

STS/EACTS Latin America Cardiovascular Surgery Conference

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CHRONIC TYPE B DISECCTION TEVAR Vs OSR

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The Society
of Thoracic
Surgeons

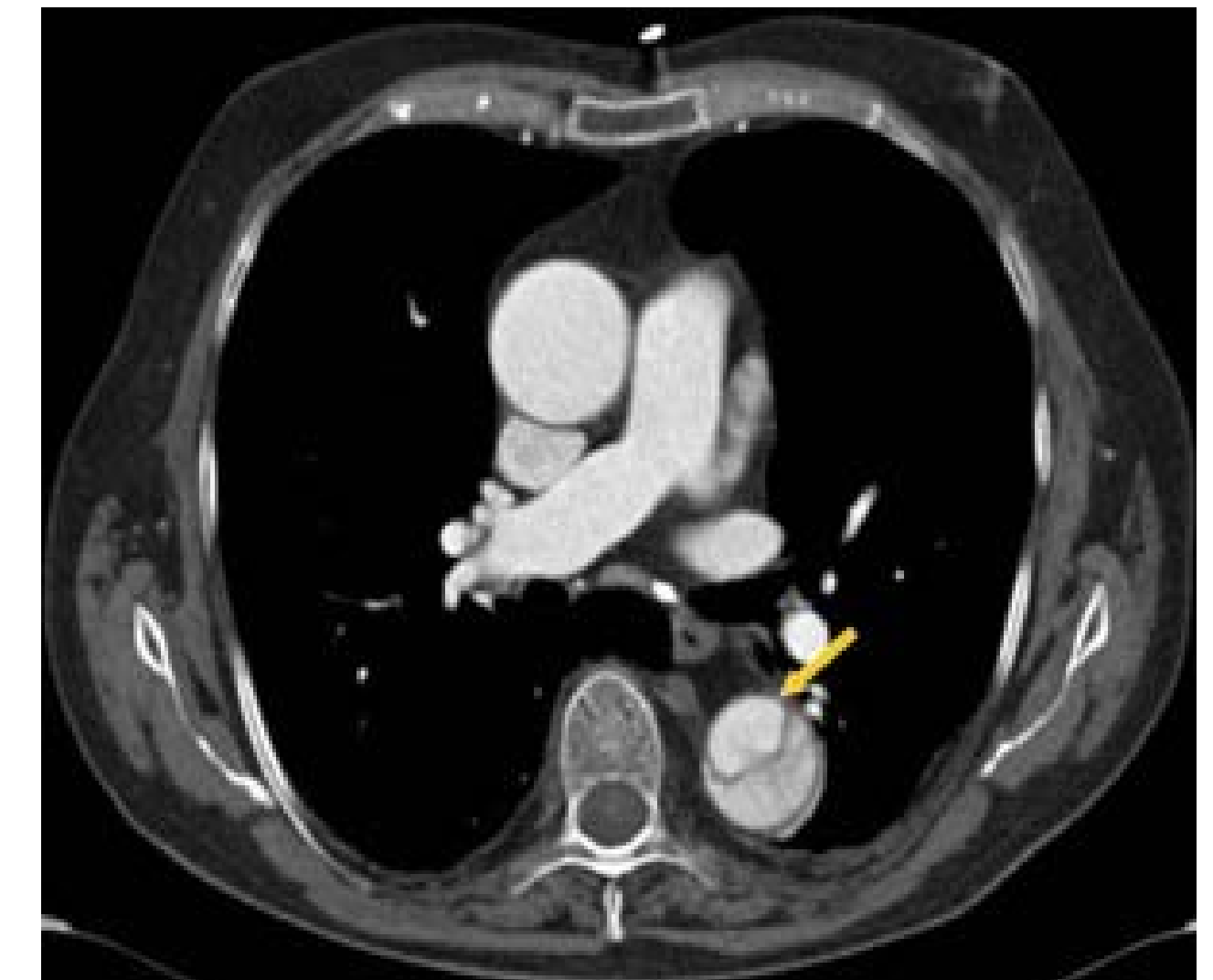
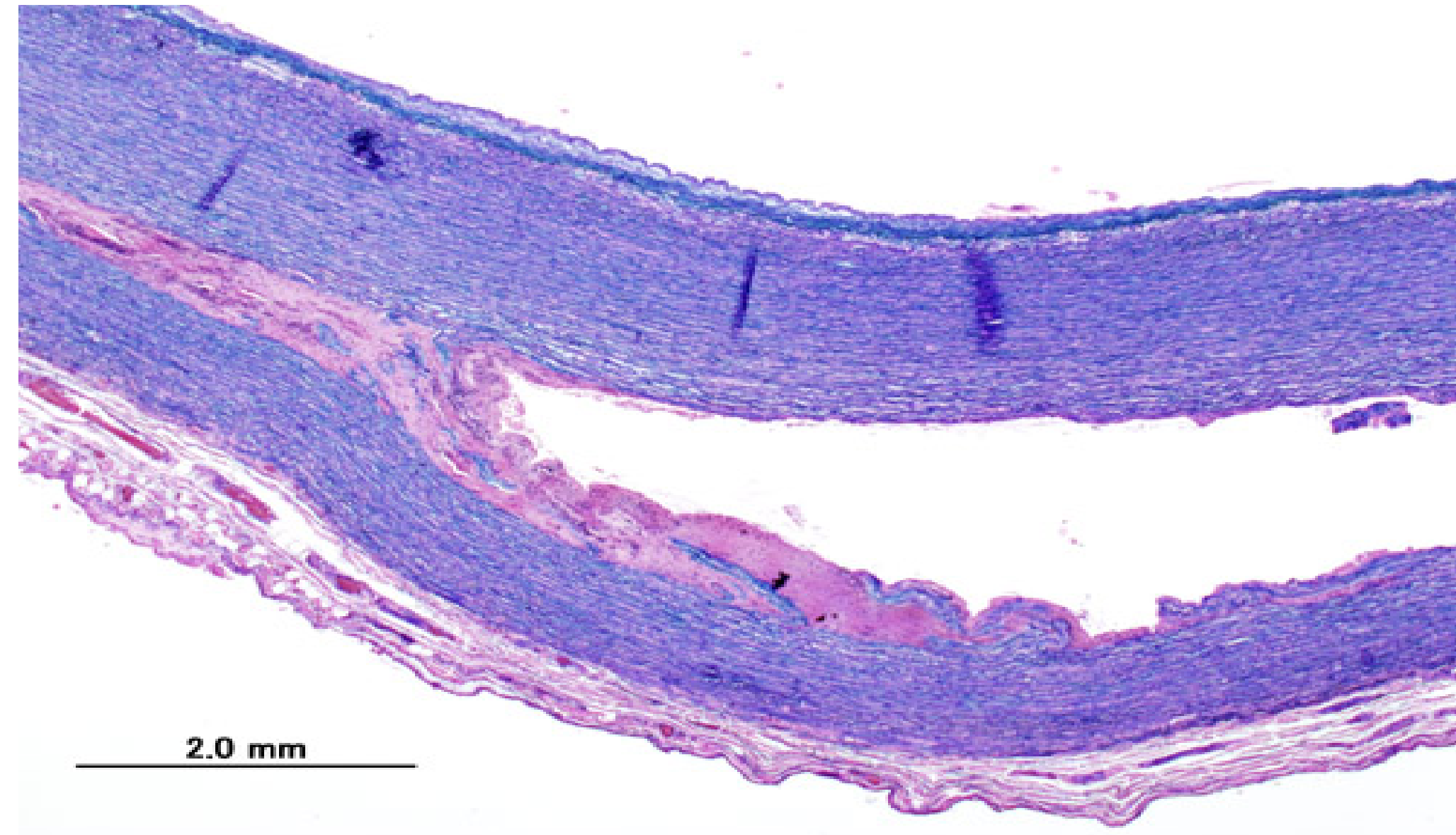
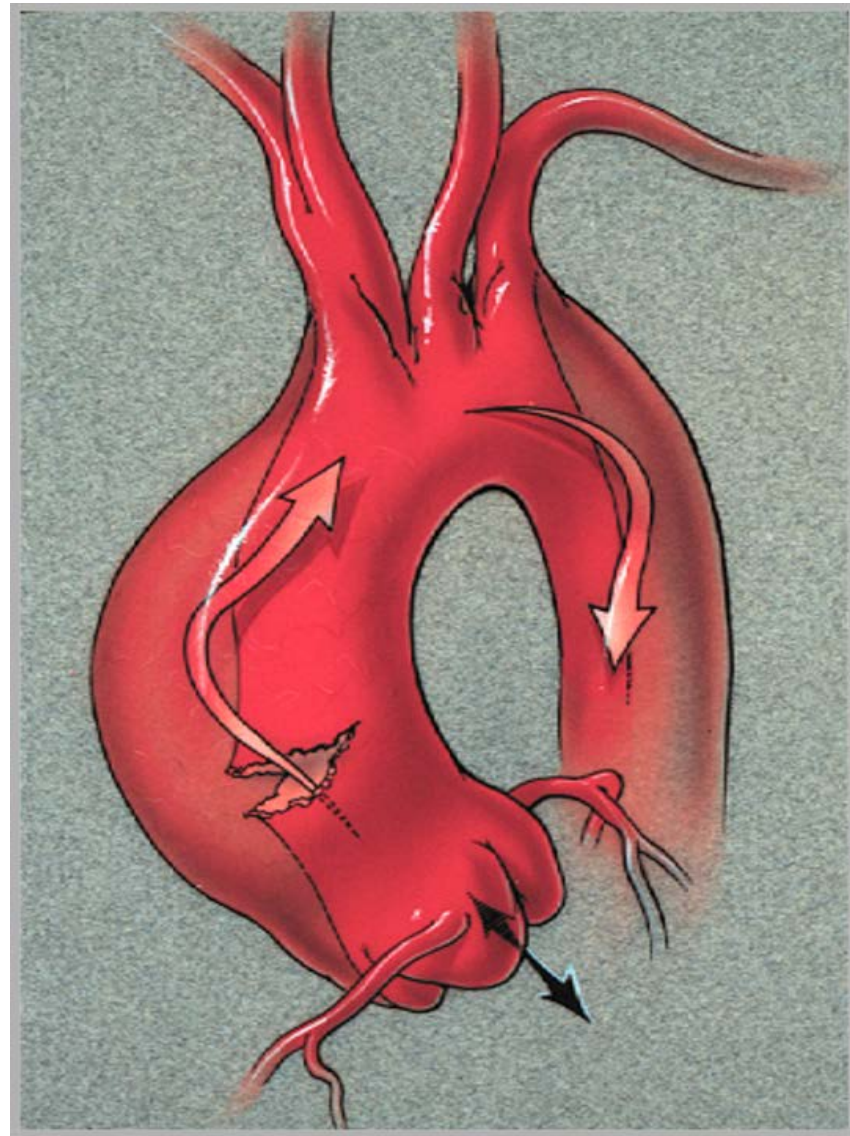


EACTS
European Association For Cardio-Thoracic Surgery

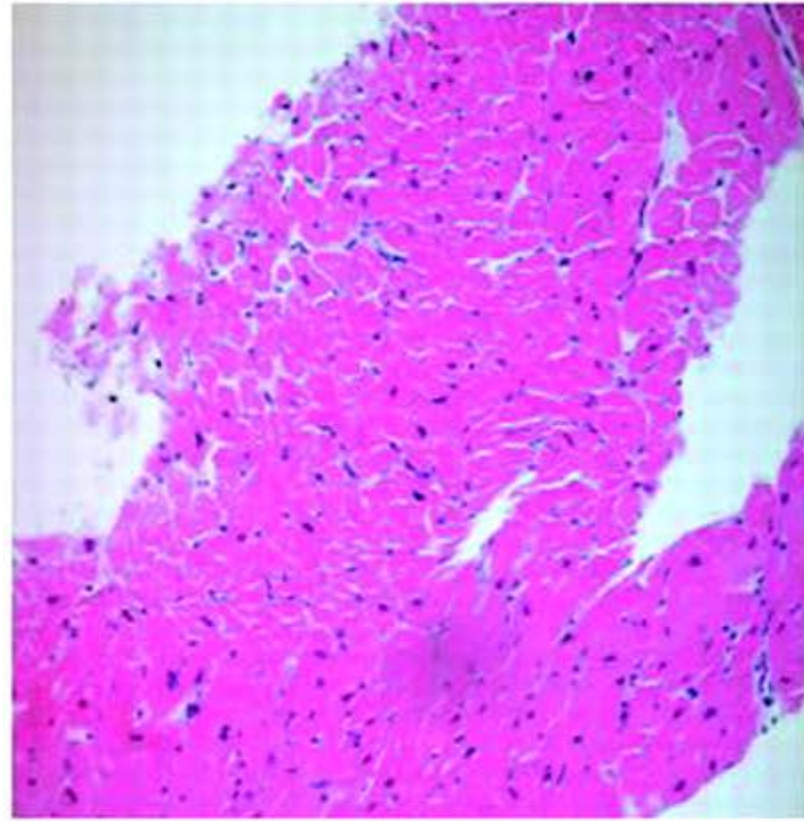


- NO DISCLOSURES

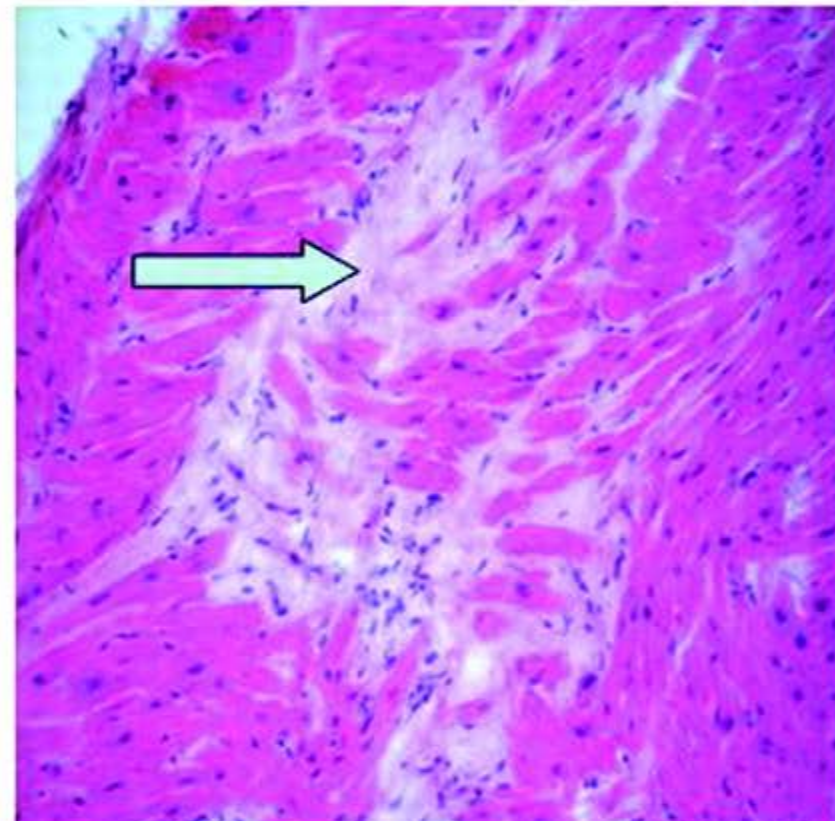
Acute Aortic Dissection..



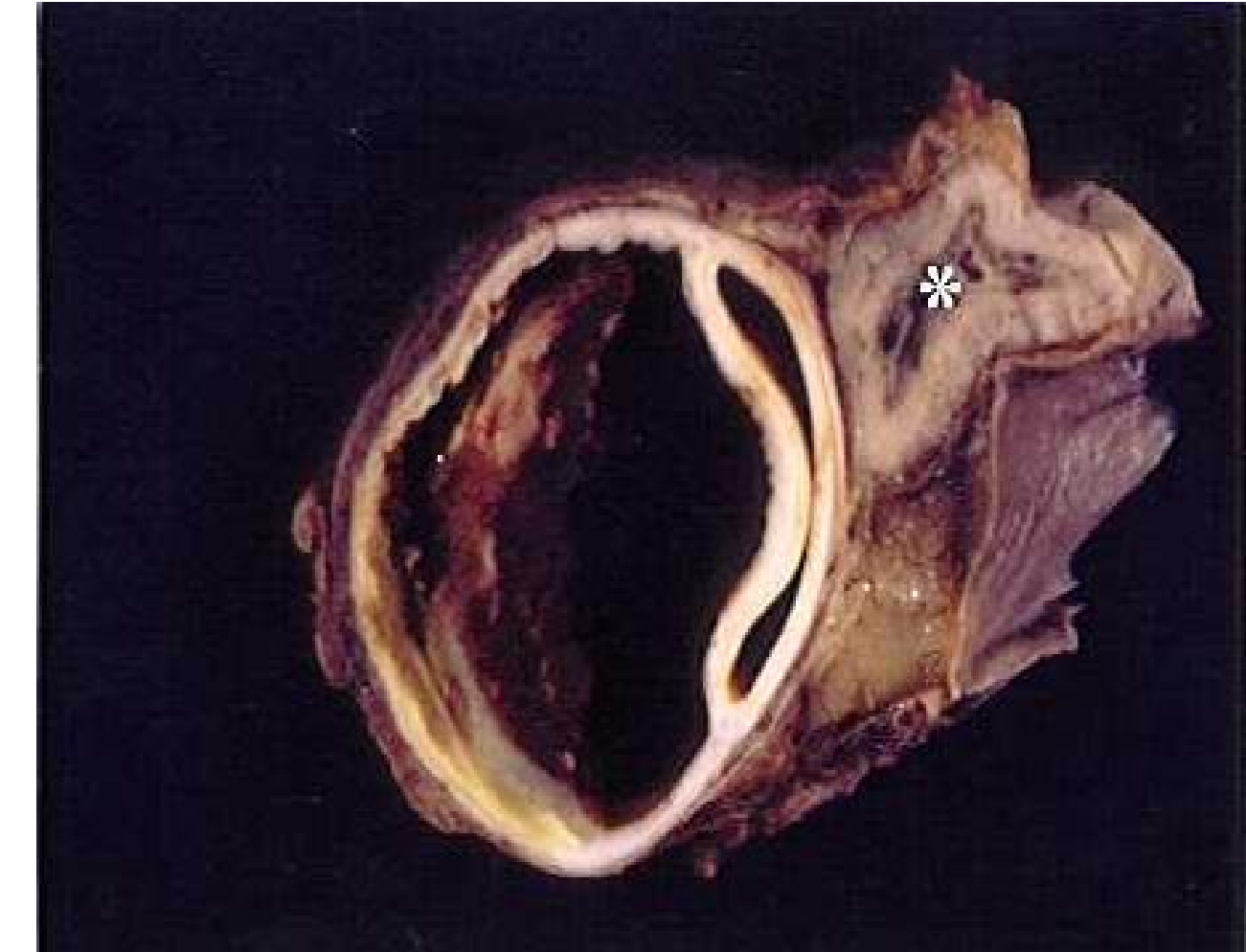
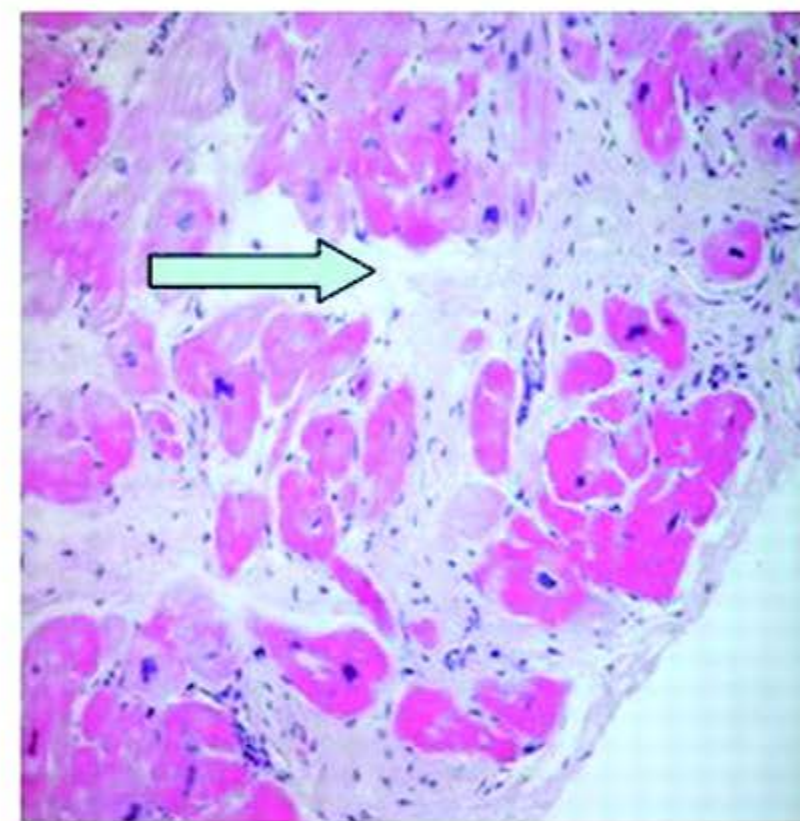
No Fibrosis



Mild Fibrosis



Severe Fibrosis



- Aortic healing process:
 - Variable among patients
 - Congenital tissue disorders
 - Size of the PIT.
 - Efficacy of medical treatment.



- We need better diagnostic tools that correlate images with the individual healing process.

Classification.

- Acute / Chronic

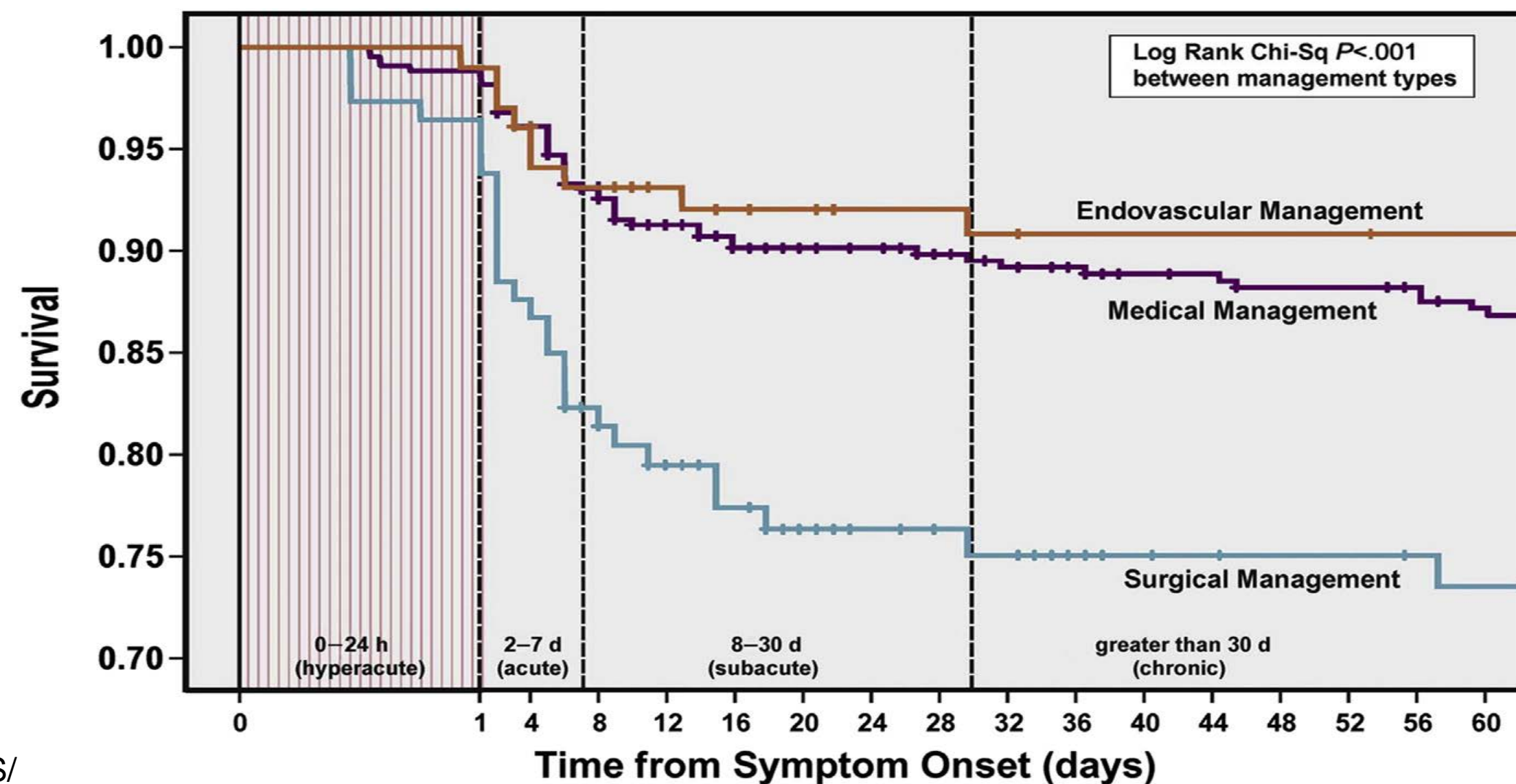


Hirst AE, Johns VJ, Kime SW. Dissecting aneurysm of the aorta: a review of 505 cases. *Medicine (Baltimore)* 1958;37(3):217-79.

- IRAD Classification



Booher AM, Isselbacher EM, Nienaber CA, et al. The IRAD classification system for characterizing survival after aortic dissection. *Am J Med* 2013; 126(8):730.e19-24.



Data analysis

Endovascular Repair of Type B Aortic Dissection Long-term Results of the Randomized Investigation of Stent Grafts in Aortic Dissection Trial

Christoph A. Nienaber, MD, PhD; Stephan Kische, MD; Hervé Rousseau, MD, PhD;
Holger Eggebrecht, MD; Tim C. Rehders, MD; Guenther Kundt, MD, PhD; Aenne Glass, MA;
Dierk Scheinert, MD, PhD; Martin Czerny, MD, PhD; Tilo Kleinfeldt, MD;
Burkhard Zipfel, MD; Louis Labrousse, MD; Rossella Fattori, MD, PhD; Hüseyin Ince, MD, PhD;
for the INSTEAD-XL trial

Circ Cardiovasc Interv. 2013;6:407-416;

The results of stent graft versus medication therapy for chronic type B dissection

Xin Jia, MD,^a Wei Guo, MD,^a Tian-xiao Li, MD,^b Sheng Guan, MD,^c Rui-min Yang, MD,^d
Xiao-ping Liu, MD,^a Min-hong Zhang, MD,^a and Jiang Xiong, MD,^a *Beijing, Zhengzhou,
and Xinxiang, China*

J Vasc Surg 2013;57:406-14.)

Long-Term Survival After Open Repair of Chronic Distal Aortic Dissection

Stefano Zoli, MD, Christian D. Etz, MD, PhD, Fabian Roder, MS,
Christoph S. Mueller, MS, Robert M. Brenner, MS, Carol A. Bodian, DrPH,
Gabriele Di Luozzo, MD, and Randall B. Griepp, MD

Departments of Cardiothoracic Surgery and Anesthesiology, Mount Sinai School of Medicine, New York, New York

Ann Thorac Surg
2010;89:1458-66

11 Weeks

23 days

2.1 years

TIME SYMPTOMS TO INTERVENTION

We might correlate timing with diagnostic images and pathology changes for a better understanding of chronic dissections.

Chronic Type B.

- Optimal Treatment should prevent late death related with the aorta.
 - Best MT- 20-50% will have distal complications , growth / rupture.
 - Aortic rupture up to 20% at 4 years

The term “ UNCOMPLICATED CTBD” is correct?

Hiratzka,etal, Circulation 2010;121:e266-369

Miyahara, et al. J Thorac Cardiovasc Durg. 2011;142:e25-31

Umana JP,et al. Ann Thorac Surg 2002;74(5):S1840-1843.

Uncomplicated CTBD. (Prophylactic TEVAR)

- PIT closure induce FL thrombosis, aortic remodeling, prevent expansion and rupture.
 - Subacute, (INSTEAD XL)

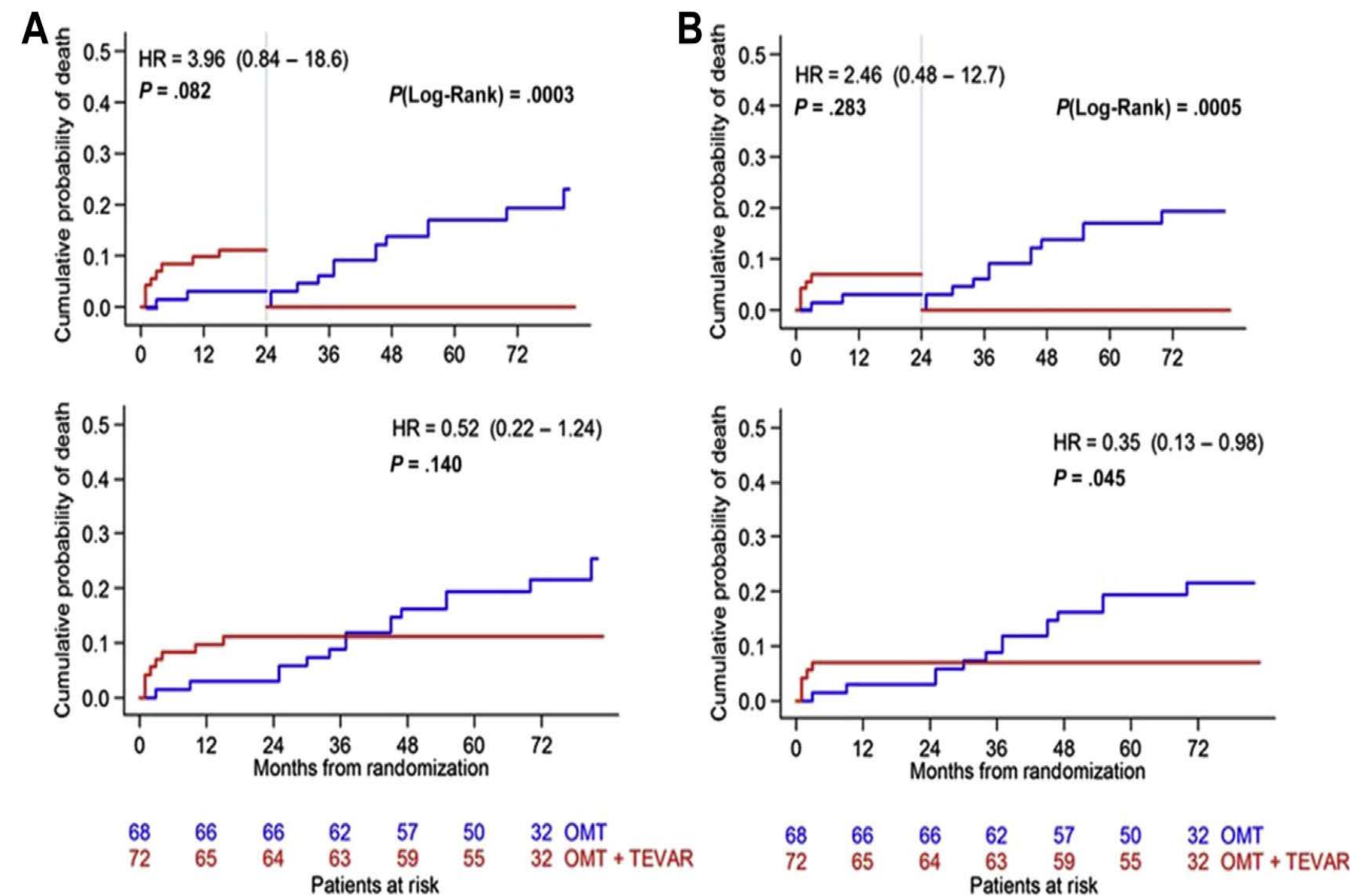
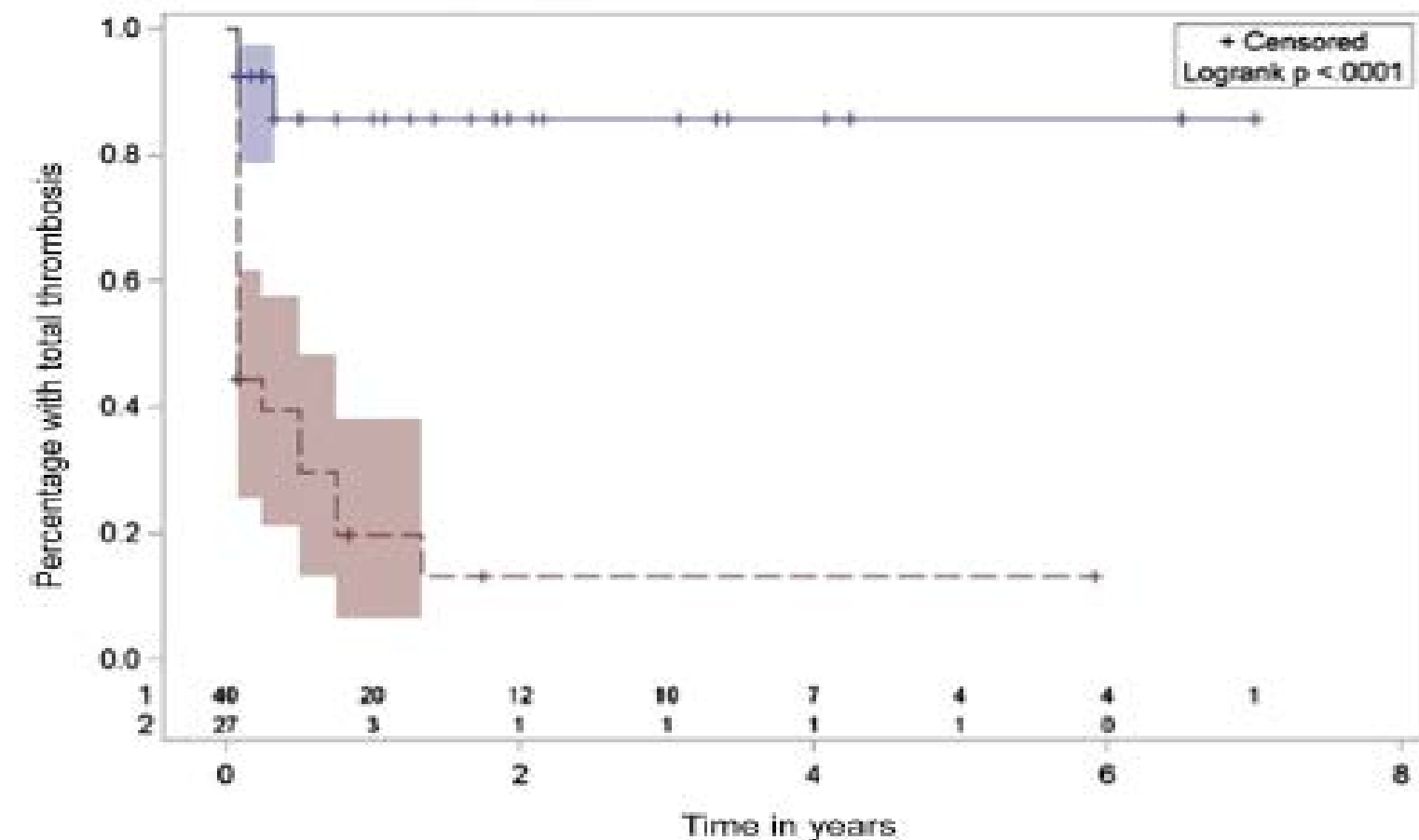


Table 5. Aortic Morphology at 5 Years

| | OMT | OMT+TEVAR | P Value |
|---------------------------------------|---------------|---------------|---------|
| FL thrombosis | 11/50 (22.0%) | 48/53 (90.6%) | <0.0001 |
| Partial FL/no FL thrombosis | 39/50 (78.0%) | 5/53 (9.4%) | <0.0001 |
| Remodeling of thoracic aorta* | 5/50 (10.0%) | 42/53 (79.2%) | <0.0001 |
| Critical expansion of thoracic aorta† | 33/50 (66.0%) | 11/53 (20.8%) | <0.0001 |

Uncomplicated CTBD. (Prophylactic TEVAR)

- Complete FL thrombosis is not consistent in CTBD



- 78% if only descending aorta is affected
- 13% more distal and thoracoabdominal extension.
- Aortic diameter at the diaphragm is a major prognosis factor .

Kang, et al, J Thorac Cardiovasc Surg 2011;142:1074-83

- Retrograde aortic dissection.

- Systematic Review de 1010 patients TEVAR
- 1.6% R.D. For all patients and 3.6% in dissection
- Acute dissection OR 10.0 and Chronic 3.4

Canaud, et al. Ann Surg 2014;260:389-95

Prophylactic TEVAR might not induce aortic remodeling in chronic cases and can be harmful for the patient

Uncomplicated CTBD

Factors associated with poor outcomes.

- Hypertension , Persistent Pain. OR 3.3 (IRAD)
- Aortic diameter > 4cm
- FL > 22mm,
- Partial FL thrombosis
- PIT > 1cm , or 5cm close to left subclavian

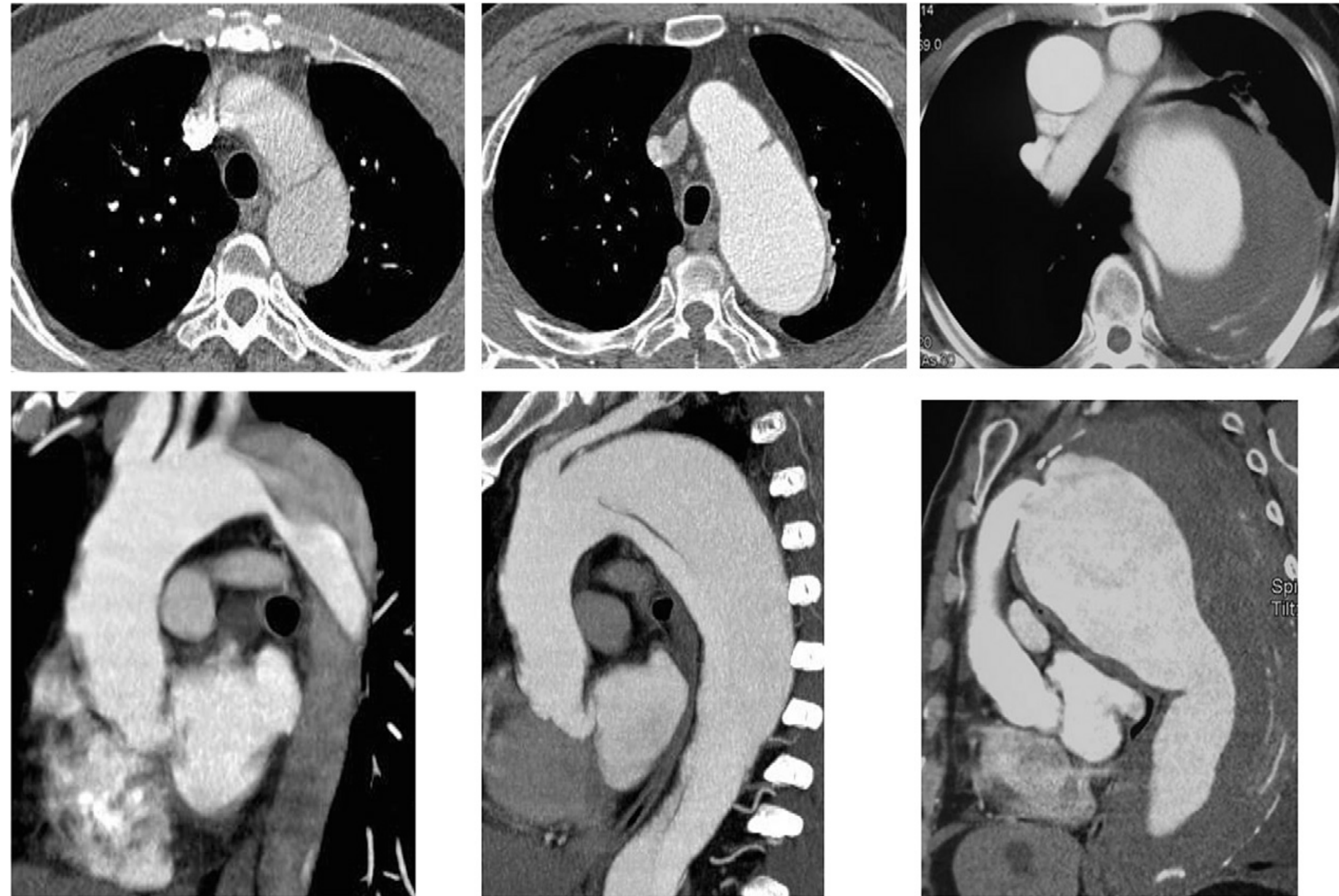
Parsa, et al. J Thor Cardio Surg 2006;54:477-482
Jonker FH. et al. Ann Thorac Surg 2012;94:1223-1229
Kato, et al. Circulation 1995;92 (9 suppl):II107-II112.
Tsai, et al. N Engl J Med 2007; 357:349-359

TIMING FOR INTERVENTION

- Subacute phase . (Virtue/ Stable)

VIRTUE. Eur J Vasc Edovasc Surg 2014;48(4):363-71
Lombardi, et al. J Vasc Surg 2014;59(6):1544-54

CTBD. Associated with Aneurysm



HARD CASES TO ANY INTERVENTION

- Flap thickened
- Multiple Lumens
- Mature entry tears
- Severe angulation
- Thrombous
- Visceral branches originated from different Lumens
- Narrow TL

CTBD. Open surgery Contemporary Results

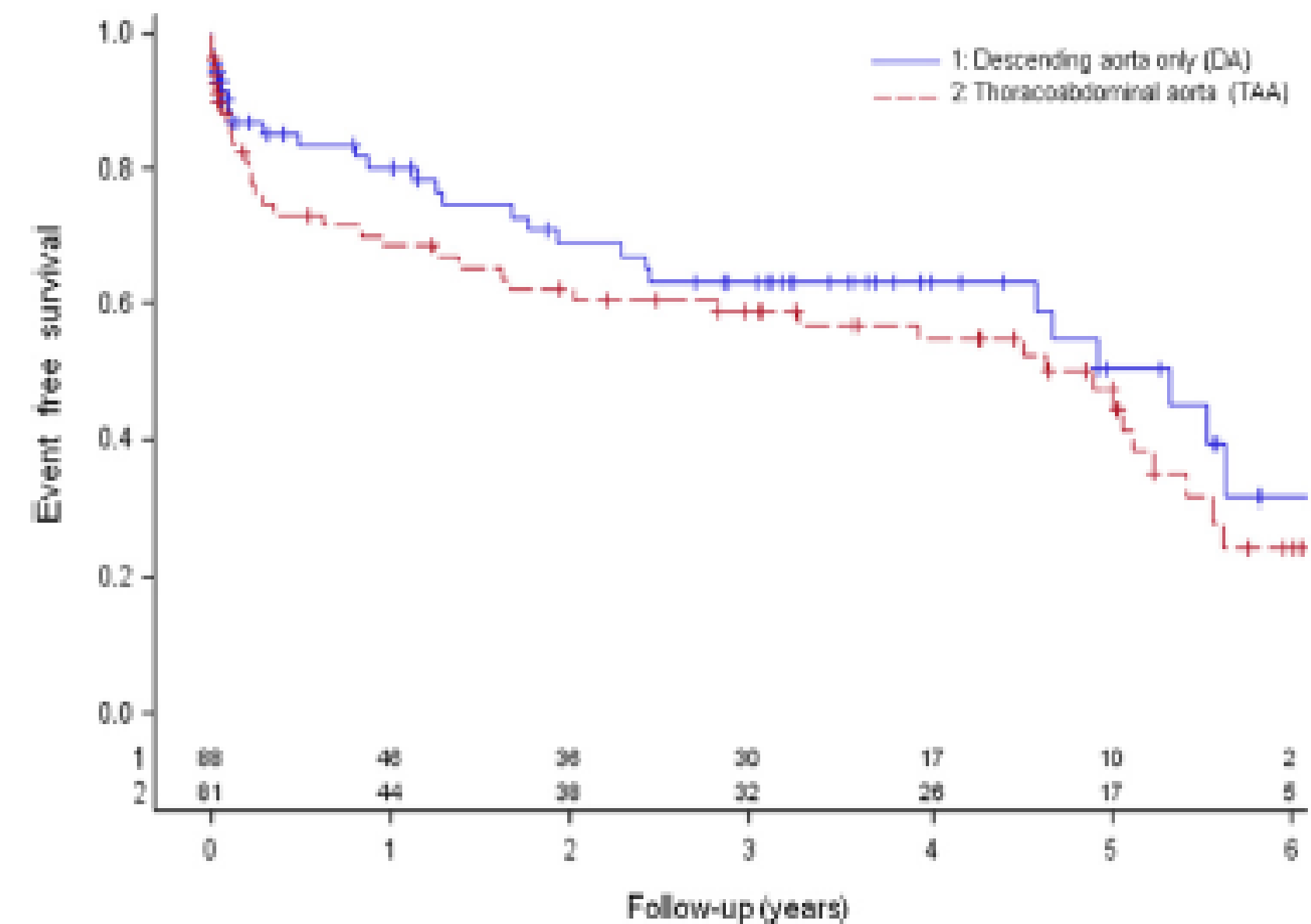
Open surgical repair for chronic type B aortic dissection: a systematic review

David H. Tian¹, Ramesh P. De Silva¹, Tom Wang¹, Tristan D. Yan^{1,2}

| | |
|---------------------|-------|
| Stroke | 7.5% |
| SCI | 5.1% |
| RF | 8.1% |
| Mortality | 7.5% |
| Late Reintervention | 11.3% |

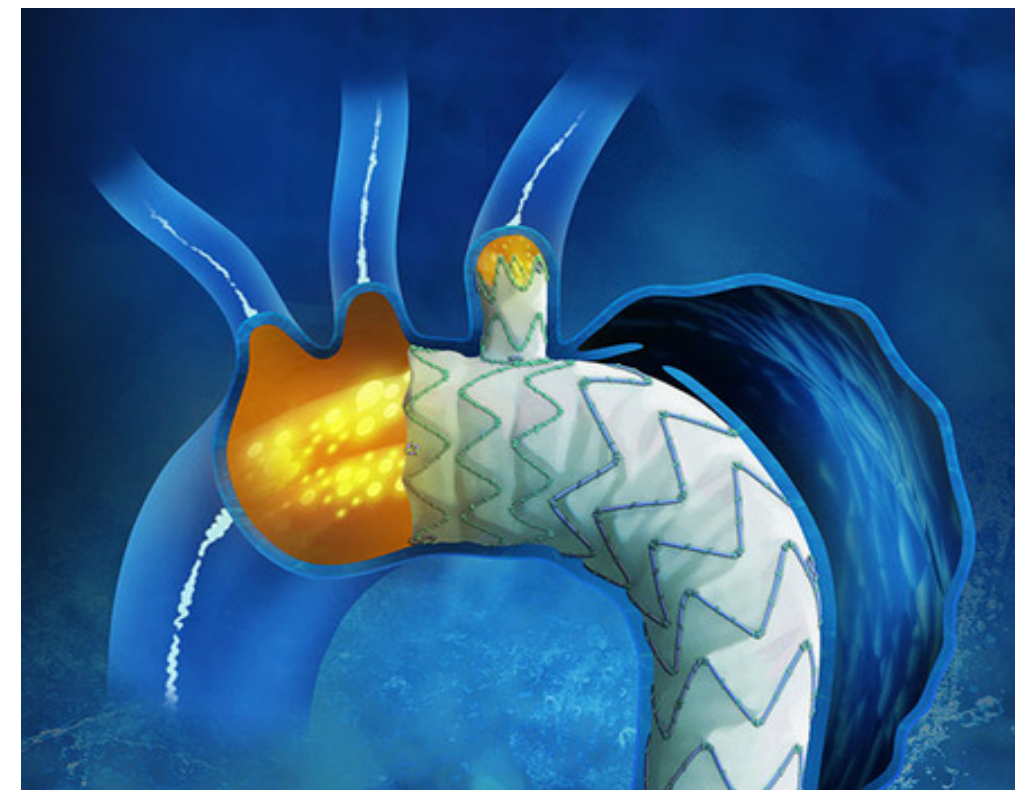
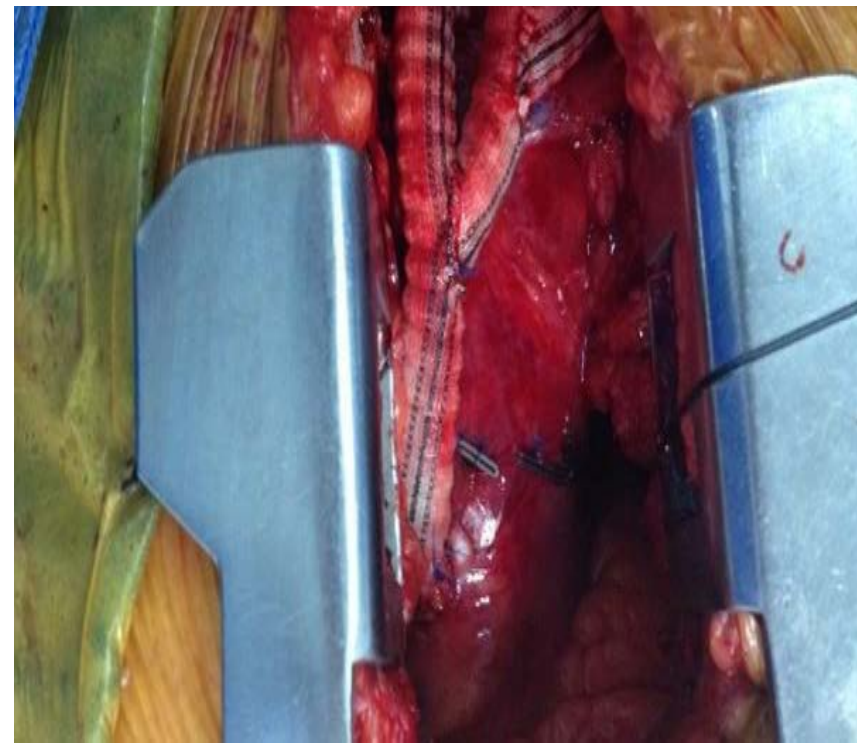
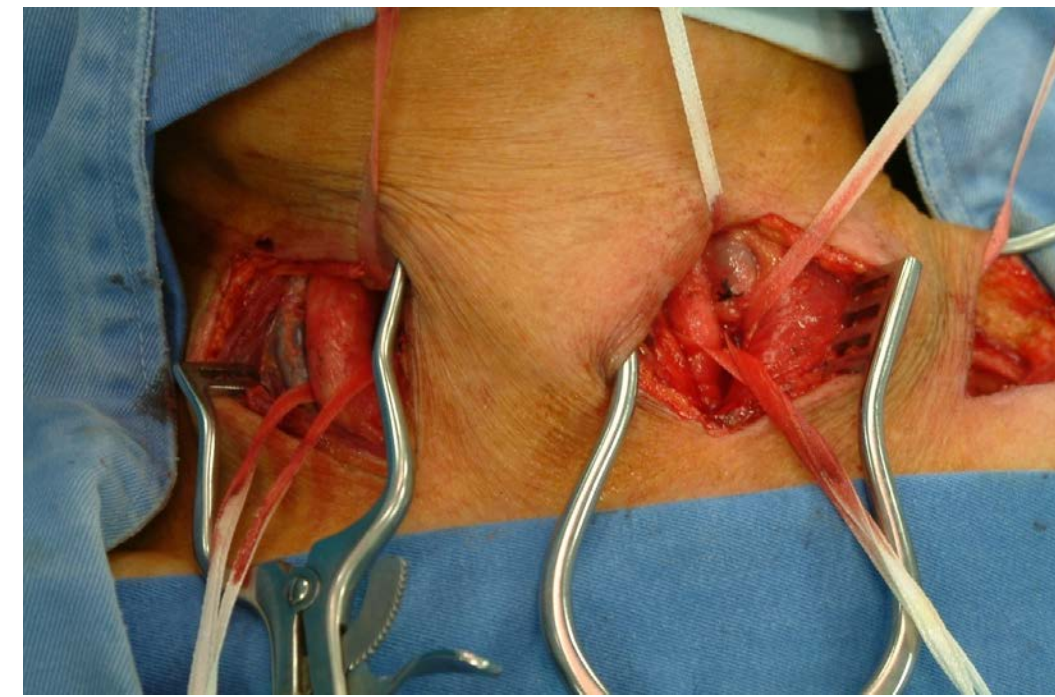
Annals of cardiothoracic surgery, Vol 3, No 4 July 2014

- All Retrospective studies,
- Weak level of evidence



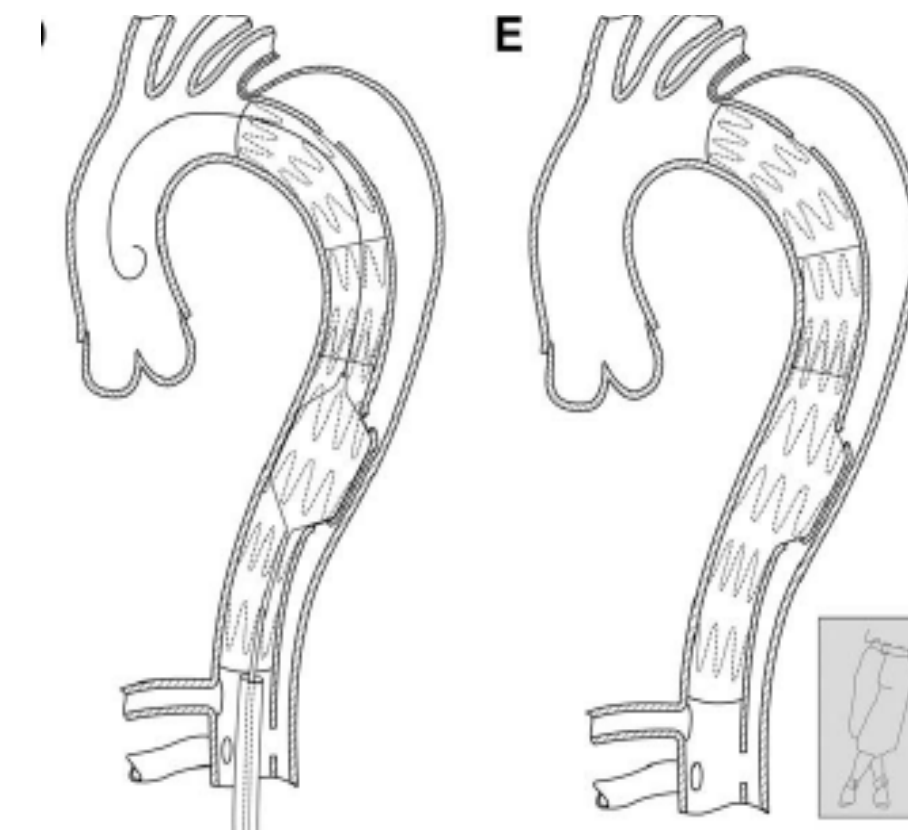
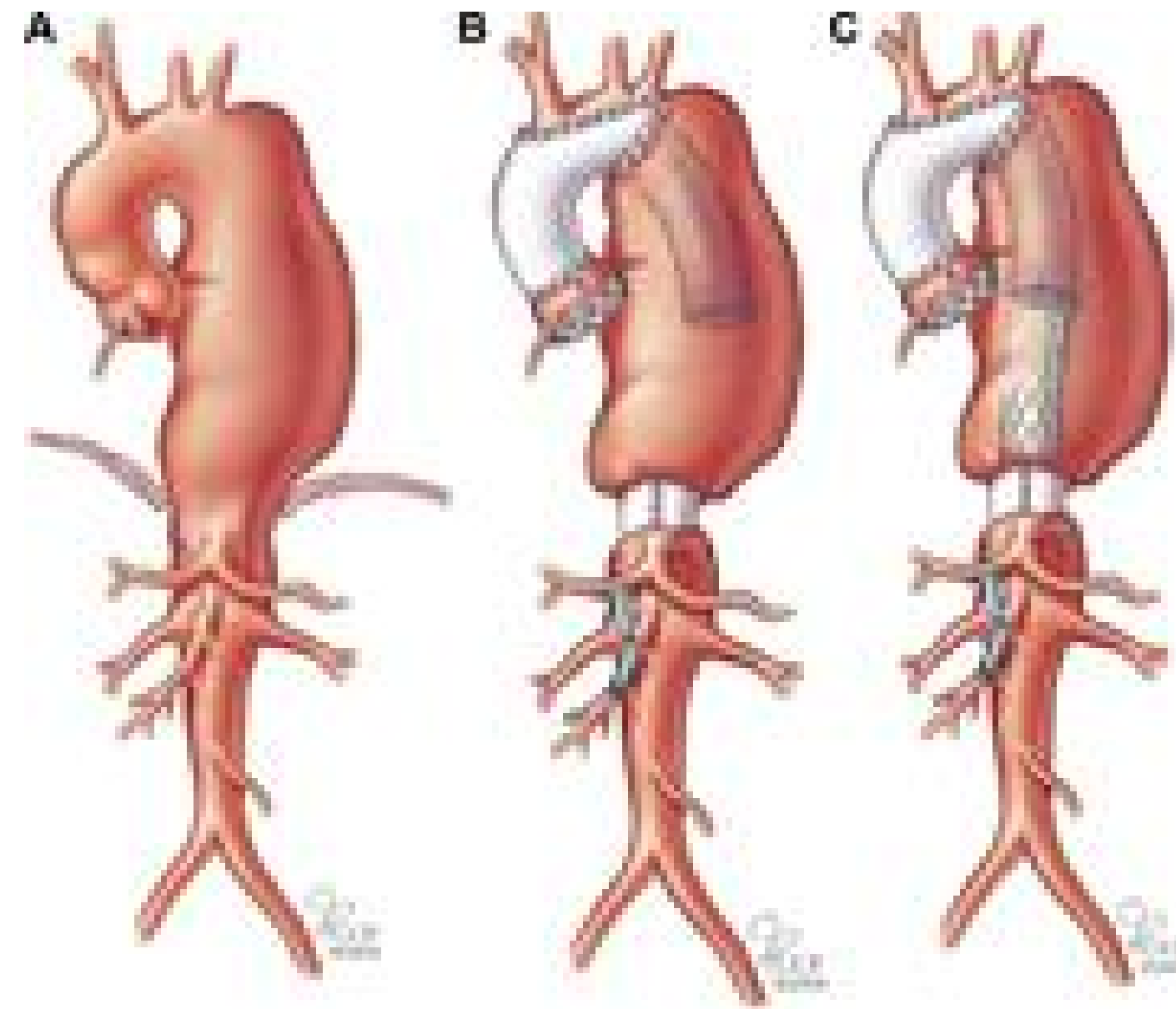
Pujara, et al. J Thorac Cardiovasc Surg 2012;144:866-73

Endovascular Therapy for CTBD Proximal Landing Zone

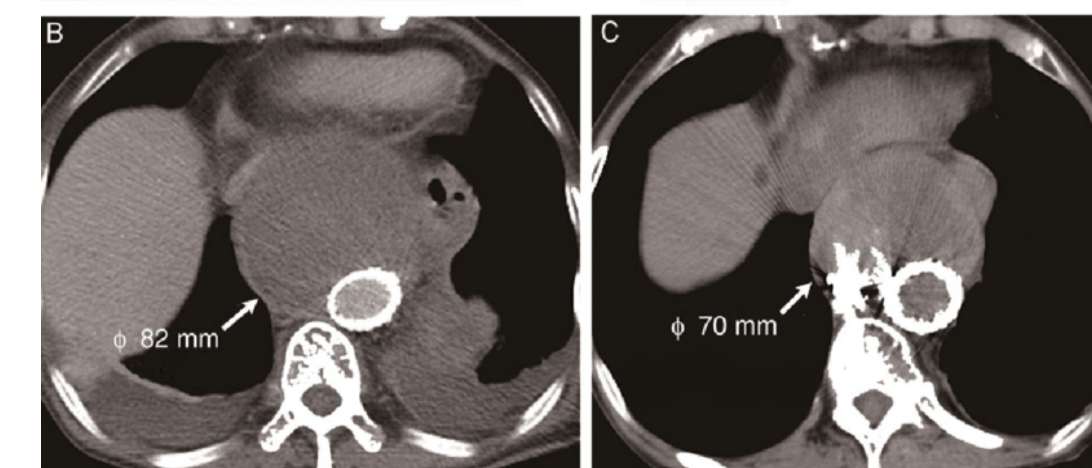
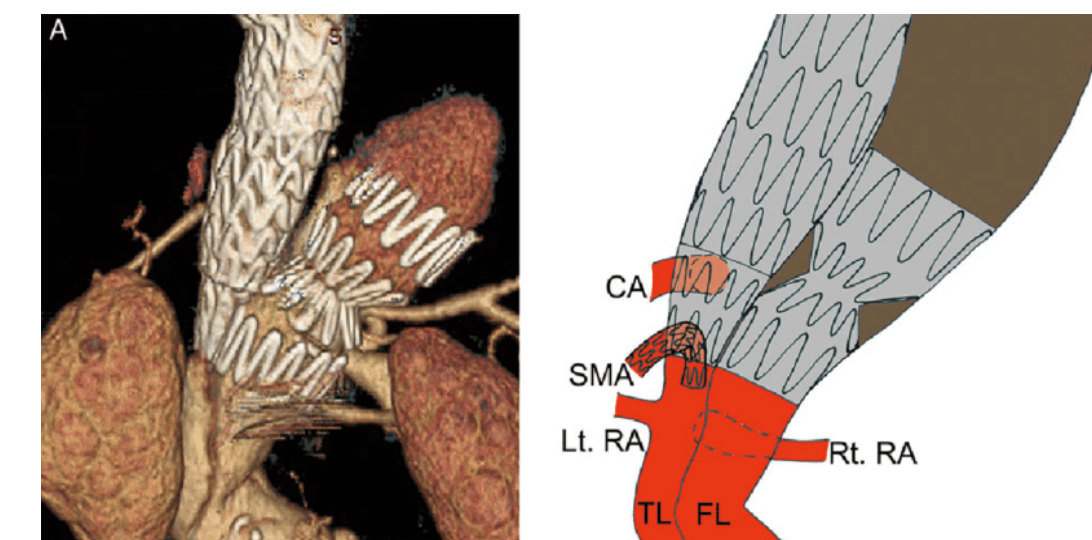


-40% of CTBD LSA occlusion

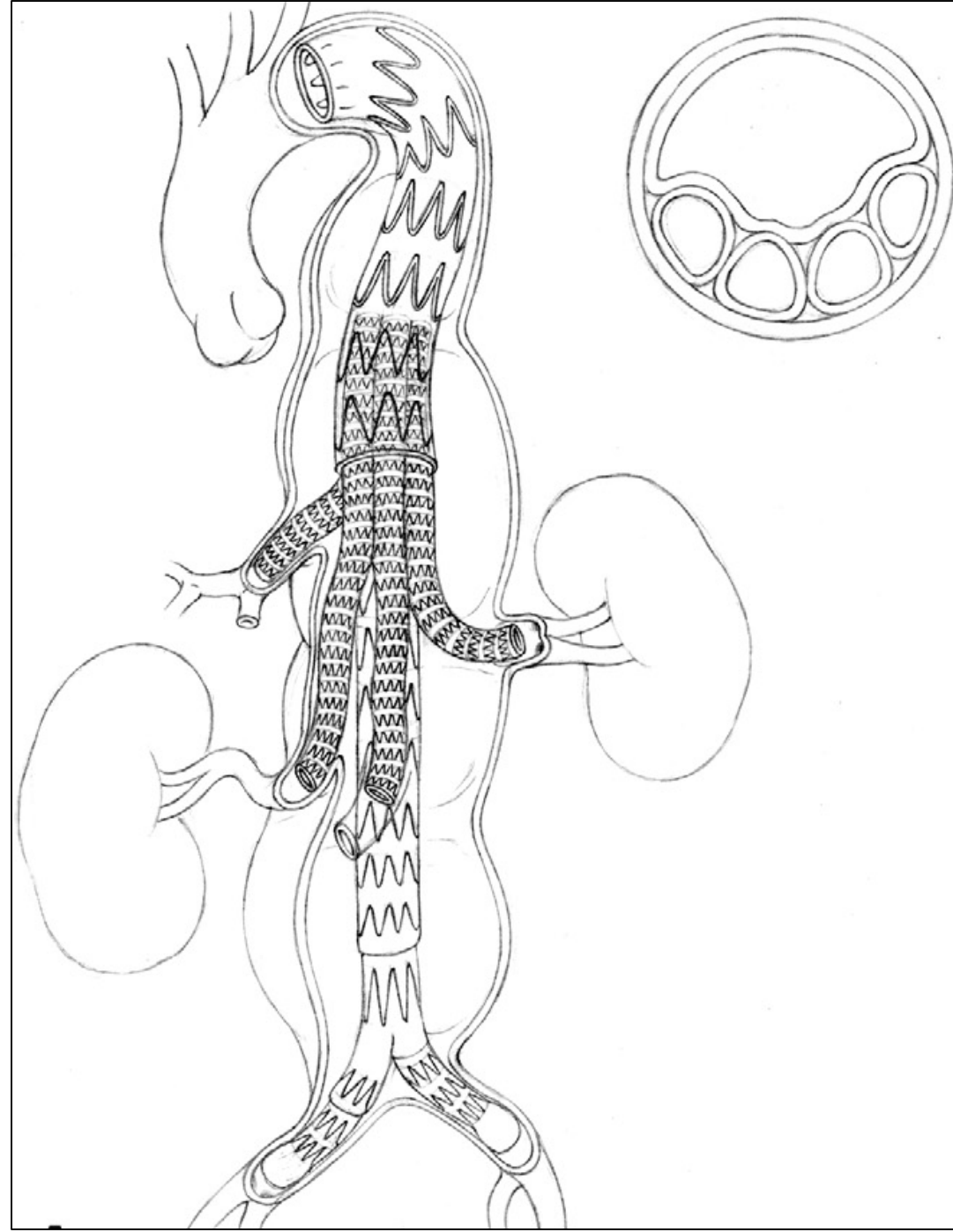
Endovascular Therapy for CTBD Distal Landing Zone



Knickerboker

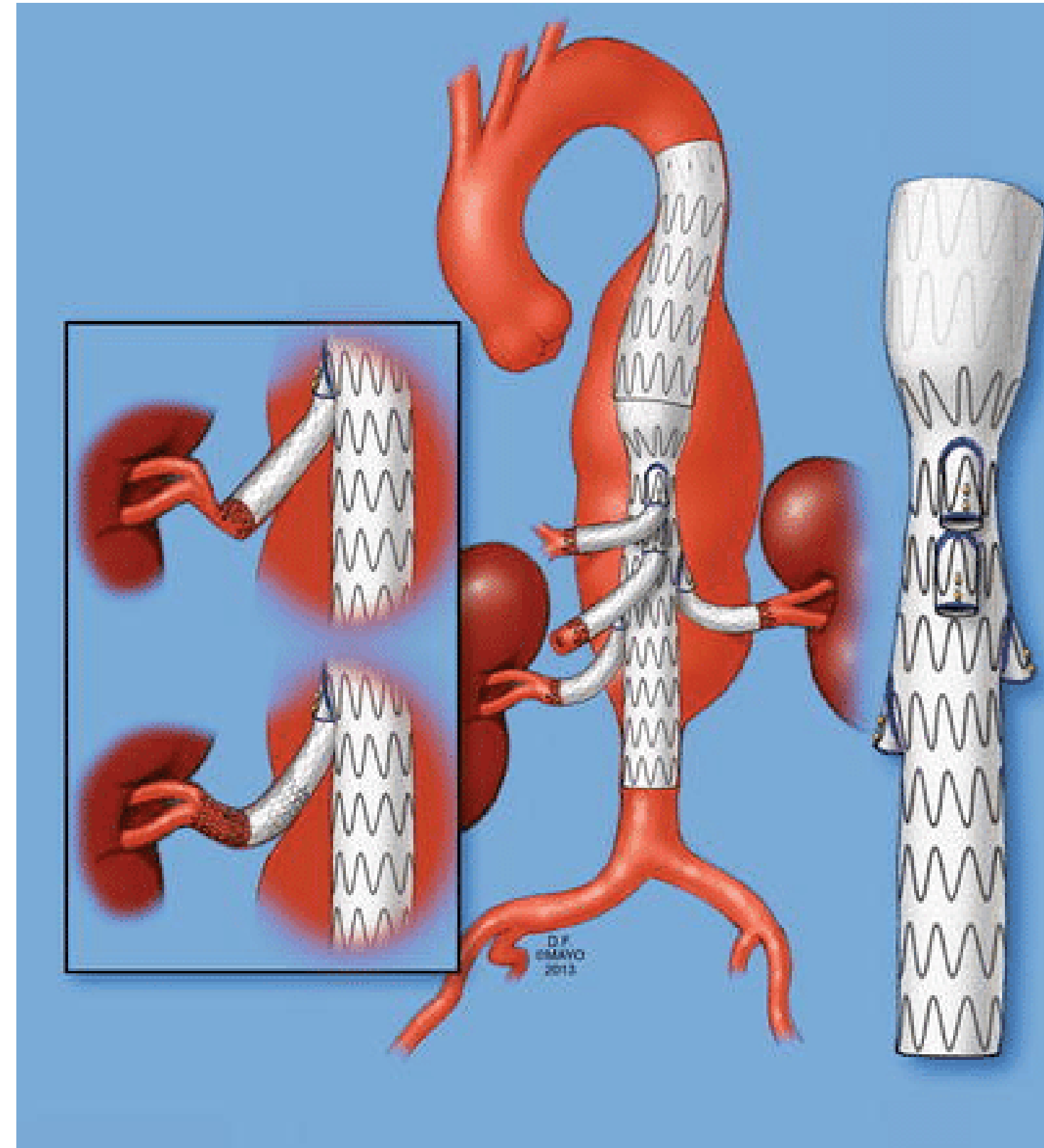


Candy Plug



Lobato A. Semin Vasc Surg 25;153-160 , 2012

Sandwich Technique



T- Branch

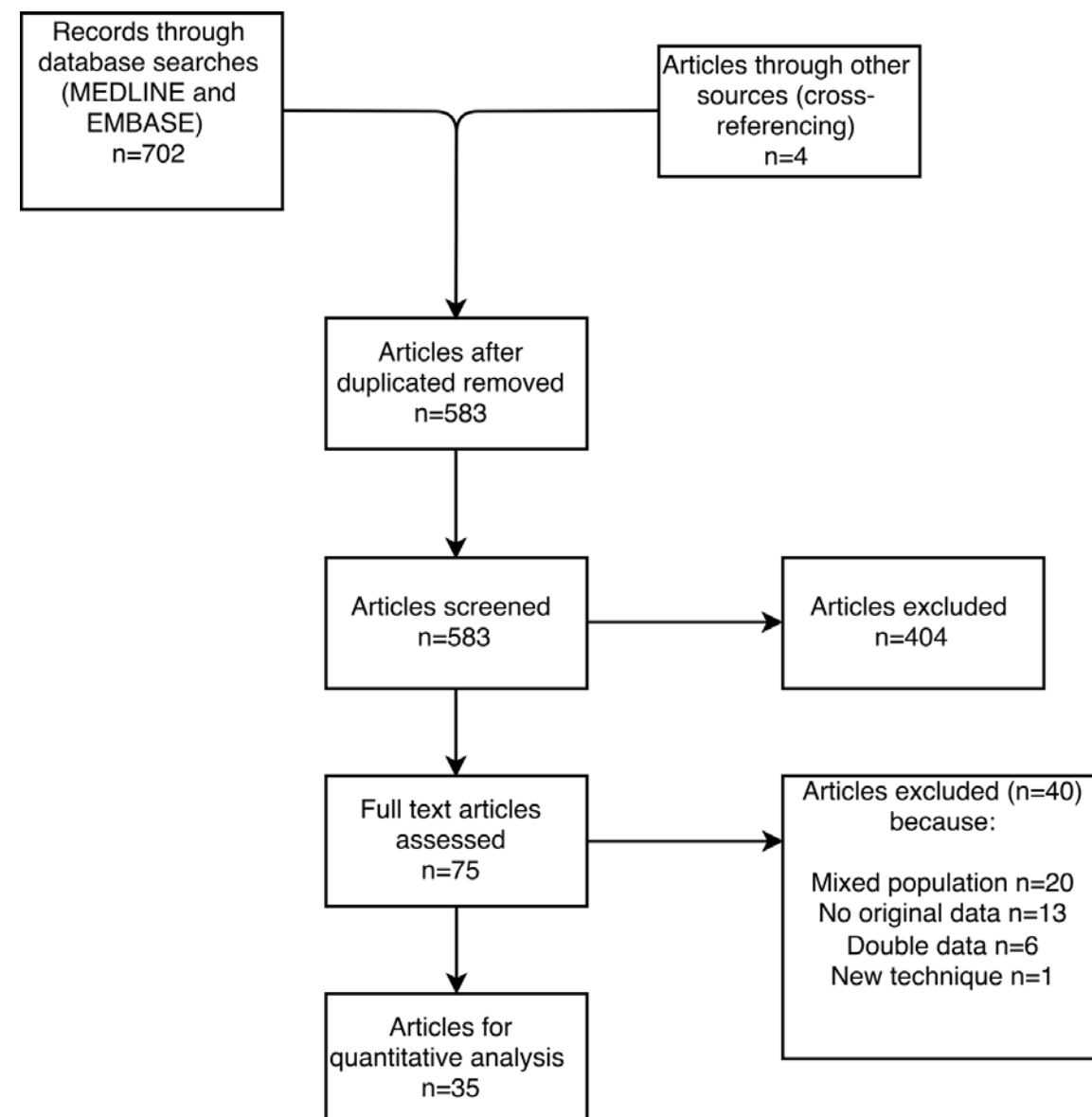


FEVAR

Contemporary Management Strategies for Chronic Type B Aortic Dissections: A Systematic Review

Arnoud V. Kamman^{1,2*}, Hector W. L. de Beaufort^{1,2}, Guido H. W. van Bogerijen¹, Foeke J. H. Nauta^{1,2,3}, Robin H. Heijmen⁴, Frans L. Moll², Joost A. van Herwaarden², Santi Trimarchi¹

- Publications from 2000 to date
- CTBD open or endovascular
- At least 1 year follow-up



| | OSR (1081) | TEVAR (1397) | B/FEVAR (61) |
|------------------------|---------------------------------------|------------------------------------|-------------------------|
| Mortality | 5.6-21% | 0.0-13.7% | 0.0-9.7% |
| Stroke | 0-13.3% | 0-11.8% | 0 |
| SCI | 0-16.4% | 0-12.5% | 0-12.9% |
| ARF | 0-33.3% | 0-34.4% | 0-3.2% |
| Reinterventions | 5.8-29% | 4.3-47.4% | 0-53.3% |
| Survival | 1y:72-92% 5y:53-86% 10y: 32-60% | 1y:82-100% 5y:64-88% 10y:63% | 1y:76-100% 3y:75-85% |



HYBRID SUITE

- Evaluation and treatment for patients with aortic diseases from the valve to the abdominal aorta

INTER-DISCIPLINARY TEAM

- CT Surgery, Vascular surgery, Interventional Cardiologist, Anesthesia, Nursing
- **FOCUSED IN PATIENT SAFETY**

Open and Endovascular repair for CTBD

FCI experience

Methods

- Historic cohort between April 2002 and April 2017 of patients that underwent endovascular or open thoracic and thoracoabdominal repair. Inclusion criteria: chronic dissection
- Our preference is TEVAR as first option in patients with suitable anatomy.
- OSR is performed in TAA and in patients with connective tissue disorders.
- Descriptive analysis of the data were done categorical data are expressed as number (%) and continuous data as mean +- standard deviation or median and Interquartile
- Follow-up was done clinically and by National database registries.

Demographics

| Population data* | TEVAR | open repair | p value Difference between groups |
|-------------------------------|--------------|--------------------|--|
| | n=39 | n=44 | |
| Male | 27 (69) | 27 (61.4) | 0.453 |
| Age years | 63 ±10.8 | 54.7±12 | 0.0003 |
| Hypertension | 35 (10.8) | 39 (90.7) | 0.857 |
| Diabetes | 1 (2.6) | 3 (7) | 0.366 |
| Dyslipidemia | 4 (10.3) | 4 (9.3) | 0.857 |
| COPD | 5 (2.6) | 3 (7) | 0.355 |
| Renal disease | 1 (2.6) | 4 (9.3) | 0.212 |
| Time Symptoms to intervention | 30 (14-89) | 81 (72-708) | |
| Previous cardiac surgery | 2 (5.1) | 14 (32.6) | 0.002 |

*Categorical data are expressed as number (%) and continuous data as mean ± standard deviation or median and Interquartile range, COPD Chronic Lung Disease

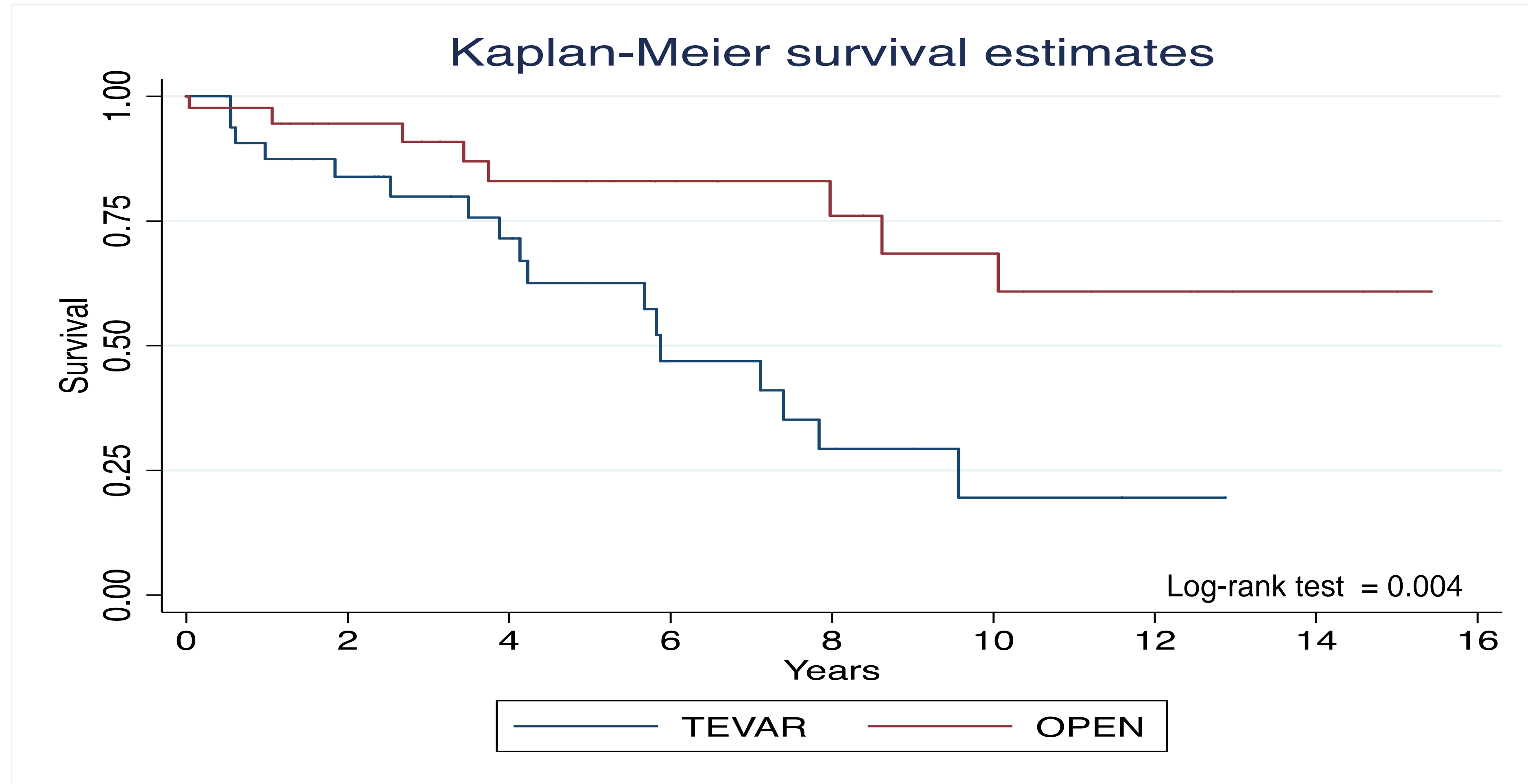
Outcomes

Perioperative data*

| | TEVAR n=39 | OPEN repair n=44 | p value Difference between groups |
|--------------------------|---------------|---------------------|--------------------------------------|
| CPB time minutes | 0 | 109 (69-202) | |
| Cross-clamp time minutes | 0 | 55 (44-60) | |
| UCI stay days | 1 (1-3) | 3 (1-5) | 0.0002 |
| In hospital stay days | 10 (7-14) | 14 (9-26) | 0.0001 |
| Postoperative events | | | |
| Transfusion | 15 (38.5) | 34 (79.1) | 0.001 |
| Neurological deficit | 0 | 2 (4.6) | 0.496 |
| Renal impairment | 2 (5.1) | 1 (2.3) | 0.487 |
| Infection | 0 | 7 (16.3) | 0.006 |
| Mortality | 0 | 9 (20.9) | 0.003 |
| Reoperation | 9 (23.1) | 3 (6.8%) | |

*Categorical data are expressed as number (%) and continuous data as mean ± standard deviation or median and Interquartile range, COPD Chronic Lung Disease

Survival analysis



Clinical follow-up was performed in 82% of cases
Follow-up in government data base was 100%.

Conclusions

- TEVAR group had better in-hospital outcomes regarding mortality, infection, LOS, ICU, transfusions
- There was a low incidence of Neurological and Renal complications in this cohort of patients.
- Although Hospital mortality was greater in the OSR, TEVAR patients showed significant less survival up to five years
- The cause for long-term mortality was not established due to a lack of proper registry in National data bases and the economic limitations to follow patients after discharge

Summary

- A new classification that guides treatment for the patients is needed.
 - It should incorporate symptoms, dynamic images and morphologic findings.
- Data analysis showed weak evidence comparing TEVAR vs OSR for CTBD.
 - Prospective trials must be conducted
- New and better devices designed for CTBD are required
- An inter-disciplinary TEAM approach provides the best treatment possible for an individual patient

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Thank You



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