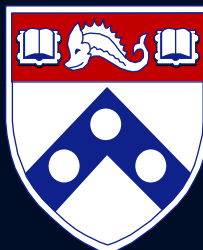


STS/EACTS LatAm CV Conference 2017

# Worldwide Results in Type A Dissection Repair and Future Treatment Options

**Joseph E. Bavaria, MD**

Director, Thoracic Aortic Surgery Program  
Roberts-Measey Professor and Vice Chair of CV Surgery  
University of Pennsylvania  
Immediate-Past President of STS



# Acute Type A Dissection: Worldwide Outcomes

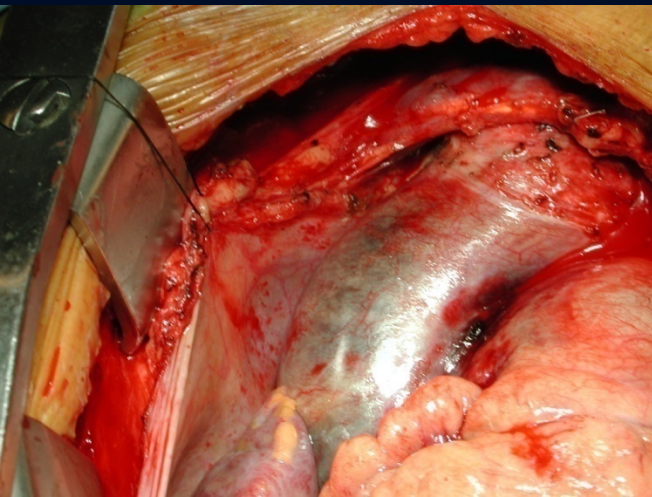
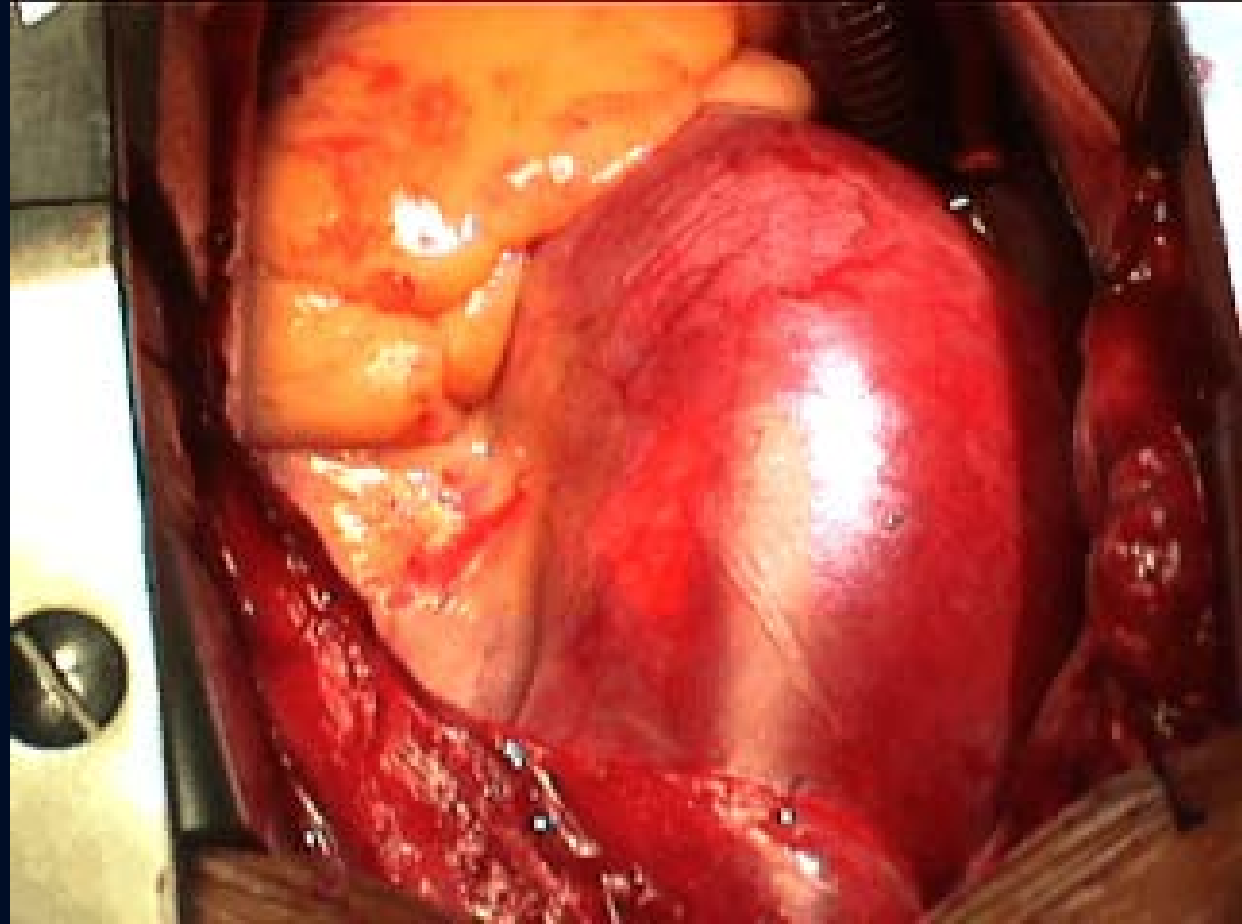
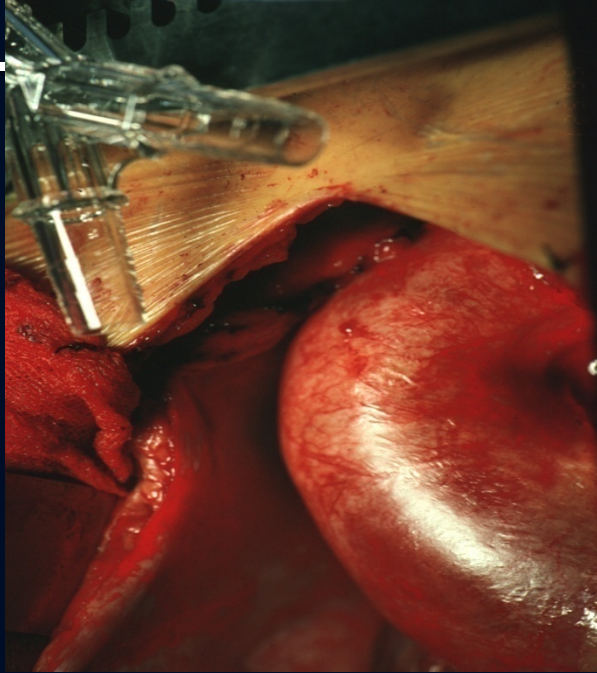
Series/Author	Date	Mortality	Stroke	Comments
Emory/Leshnower	2015	4.7%	7%	Highly selected DV cases only
IRAD	2016	18%	-	25-18% over 17 years
GERAADA	2016	17%		All patients
Canadian Aortic/McClure	2017	17.8%		All patients; 30% deaths from CVA
UPenn Series	2015	13.0%	11%	All patients; 5% new CVA; 6% new TIA

Need New Treatments!!!



# Acute Type A Dissection? New Treatments

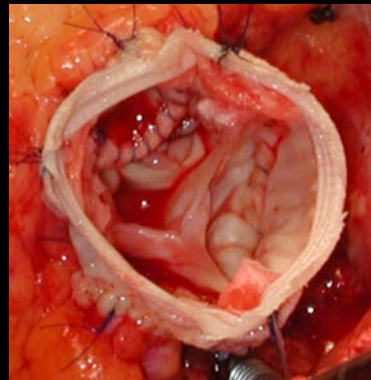
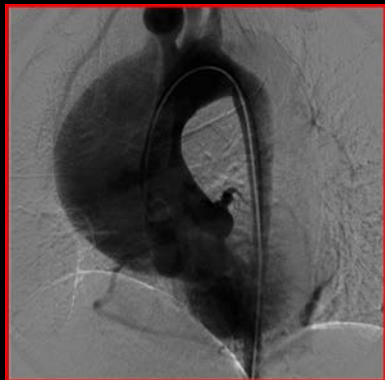
Type A Dissection is a Catastrophic Presentation!!



# New Concepts in Type A Repair:

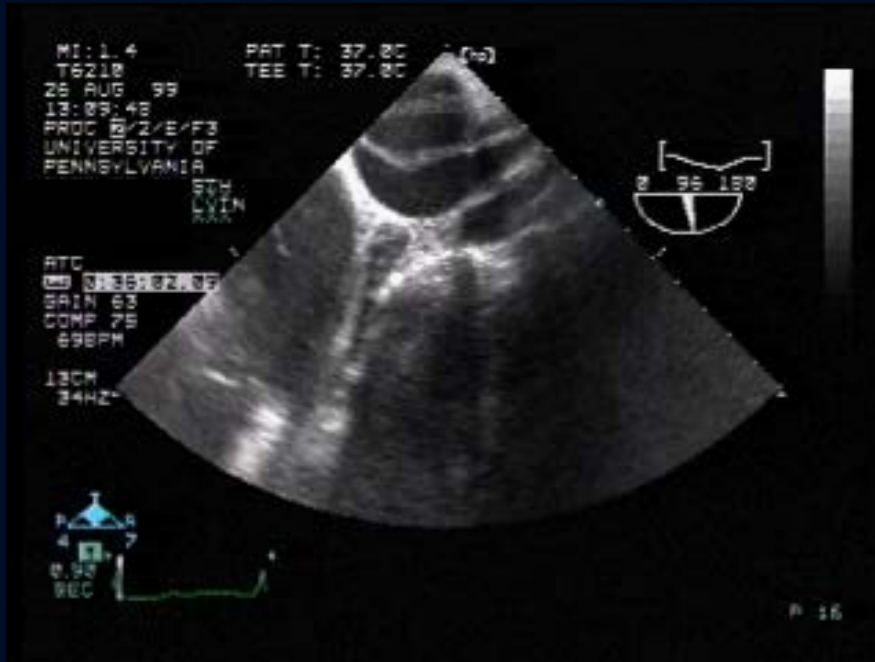
In an effort to Improve outcomes

- Central Aortic Cannulation
- Distal Aortic Solutions
- The Root
  - Valve Retention vs Composite graft Root
- Towards an Endo Aortic solution



Arterial Cannulation Site: This can be a Difficult decision!

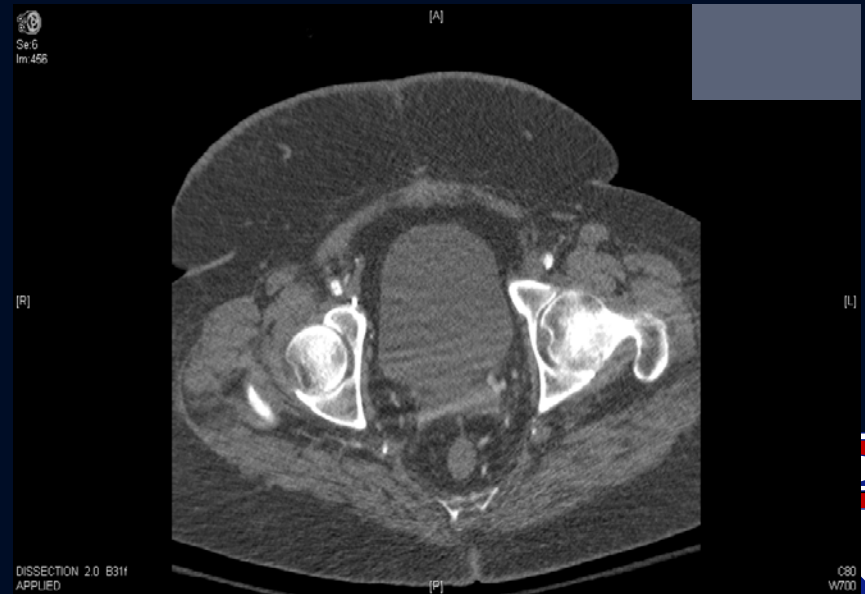
There is **NO** perfect cannulation site in acute Type A Dissection



Left Subclavian dissection



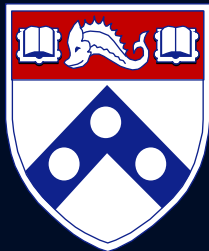
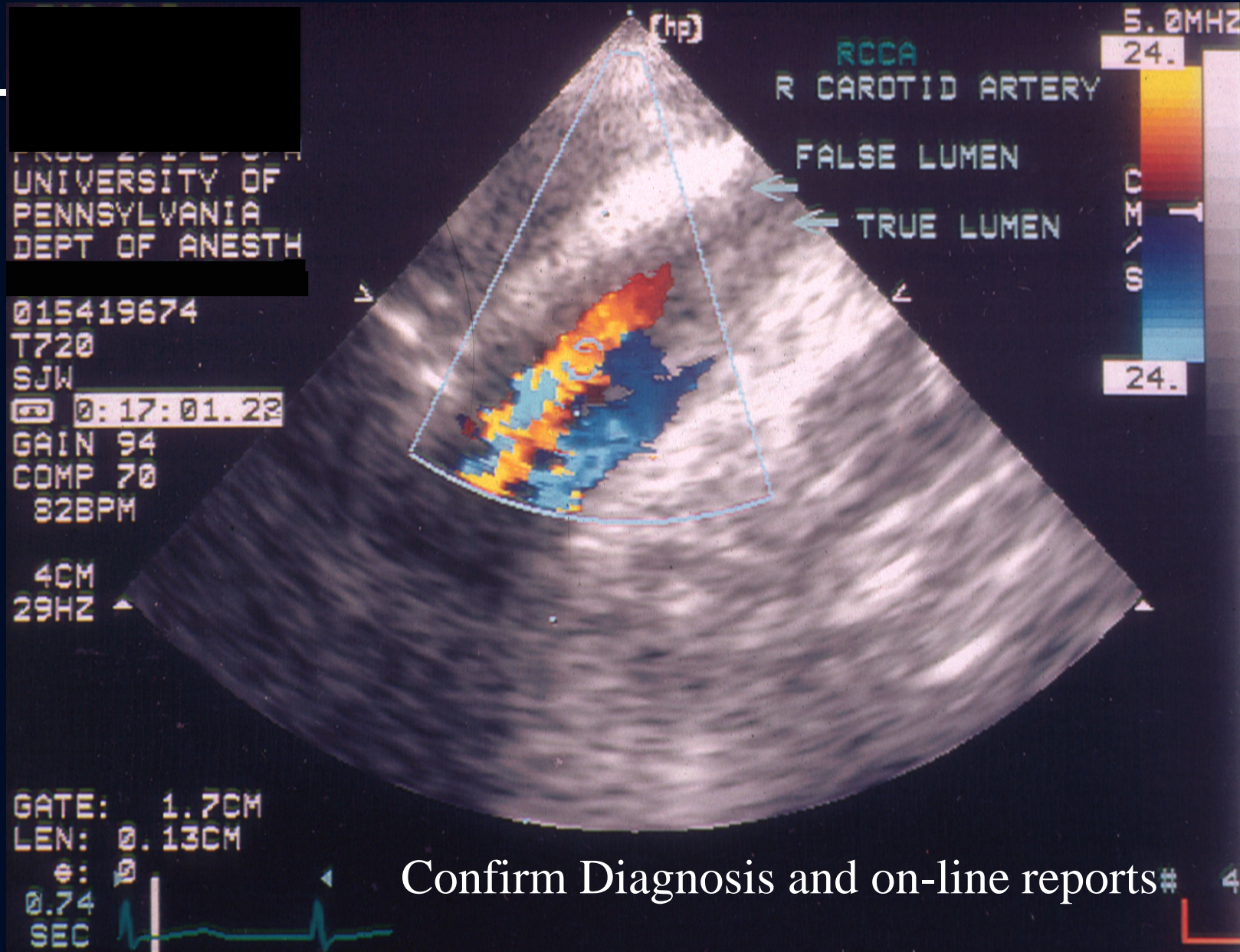
Arch dissection



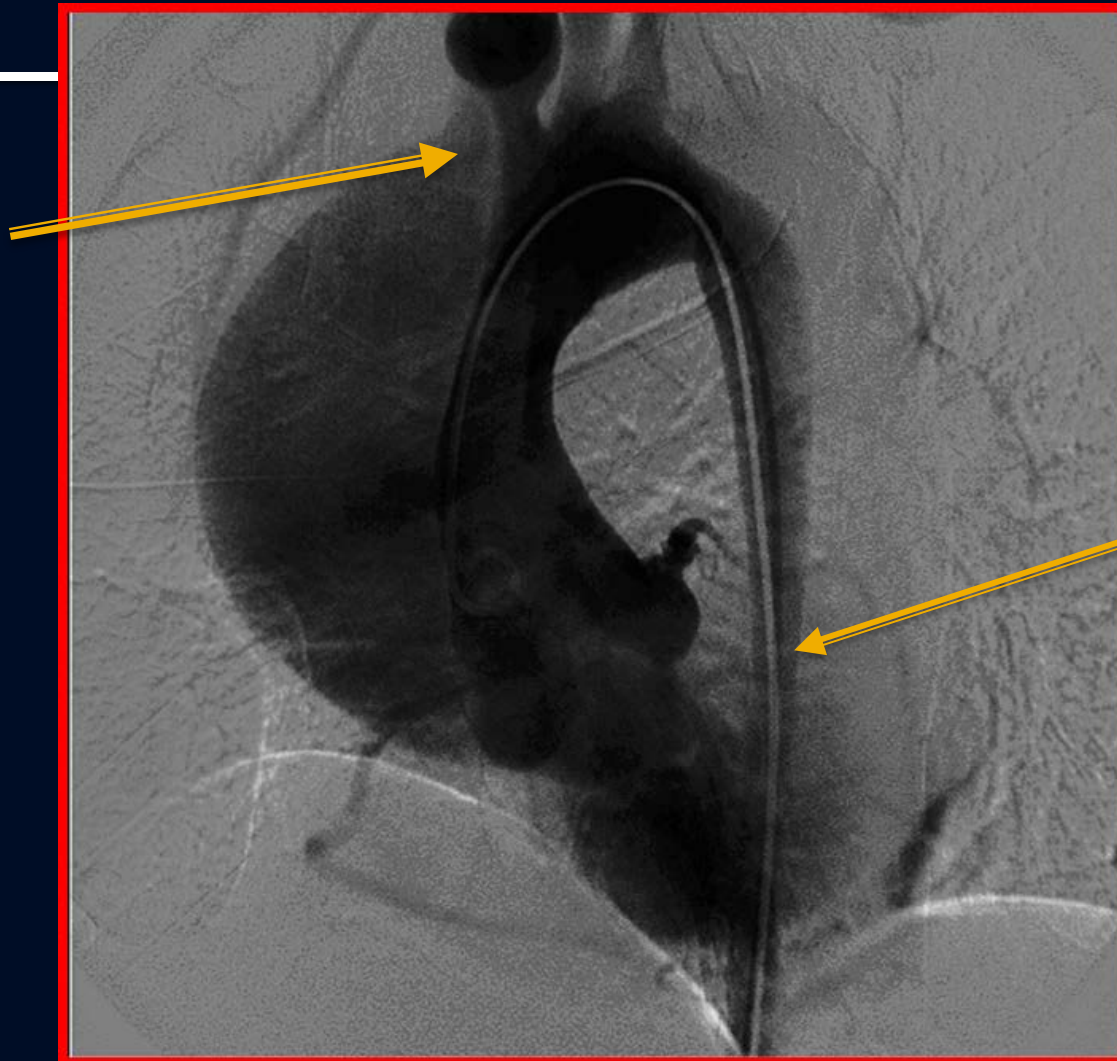
Calcified femoral artery



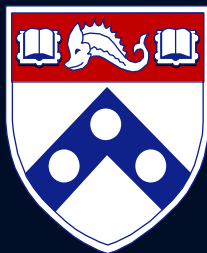
# Right Carotid Artery Doppler (TEE Probe): Acute Type A Dissection

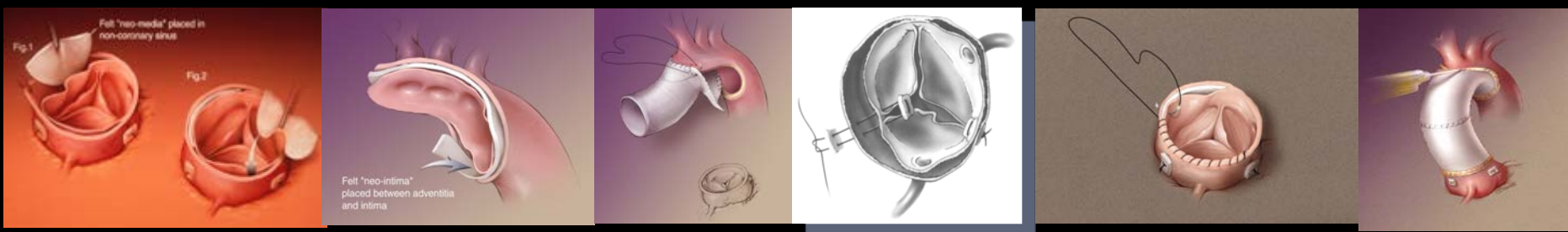


# Complex Innominate Perfusion and Femoral



Small DTA True Lumen



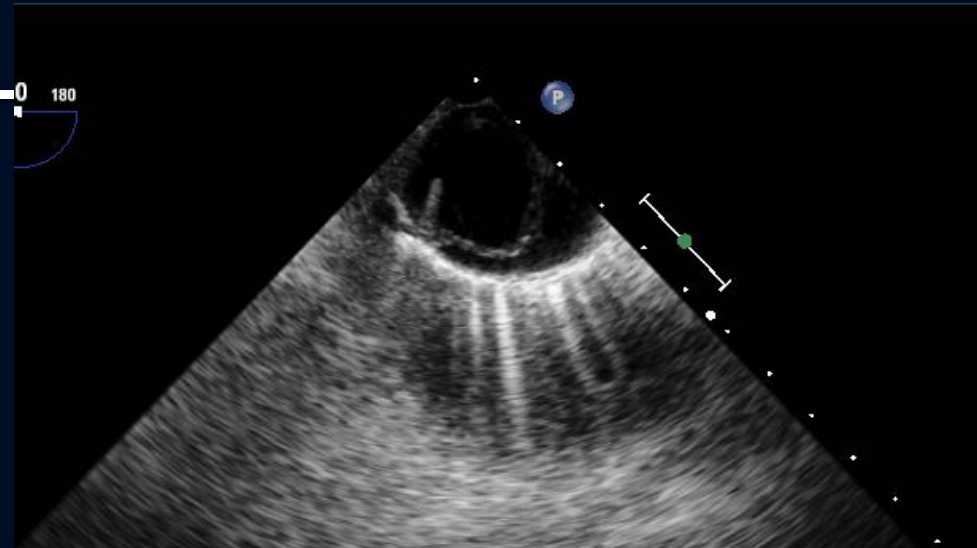
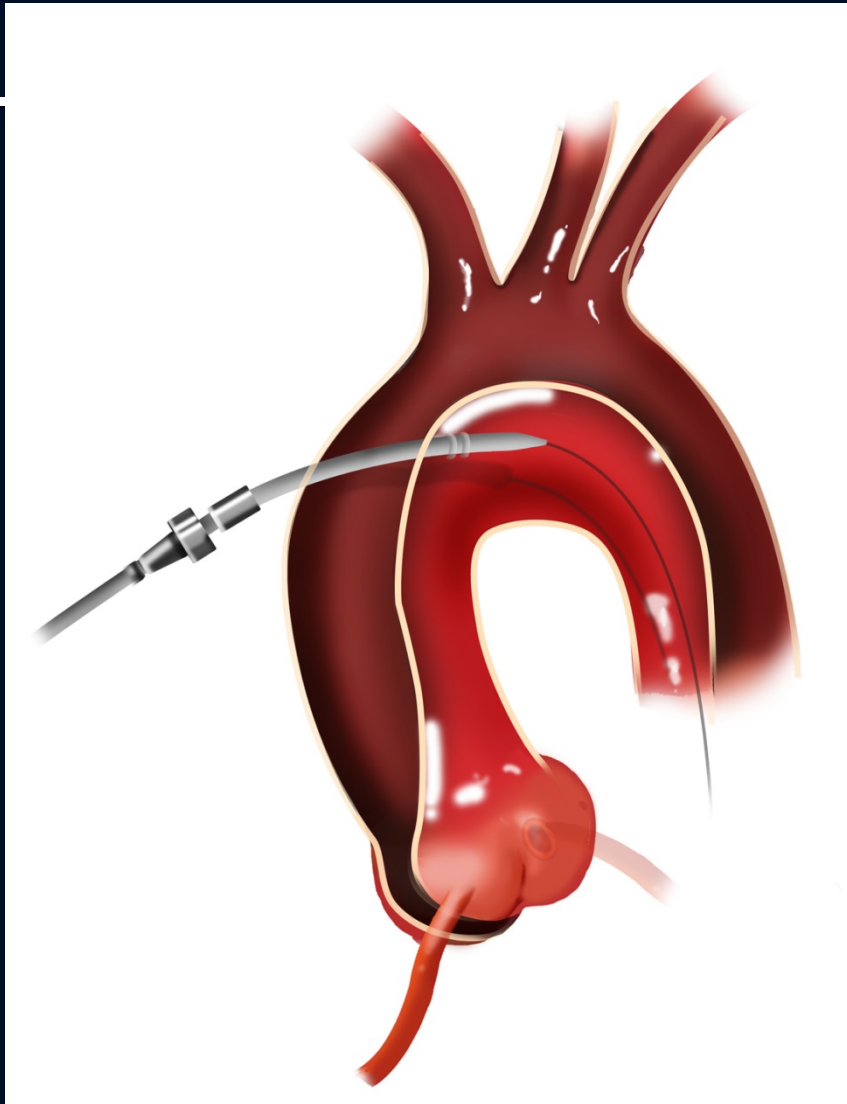


**Our Group has adopted a  
“Central Aortic first”  
Cannulation Strategy at this  
time.**

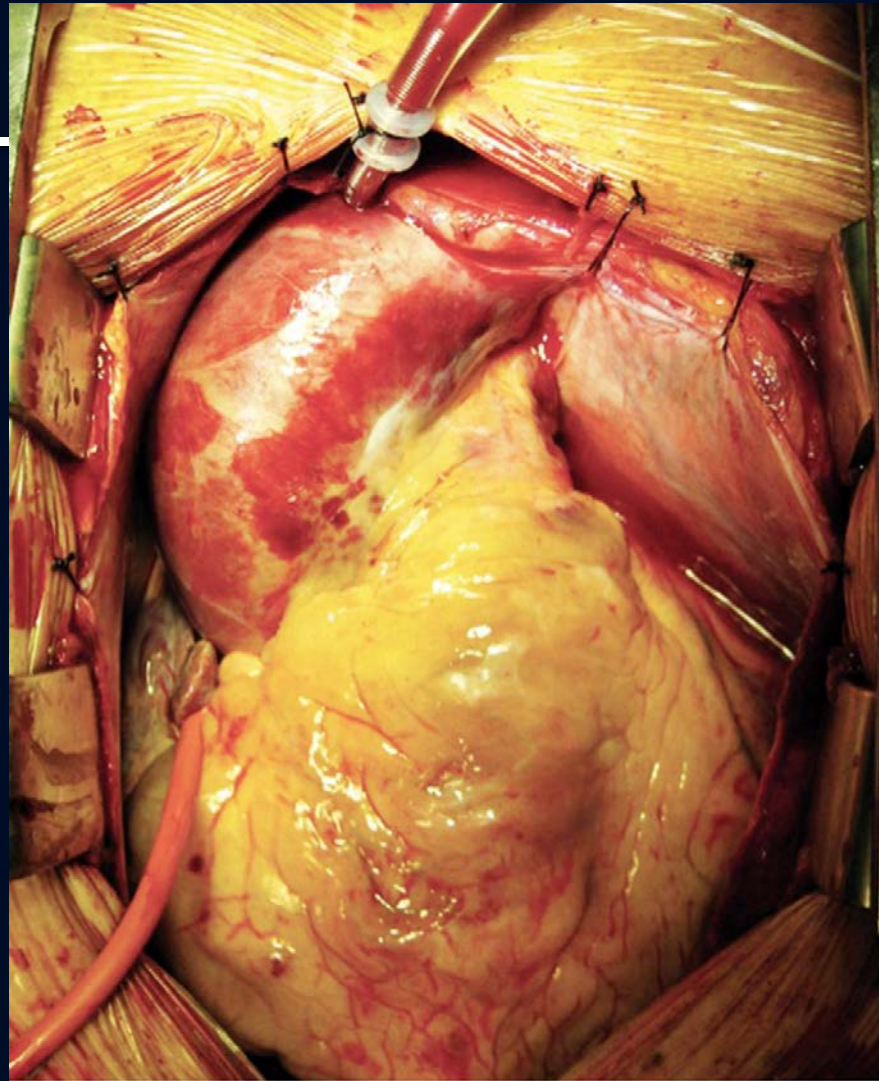




# "Central" Cannulation Strategy

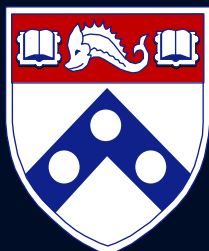


## Intraoperative view of the cannulated distal ascending aorta

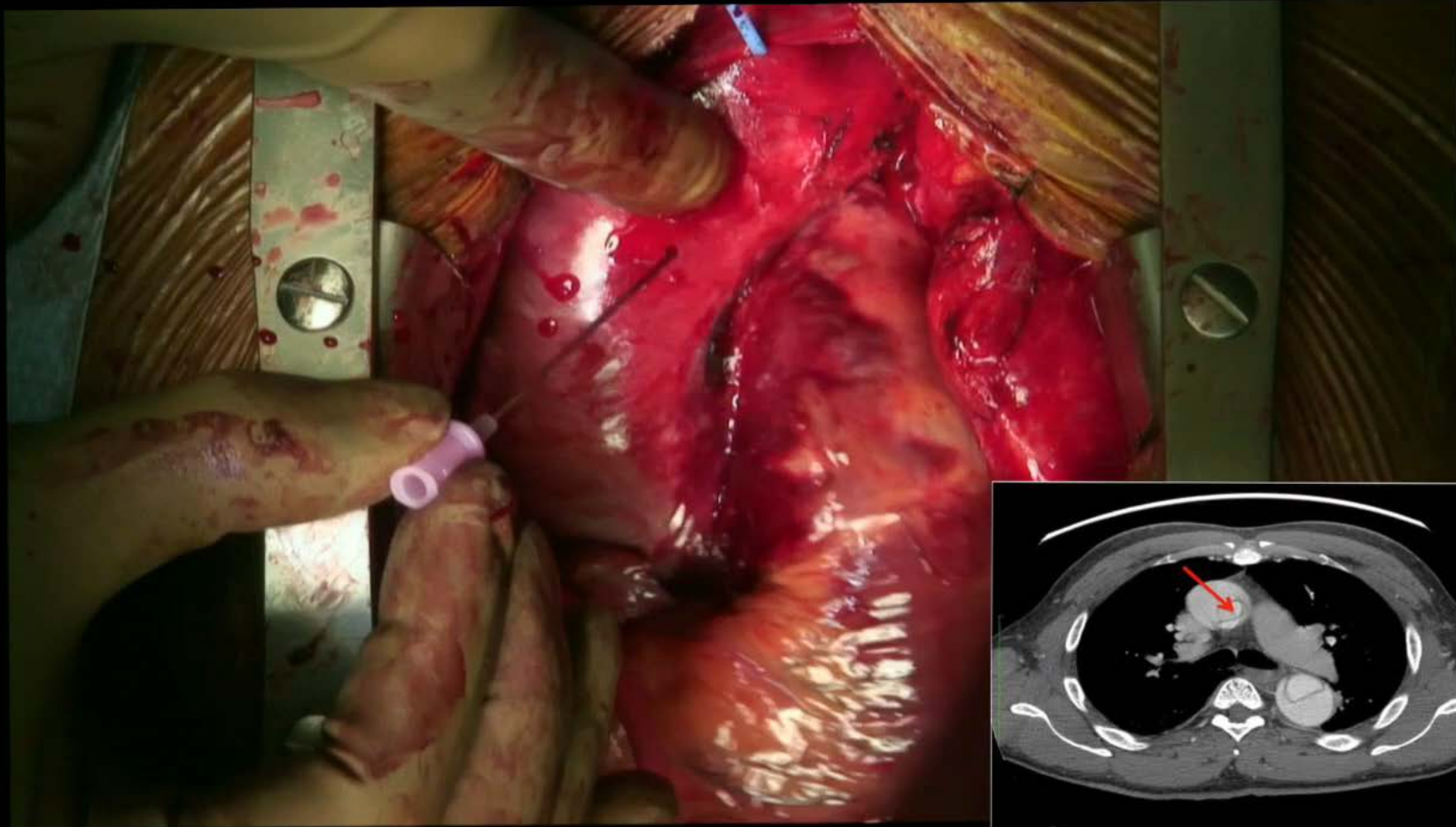


Rylski B; Bavaria, J et al. Eur J Cardiothorac Surg 2014;46:156-166

EUROPEAN JOURNAL OF  
CARDIO-THORACIC SURGERY



# Direct Ascending Cannulation



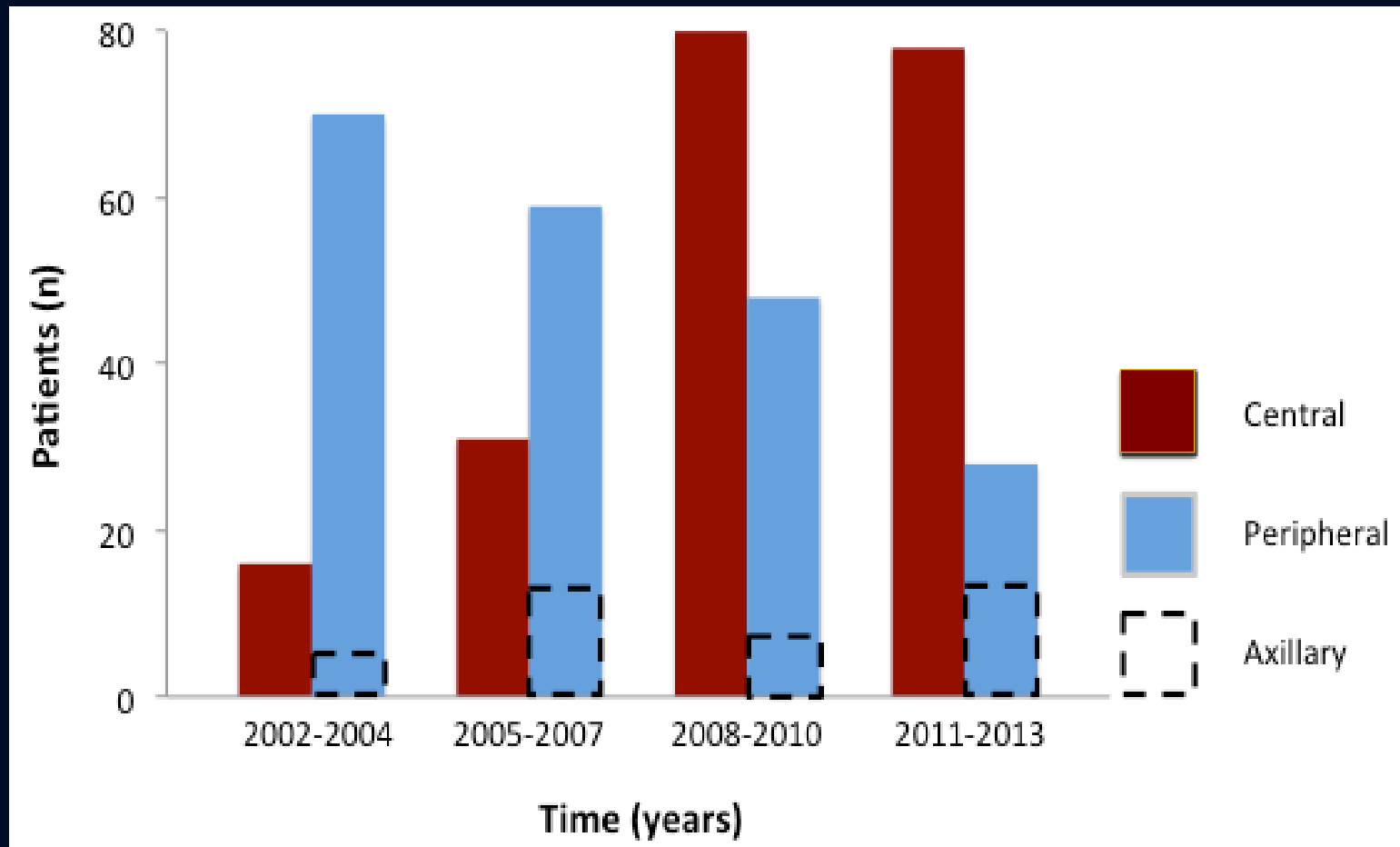
# Central Cannulation in Type A

(D. Trivedi, ... T.Gleason, et al; Univ Pitt. AnnThorSurg 2016)

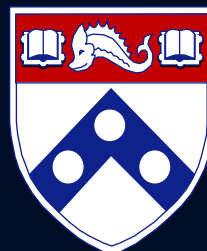
- N=264 Consecutive DeBakey Type I Dissections (2007-14) ... Their concept..
- Diagnosis to Incision (DTI)
- Incision to Bypass (IBT)
- 203/264 Central Aortic Cannulation
  - Reduced IBT from 61 to 37 min (compared to AX). P=.001
  - Mortality: 7 vs 13 vs 29 (Central/Ax/Femoral)
  - CVA: 3 vs 4.4 vs 7.7



# Type A Dissection Volumes and Cannulation Strategy (n=249/570)

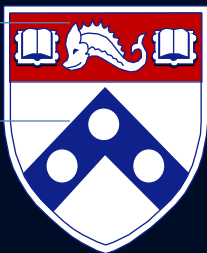


Penn Thoracic Aorta Program Data



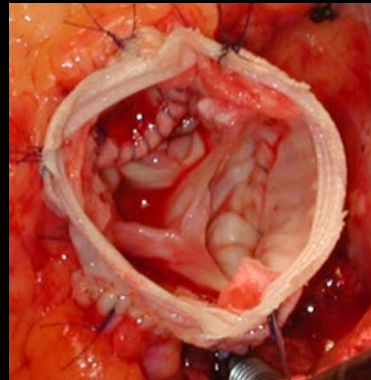
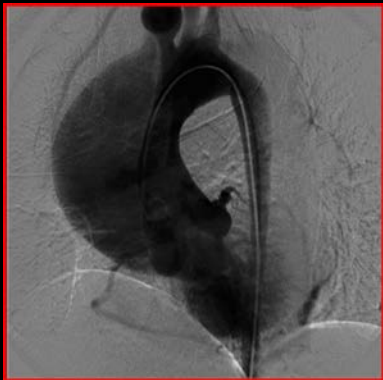
# Post-Operative Outcomes

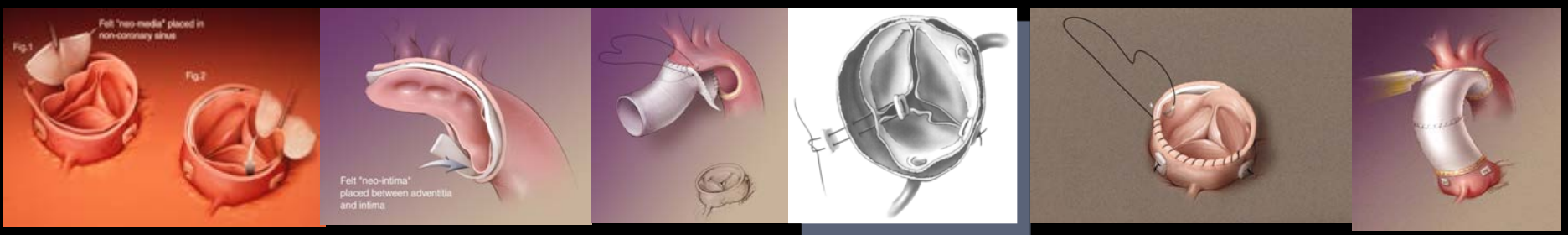
Postoperative morbidity	Central Cannulation
	(n = 205)
In-hospital mortality	17 (8.3)
Morbidity	
Bleeding	9 (4.4)
Stroke	10 (4.9)
TIA	11 (5.4)
Renal failure (STS defn)	34 (16.6)



# New Concepts

- Central Aortic Cannulation
- Distal Aortic Solutions
- The Root
- Towards an Endo Aortic solution



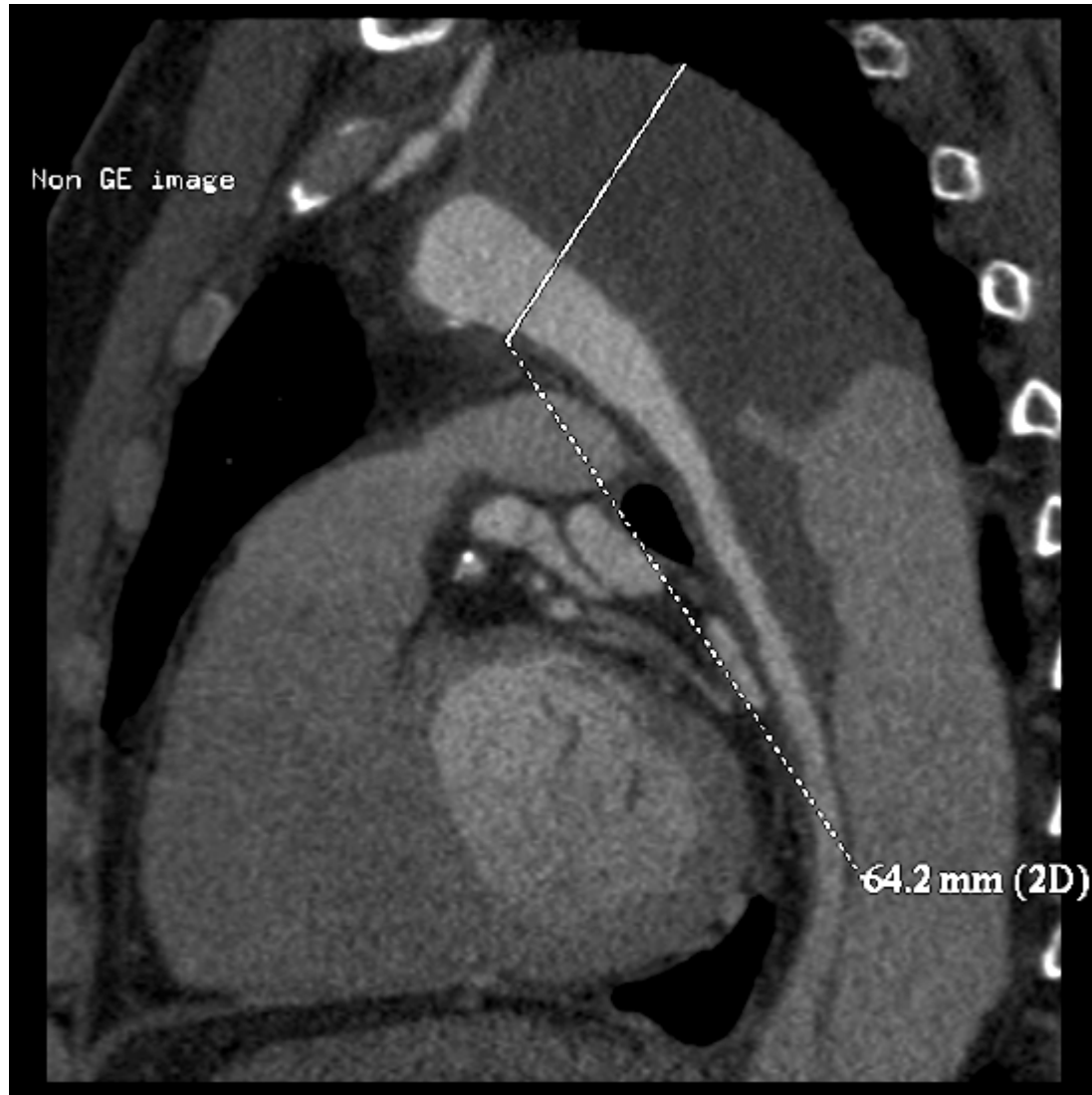


# The Future Arch Treatment "Civil War" ....





# 40 y.o male 1 year post Type A repair (6.4 cm)



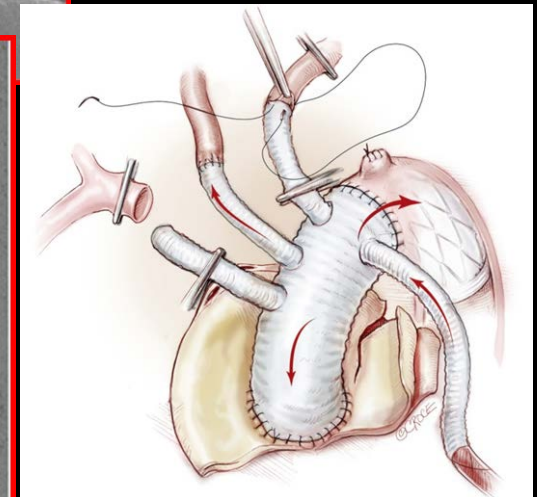
Do we have a  
problem with  
the distal aorta  
after repair of  
acute type A  
dissection? ....

**YES**



Especially if we use a **COMPOSITE** index of Index Operation  
Failure: 1. Aortic Death; 2. Reoperation; 3. Aneurysm > 6.0 cm.

# Technical: Conventional Total Arch with Frozen Elephant Trunk: Standard Zone 3 Arch FET

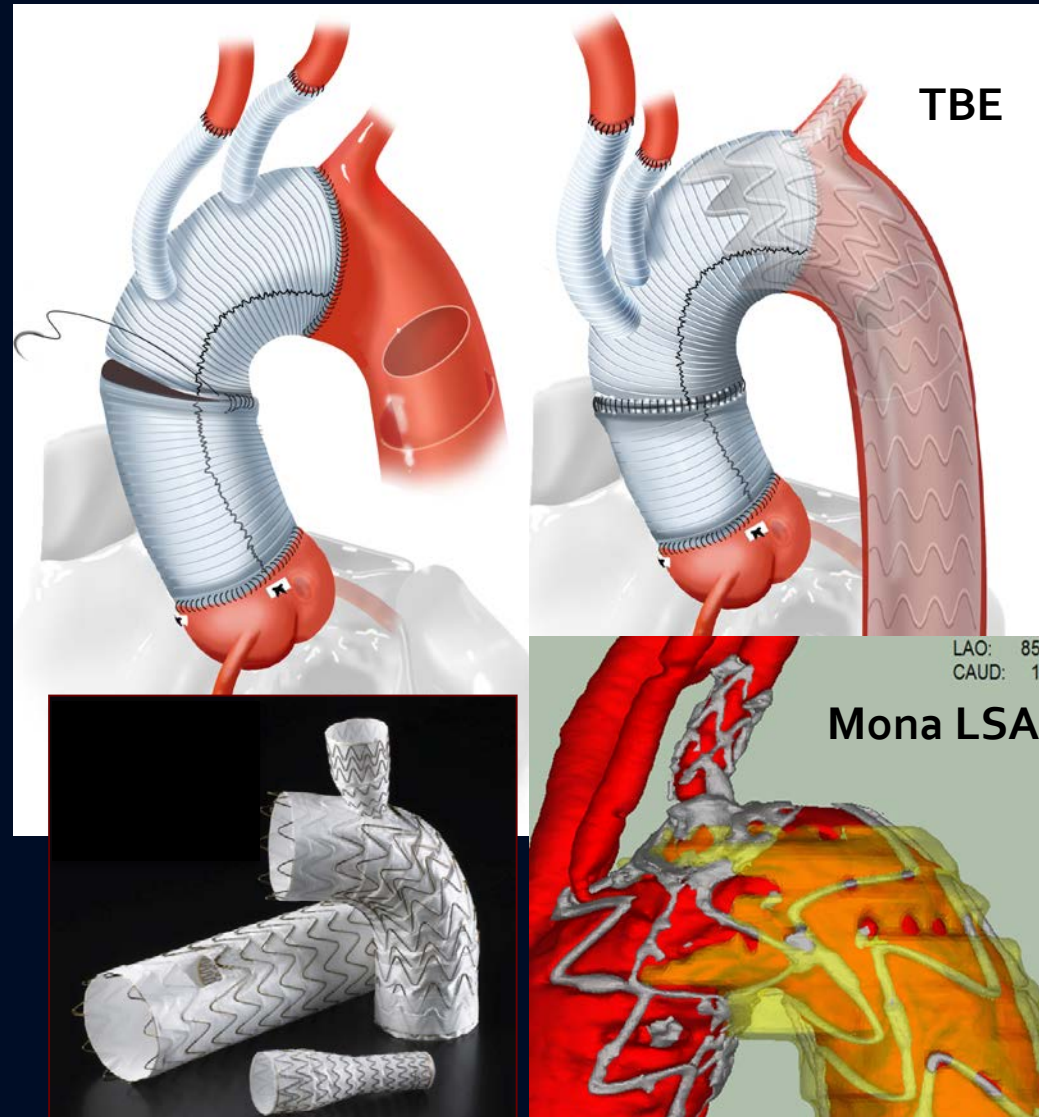


# So how should we handle the ARCH?

## Or ... ZONE 2 Arch with Branched TEVAR completion

### ■ Advantages

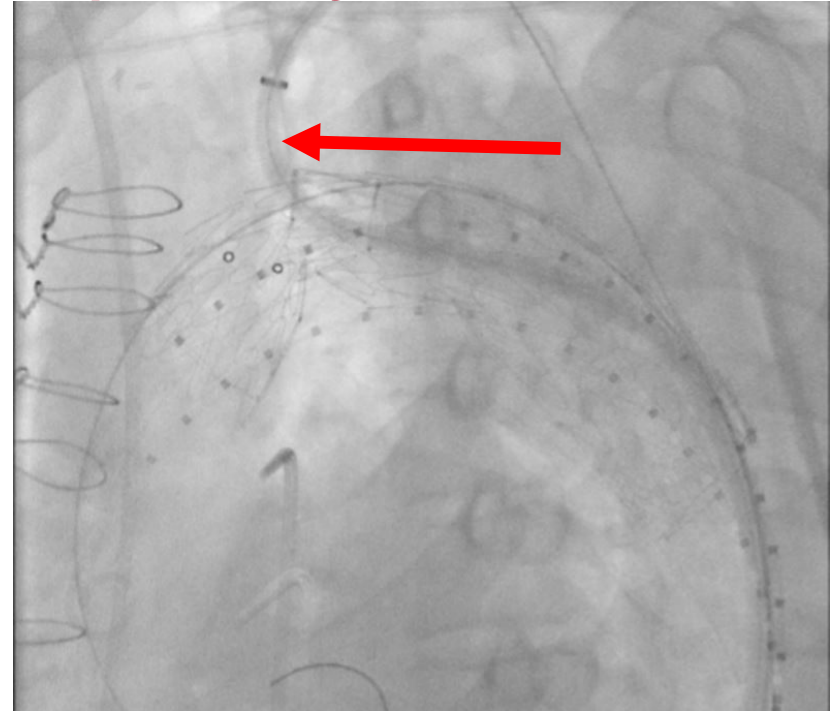
- Simpler Distal Anastomosis
- Can address most complex arch tears and eliminate flap in proximal head vessels
- Shorter ACP times
- Definitive TEVAR options
- Less risk of Recurrent laryngeal nerve injury



# Zone 2 TBE (12 mm Portal) in “Residual” Type A Dissection (Downstream Aorta) 10 days



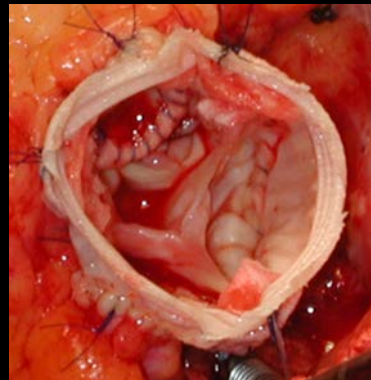
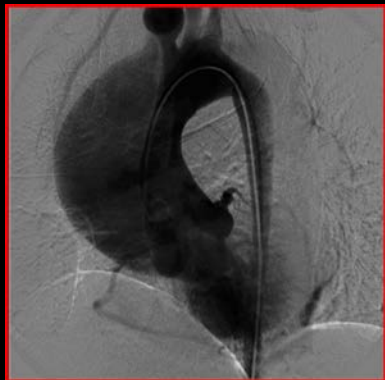
**3 cm Dacron LZ previously constructed with Zone 2 Arch (10 days earlier)**

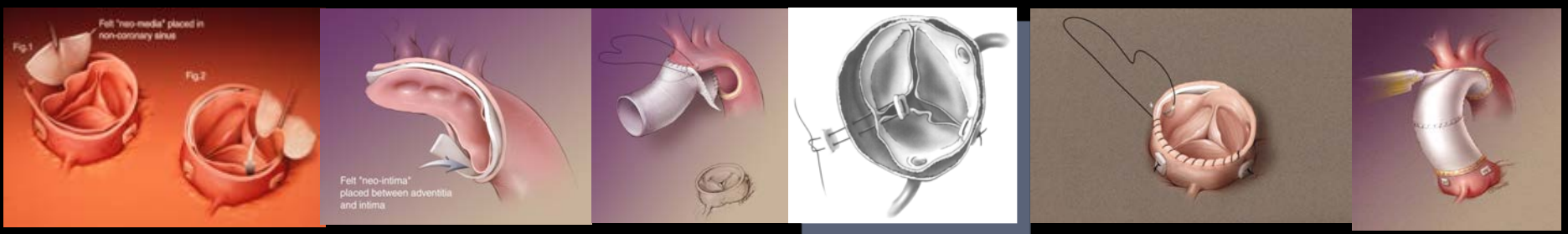


Side branch sheath positioned in LSA  
Note nice horizontal access

# New Concepts

- Central Aortic Cannulation
- Distal Aortic Solutions
- The Root
  - Valve Retention vs Composite graft Root
- Towards an Endo Aortic solution





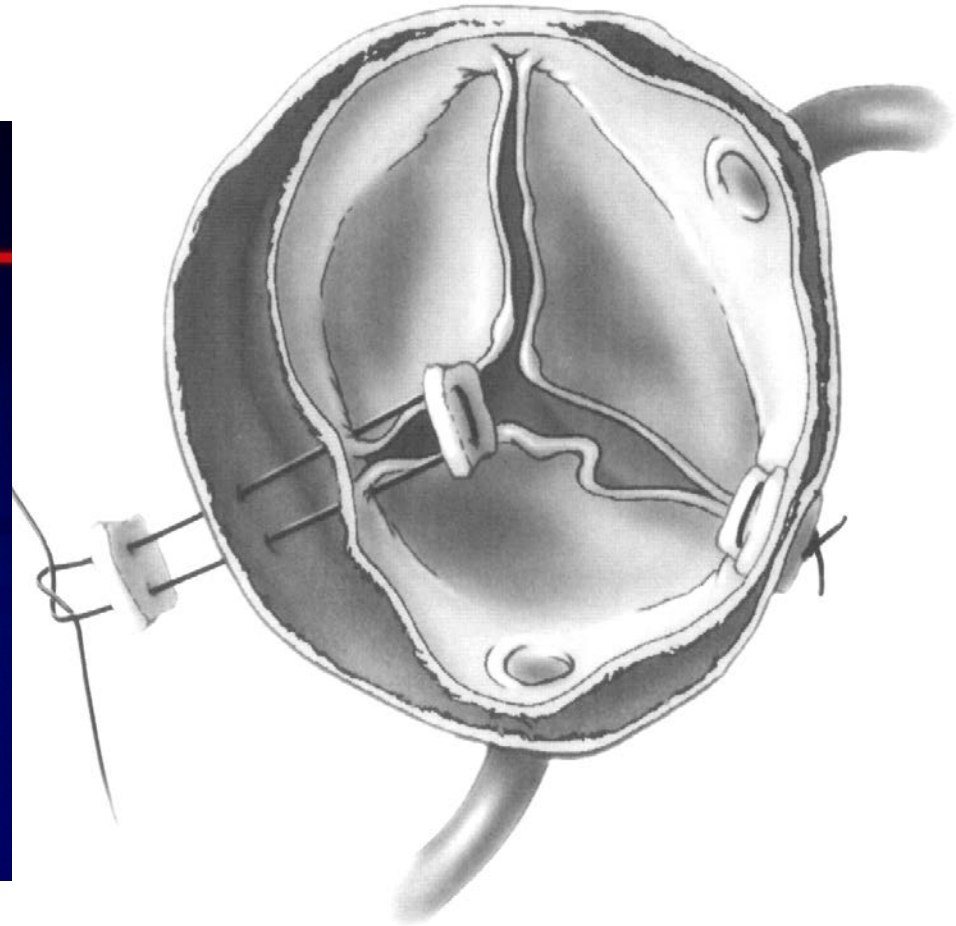
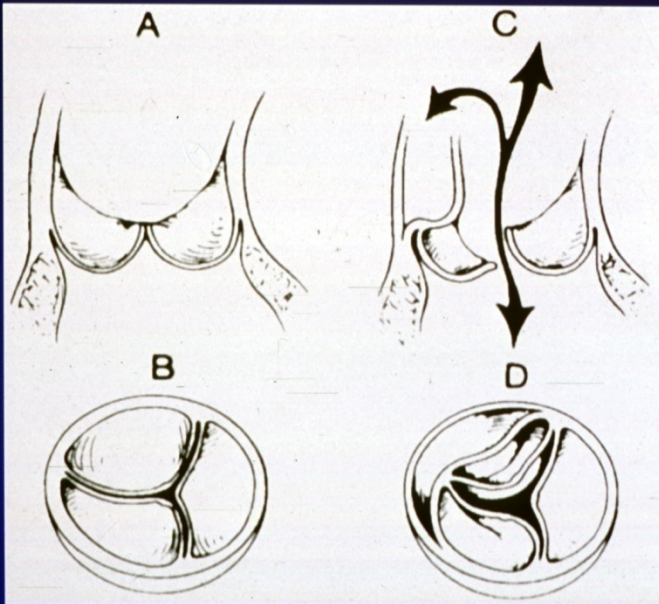
# The Horizon Regarding the "Root Debate"

## The Trans-Atlantic Rift



# Aortic Valve Resuspension

## Mechanism of Aortic Regurgitation in Type A Dissection





# ROBUST: Aortic Root Reconstruction/Sinus of ValSalva Repair

Fig.1 Felt "neo-media" placed in non-coronary sinus

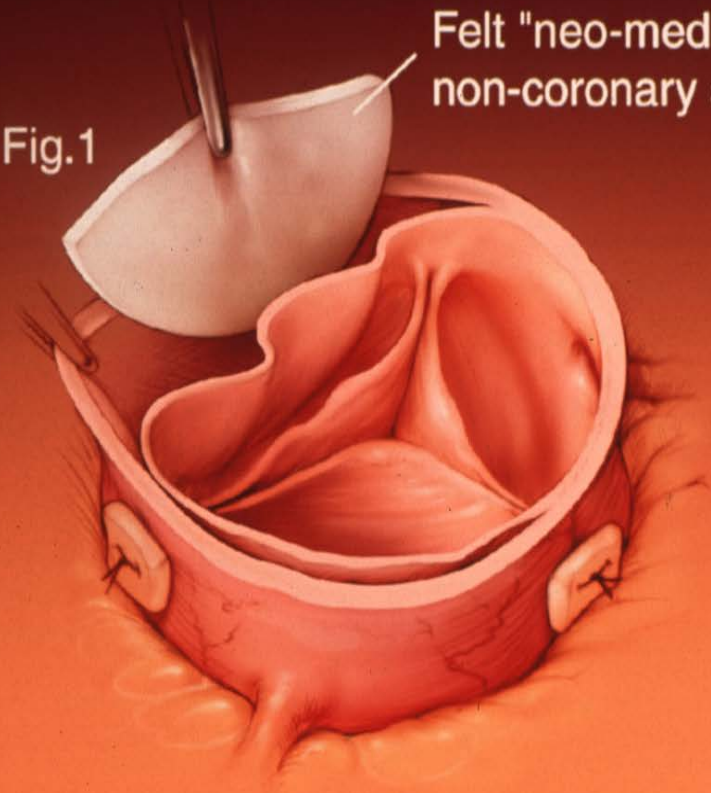
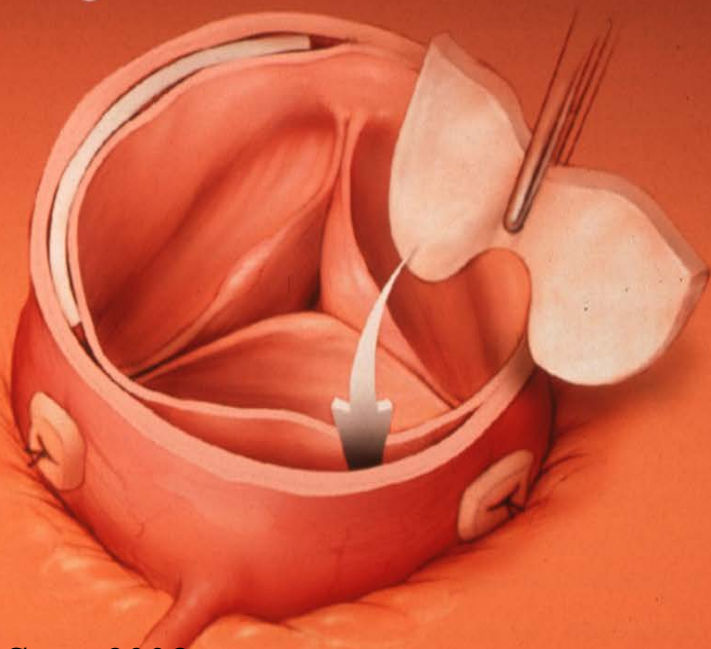


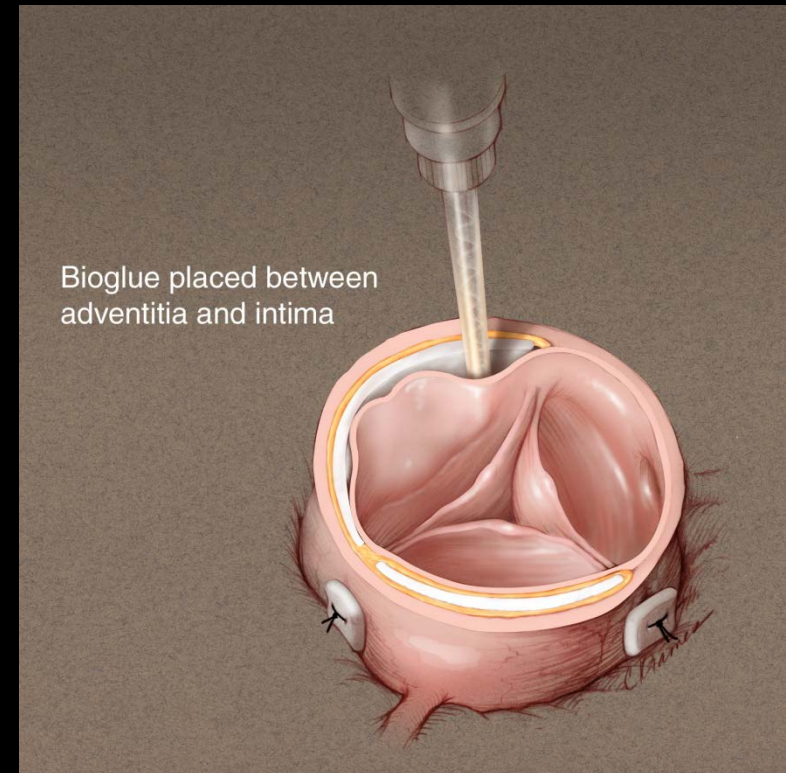
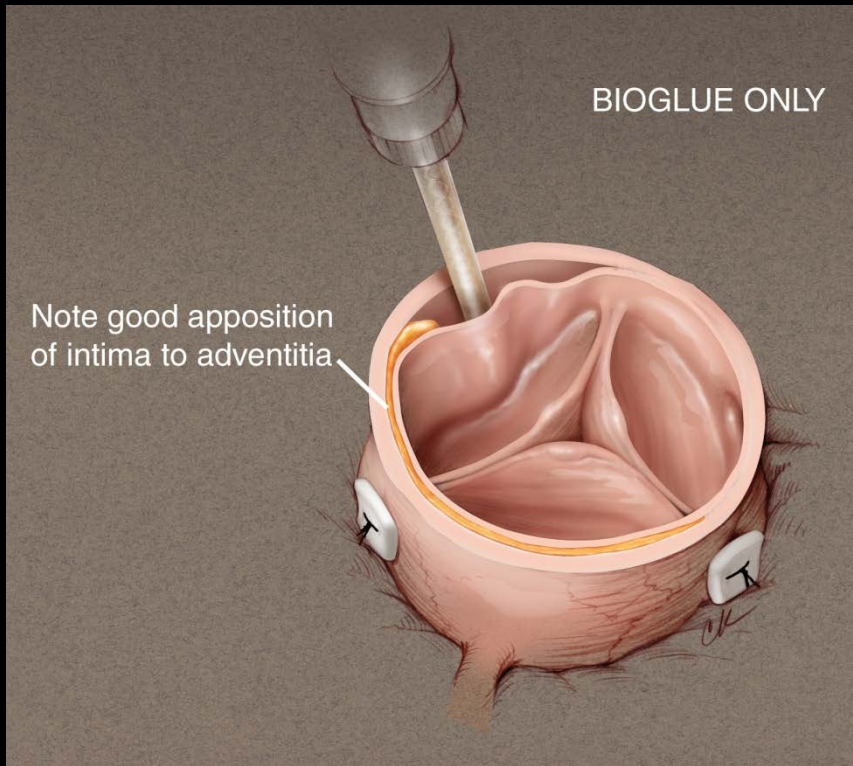
Fig.2



Bavaria, Pochettino, Gleason, et al; Ann Thor Surg 2003

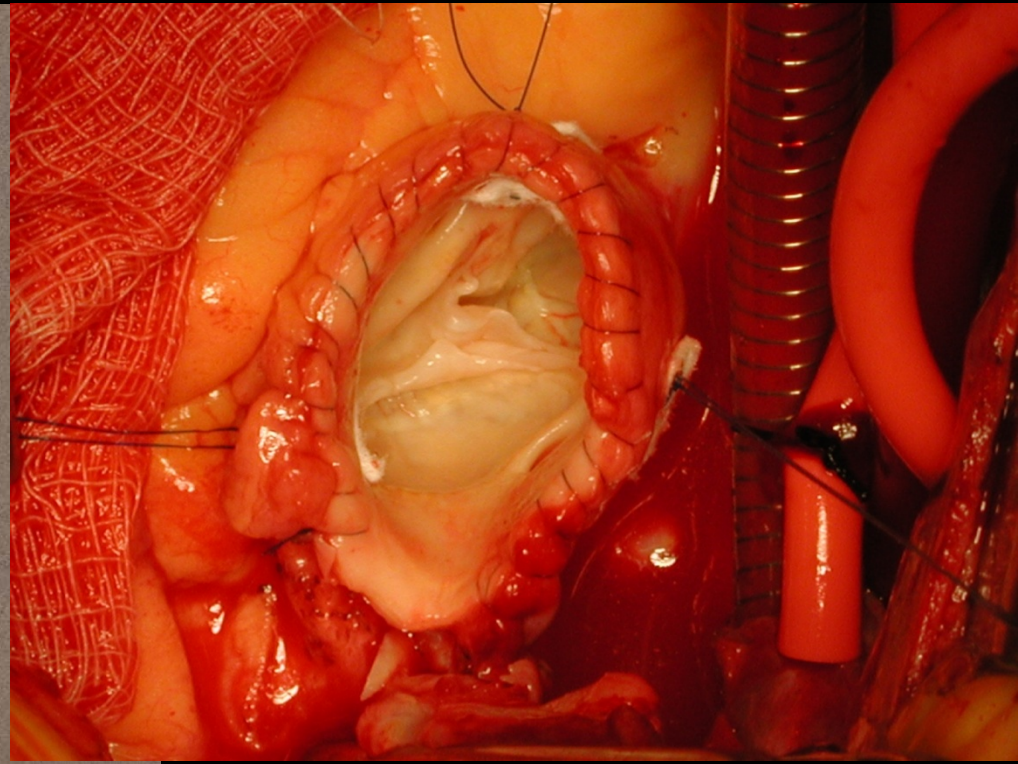
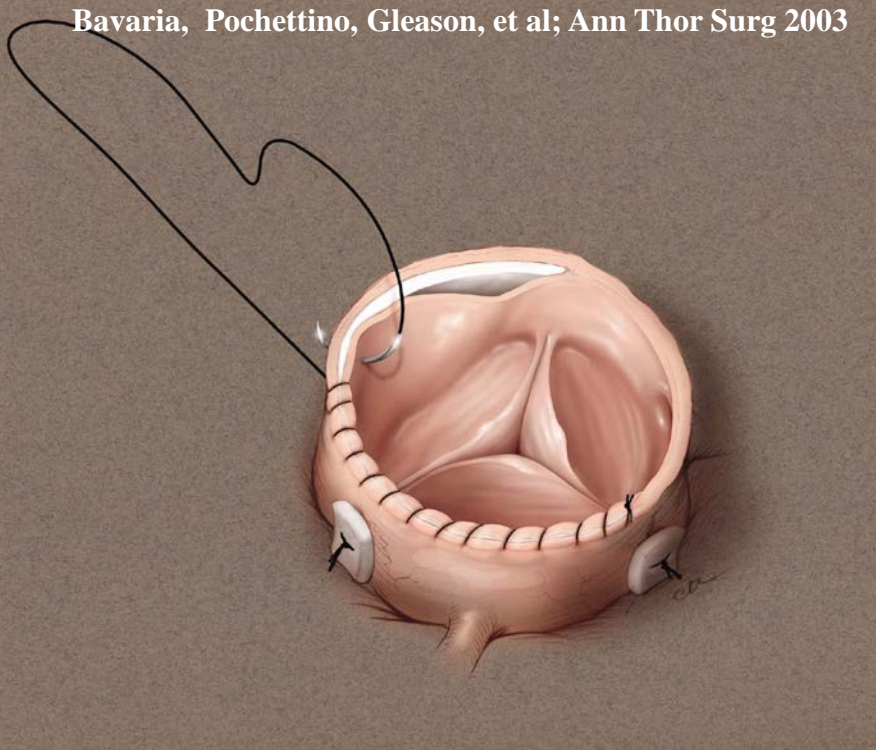


# Obliteration of Proximal False Lumen



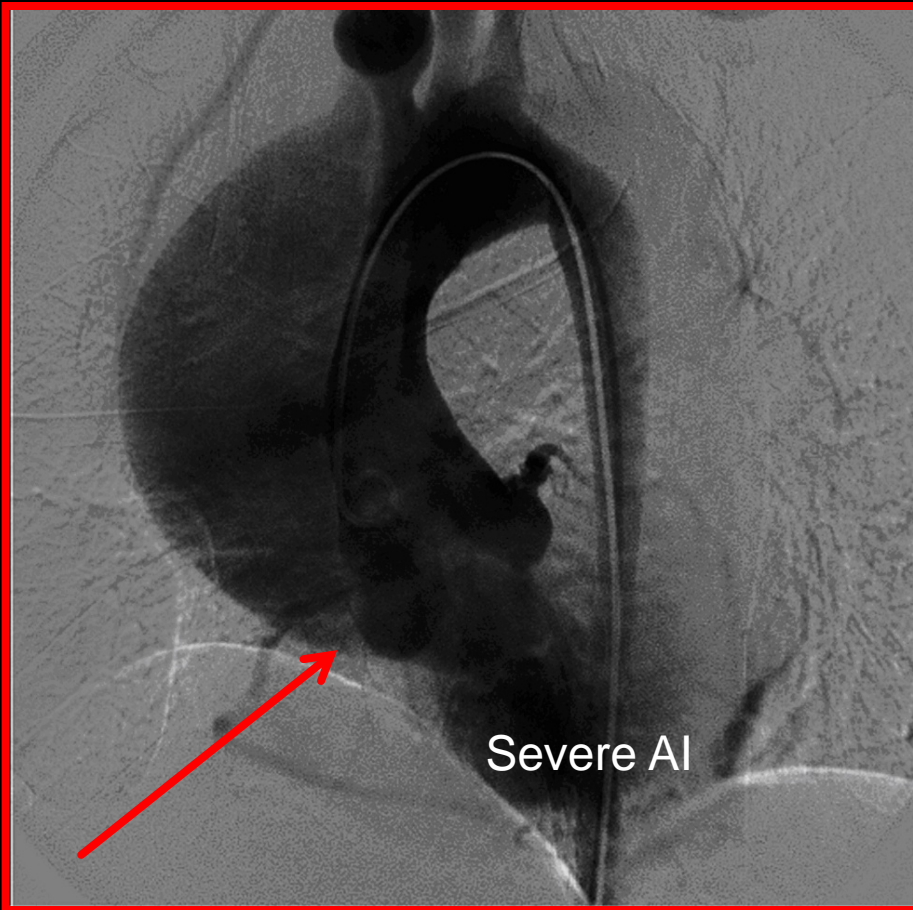
# Completed Root Repair and Aortic Valve Resuspension with Neo-Media

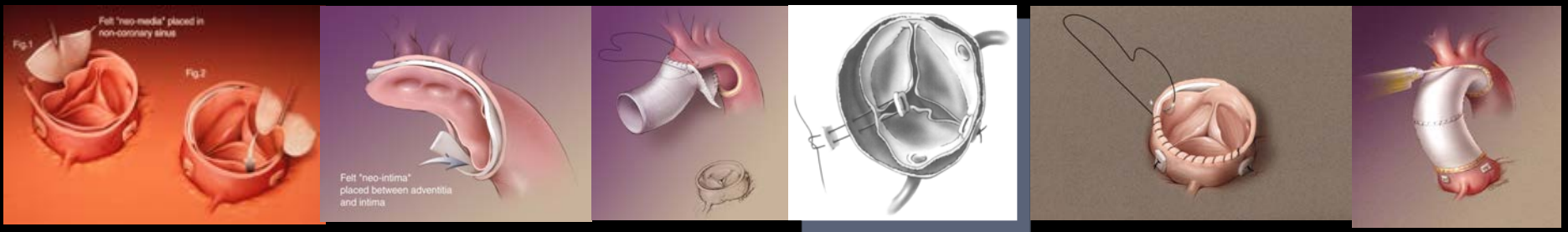
Bavaria, Pochettino, Gleason, et al; Ann Thor Surg 2003



IMPORTANT: **72%** of Aortic Roots/Valves were **NORMAL** prior to Dissection!

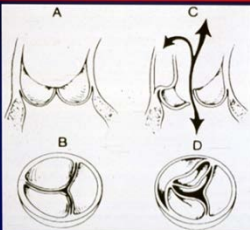
# Type A (DeBakey Type I) Dissection: Pre and Post Proximal Repair with E-Vita (type) Distal Graft: Note Root Repair and AI



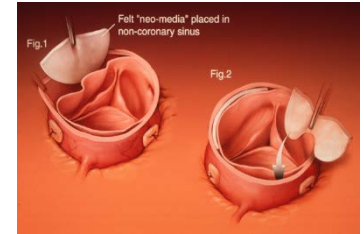
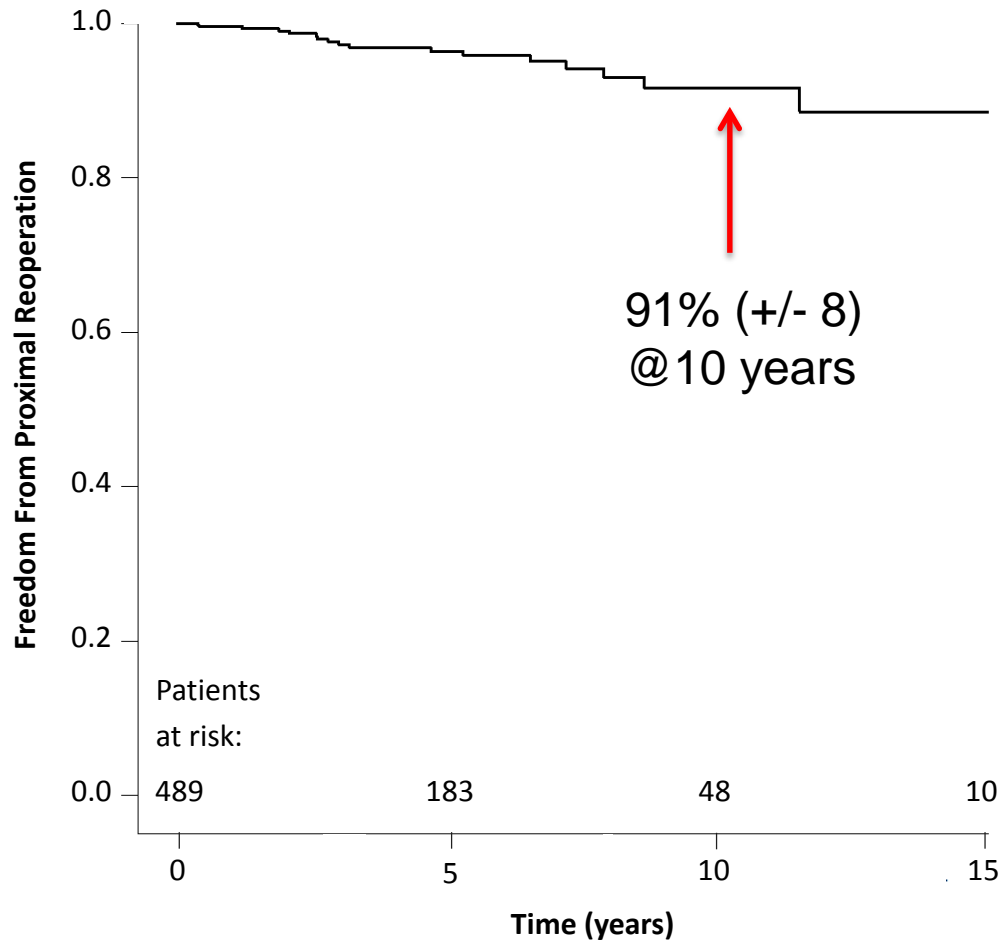


Now Why would we want to Replace this Nice Aortic Valve?? ..... NO ... WE WANT TO PRESERVE.

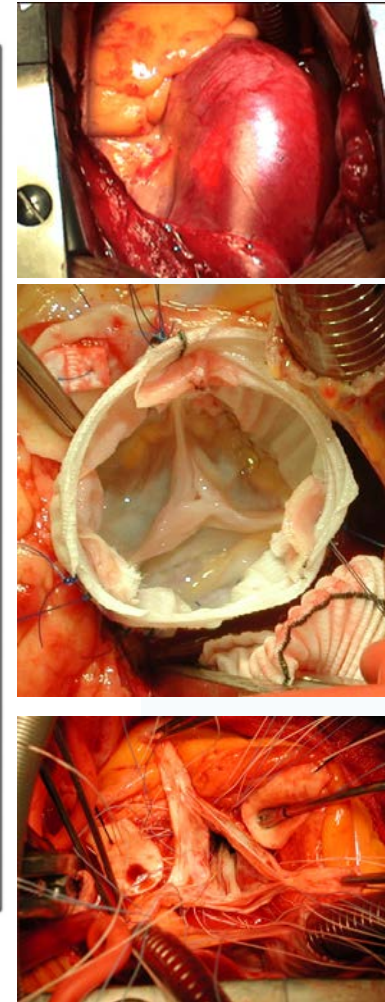
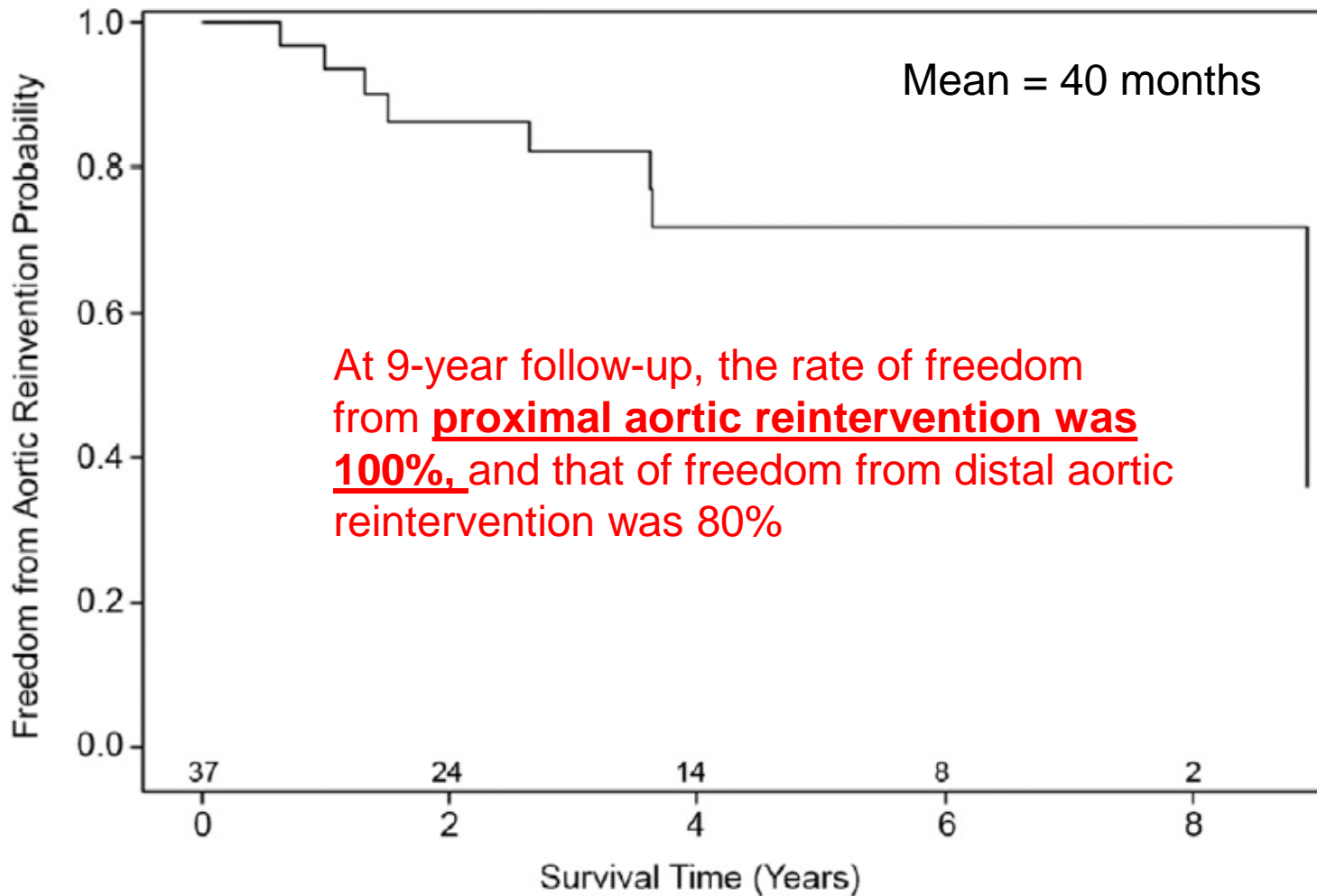
Mechanism of Aortic Regurgitation in Type A Dissection



# Acute Type A Dissection: Freedom from Proximal Re-Operation using “Neo-Media” Resuspension and the Penn Aortic Root Decision algorithm

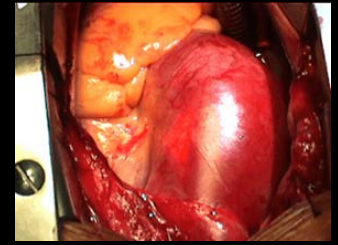


# Freedom from All Aortic Reintervention after VSRR in acute type A aortic dissection

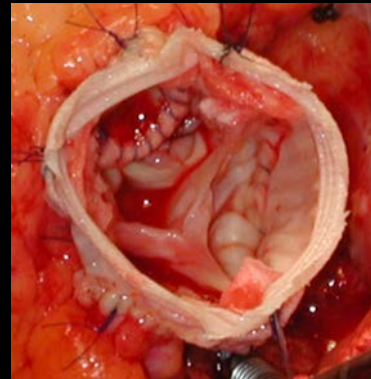


Leshnower... Chen. *Ann Thorac Surg* 2015;99:795–801

# New Concepts

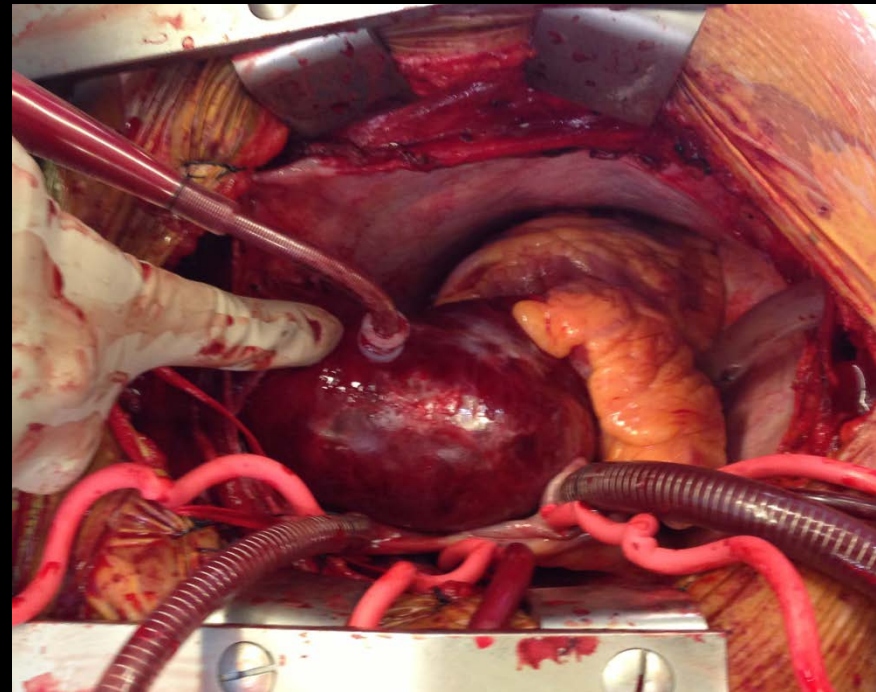
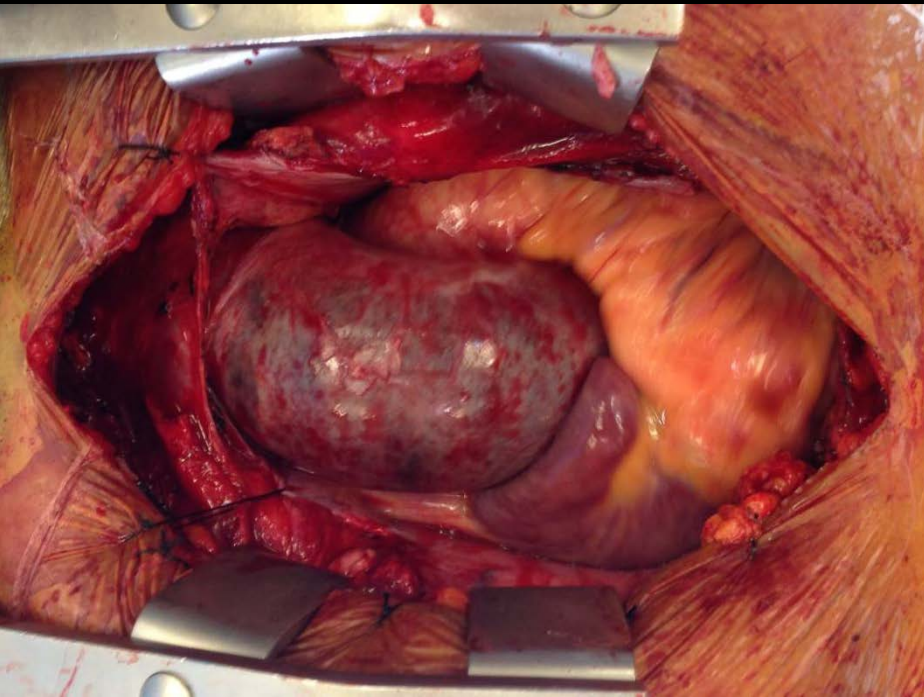


- Central Aortic Cannulation
- Distal Aortic Solutions
- The Root
  - Valve Retention vs Composite graft Root
- Towards an Endo Aortic solution





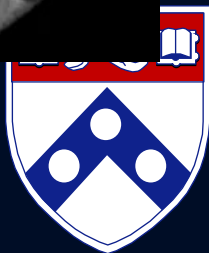
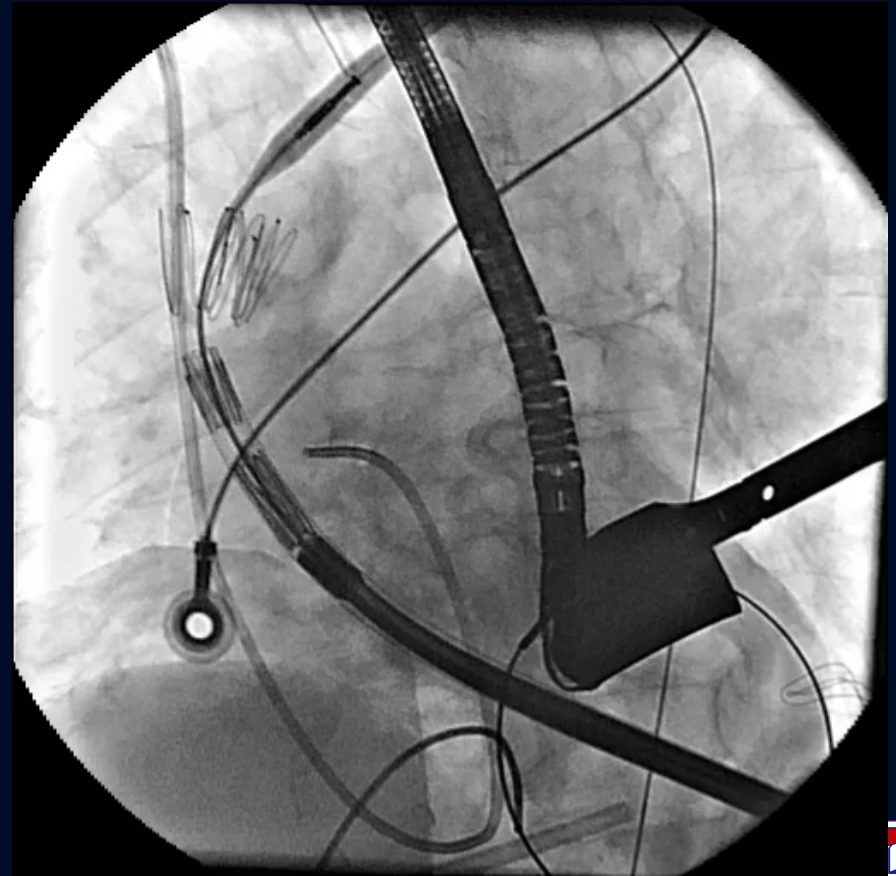
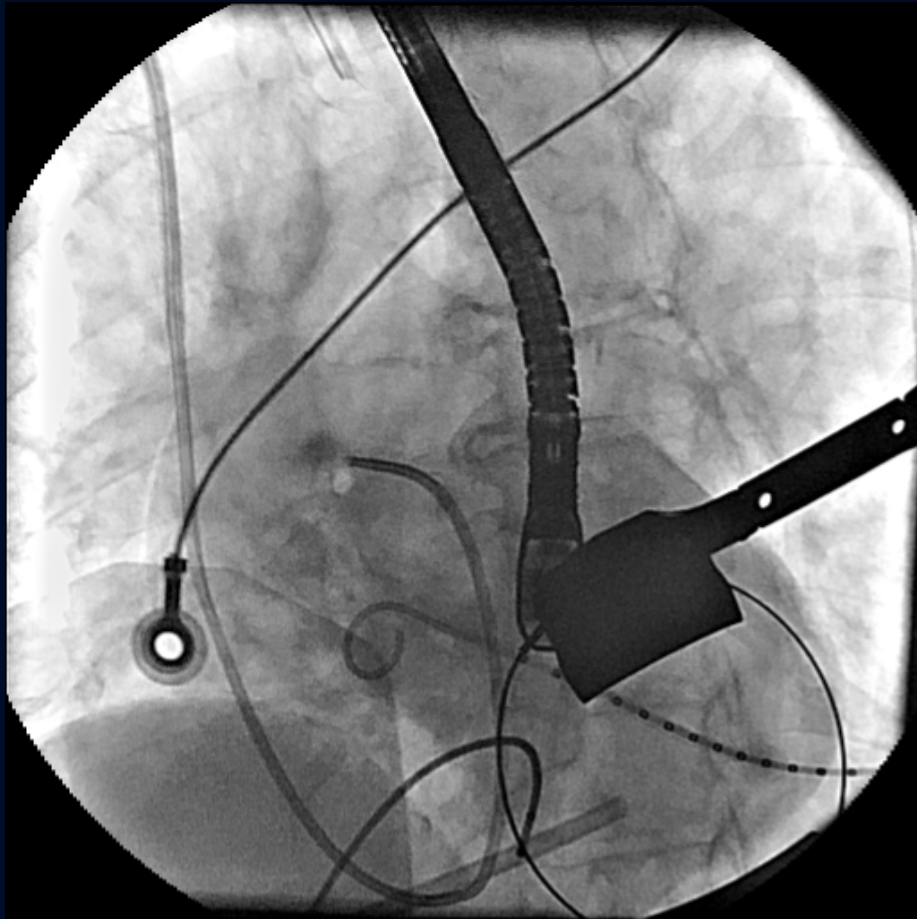
# Can We Place an Endograft (TEVAR) into something like this???



Central cannulation: true lumen ascending aorta, SVC and RA  
DHCA with retrograde cerebral perfusion



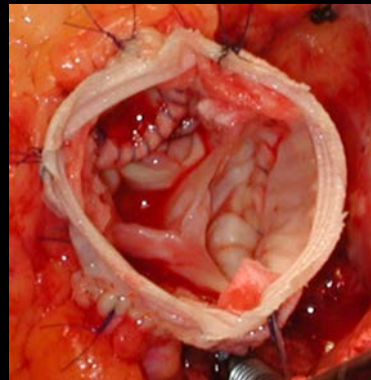
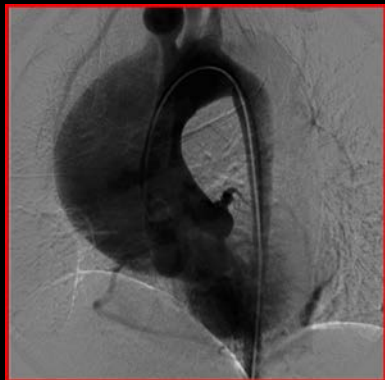
# Transapical TEVAR for Type A Aortic Dissection



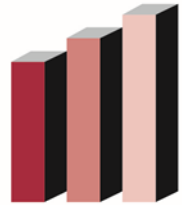
# New Concepts: Future....

## (and most important)

- Central Aortic Cannulation
- Distal Aortic Solutions ←
- The Root
  - Valve Retention vs Composite graft Root
- Towards an Endo Aortic solution



# **Availability/Creation of a Newly Designed Thoracic Aortic Surgery Database: *A Report from the STS Adult Cardiac Surgery Database***



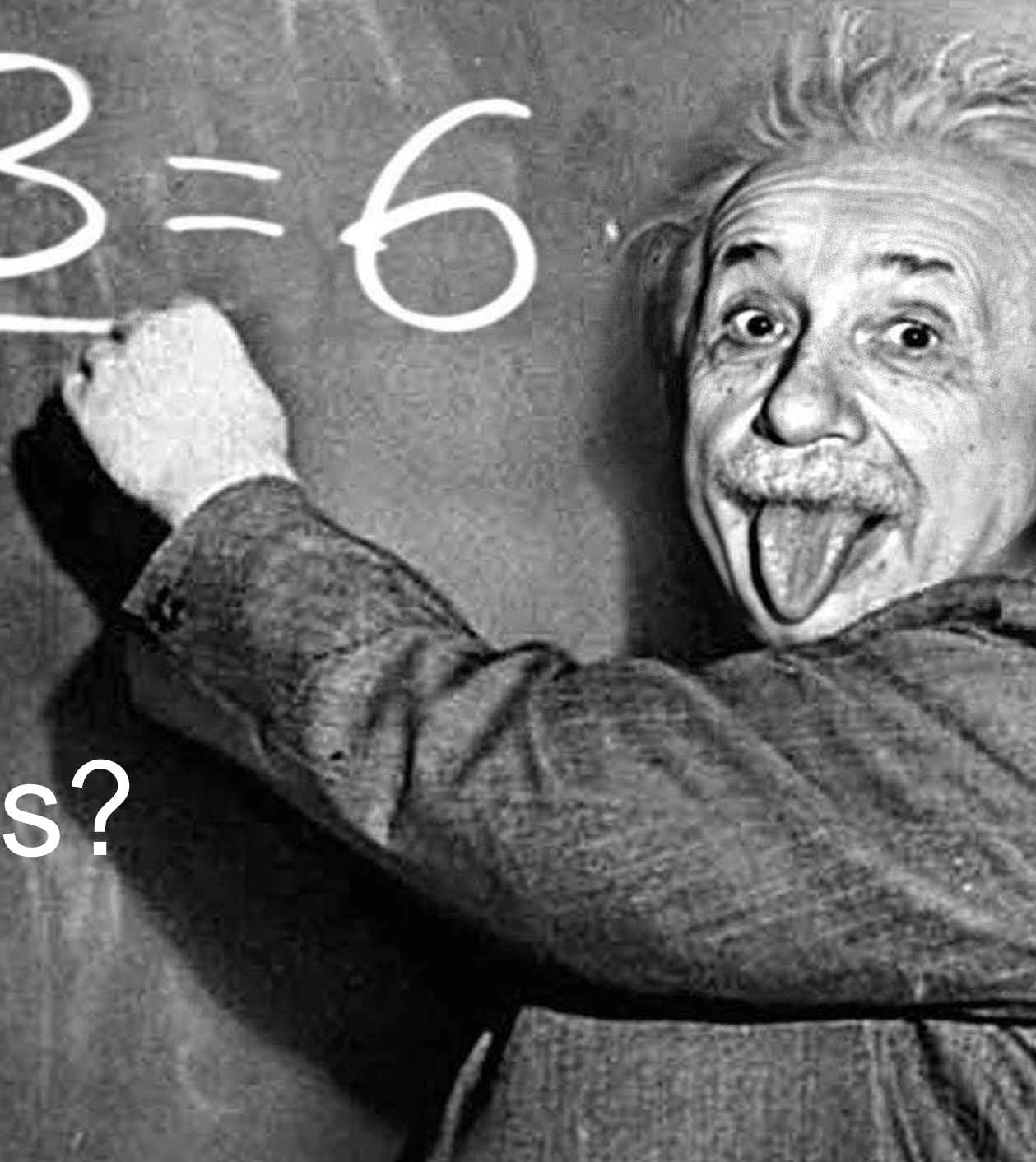
**STS**  
**National Database™**  
*Using data to drive quality*



**The Society  
of Thoracic  
Surgeons**

**Nimesh D. Desai MD. PhD., J. Bavaria, MD on Behalf of the STS Aortic Surgery Task Force  
(First reported at the Jan. 2017 STS Annual Mtg)**

$$6 - 3 = 6$$



Questions?