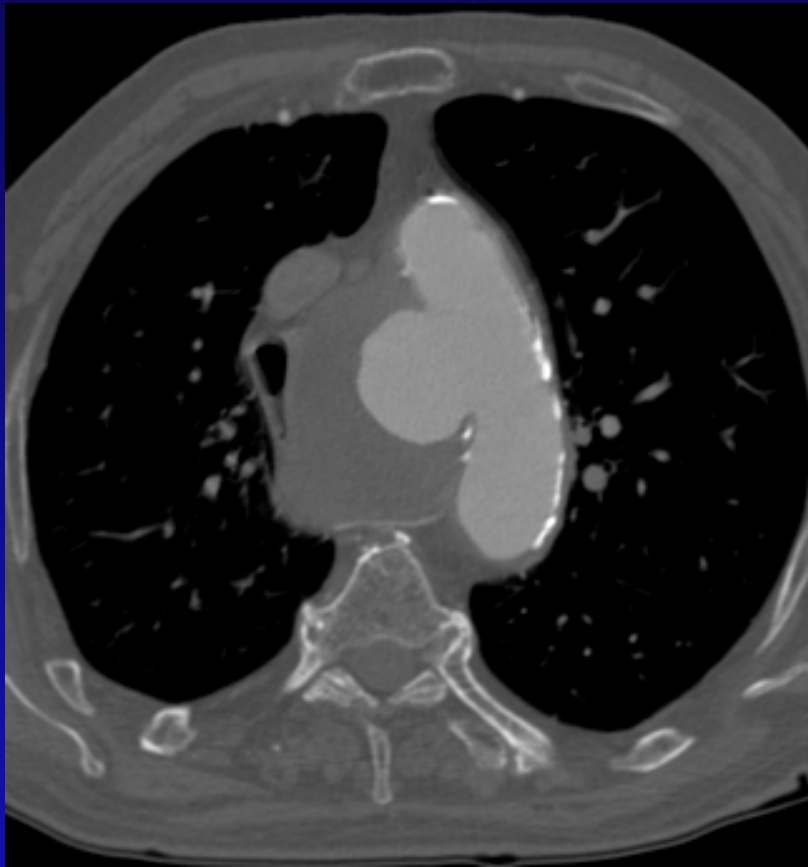
Cardiac & Vascular Combined Surgical Program



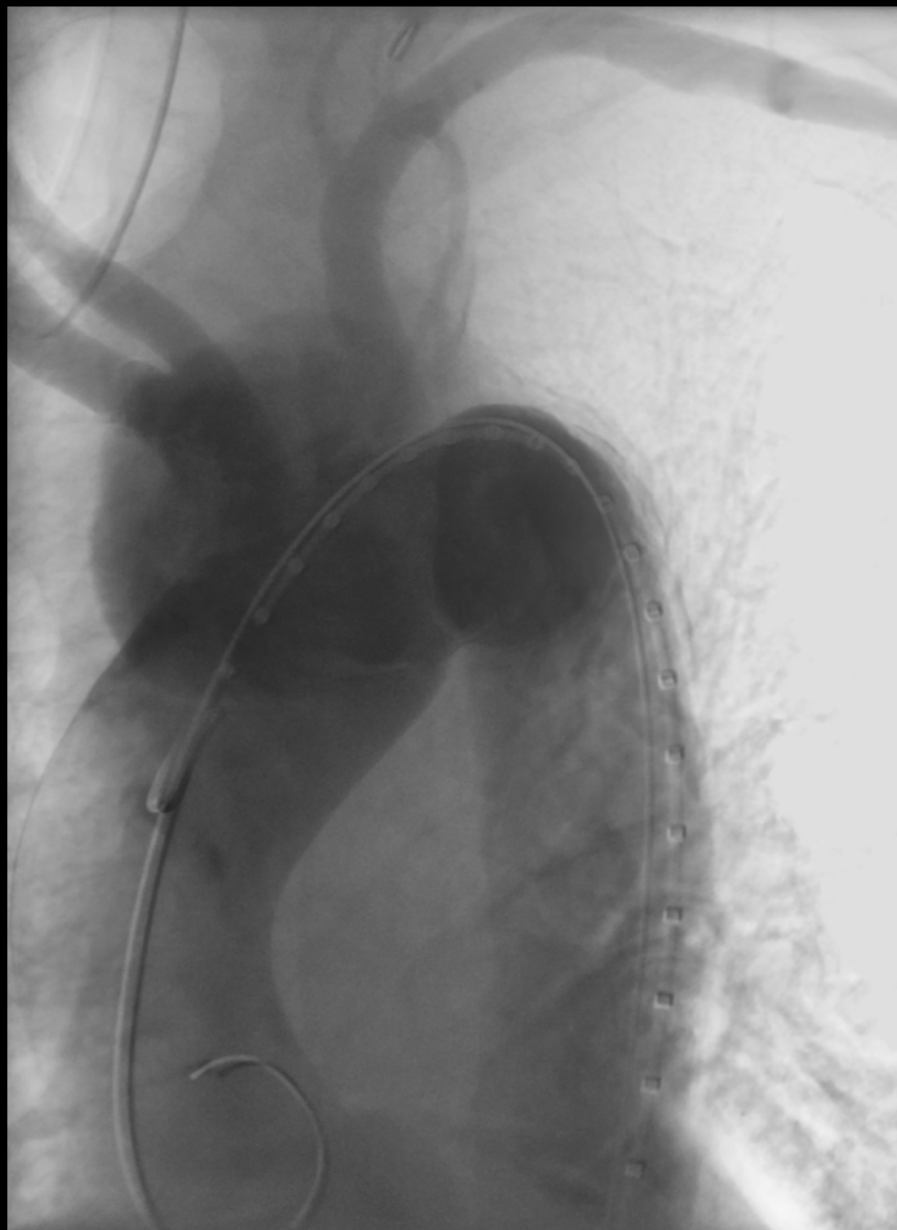
2nd stage



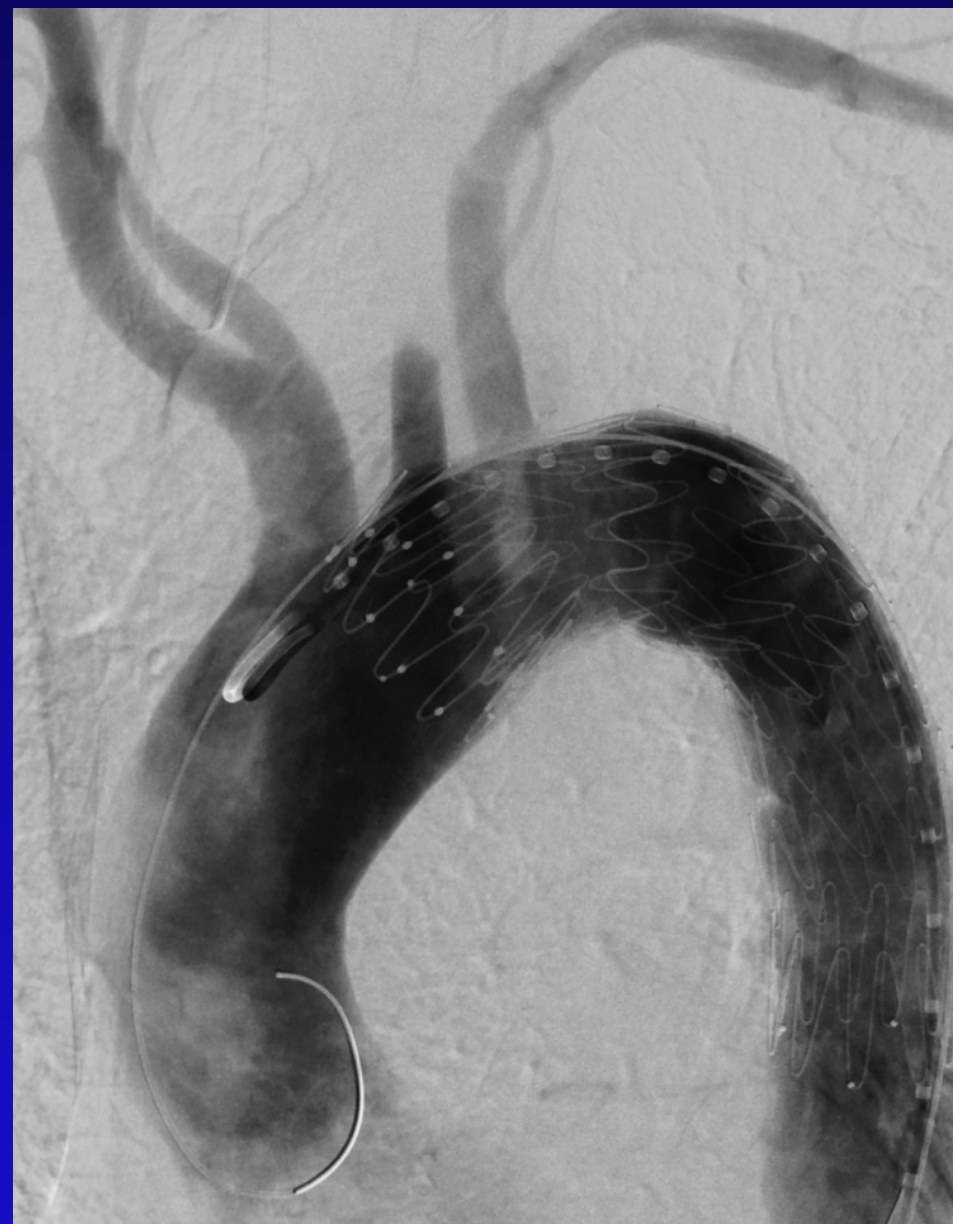
Arch Repairs



87 yo man presents with vocal cord paralysis and hoarseness



Intra-op Pictures

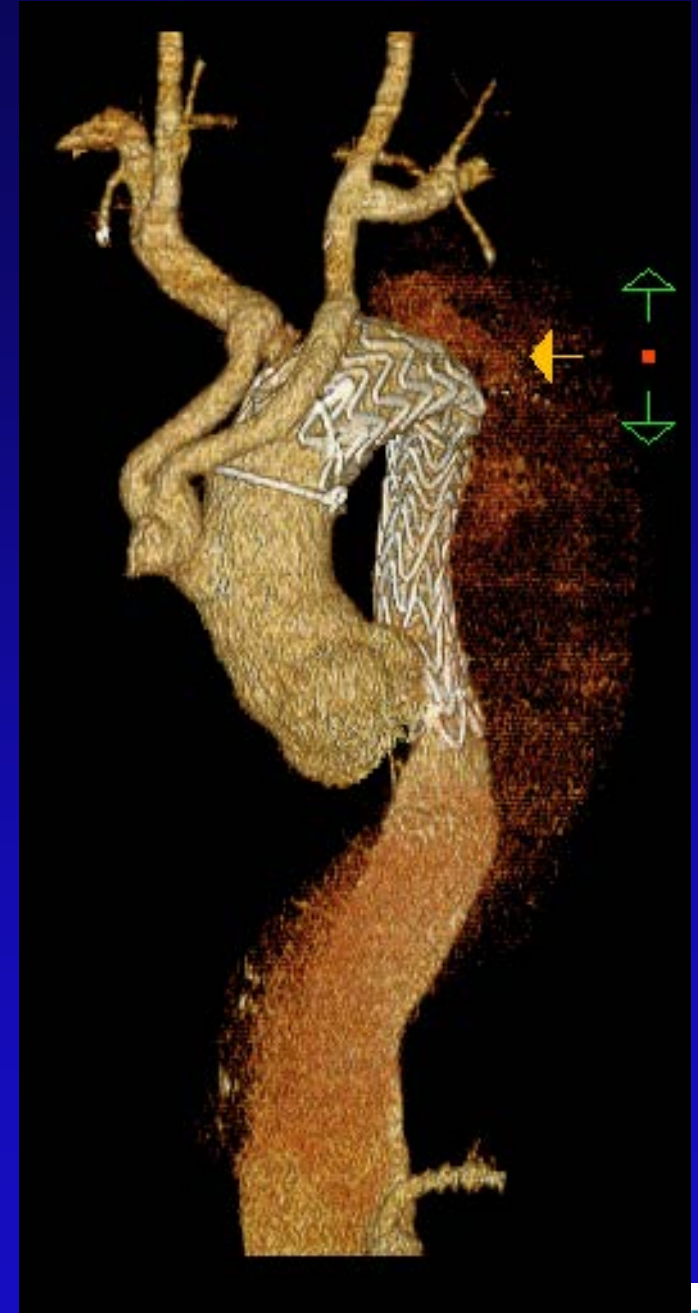


Post-op Pictures



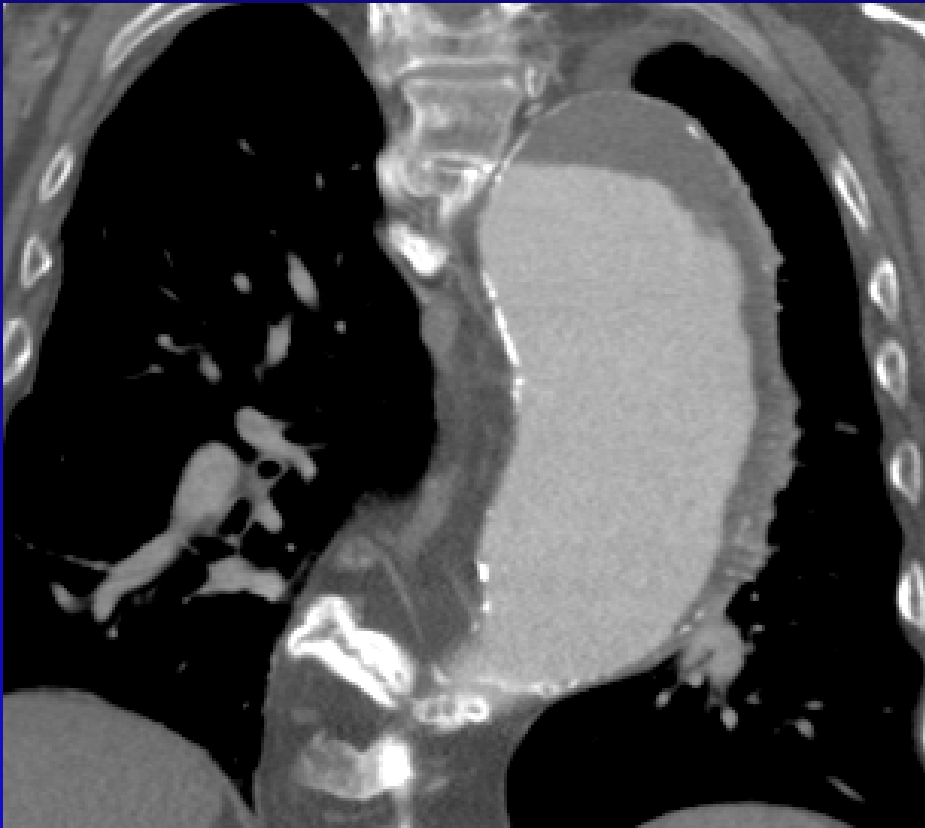
Pt d/c from Hospital POD#1

Debranching

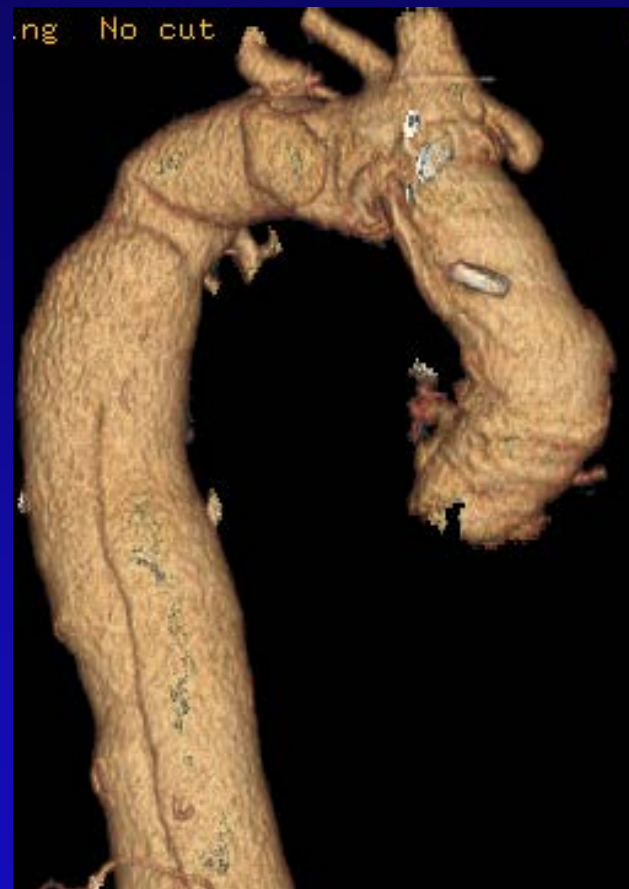


Zone zero repairs

- ~30 cases since 2008.



Zone zero repairs



How do we best provide care?

Multiple domains of expertise

Large geographic areas to cover

Surveillance

Resource allocation

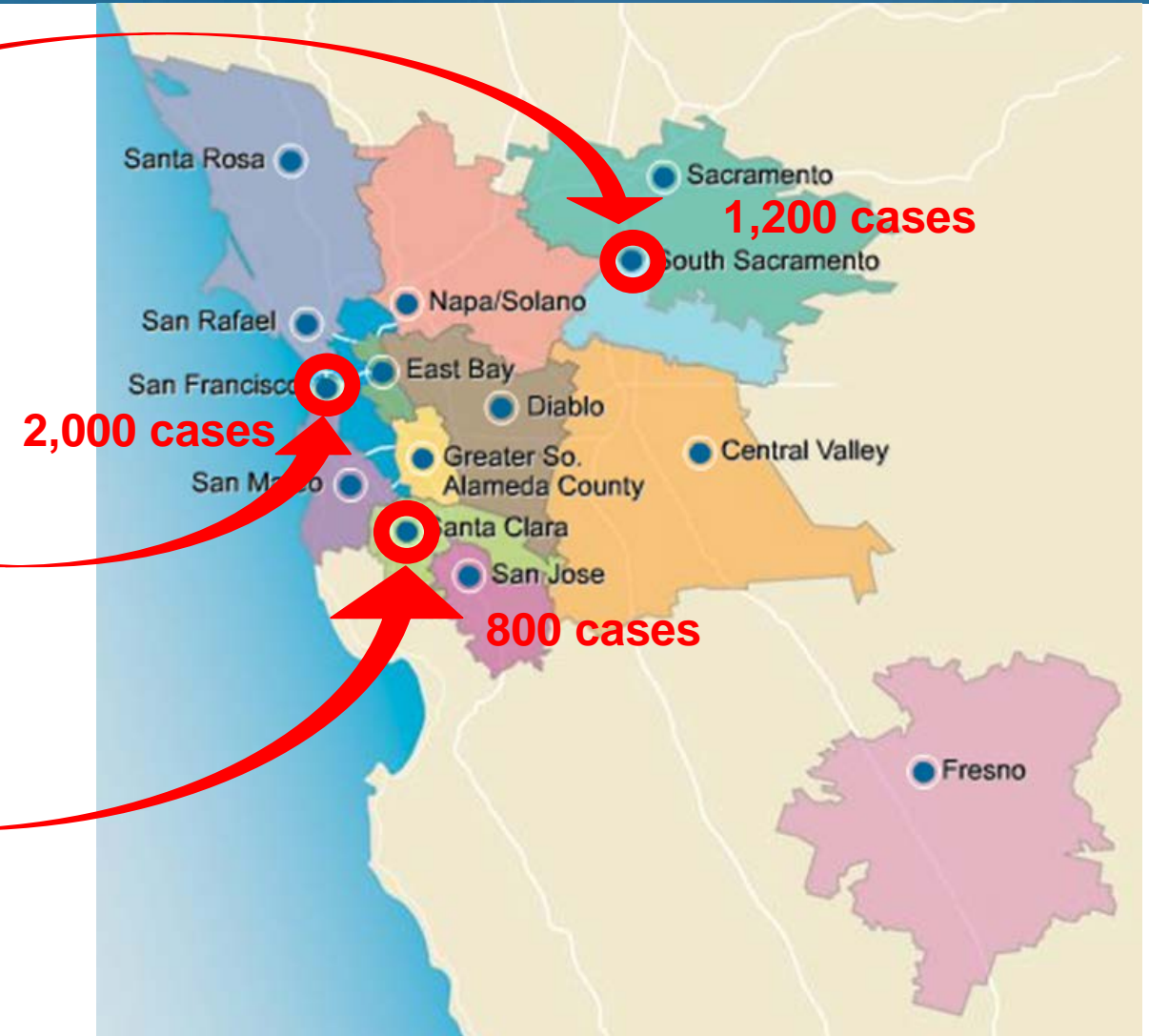


Current State

10,000 patients with TAA:

- Triage of 2,000 new cases
- Interval care for existing cases
- Image ordering and review
 - 4,000-5,000 chest CTs
 - 4,000 echocardiograms
 - 70-100 chest MRIs

Referrals to CVS are ad-hoc,
and span the risk spectrum



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 **KAISER PERMANENTE®**

Center for Thoracic Aortic Disease – Vision Statement

We are building a **multi-disciplinary** center of excellence for TAA patients that will include Cardiologists, Cardiovascular Surgeons, Geneticists, Imaging and other related specialists.

Our plans:

1. Dedicated clinic for high-risk patients (Marfan's, other CTD, FMHx TAA)
2. Robust safety net system to capture new cases directly from echo, CT, MRI
3. Comprehensive and centralized triage and evaluation of all new cases
4. High-quality and consistent imaging availability throughout the region
5. Standardized care pathways for patients of all risk levels (low, moderate, high)

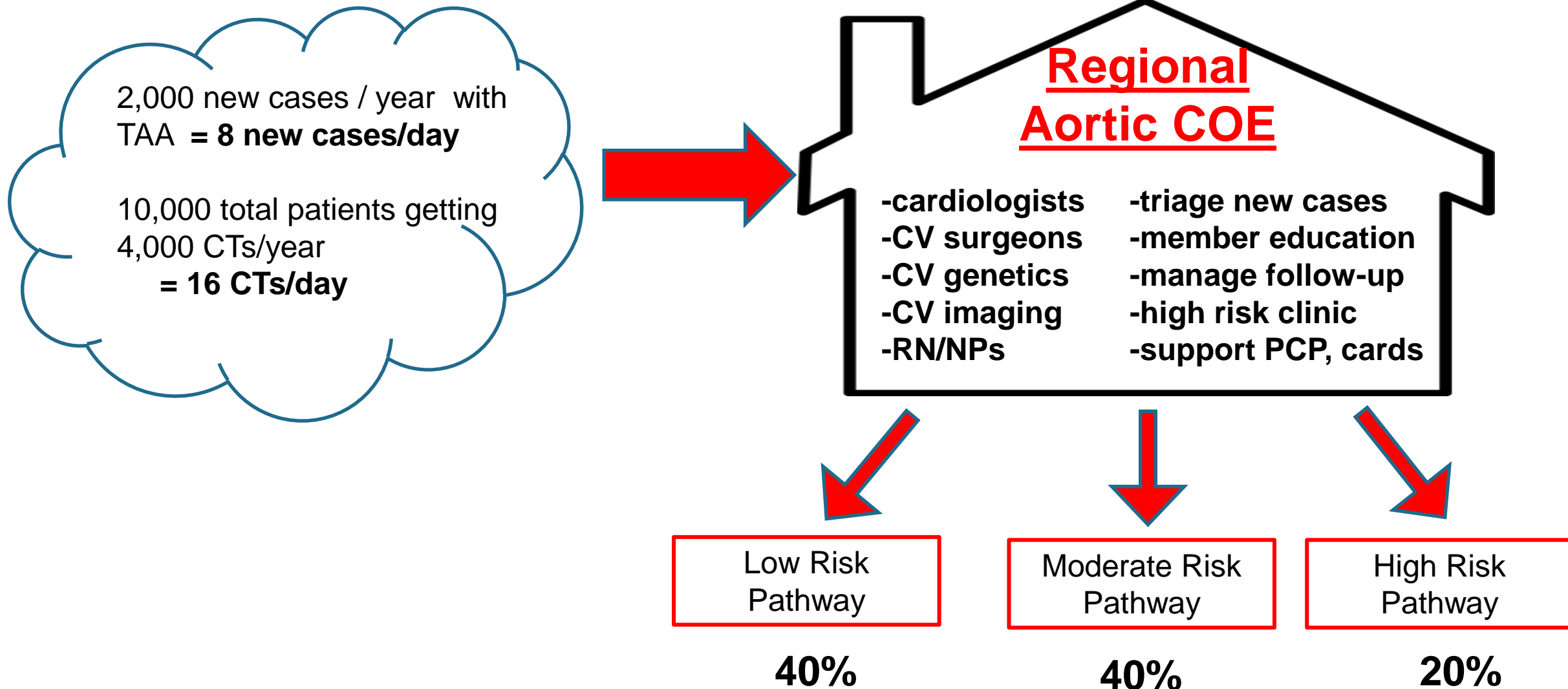


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Contact: Sarah Lahidji, QOS 8-428-4412



Thoracic Aortic Disease Center



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The Evolving Thoracic Aortic Center

Clinic one day a week at San Francisco, which is a regional site for cardiac surgery

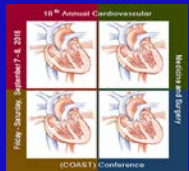
Integration of cardiac surgery staff with cardiology to evaluate and discuss patients on routine basis

Advance practitioner support for systematic screening, surveillance, and triage of imaging

Creation of databases and outcome data. Epidemiology of thoracic aortic aneurysms in our system presented at AATS this past April.



Matt Solomon, MD



Center for Thoracic Aortic Disease – Partnerships

QOS

Sarah Lahidji, MHA

Maja Falcon, PhD

Cardiology

Matt Solomon MD, PhD

Ann Sheridan, MD

Dorinna Mendoza, MD

Sahar Naderi, MD

Scott Adelman, MD

Scott Yang, MD, PhD

Genetics

Norma Chow, MS, LCGC

Emily Chen, MD

CV Surgery

Vic Melikian, MD

Hon Lee, MD

Joe Huh, MD

Paul LaPunzina, MD

Anne Gisslow, RN

Wendy Cirimele, RN

Radiology

Tom Urbania, MD

Cliff Sweet, MD

Patrick Chang, MD

Todd Oskinski, MD

Geoff Allen, MD

Ahmad Sheikh, MD

Duncan Mason, MD

Kathryn Totah, RN

Mario Pompili, MD

Vascular Surgery

Oswaldo Yano, MD

Hong Hua, MD

Stanford University

David Liang, MD, PhD

Sunny Pellone, RN

Mitchel Pariani MS, LCGC



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Future Directions

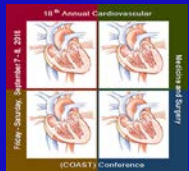
Establishing an aortic center of excellence

Connecting the hub and spokes within KP Northern California

Standardizing imaging protocols and interpretations for aneurysms

Continued partnerships between vascular and cardiac surgery, with focus on emerging technologies (device trials)

Research and outcome data



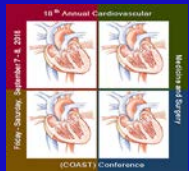
Summary

Aortic pathology is complex and multi-factorial

Care involves multiple specialties including cardiology, radiology, vascular and cardiac surgery

Early identification and balanced surveillance is key to preventing complications such as rupture or dissection

The KP environment is ideal to establish coordinated surveillance programs across regions with strategically placed centers of excellence





That's all Folks!

Thank You