

# A Team Approach to Aortic Disease

# Aortic Pathologies

- Acute Aortic Syndrome
- Aneurysmal Disease
- Ehlers-Danlos syndrome
- Loeys-Dietz syndrome
- Marfan syndrome
- Takayasu's arteritis
- Giant-cell arteritis
- Lymphoma
- Adult congenital aortic disease (i.e. coarctation, congenital aortic valve, Turner syndrome)



# Philosophy Behind the Team

- Reduce early Mortality
- Avoid reoperations
- Improve long-term outcomes
  
- Ultimately, pooling numerous skill sets together to handle aortic emergencies and conditions carrying a high morbidity and mortality
- Need for a group to establish resources and infrastructure to handle both emergencies and long-term care of a chronic condition



# Team Members: Creating a Group to Standardize Optimal Care

- Vascular Surgeons
- Cardiac Surgeons
- Adult Congenital Cardiology
- Cardiology with a connective tissue disease focus
- Anesthesiologist
- Intensivists
- Neurosurgeons
- Imaging Specialists
- Rheumatology



# Development of Dedicated Aortic Experience

- Open repair
  - Branched Endovascular Aneurysm Repair
  - Fenestrated Endovascular Aneurysm Repair
  - Snorkel Endografts
  - Physician Modified Endografts
- 
- Creation of 3-D models



# Multidisciplinary Conferences/Clinics

- Case discussion: management options, treatment algorithms, surgical plans
- Review of latest technology and literature
- Current treatment recommendations
- Coordinate multidisciplinary follow-up and surveillance plans

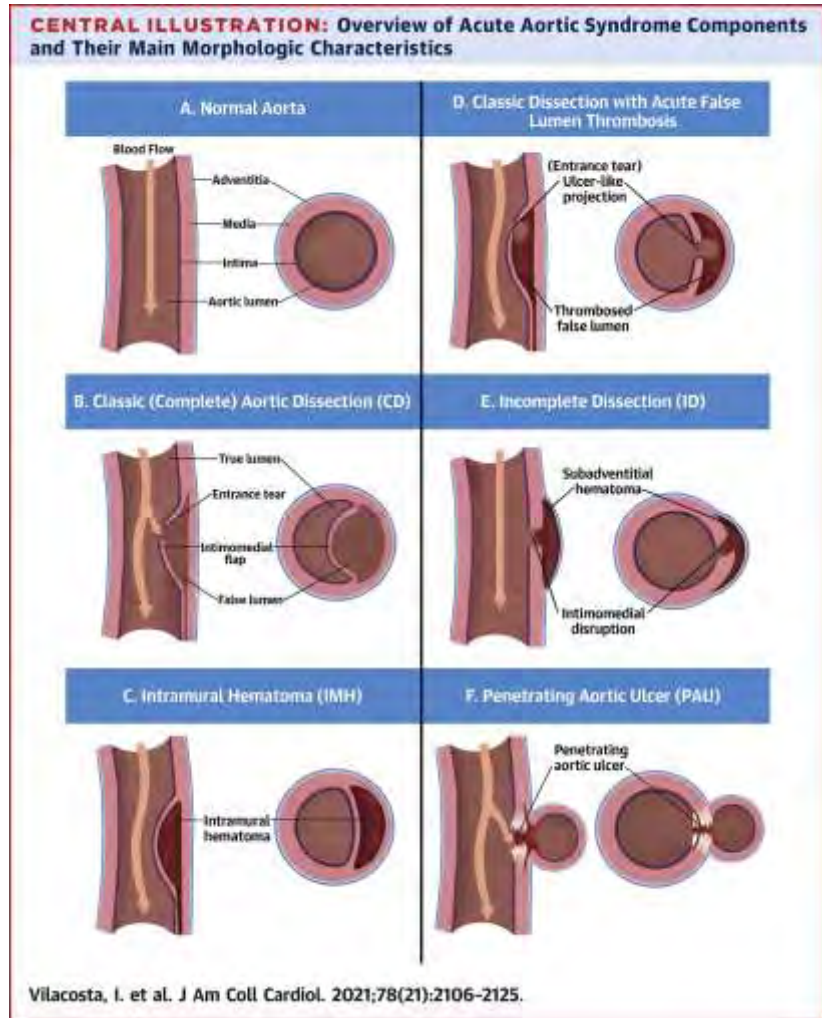


# Education and Accessibility

- Creation of dedicated hotline/centralized call center with ability for rapid transport arrangement
- Raising regional awareness through outreach, conferences, and lectures
  - Target small to medium size emergency departments



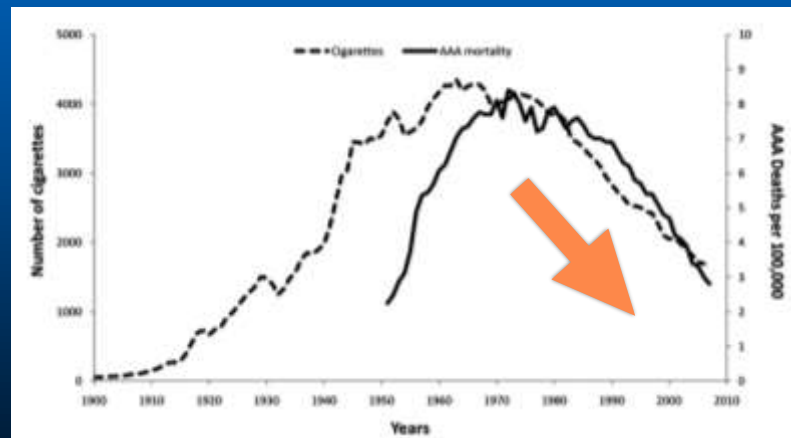
# Acute Aortic Syndrome





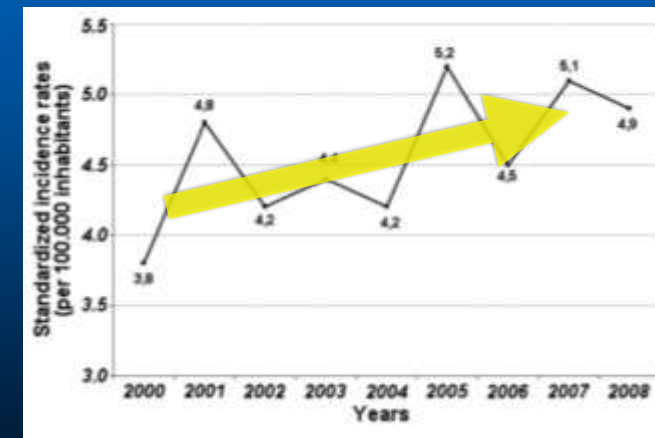
# Aortic Dissection: Increasing Incidence

**Abdominal Aortic Aneurysm**  
**Decreasing**



*Lederle Circ 2011*

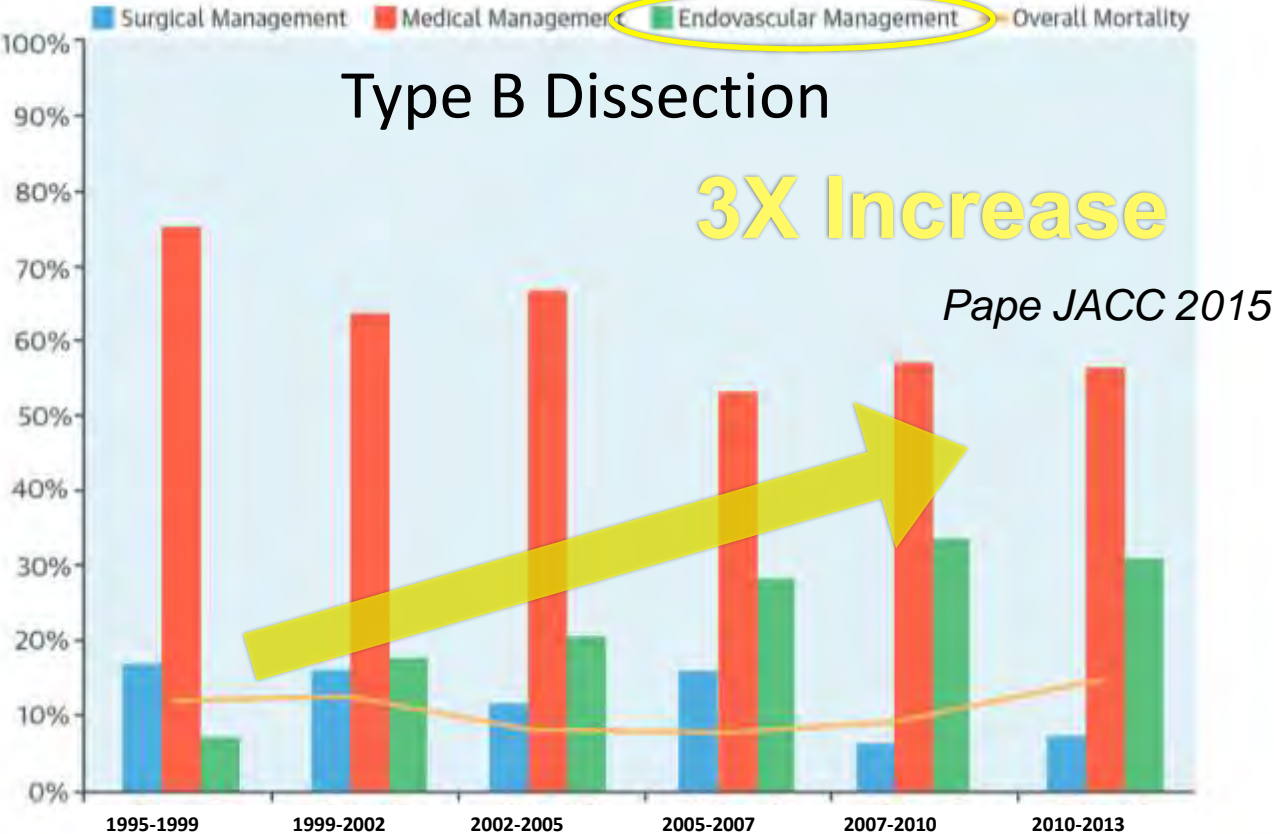
**Aortic Dissection**  
**Increasing**



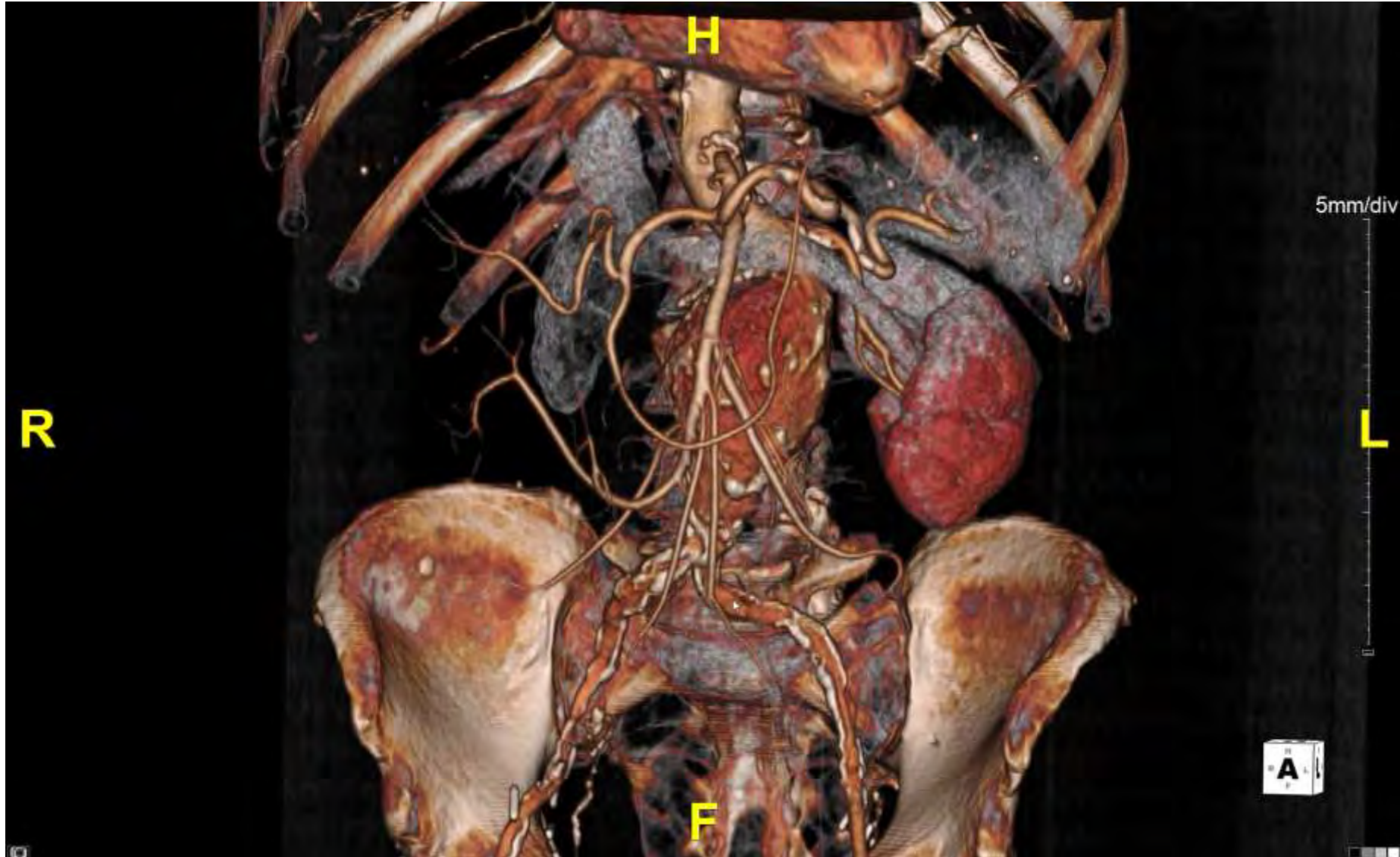
*Pacini Int J Cardiol 2013*



# Aortic Dissection: Increasing Incidence



# Automated Centerline Measurements



# Physical Model from 3D Reconstruction

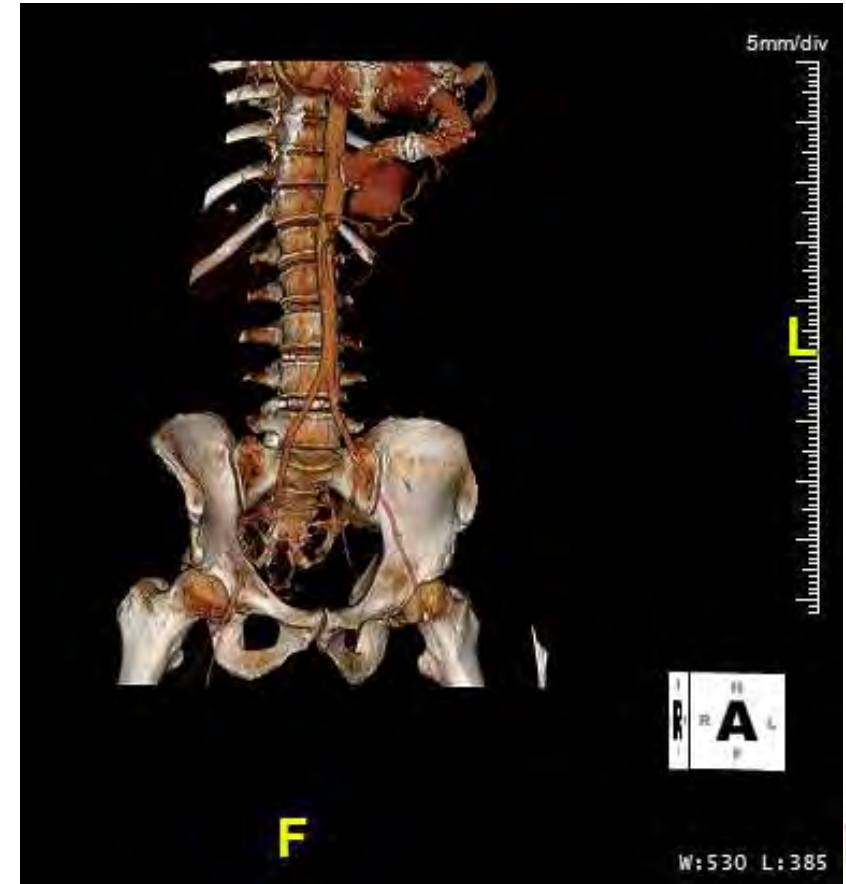
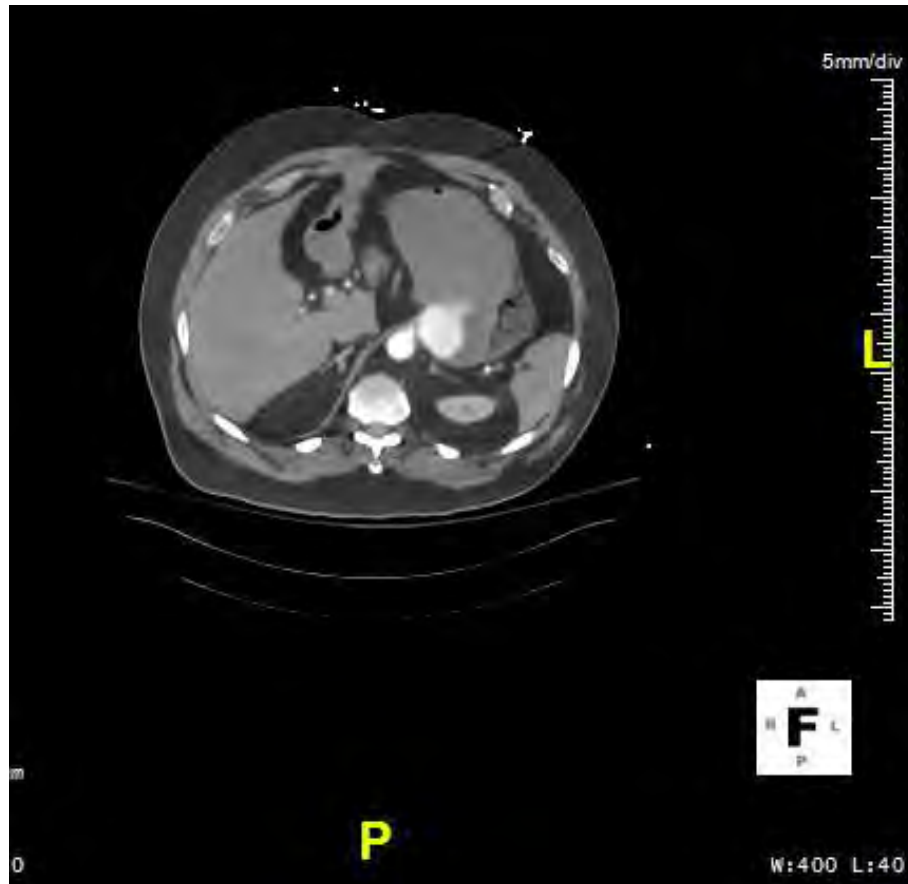


# Shone's Syndrome Complication

- Subaortic obstruction, bicuspid valve and coarctation
- Previous subaortic resection, mechanical AVR, complex LV apex to descending aortic conduit
- Outside presentation to ED with GI bleeding—pseudoaneurysm eroding into the stomach
- Teams involved: Adult congenital cardiology, vascular surgery, cardiac surgery, critical care anesthesia, cardiac anesthesia



# Shone's Syndrome Complication



# Shone's Syndrome Complication: Acute Intervention

- Covered stent grafting (x4) of the LV apex conduit to the descending aorta
- Amplatzer plug (x2) of descending thoracic aorta



# Shone's Syndrome Complication: Open Intervention

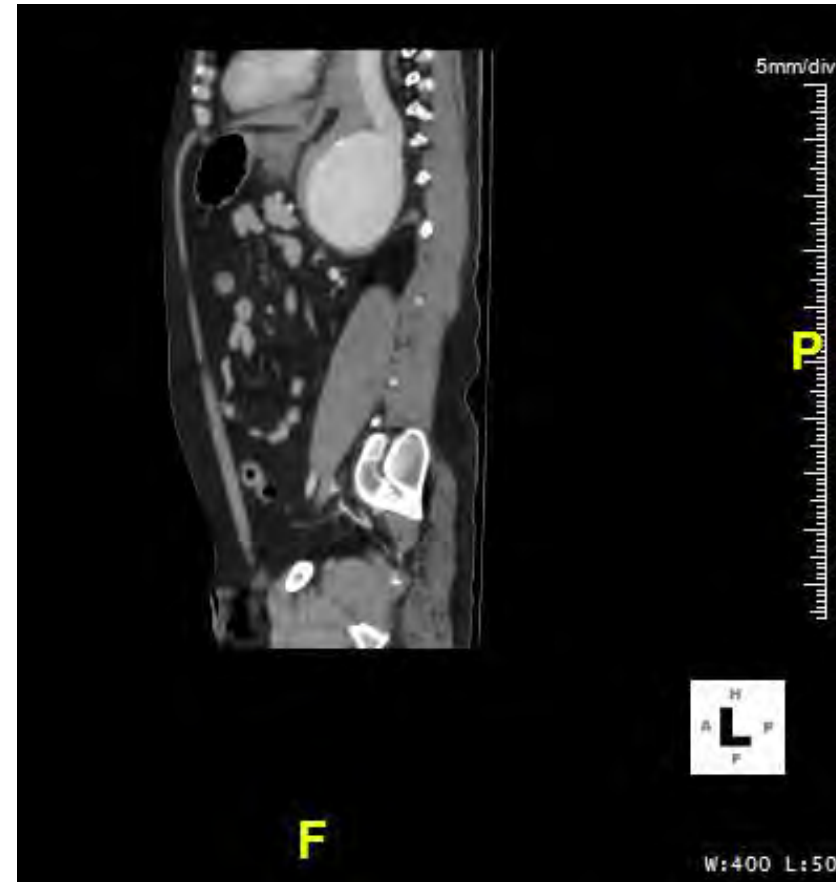
- Replacement of descending thoracic aorta
- Resection of old apical conduit
- Implantation of new valve conduit with Dacron graft, new mechanical valve attached to remnant apical graft
- Repair of stomach defect by general surgery





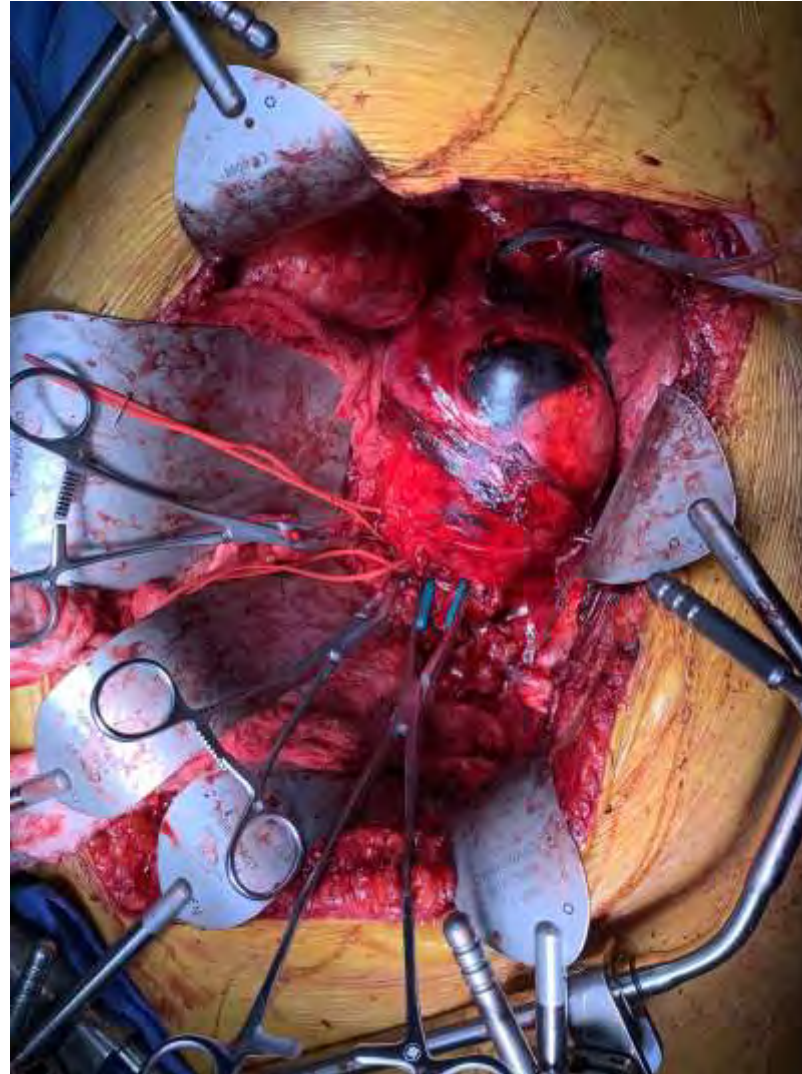
# Rupture Thoracoabdominal Aortic Aneurysm-Open Repair

- Call to transfer desk, construction worker with crushing back pain presented to local ED.
- Transfer to NMC, in the OR within 50 minutes
- Teams involved: Vascular surgery, Cardiothoracic surgery, Cardiac anesthesiology, Critical Care anesthesia, neurosurgery

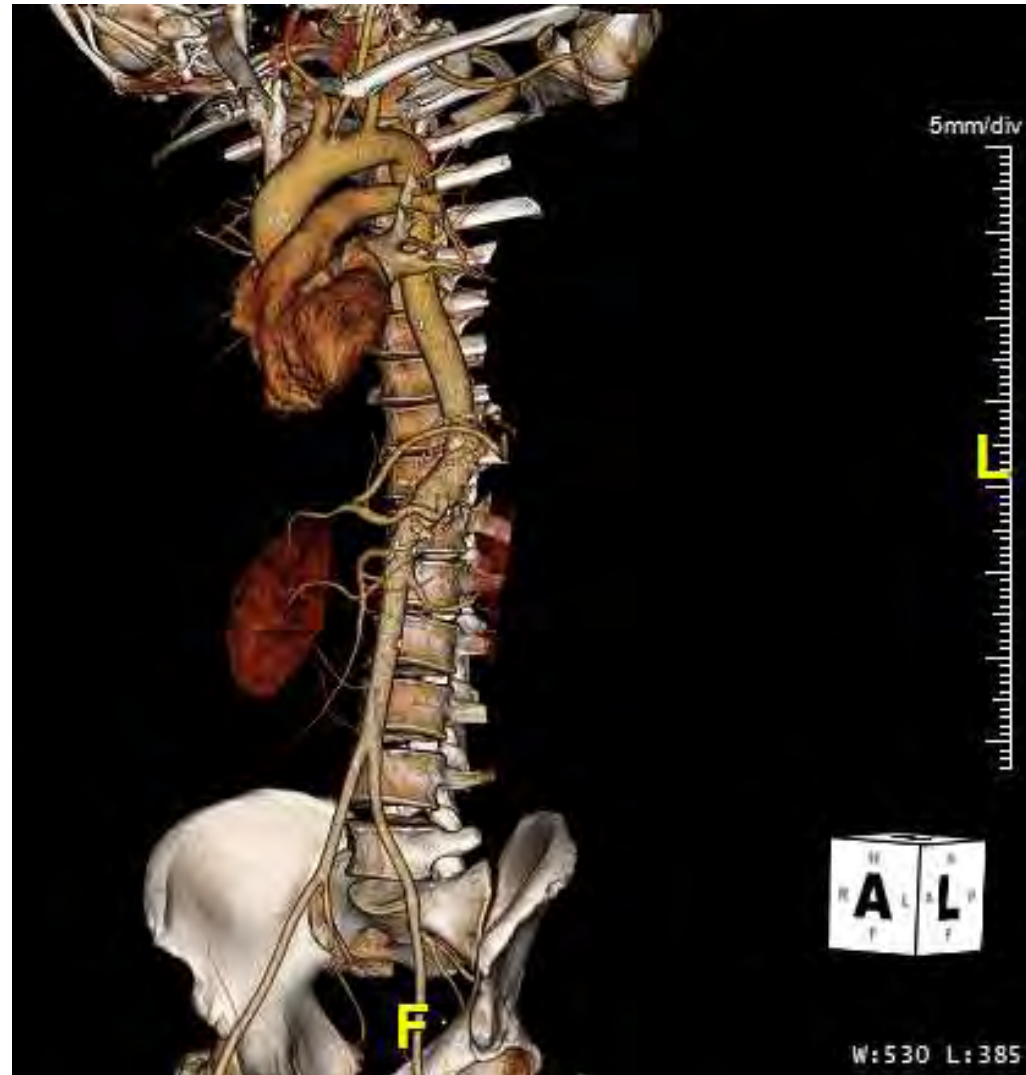


# Ruptured Thoracoabdominal Aortic Aneurysm-Open Repair

- Lumbar Drain
- Esophagogastroduodenoscopy
- Takedown of diaphragm
- Thoracoabdominal aortic aneurysm repair (Type 5) with Dacron graft
- Celiac artery bypass



# Ruptured Thoracoabdominal Aortic Four-year Follow-Up

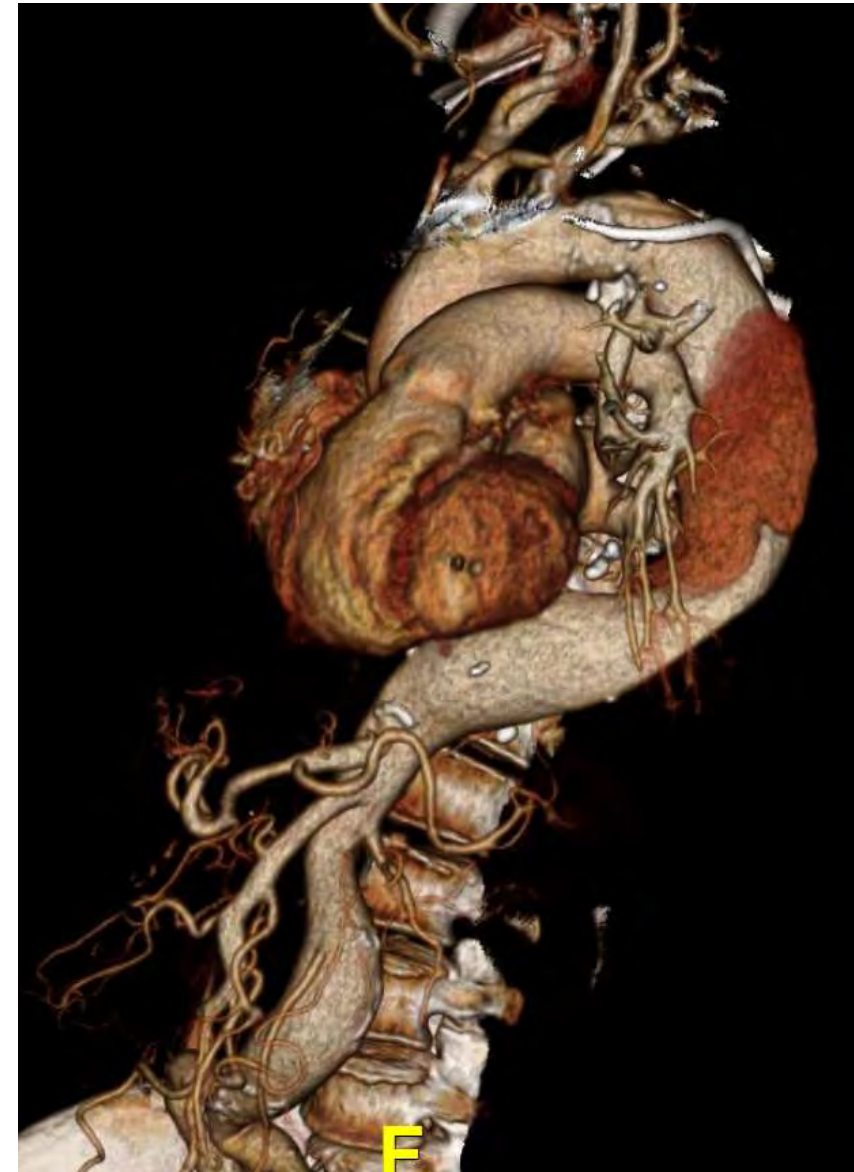
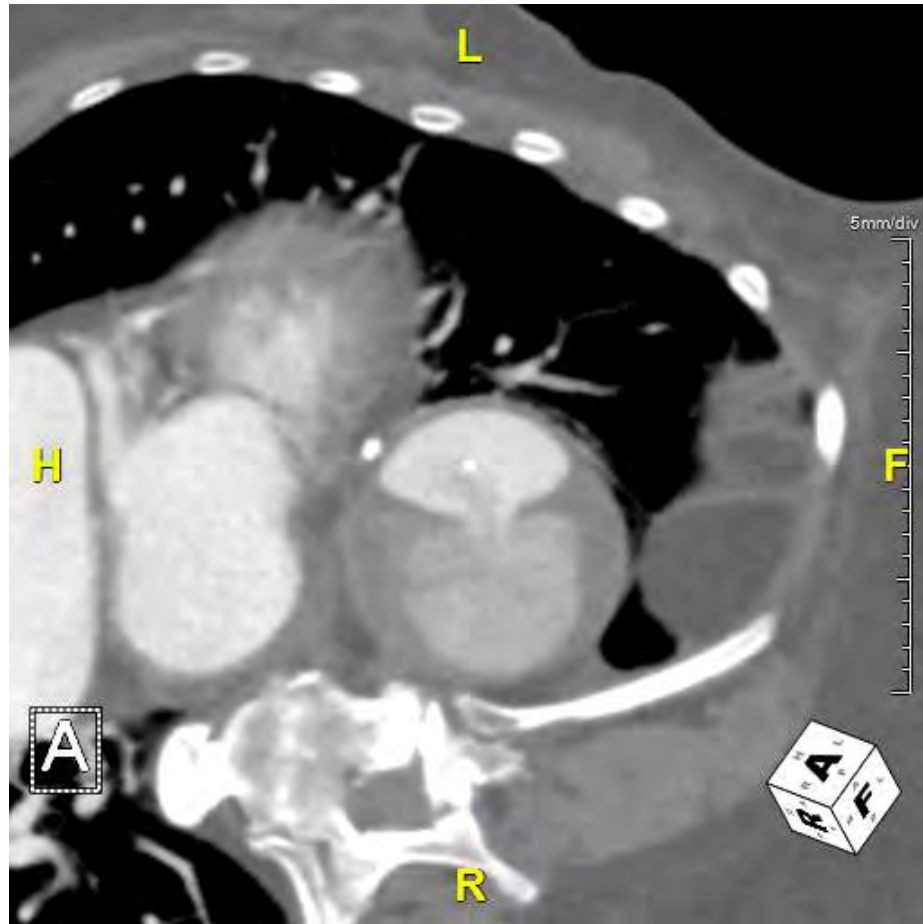


# Aortic Dissection with Aneurysmal Degeneration

- 2018 presentation with symptomatic intramural hematoma with conversion to a Type B aortic dissection
- Initial medical management
- Aneurysmal degeneration of dissection with maximal size of 6.4cm



# Aortic Dissection with Aneurysmal Degeneration

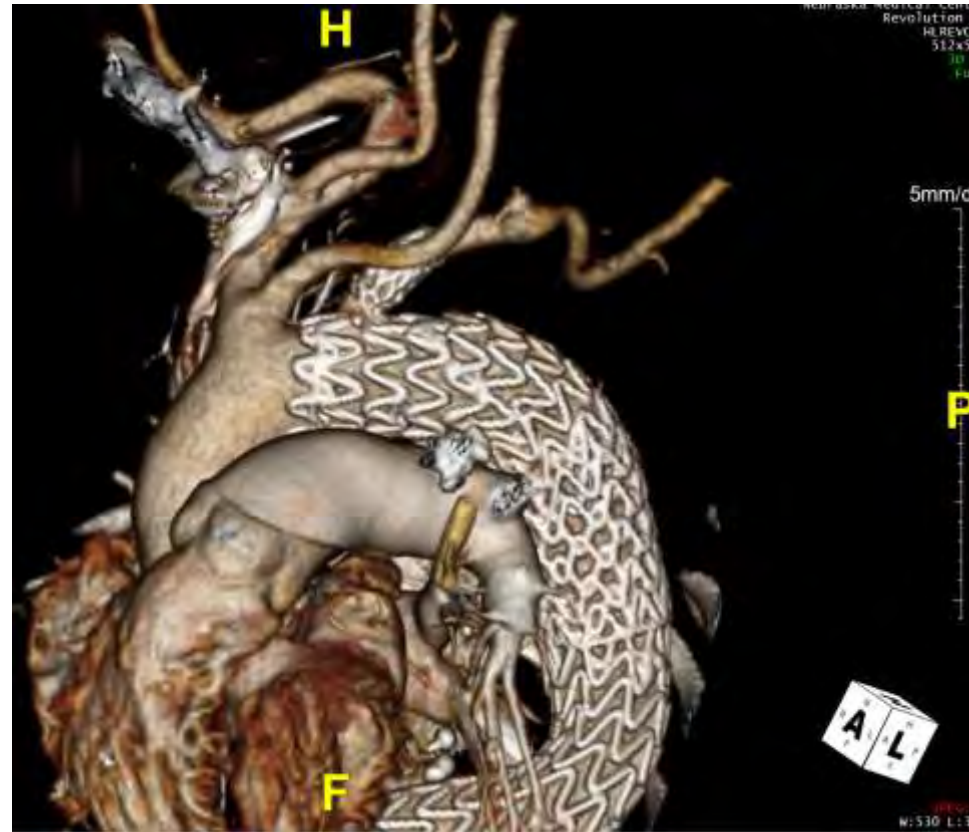


# Aortic Dissection with Aneurysmal Degeneration

- Candidate for a branched aortic endograft
- Teams involved, vascular surgery, cardiac anesthesia, critical care anesthesia, neurosurgery

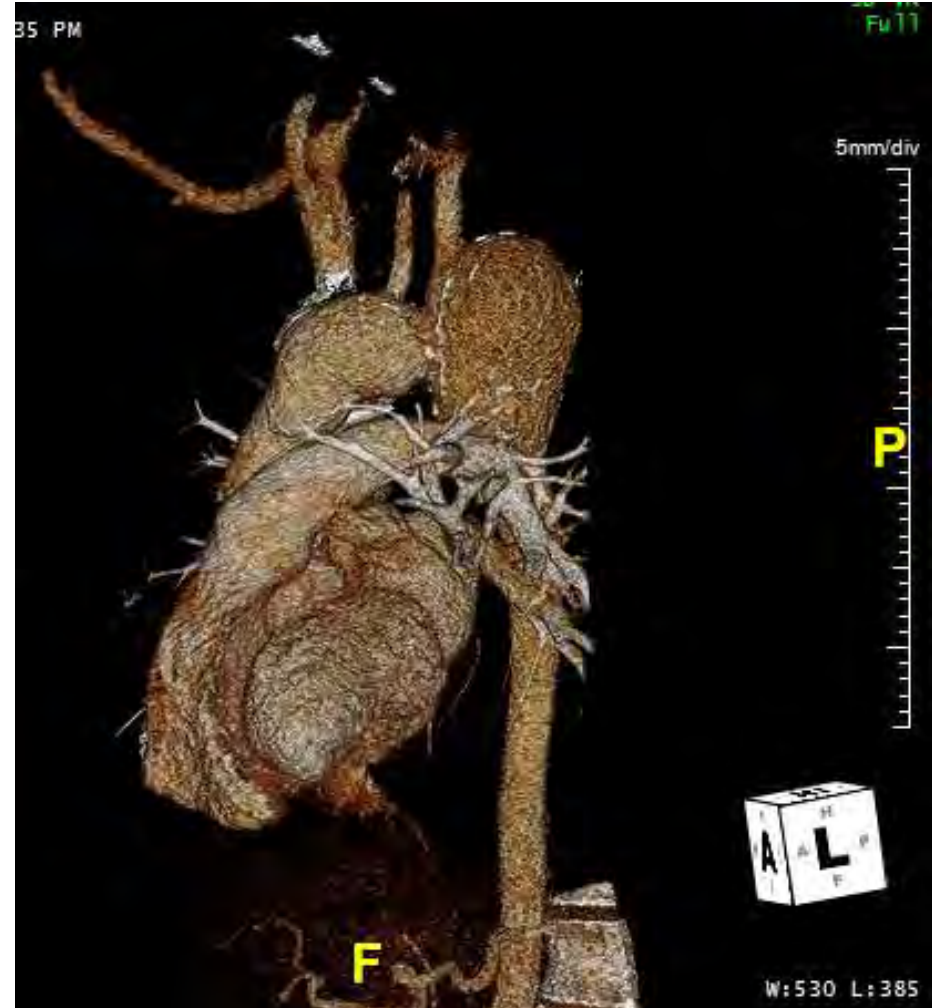


# Aortic Dissection with Aneurysmal Degeneration



# Aortic Coarctation

- History of aortic coarctation with repair at age 7 with Dacron graft
- Recurrent coarctation with repair by boomerang patch augmentation
- Presents with 5.7 post-stenotic thoracic aneurysm
  
- Teams involved include cardiac surgery, vascular surgery, cardiac anesthesia, critical care anesthesia, neurosurgery, pediatric and adult congenital cardiology





# Aortic Coarctation

- Staged repair with debranching of the innominate artery, carotid to carotid bypass, carotid to subclavian bypass
- Thoracic aortic endograft via left CIA conduit



# Summary

- There are a number of unique challenges posed by aortic pathology requiring multiple different specialties to contribute to achieve acceptable outcomes
- Team approach allows for care in the acute setting and the elective setting
- The patient population is increasing due to the increase in acute aortic syndromes and extended lifespan of the congenital heart disease patients
- Tremendous potential in the research arena for basic science, translational research, new device technology/trials

