

Aortic Root Surgery for Acute Type A Dissection

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Conflict of interest

None

Introduction

- **General principle** of curative surgery in **acute type A aortic dissection (ATAAD)**
 - **Life-saving**
 - Replacement of **diseased** aortic segment
 - Functional restoration of aortic valve

Introduction

- **Diseased** aortic segment?
 - Primary entry-tear
 - Involved by dissection flap
 - Functional deterioration
 - **Medical condition of the patient**
-  **Determination of the surgical extent**

Focusing on the aortic root involvement of ATAAD

Root **conservation** vs. **Aggressive** root repair

- RCT impossible
- Lack of real world data
- Diverging result from “Big mans”
- Numerator/denominator issue



The **controversy** is still **ongoing**

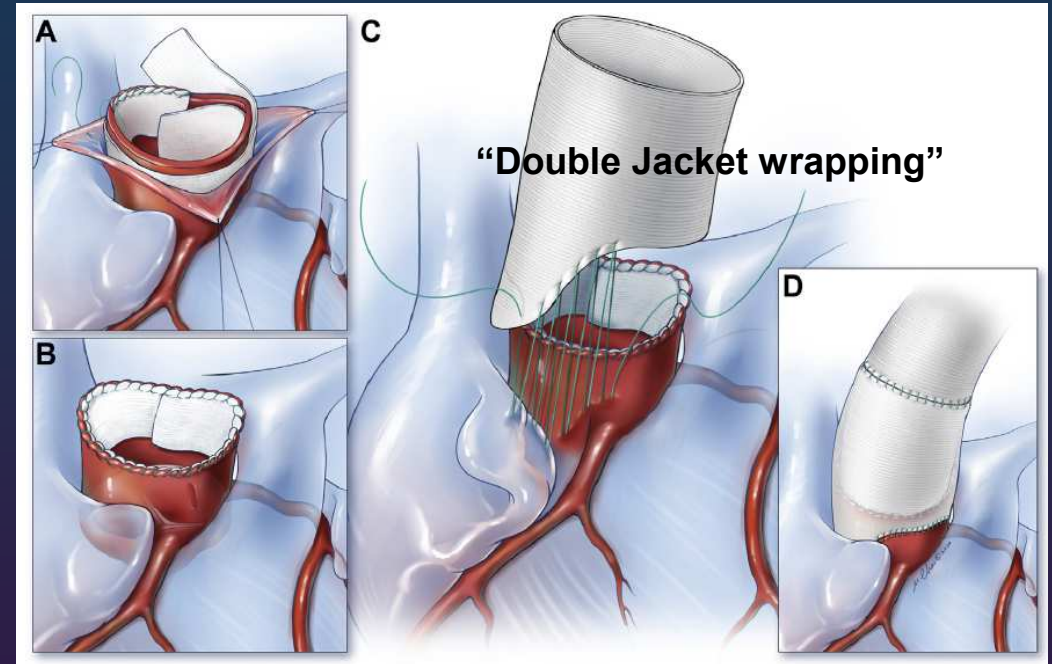
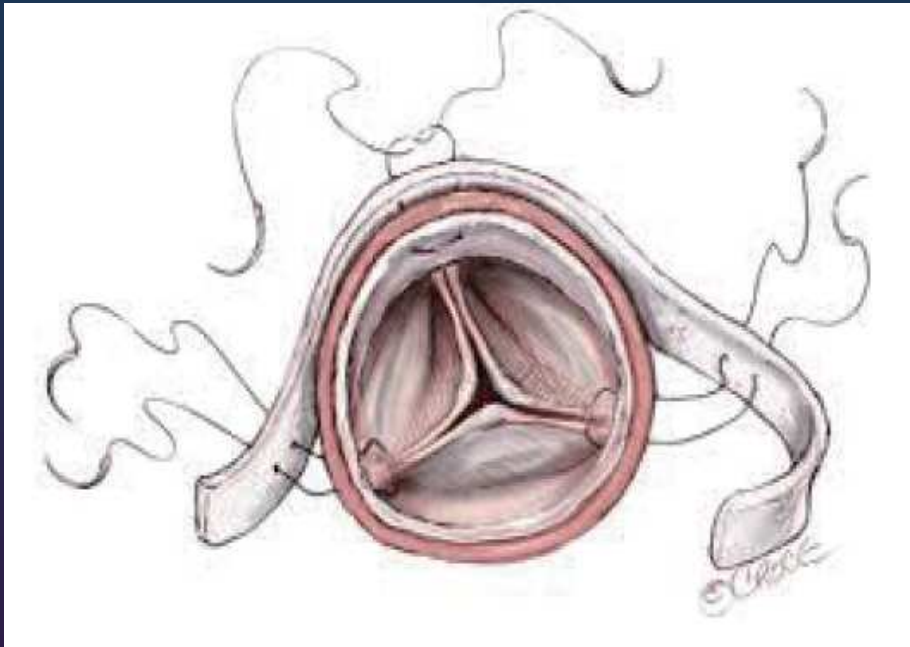
Surgical options for aortic root in ATAAD

- **Conservative** management (Root sparing)
 - Root fortification by
 - “Sandwich” technique (Proximal inverted graft technique)
 - “Neo-media” technique
 - Biologic glues
- **Aggressive** management (Root replacement or remodeling)
 - Bentall operation
 - David reimplantation
 - Root remodeling (Yacoup or Lansac technique)

Surgical options for aortic root in ATAAD

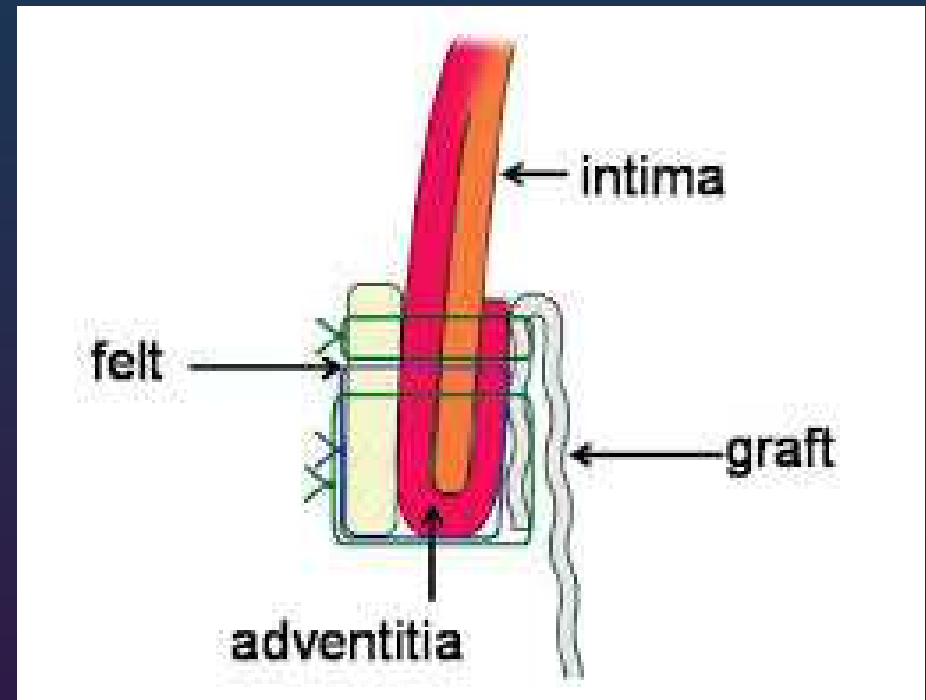
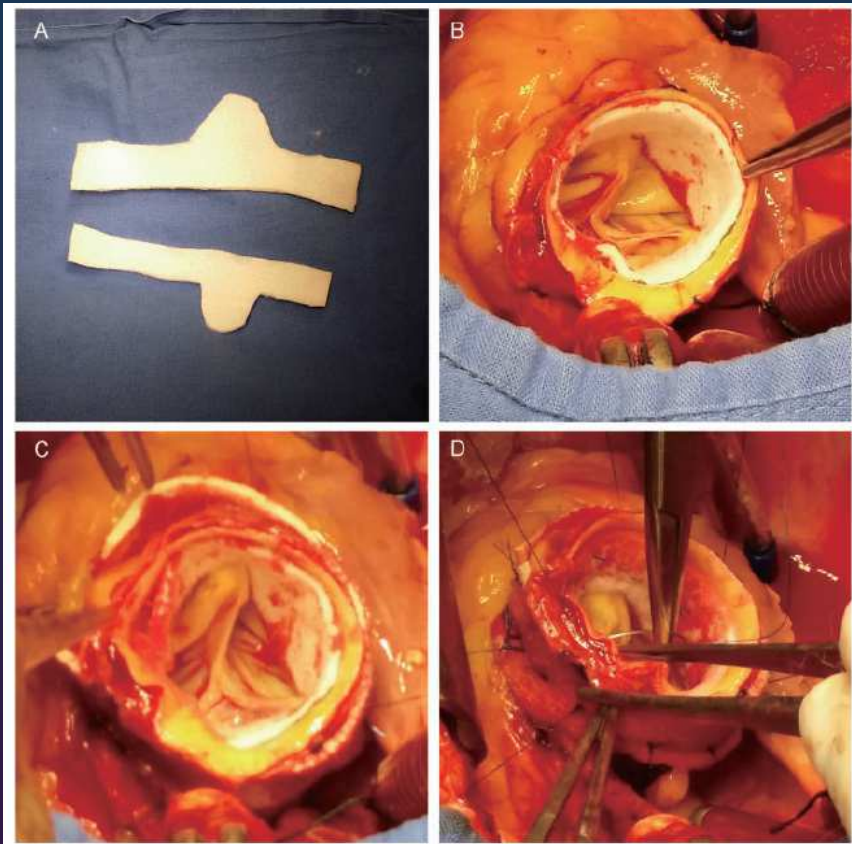
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“Sandwich” technique



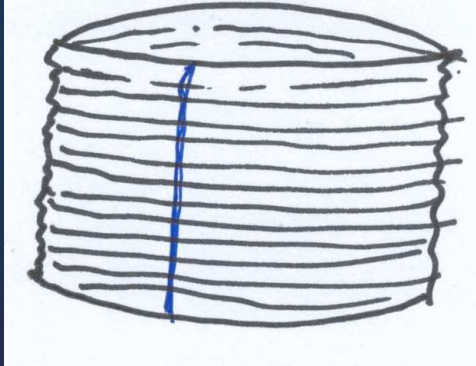
Okita Y. et al. *Ann Cardiothorac Surg* 2013;2:222-8

“Sandwich” technique

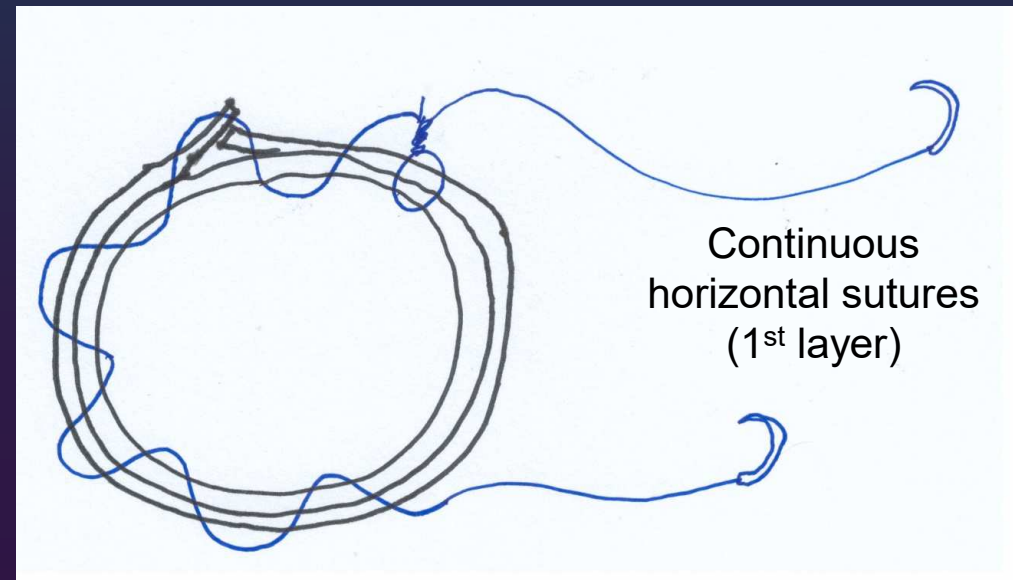
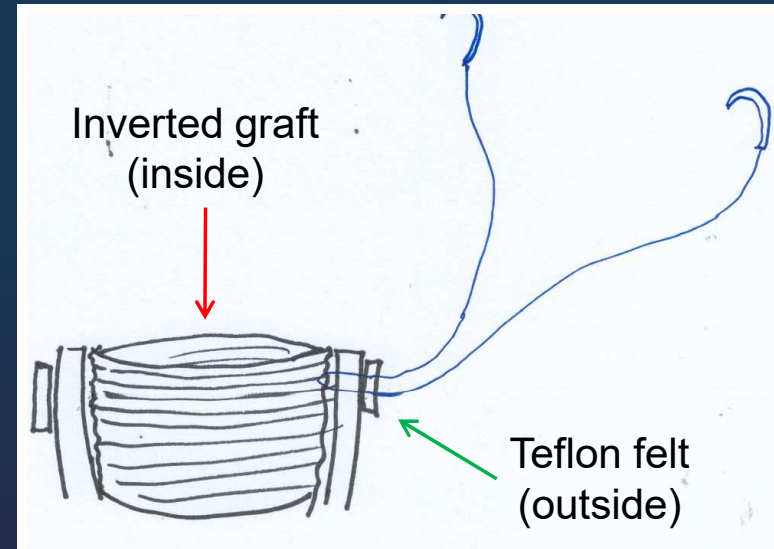
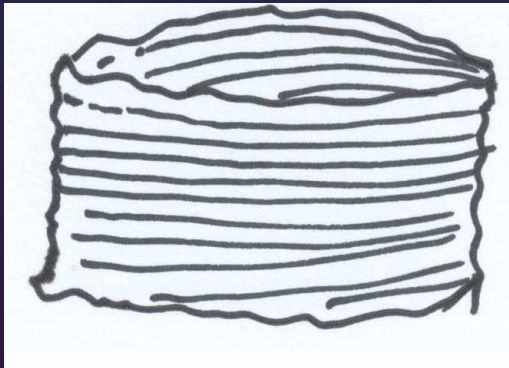


Yangfeng T. et al. *Ann Cardiothorac Surg* 2013;2:222-8

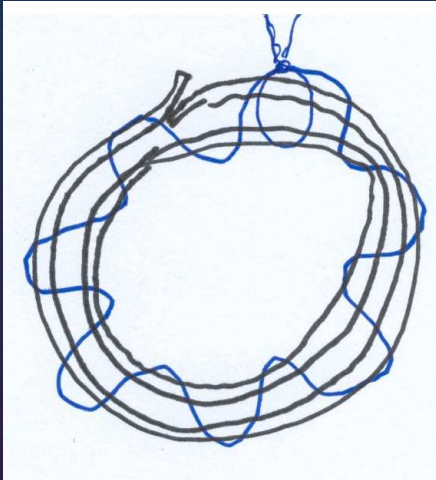
Inverted graft technique



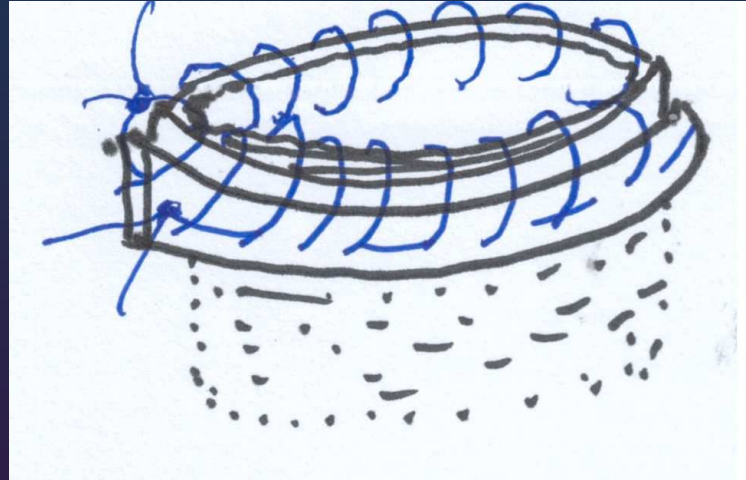
Sliced graft
(3~5cm)



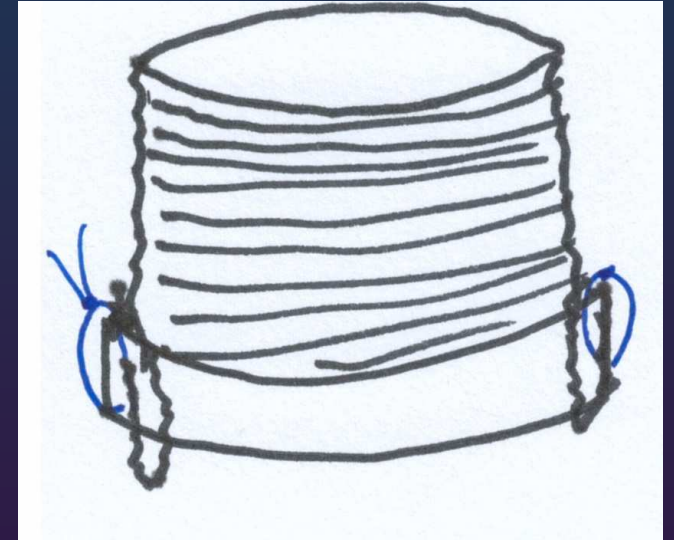
Inverted graft technique



1st layer completion



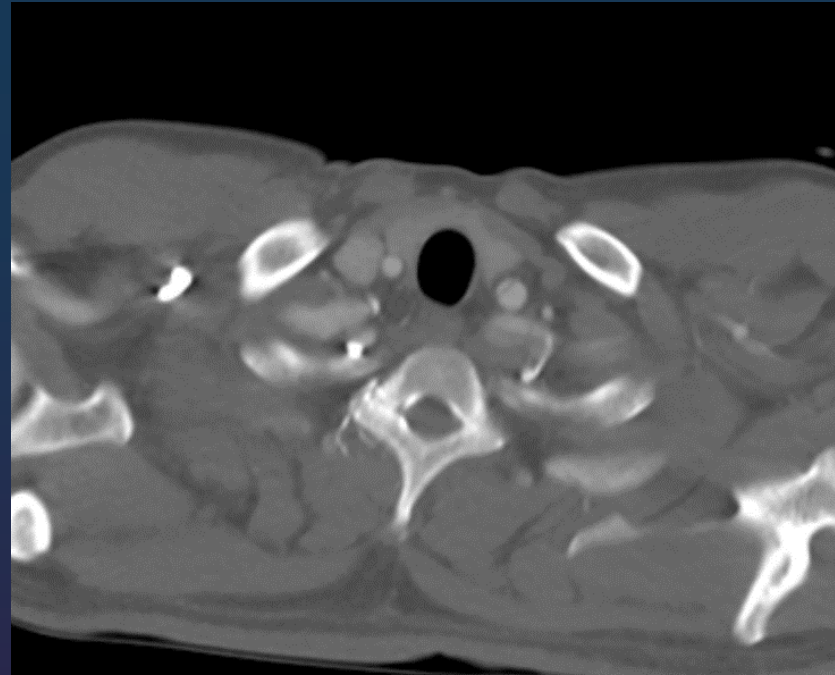
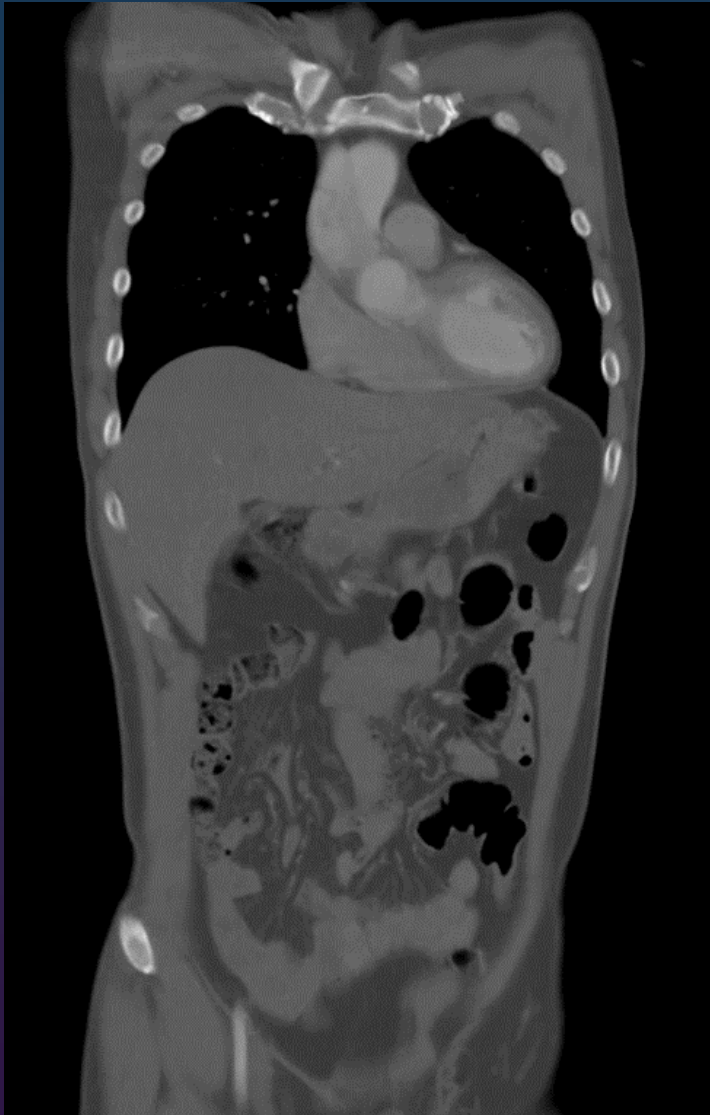
Deep bite continuous over & over suture



Completion of aortic root repair

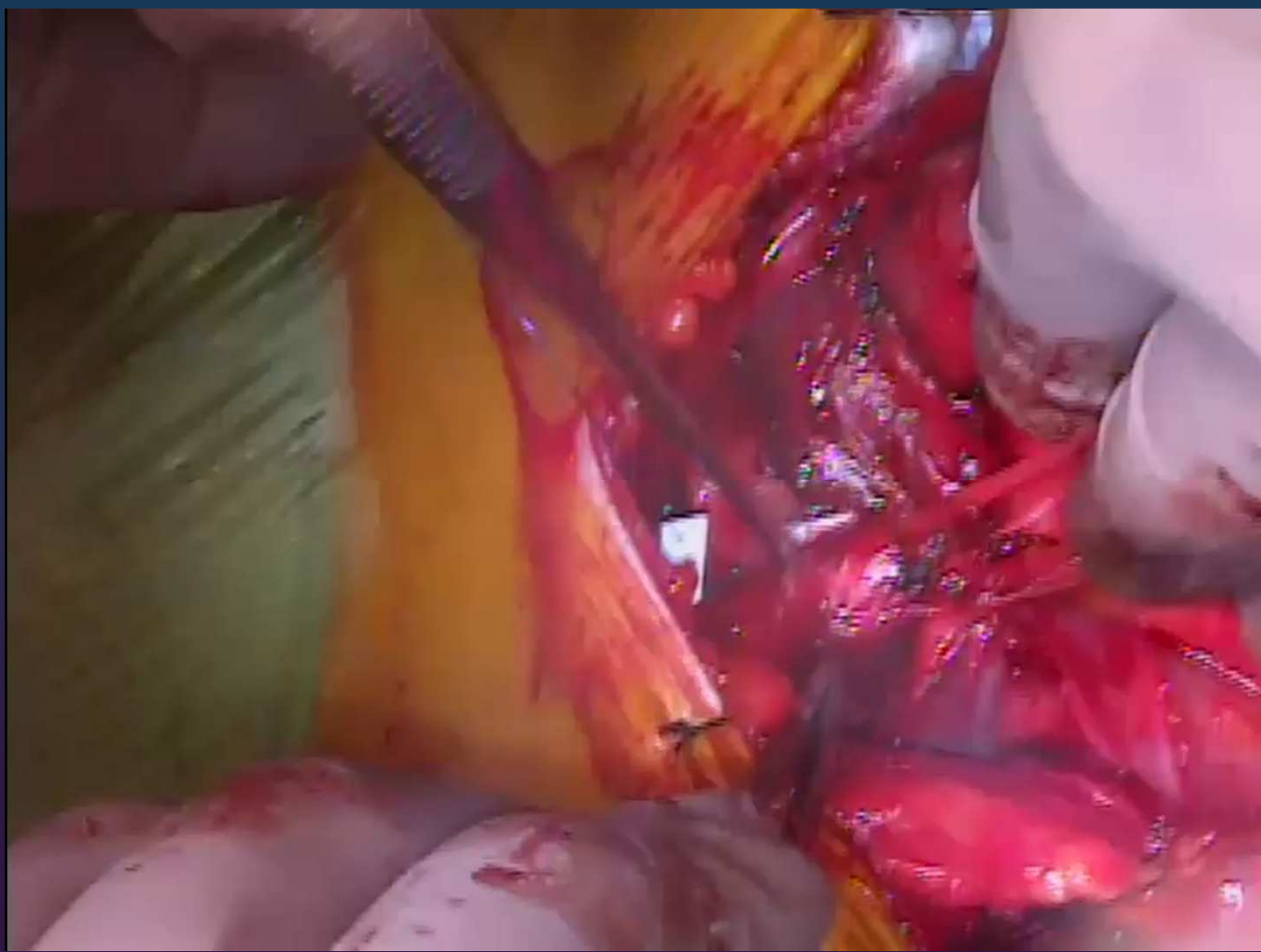
Case

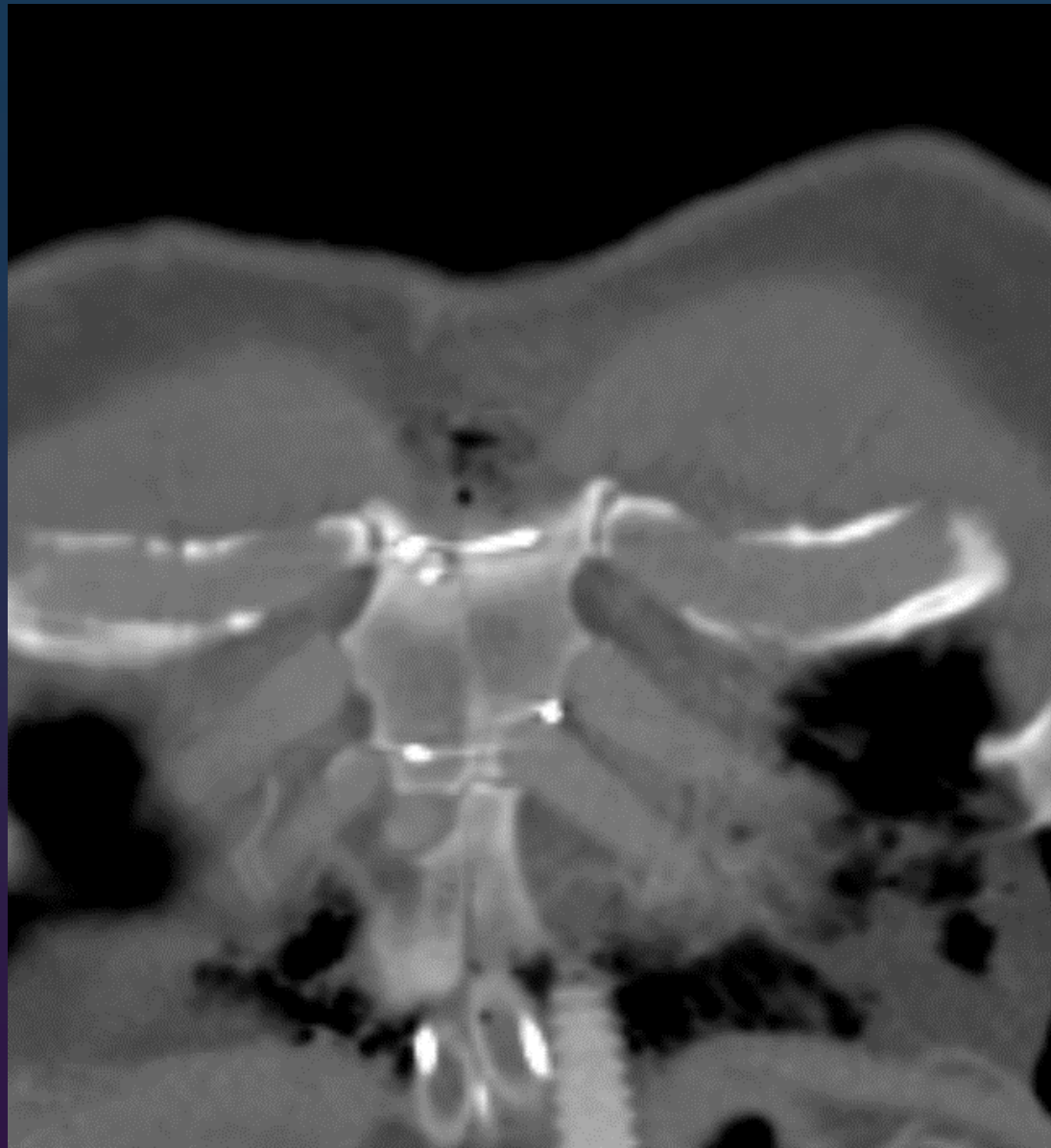
- M/50
- ATAAD with both lower limb mal-perfusion, paraplegia d/t spinal cord infarction
- Presented six hour after symptom onset d/t COVID-19 shutdown issue



Primary entry tear at zone 2

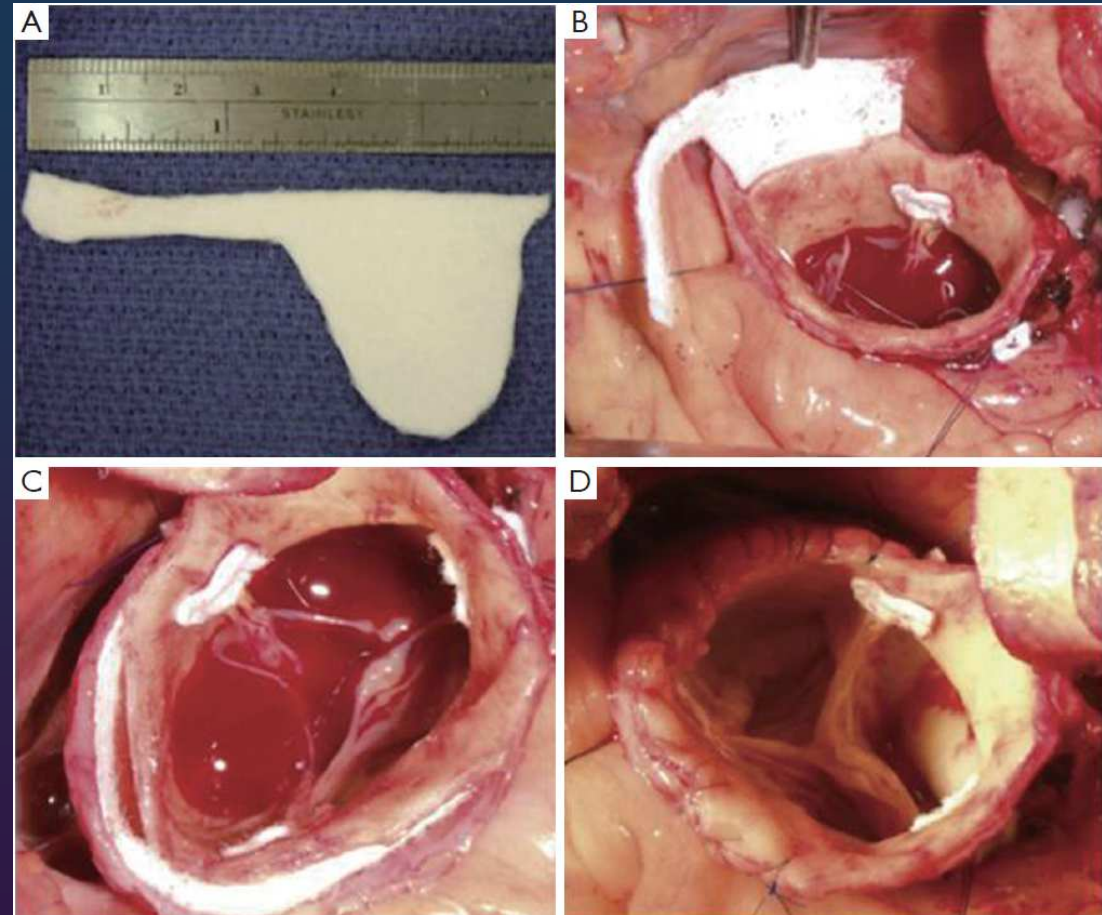
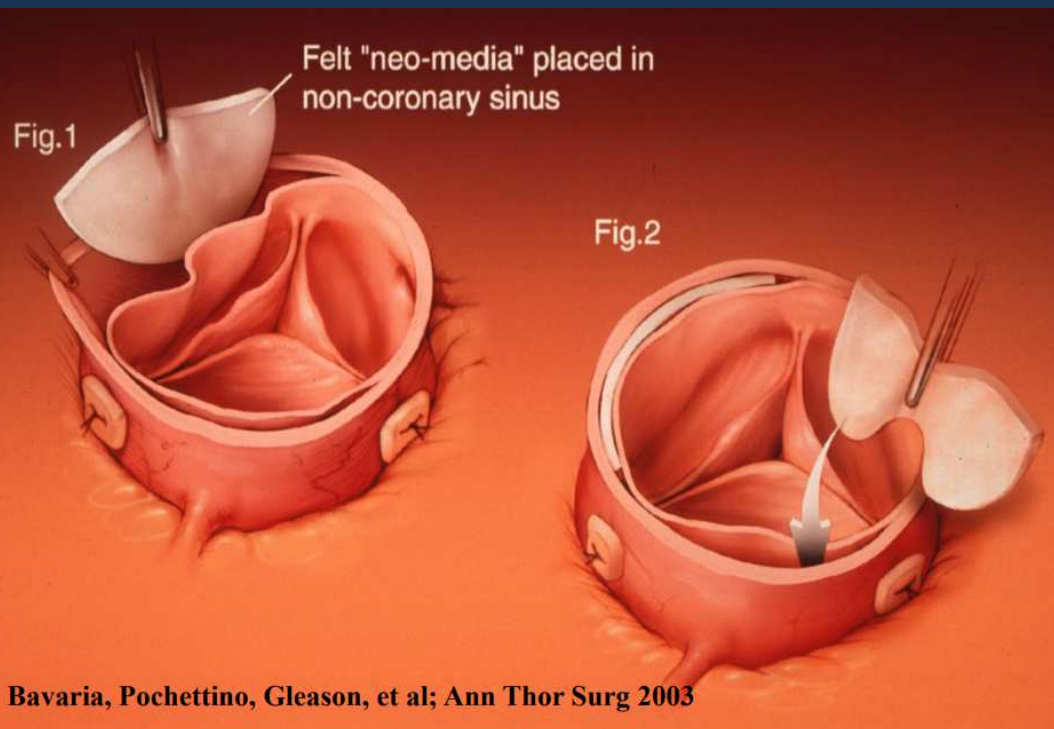
Abdominal aorta & both iliac a. obstruction





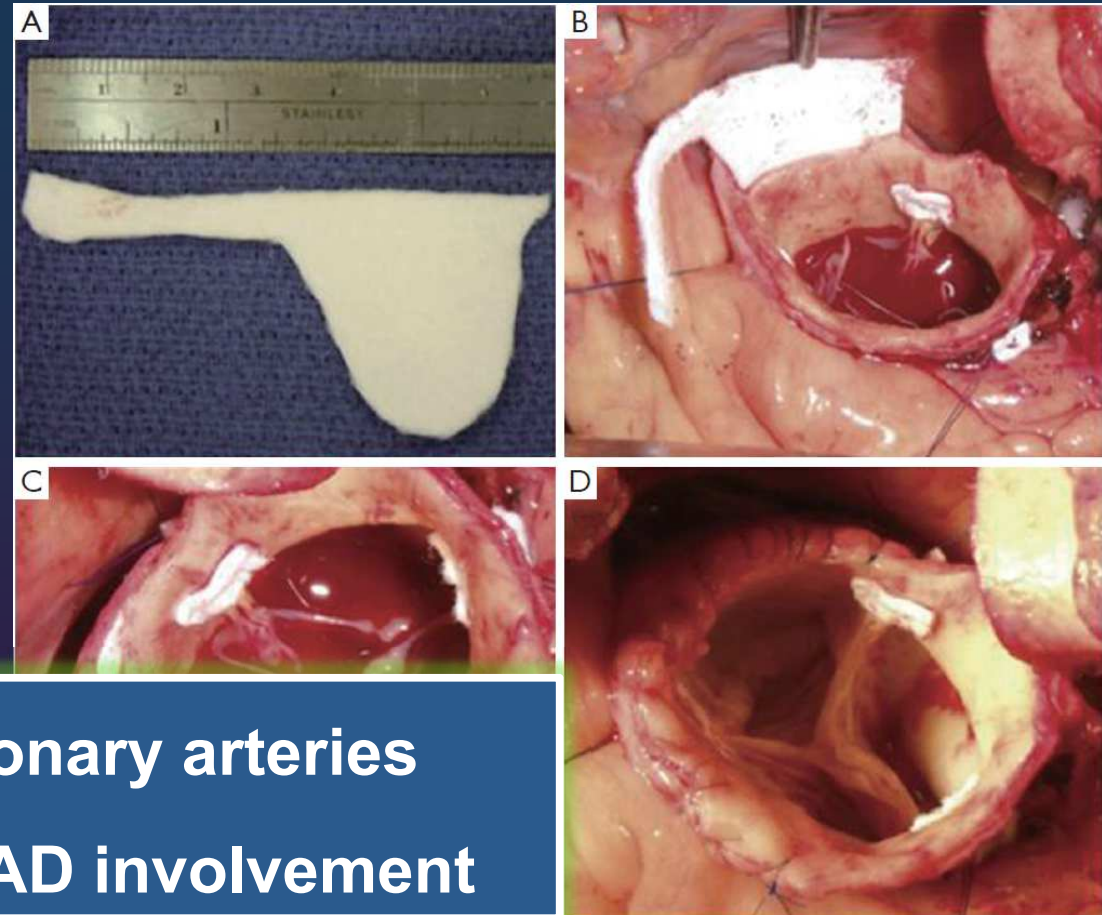
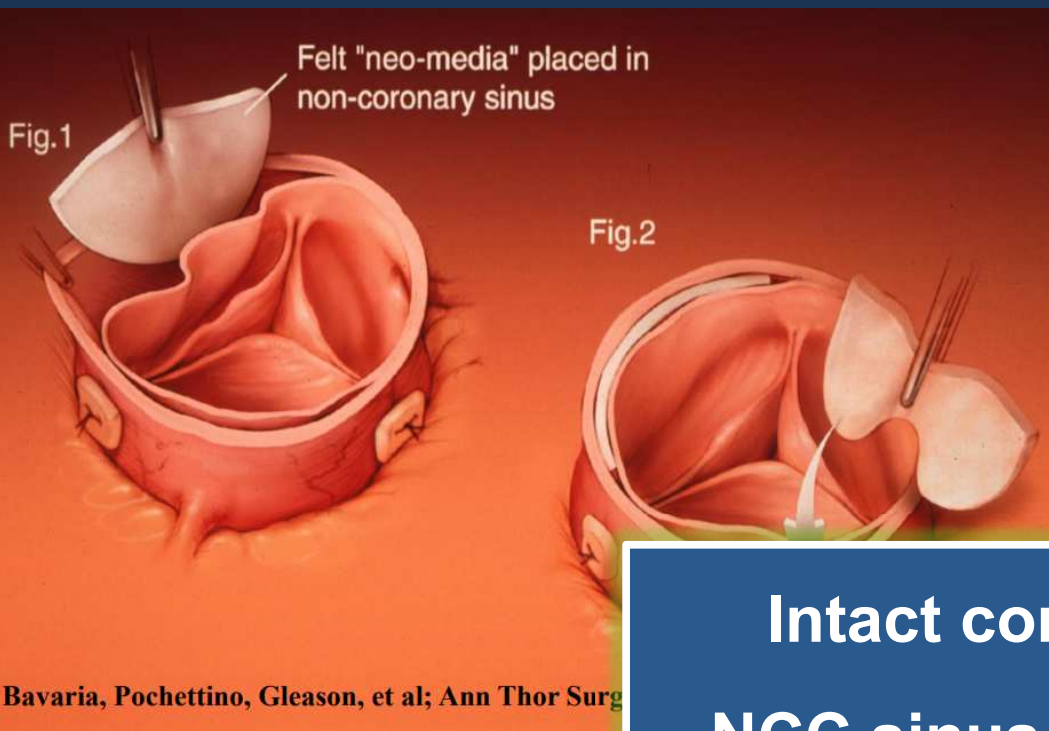
Postoperative day 2

“Neo-media” technique



Rylski B. et al. Ann Thorac Surg 2014;98:582-8

“Neo-media” technique

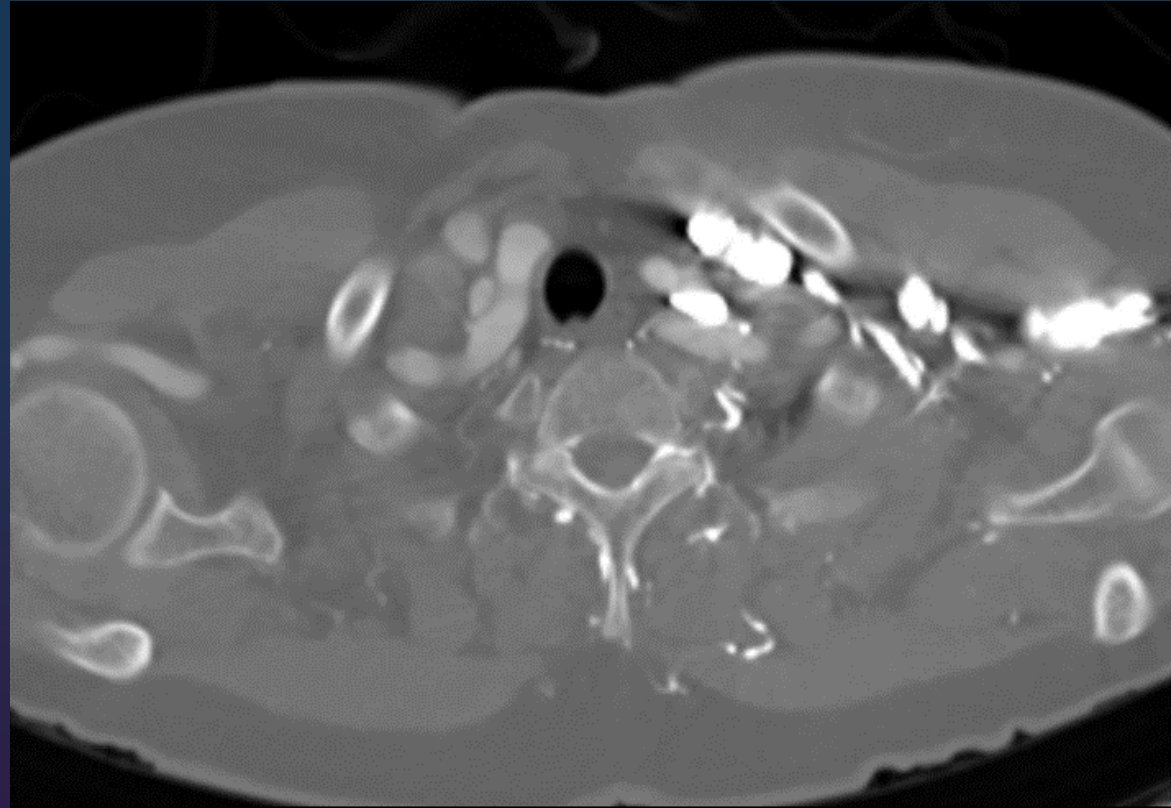


Intact coronary arteries
NCC sinus AD involvement

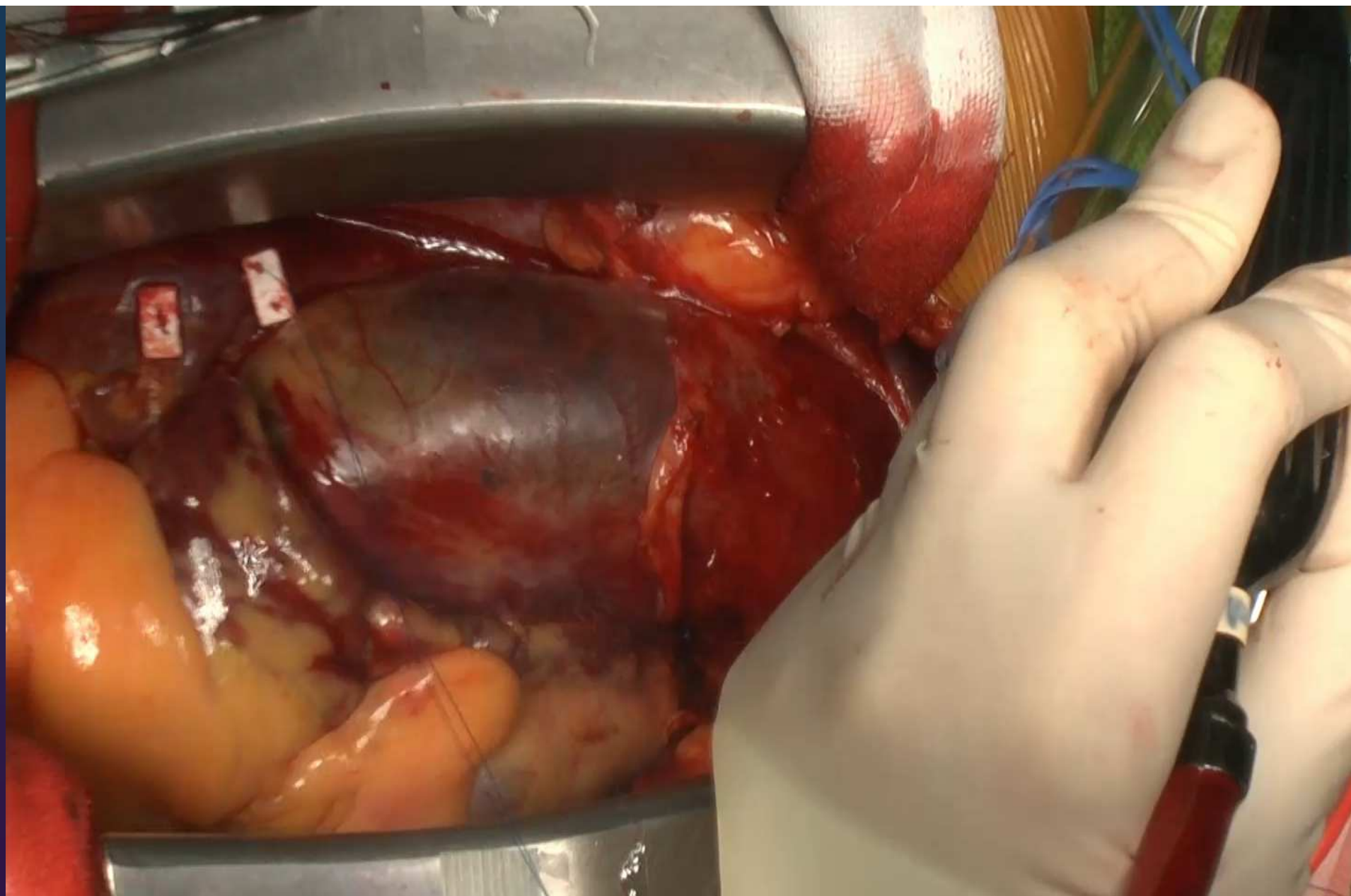
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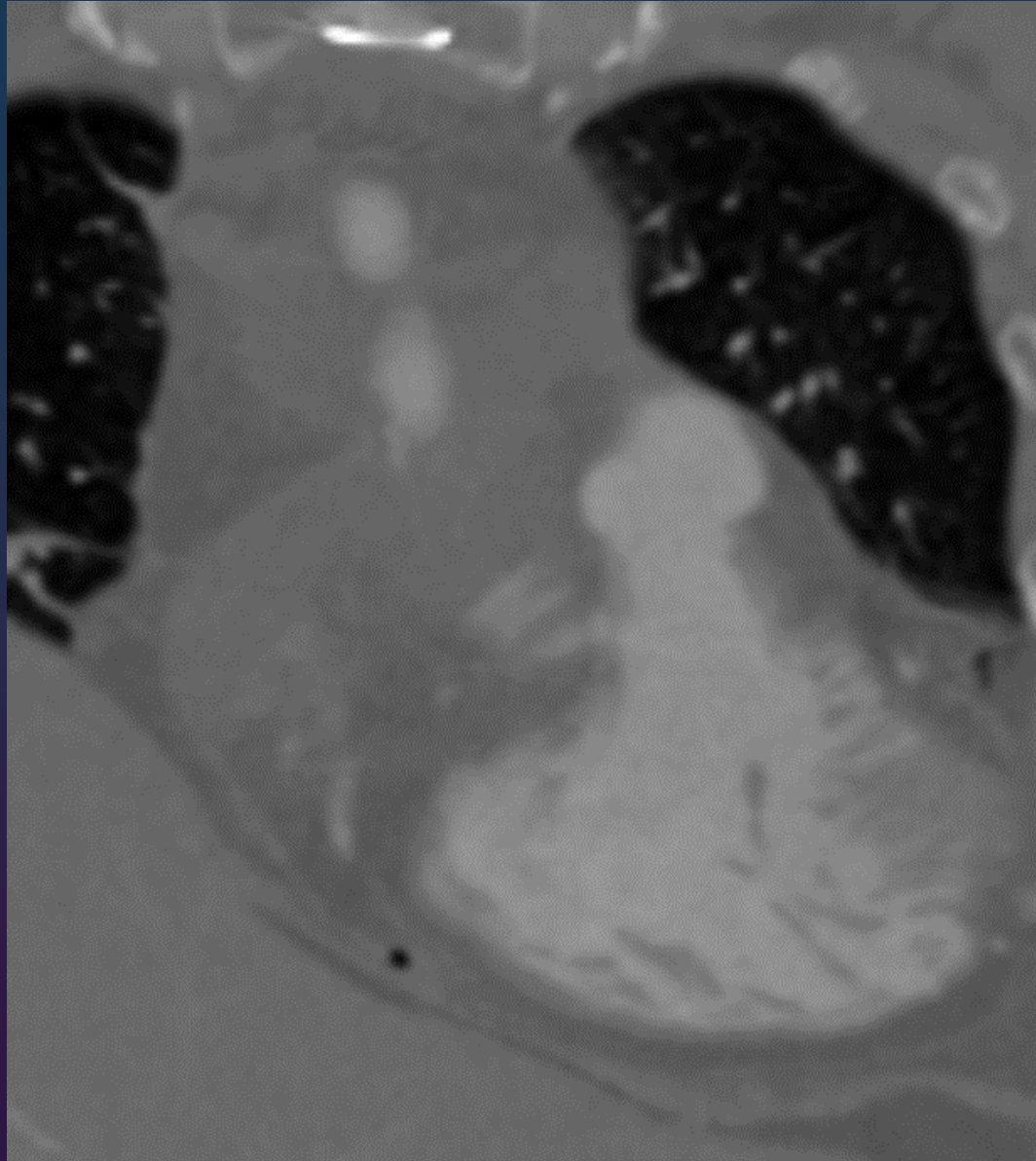
Case

- F/64
- ATAAD with extensive root & neck vessel involvement
- Patent ductus arteriosus (Detached PDA probably served as primary intimal tear)



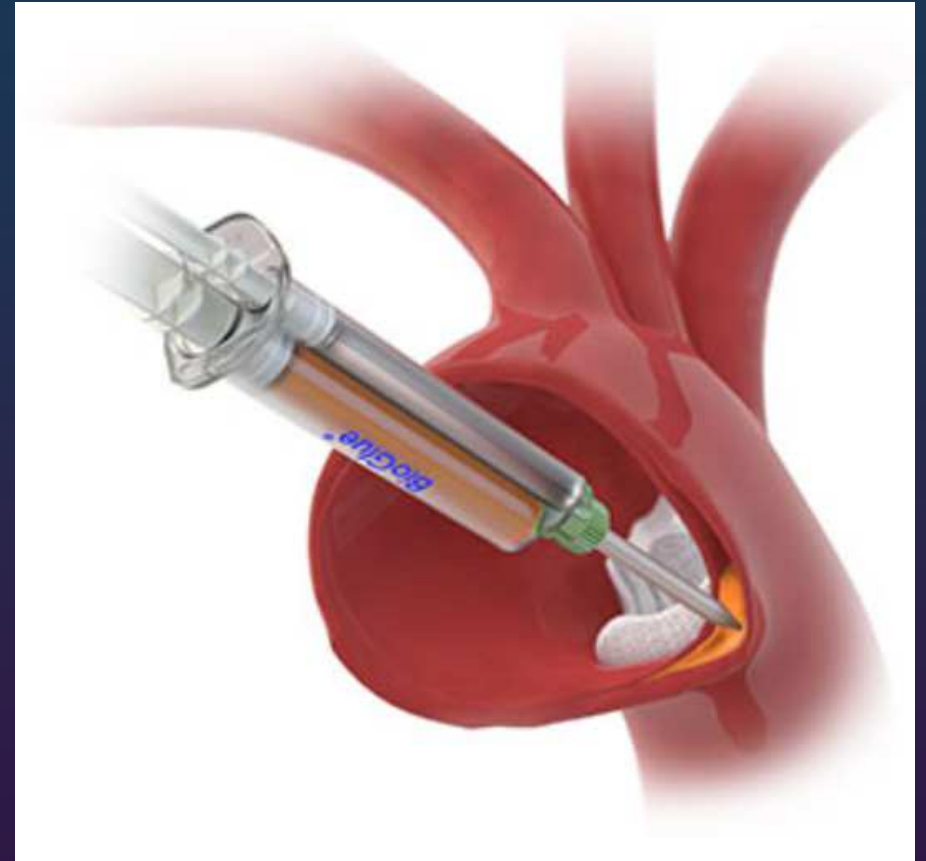
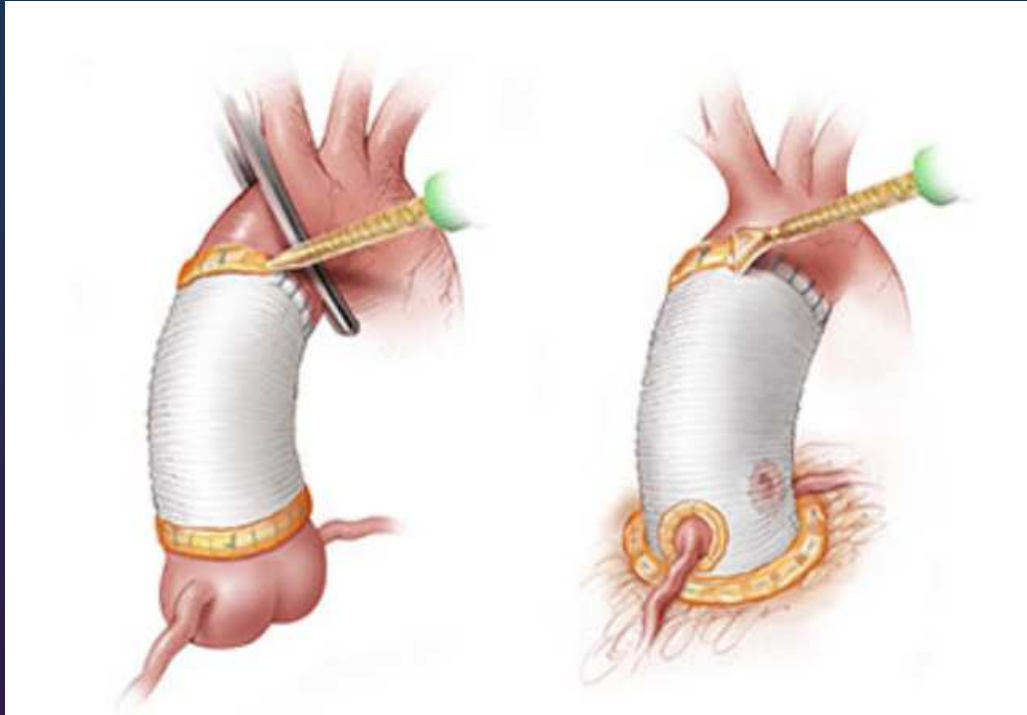
**Extensive AD involvement of root
- NCC/RCC annular level**





Postoperative day 5

Biologic glues

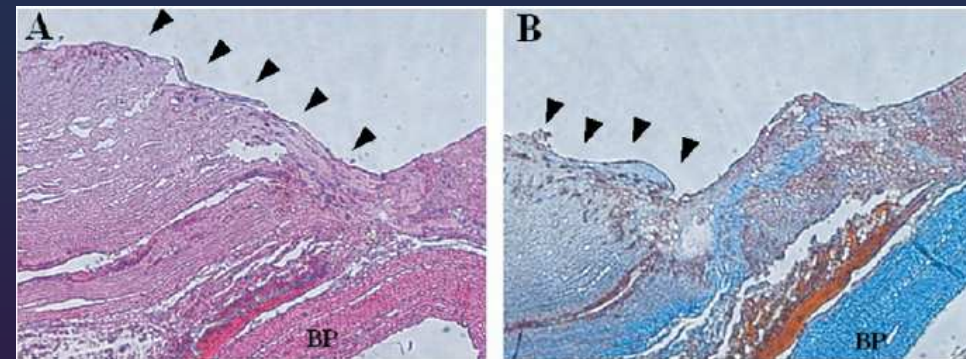
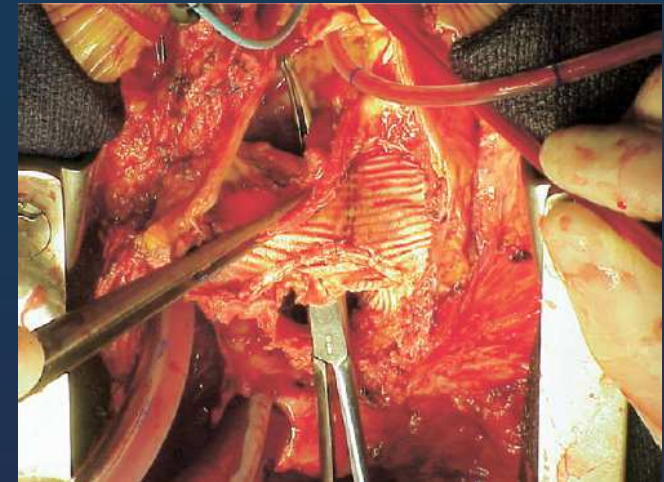


Biologic glues

- Acceptable early death

But

- Unacceptably high reoperation rate
 - Aortic root re-dissection
 - Anastomosis detachment
 - Pseudo-aneurysm formation
- Histologic toxic effect on aortic smooth muscle cells and elastin

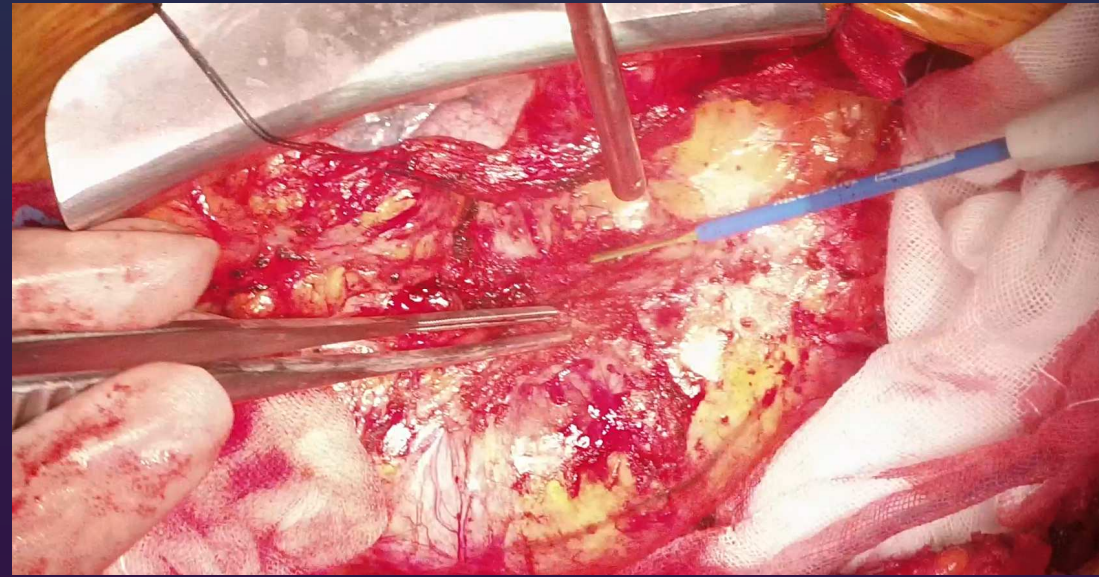
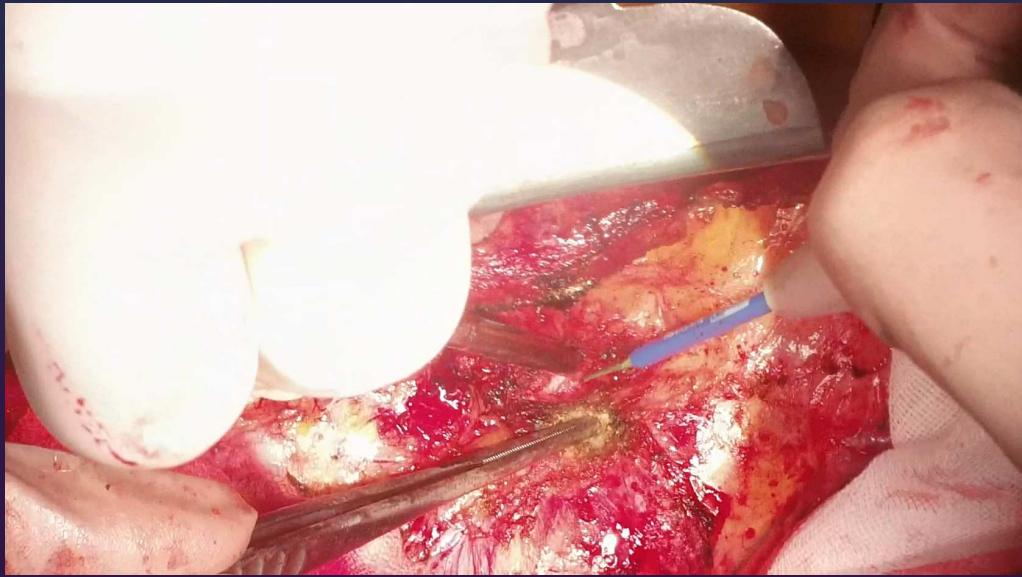


Casselman FP. et al. *Ann Thorac Surg* 2000;70:1227-33
Von Oppell UO. et al. *J Heart Valve Dis* 2002;11:249-57
Suehiro K. et al. *Jpn J Thorac Cardiovasc Surg* 2002;50:195-200
Fukunaga S. et al. *Eur J Cardiothorac Surg* 1999;15:564-9
Hata H. et al. *Ann Thorac Surg* 2007;83:1621-6
Suzuki S. et al. *Ann Thorac Cardiovasc Surg* 2006;12:333-40.

Biologic glues

- The other important problem of biologic glues

Terrible adhesion in redo operation



Direct repair technique



Bo Yang



ADULT: AORTA

Short-term outcomes of a simple and effective approach to aortic root and arch repair in acute type A aortic dissection



Bo Yang, MD, PhD,^a Aroosa Malik, BS,^a Victoria Waidley, BS,^a Kellianne C. Kleeman, MD,^a Xiaoting Wu, PhD,^a Elizabeth L. Norton, MS,^b David M. Williams, MD,^c Minhaj S. Khaja, MD, MBA,^c and Whitney E. Hornsby, PhD^b

(J Thorac Cardiovasc Surg 2018;155:1360-70)

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Bentall vs. David in ATAAD

Bentall

Still a **gold standard** procedure

Life-long **anticoagulation** may adversely affect to false lumen thrombosis & remodeling

Need for **longer cardiac procedural time** than conservative root repair

Vs.

David

Recently spotlighted by **expert surgeons**

Anticoagulation is **unnecessary**

Free from valve related complications?

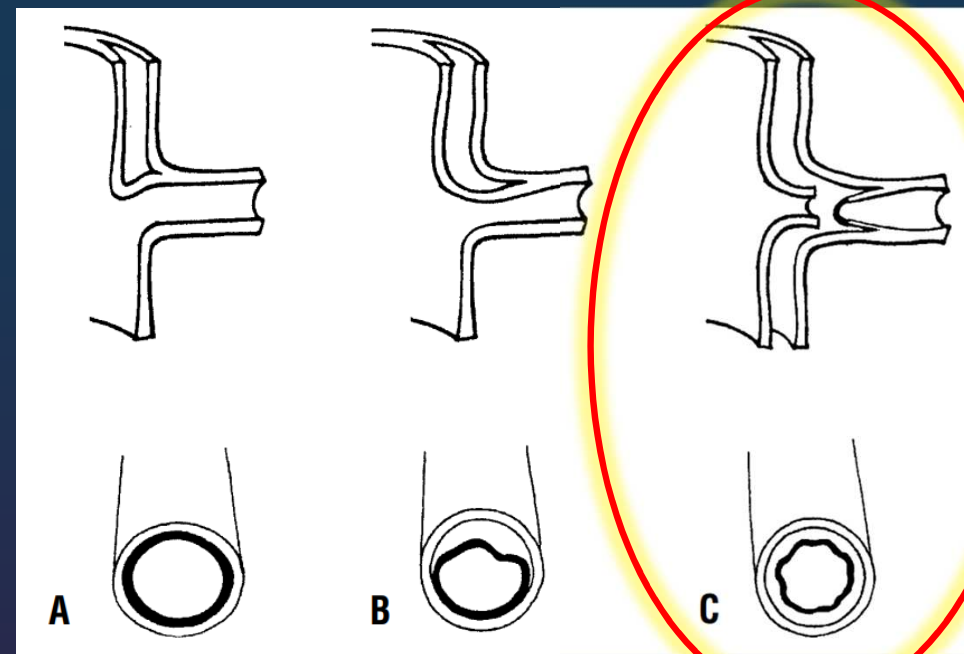
Need for **much longer cardiac procedural time** than Bentall operation.

Long-term outcomes?

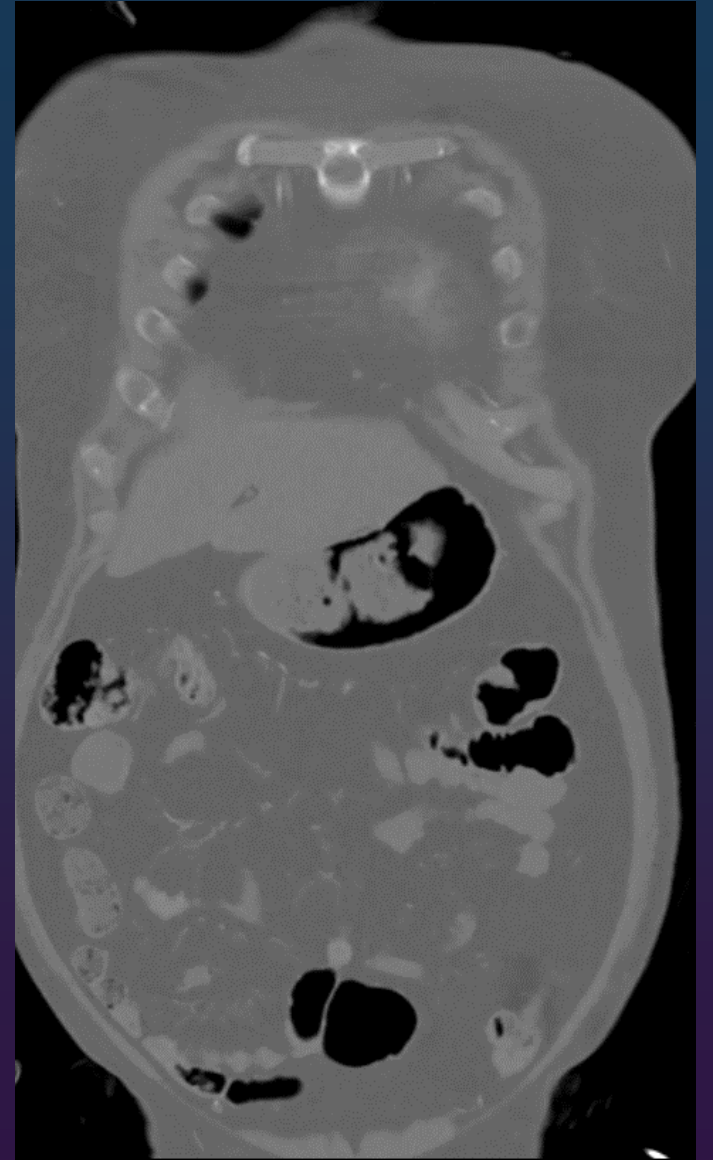
 I prefer Bentall op. in ATAAD in most situations

Case

- F/32
- Rt. CCA mal-perfusion
- CPCR before anesthetic induction d/t RCA trans-section by AD involvement



J Thorac Cardiovasc Surg 2001;121:552-60







Postoperative day 8



Postoperative 56 months

Summary

- There's no absolute superior strategy
- Patient tailored approach is important

Thank you for your attention!