VII CONGRESSO NAZIONALE

ECOCARDIOCHIRURGIA 2014

Il "frozen elephant trunk": una soluzione percorribile, rischio/beneficio

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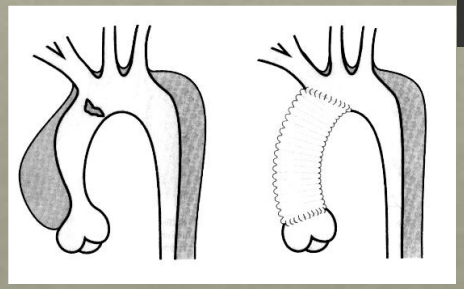
Surgical repair

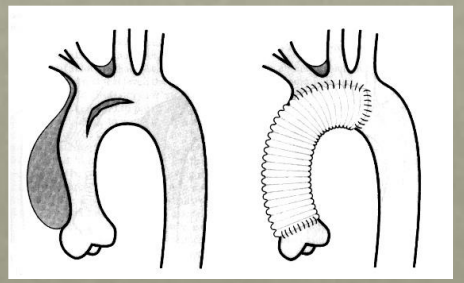
Main Goal

Save the life of the patient

- To replace the ruptured aortic segment
- To restore the blood flow in the true lumen

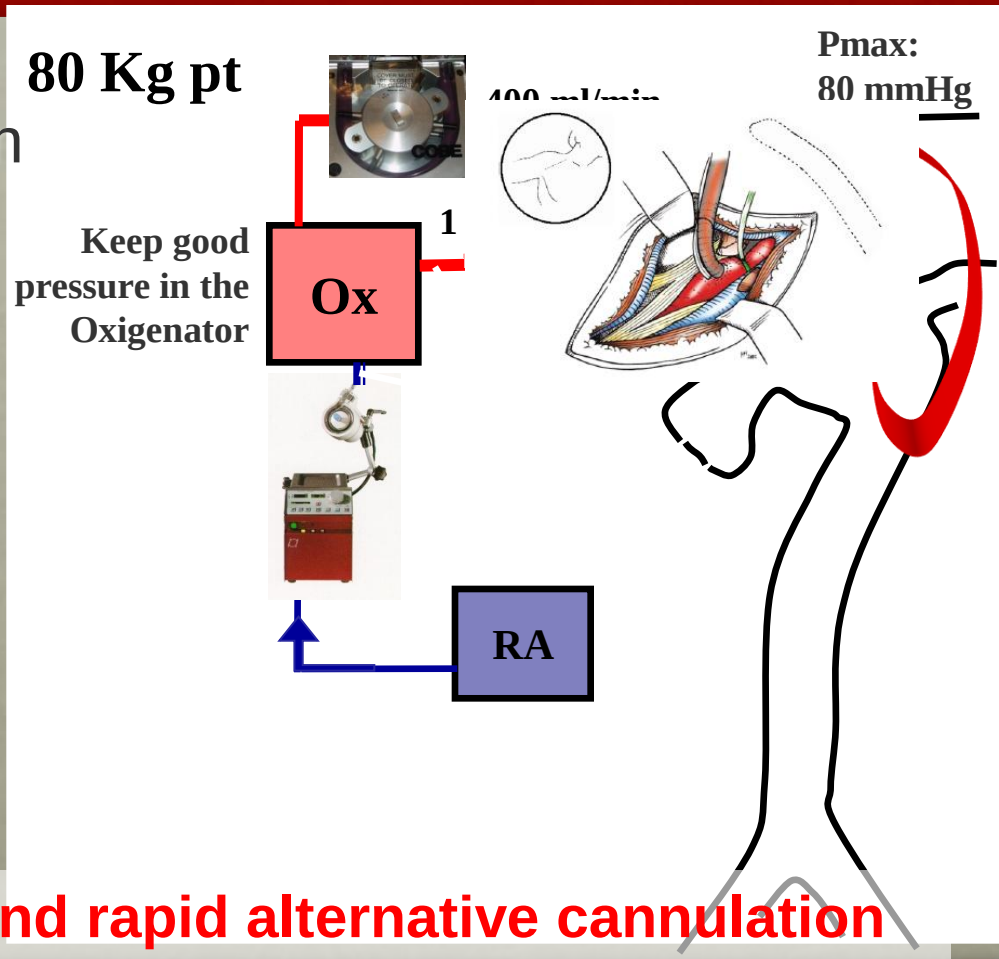


The basic principles involved replacement of the ascending aorta and *resection of the primary intimal tear*, with the construction of an open distal anastomosis



How to treat acute aortic dissection

- Antegrade systemic perfusion
  - Right Axillary artery
  - Innominate artery
  - Ascending aorta
- Antegrade selective cerebral perfusion
  - Moderate hypothermia

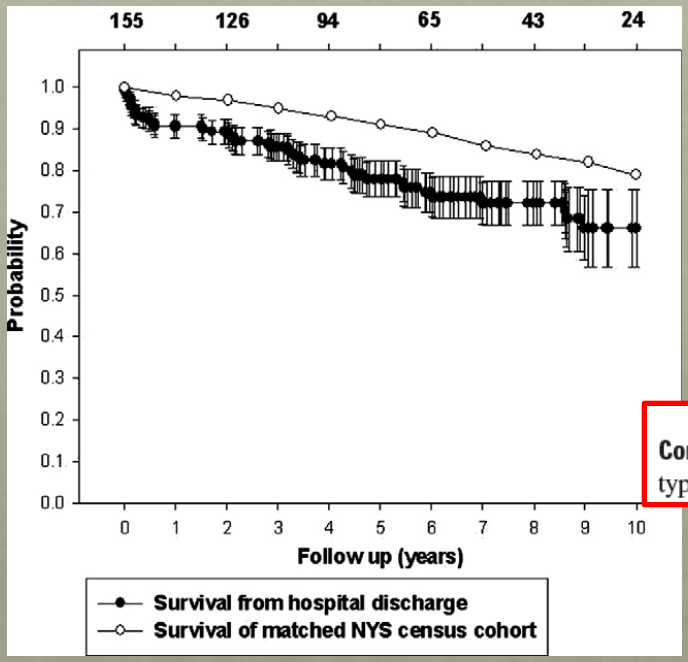


Femoral artery is still a valid and rapid alternative cannulation site

Primary entry tear resection

The fate of the distal aorta after repair of acute type A aortic dissection

James C. Halstead, MA (Cantab), MB, BChir, MRCS (Eng),[a] Matthias Meier, MD,[a] Christian Etz, MD,[a]
David Spielvogel, MD,[a] Carol Bodian, DrPH,[b] Michael Wurm, MD,[a] Rohit Shahani, MD,[a] and Randall B. Griepp, MD[a]



Objectives: The residual aorta's behavior after repair of acute type A dissection is incompletely understood. We analyzed segmental growth rates, distal reoperation, and factors influencing long-term survival.

Methods: One hundred seventy-nine consecutive patients (70% male; mean age, 60 years) with acute type A dissection underwent aggressive resection of the intimal tear and open distal anastomosis (1986-2003). Hospital mortality was 13.4%. Survivors had serial computed tomographic scans: digitization yielded distal segmental dimensions. Segment-specific average rates of enlargement and factors influencing faster growth were analyzed. Distal reoperations and patient survival were examined.

Results: Eighty-nine (57%) patients had imaging data sufficient for growth rate calculations. The median diameters after repair were as follows: aortic arch, 3.6 cm; descending aorta, 3.7 cm; and abdominal aorta, 3.2 cm. Subsequent growth rates were 0.8, 1.0, and 0.8 mm/y, respectively. Initial size of greater than 4 cm (P = .005) and initial diameter of less than 4 cm with a patent false lumen (P = .004) predicted greater growth in the descending aorta, and male sex (P = .05) significantly affected growth in the abdominal aorta. No significant factors were found for the aortic arch. There were 25 distal aortic operations (16 patients), and risk of survival after repair rological deficit at false lumen of the ascending aorta (P = .03), and a patent distal false lumen postoperatively (P = .06) but not distal reoperation.

Conclusions: Growth of the distal aorta after repair of acute type A dissection is typically slow and linear. Distal reoperation is uncommon, and late risk of death is approximately twice that of a healthy population.

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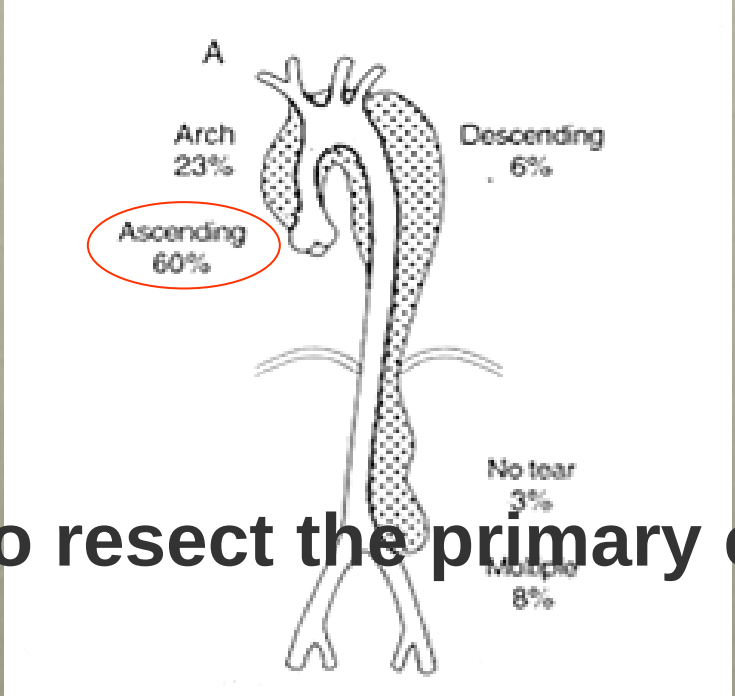
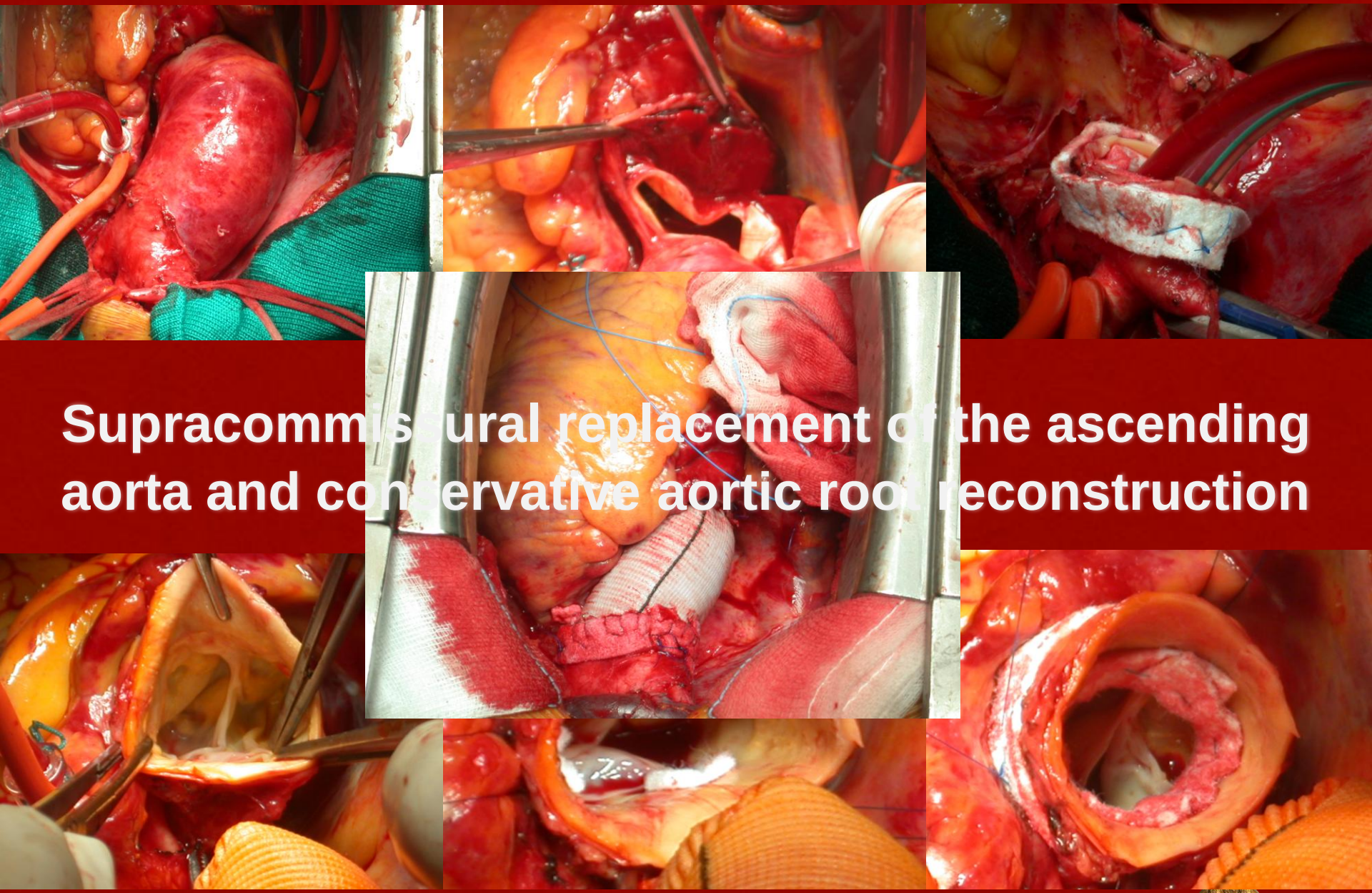
J Thorac Cardiovasc Surg 2007;133:127-35

Surgical repair

Localization of the intimal tear

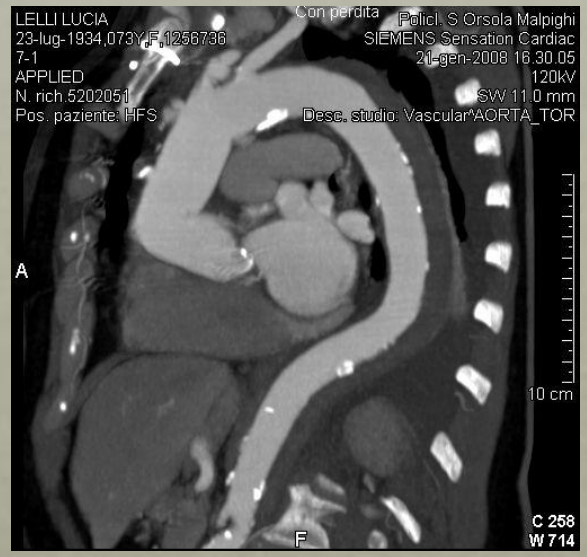


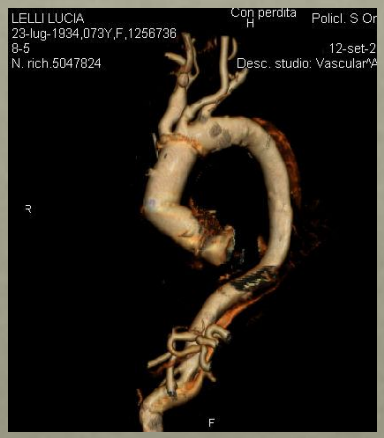
We have to resect the primary entry tear



Supracommissural replacement of the ascending aorta and conservative aortic root reconstruction

Hemiarch replacement

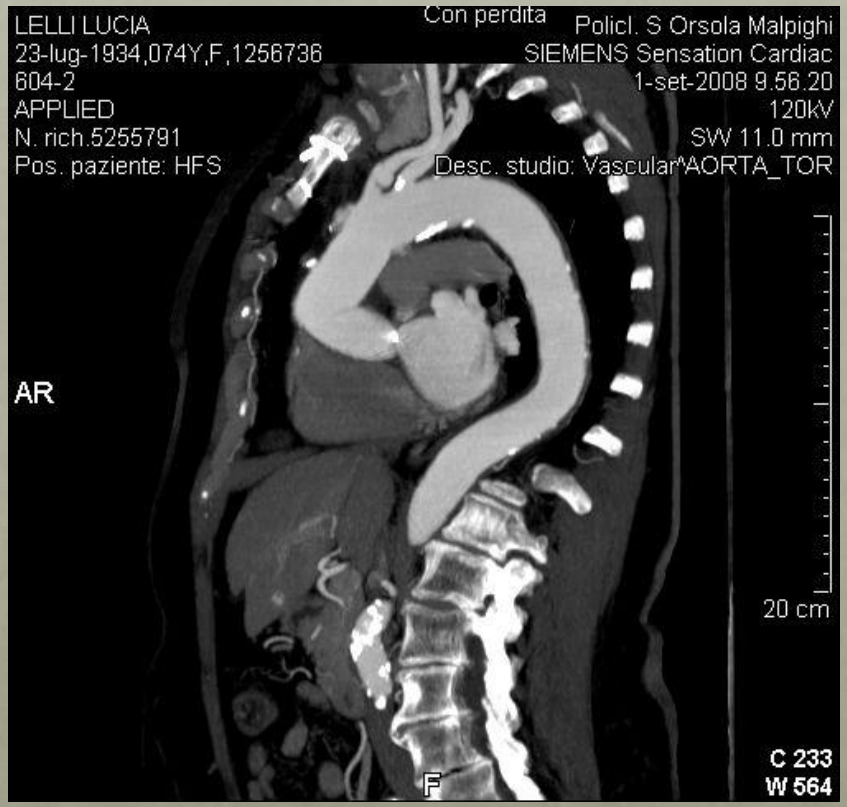


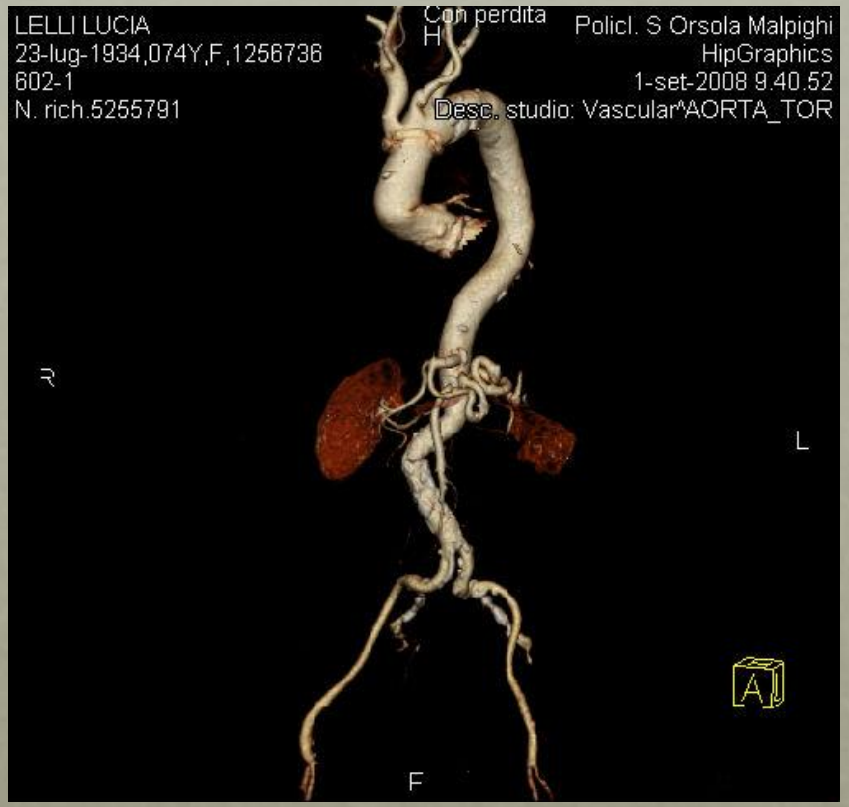


September 2007

January 2008

Hemiarch replacement

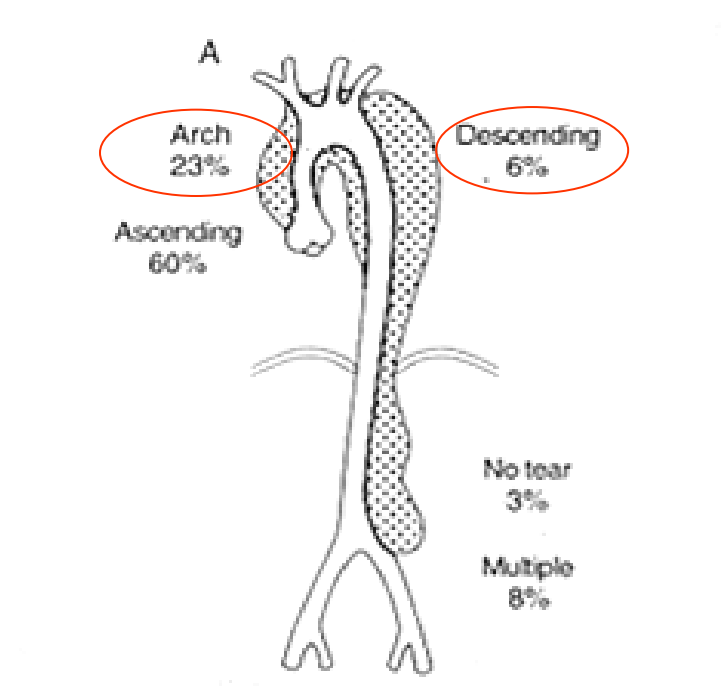




September 2008

What should we do with the arch?

Localization of the intimal tear



Indication for any kind of surgery

Contents lists available at SciVerse ScienceDirect

International Journal of Cardiology

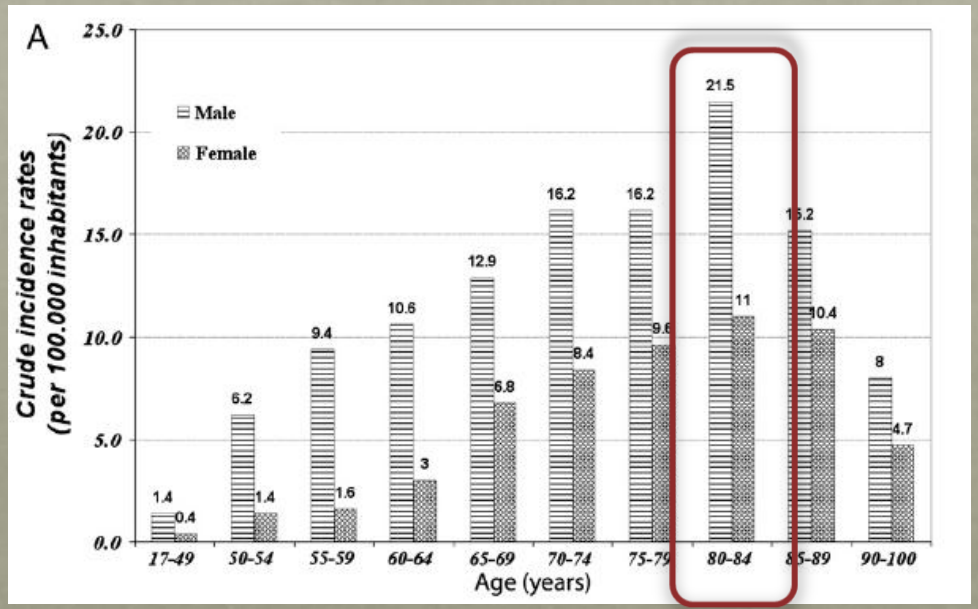
journal homepage: www.elsevier.com/locate/ijcard

Acute aortic dissection: Epidemiology and outcomes

Davide Pacini [a,*], Luca Di Marco [a], Daniela Fortuna [b], Laura Maria Beatrice Belotti [b], Davide Gabbieri [c], Claudio Zussa [d], Florio Pigini [e], Andrea Contini [f], Maria Cristina Barattoni [d], Rossana De Palma [b], Roberto Di Bartolomeo [a]

January 2000–December 2008

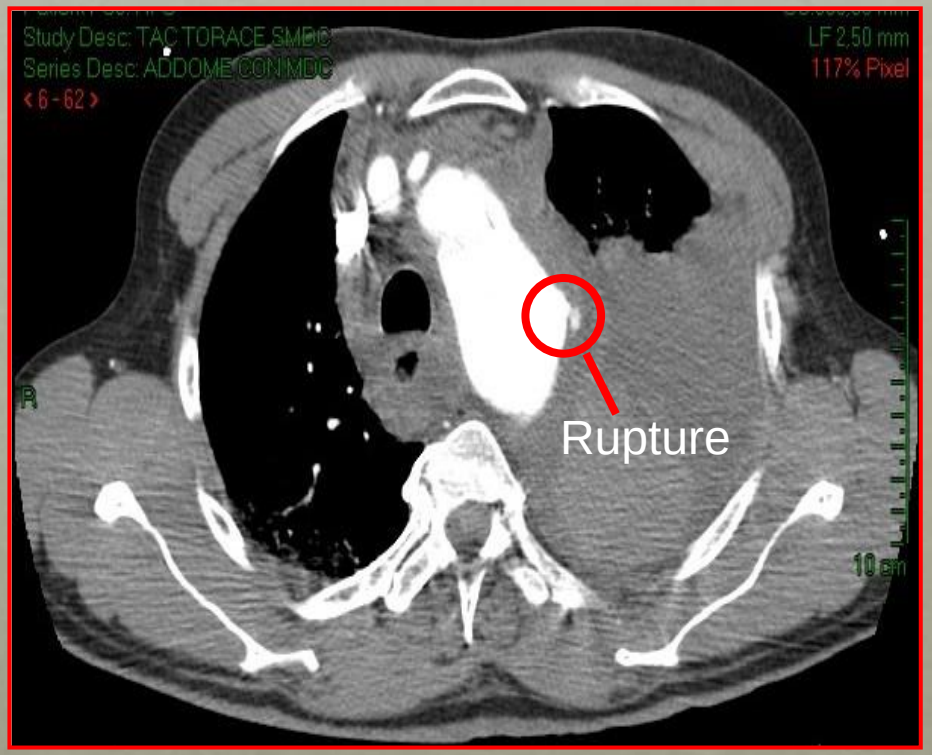
1499 Emilia-Romagna residents were hospitalized for AD

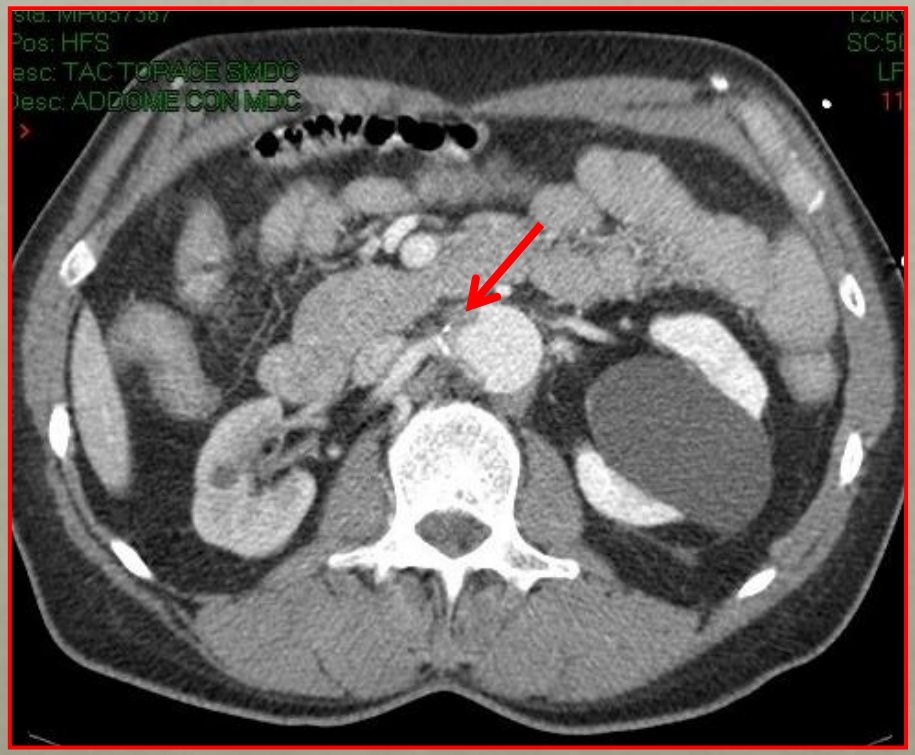


Mean age: 67.6±13.5 years (range 17–100 years)

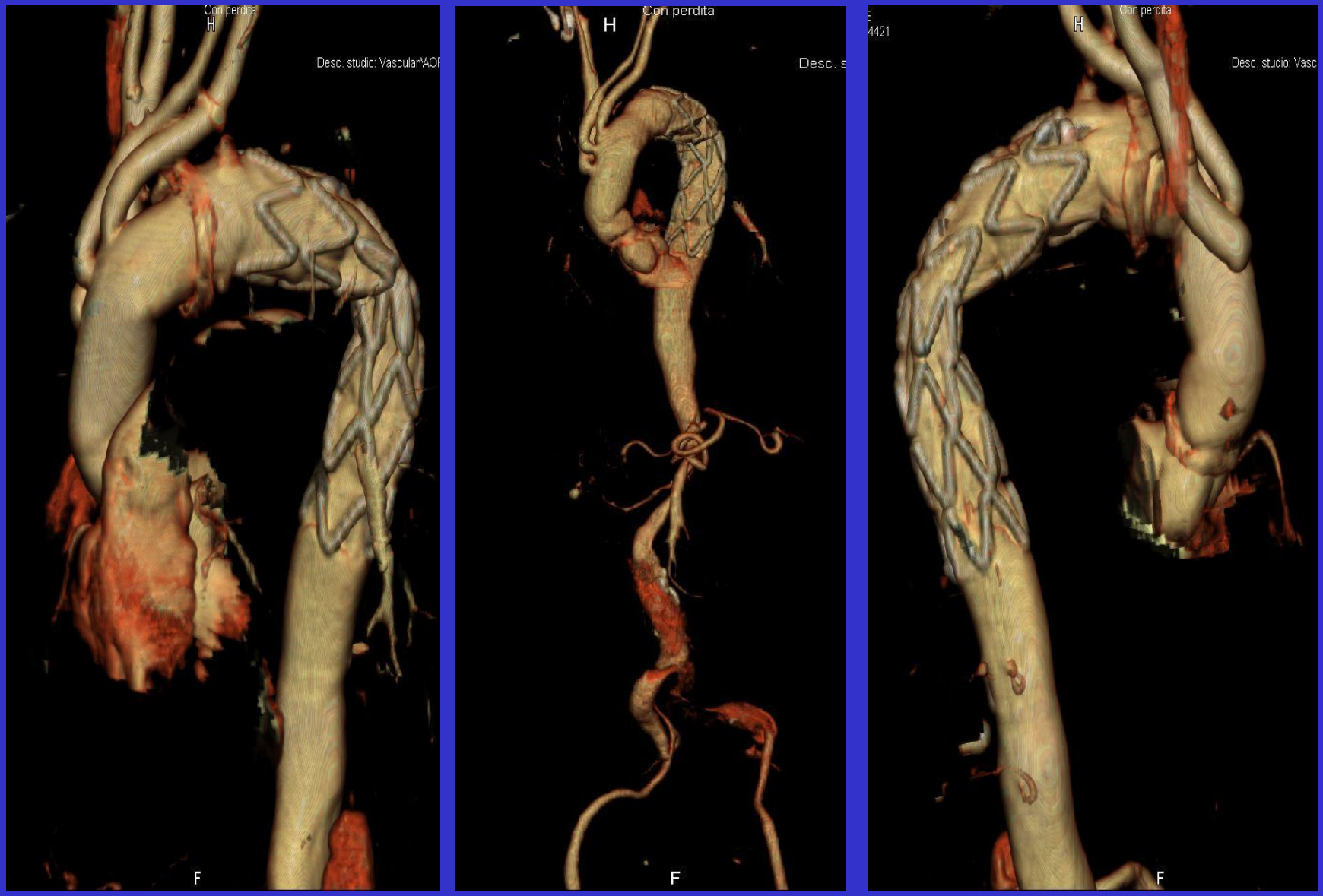
296 (19.8%)	≥80 years
22 (1.5%)	≥90 years

Mandatory arch replacememnt



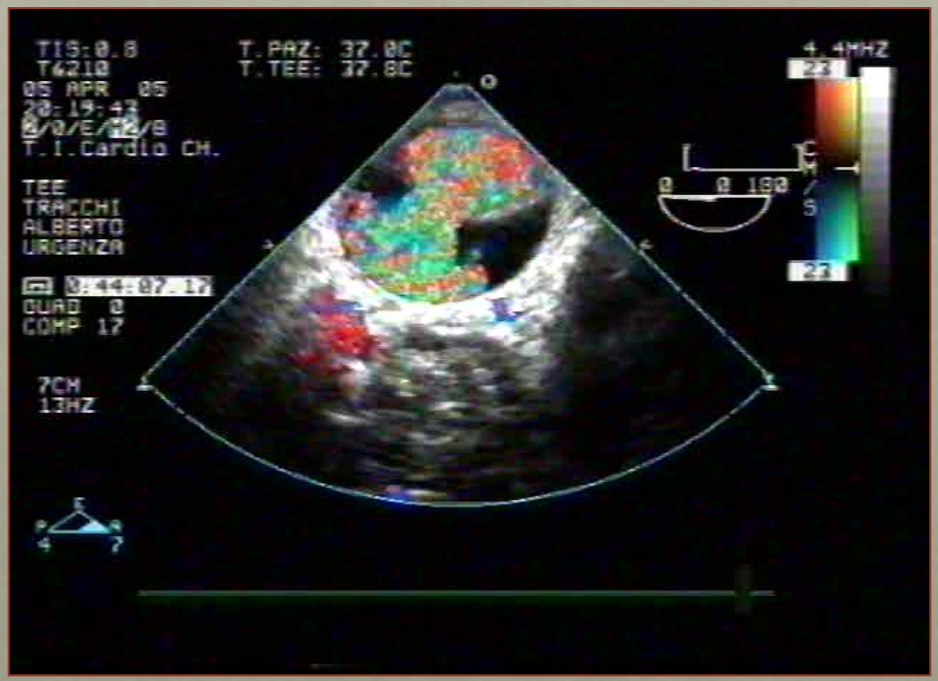


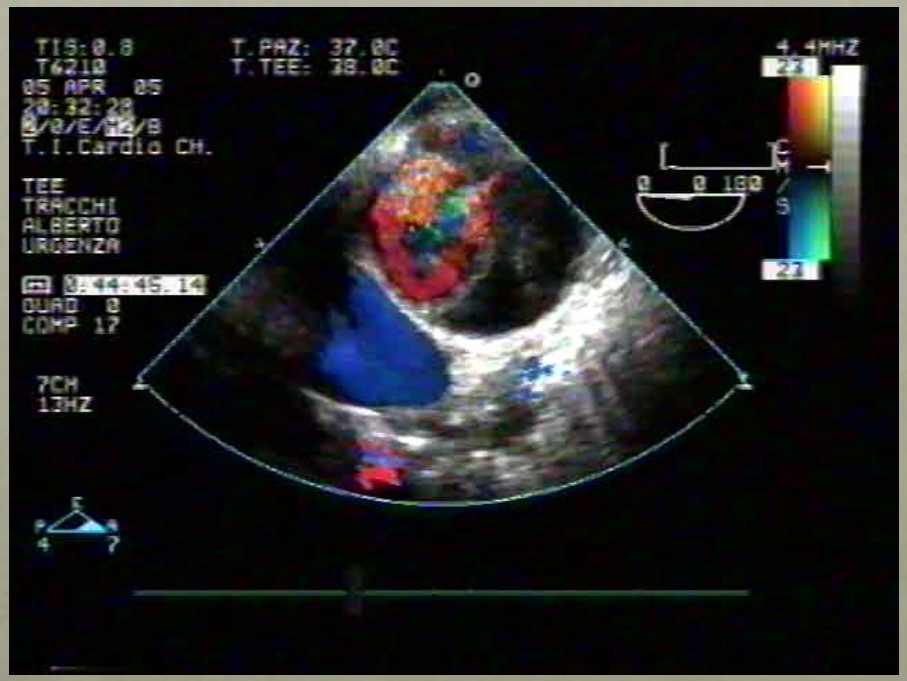
POSTOPERATIVE ANGIO CT SCAN



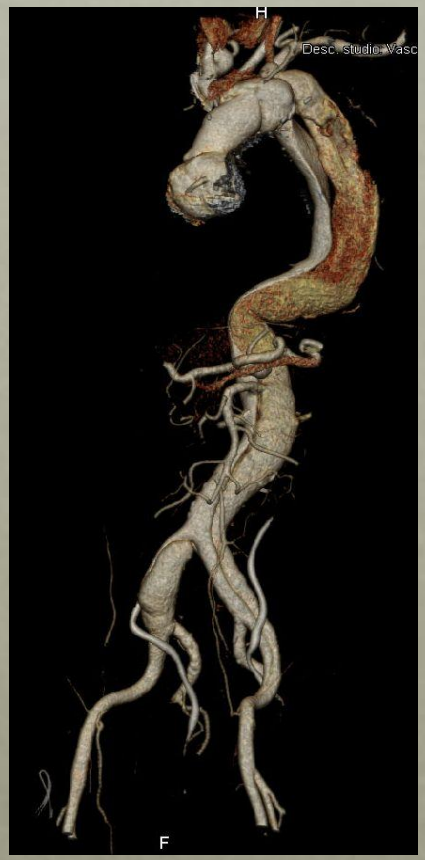
No resection of the Primary entry tear

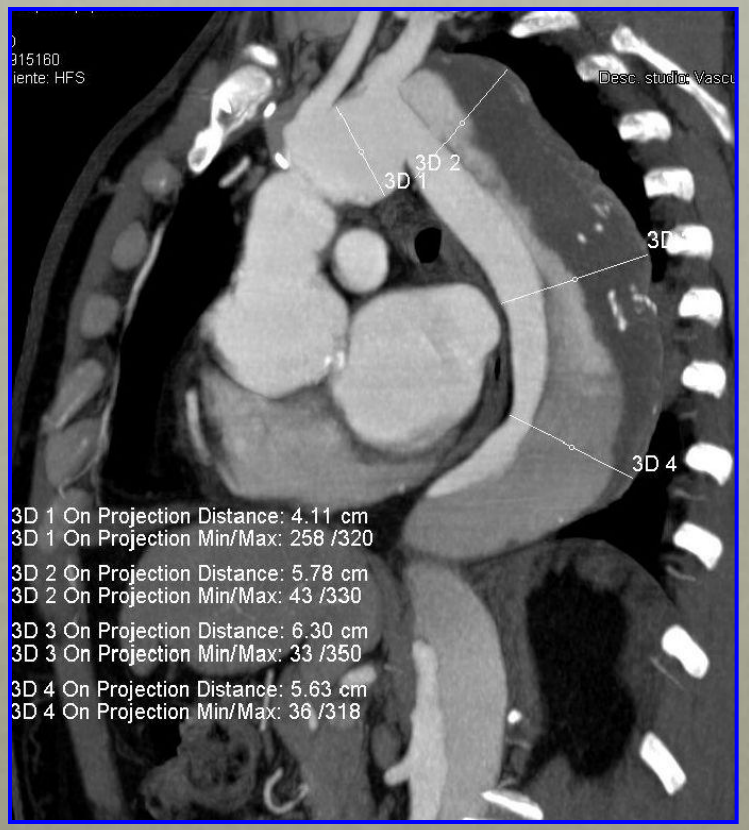
Perfusion of the aortic lumens



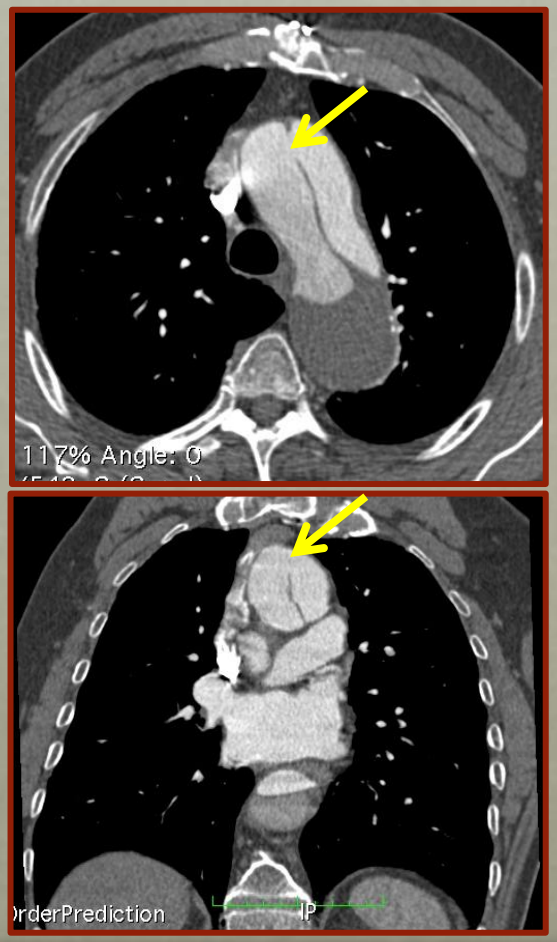


No resection of the Primary entry tear





No resection of the Primary entry tear



How to treat the arch?

Jotec Evita Open plus hybrid prosthesis

The Frozen elephant trunk technique

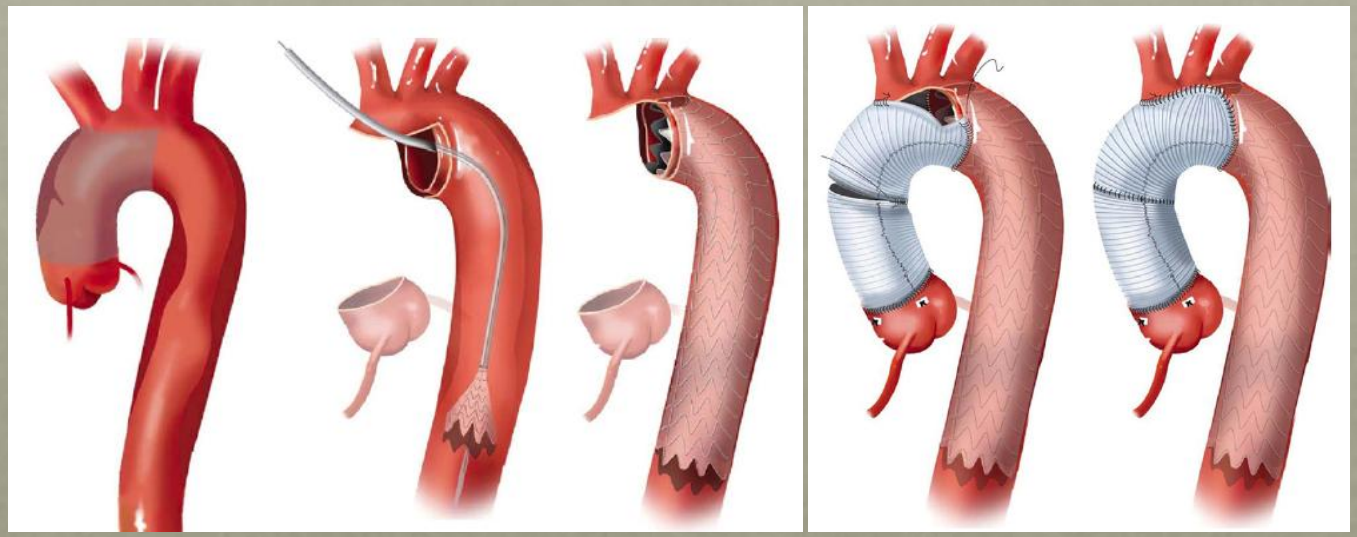
(FET)

How to treat the arch?

Hybrid approach:

The Frozen elephant trunk technique

Antegrade Thoracic Stent Grafting During Repair of Acute DeBakey I Dissection Prevents Development of Thoracoabdominal Aortic Aneurysms



Pochettino A. et al.

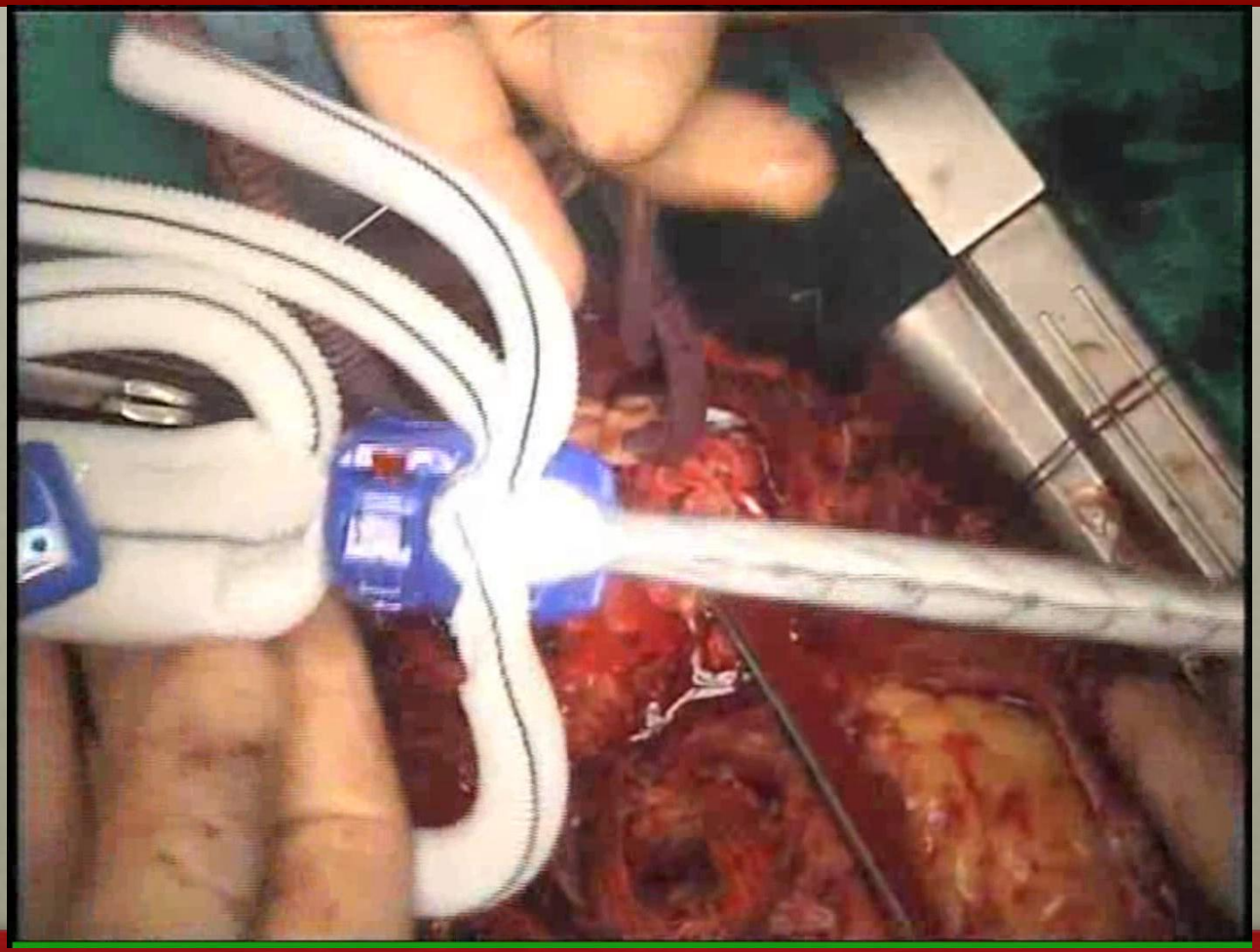
Ann Thorac Surg 2009

How to treat the arch?

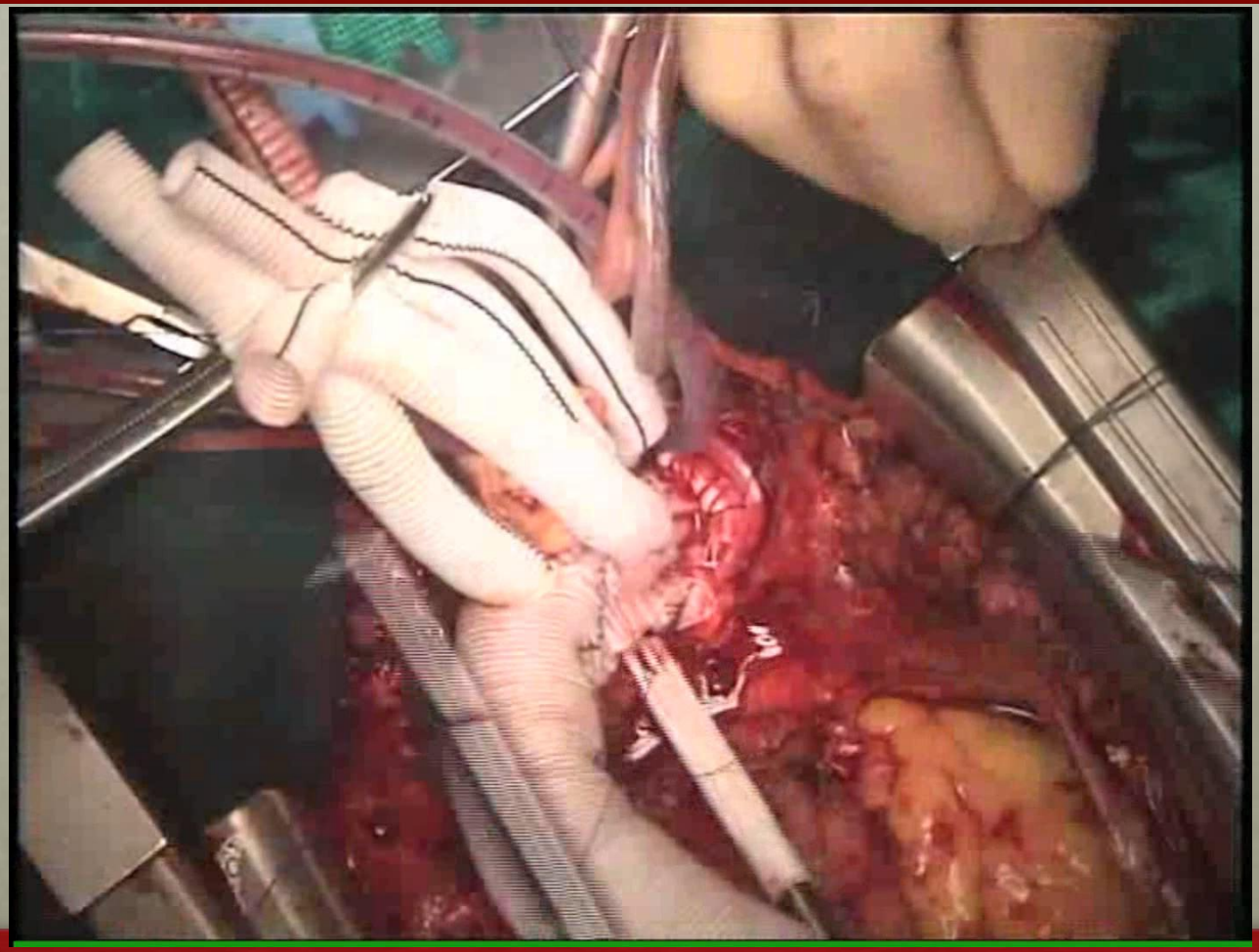
Vascutek Thoraflex hybrid prosthesis

The Frozen elephant trunk technique (FET)

The frozen elephant trunk

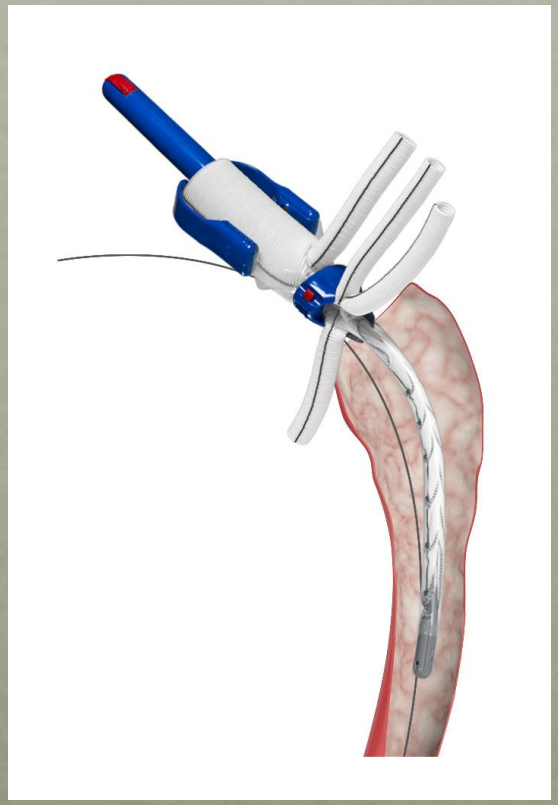


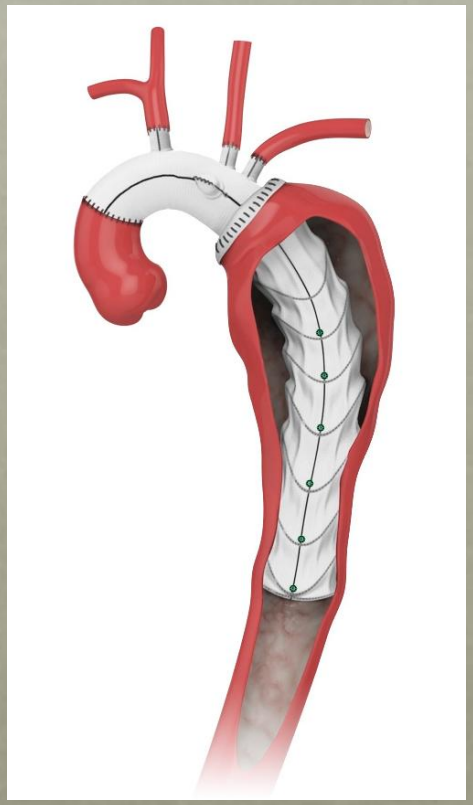
The frozen elephant trunk



Why The frozen elephant trunk?

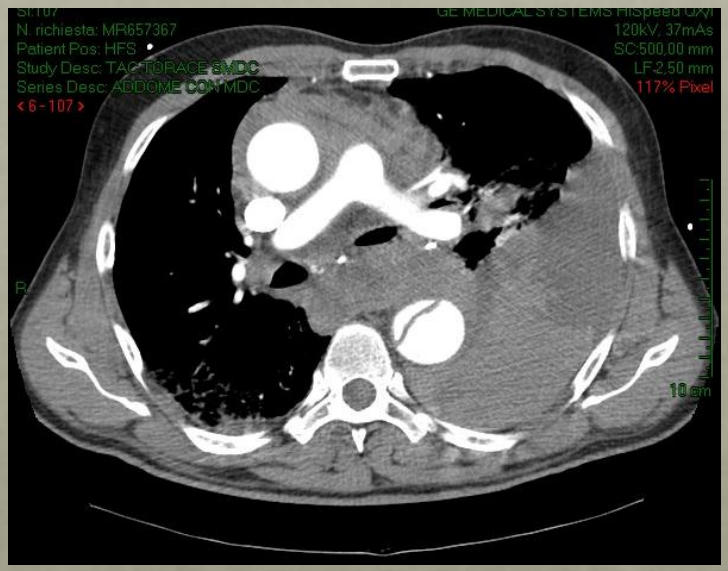
1. Improvement of distal anastomosis hemostas

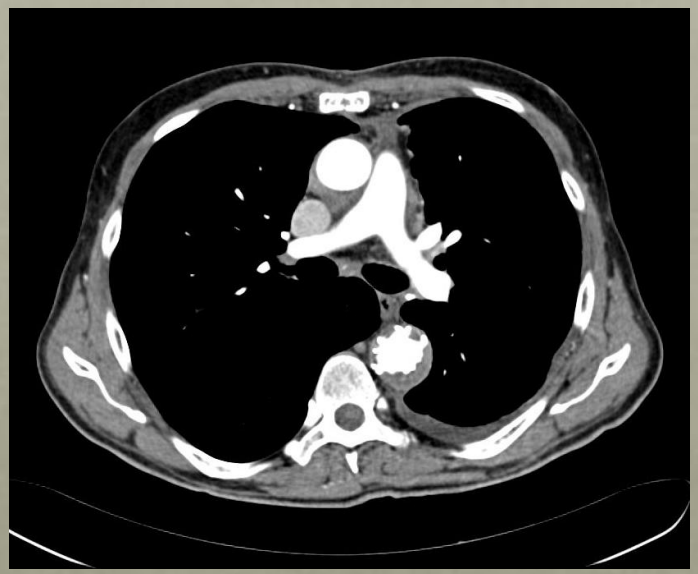




Why The frozen elephant trunk?

1. Improvement of distal anastomosis hemostas
2. Stabilization of the descending aorta



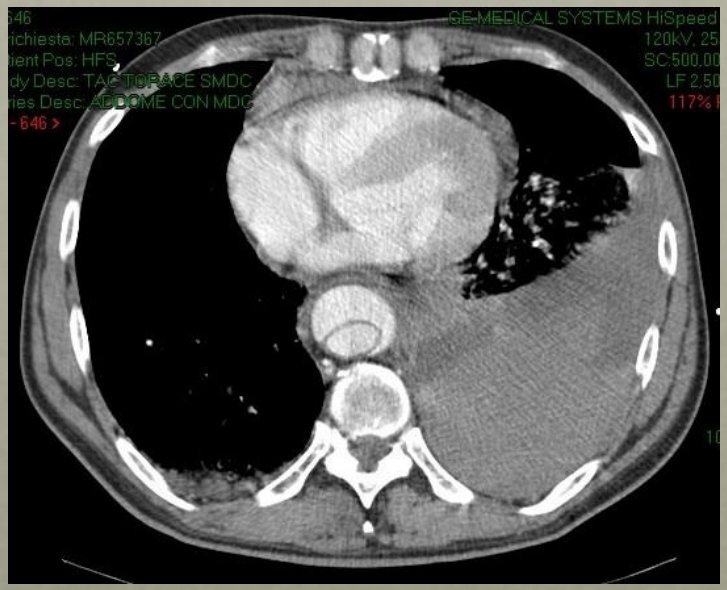


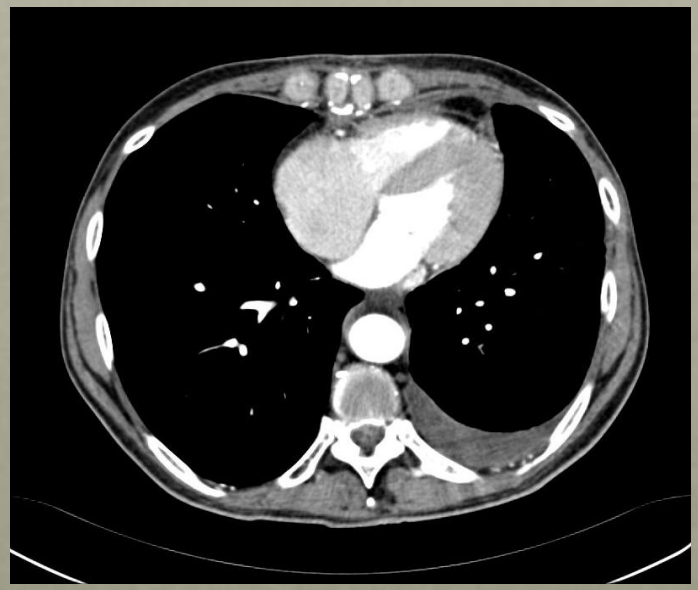
Preoperative

3 months after surgery

Why The frozen elephant trunk?

1. Improvement of distal anastomosis hemostas
2. Stabilization of the descending aorta
3. Re-expansion of the true lumen



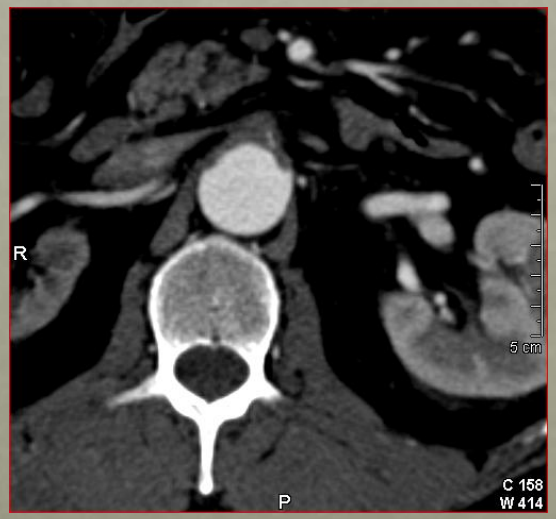


Preoperative

3 months after surgery

Why The frozen elephant trunk?

1. Improvement of distal anastomosis hemostas
2. Stabilization of the descending aorta
3. Re-expansion of the true lumen
4. Resolution of dynamic branch occlusion



Acute type A aortic dissection: significance of multiorgan malperfusion

Davide Pacini[a,*], Alessandro Leone[a], Laura Maria Beatrice Belotti[b], Daniela Fortuna[b], Davide Gabbieri[c], Claudio Zussa[d], Andrea Contini[e], and Roberto Di Bartolomeo[a] on behalf of RERIC (Emilia Romagna Cardiac Surgery Registry) Investigators[†]

AORTIC SURGERY

Overall in-hospital mortality: 105/502 pts (21%)

	MPS	No MPS	P value
Hospital mortality	43.7 %	13 %	<0.001

Multivariate analysis

	OR	CI	P value
Visceral malperfusion	9.5	2.4-37.4	0.0012
Coronary malperfusion	3.7	1.7-8.0	<0.0001
Shock	2.1	1.2-3.5	0.007

The Emilia-Romagna Registry of Acute Aortic

Pacini et al. EJCTS

doi:10.1093/ejcts/ezs500

Multicenter early experience with extended aortic repair in acute aortic dissection: Is simultaneous descending stent grafting justified?

Konstantinos Tsagakis, MD,[a] Davide Pacini, MD,[b] Roberto Di Bartolomeo, PhD,[b] Michael Gorlitzer, MD,[c] Gabriel Weiss, MD,[c] Martin Grabenwoger, PhD,[c] Carlos A. Mestres, PhD,[d] Jaroslav Benedik, MD,[a] Stepan Cerny, PhD,[e] and Heinz Jakob, PhD[a]

January 2005 – January 2010

Results

- 158 pts with Aortic Dissection
  - **68 pts acute dissection**
- In-hospital mortality: 13%
- Thoracic false lumen thrombosis 94%

Institutions

- Essen, Germany
- Bologna, Italy
- Wien/Hietzing, Austria
- Prague, Czech Republic
- Barcelona, Spain

J Thorac Cardiovasc Surg 2010;140:S116-20

Why The frozen elephant trunk?

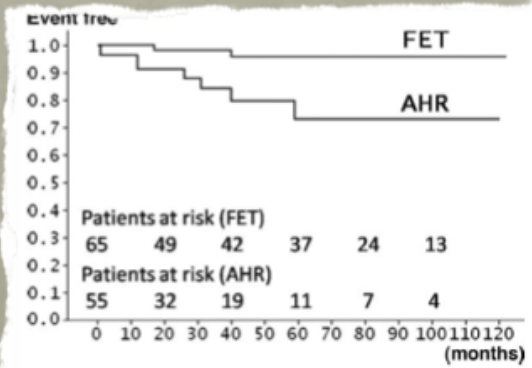


Fig 4. The aortic event rate of events affecting the thoracic aorta over 5 years showed a significant difference between the frozen elephant trunk (FET) and the ascending aortic or hemiarch replacement (AHR) groups (95.7% versus 73.0%, p = 0.01).

Operative Strategy for Acute Type A Aortic Dissection: Ascending Aortic or Hemiarch Versus Total Arch Replacement With Frozen Elephant Trunk

Naomichi Uchida, MD, Hidenori Shibamura, MD, Akira Katayama, MD, Norimitsu Shimada, MD, Miwa Sutoh, MD, and Hiroshi Ishihara, MD

Division of Cardiovascular Surgery, Hiroshima-city Asa General Hospital, and Kajikawa Private Hospital, Hiroshima, Japan

Background. This report compares long-term results with total arch replacement with frozen elephant trunk (FET) to ascending aortic or hemiarch replacement (AHR) for acute type A aortic dissection.

Methods. The subjects were 120 cons ncluding 65 who received FET and 55 w cute type A aortic dissection from 1997 esults after surgery were retrospective ween the FET and ARH groups.

Results. Three patients in the FET group died, and 2 atients in the AHR group died. In long-term follow-up mean, 67 months), the survival rate after 5 years was 95.3% for the FET group and 69.0% for the AHR group ($p = 0.03$). The event rate for the thoracic aorta after 5 years showed a significant difference between the FET and AHR groups (95.7% versus 73.0%, $p = 0.01$). A false was patent in 16 was thrombosed ype A aortic dis- ve primary repair safety. FET may reduce the necessity for further operations to manage a residual false lumen.

Conclusions. In patients with acute type A aortic dissection, it is possible to perform extensive primary repair using the FET technique with relative safety. FET may reduce the necessity for further operations to manage a residual false lumen.

(Ann Thorac Surg 2009;87:773–7)

CONCLUSIONS

- Ascending aortic replacement and hemiarch remains the treatment of choice in the majority of the patients.

- Aortic arch replacement is necessary when the primary intimal tear is located into the arch or if the arch is aneurysmatic or ruptured in order to improve early and late results in term of survival and need of reoperation.

CONCLUSIONS

- The frozen elephant trunk technique represents a feasible and promising option allowing arch repair and descending aorta stabilization.

- The frozen elephant trunk can reduce the need of further distal aortic repair.

Thank you