



# **Síndromes Aórticos Agudos**

## **Diseción Tipo B**

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**Jefe Cardiología Intervencionista**

**Presidente SOLACI**

# Conflicto de intereses

Nombre: Oscar A. Mendiz

Potenciales conflictos de intereses relacionados a la presentación:

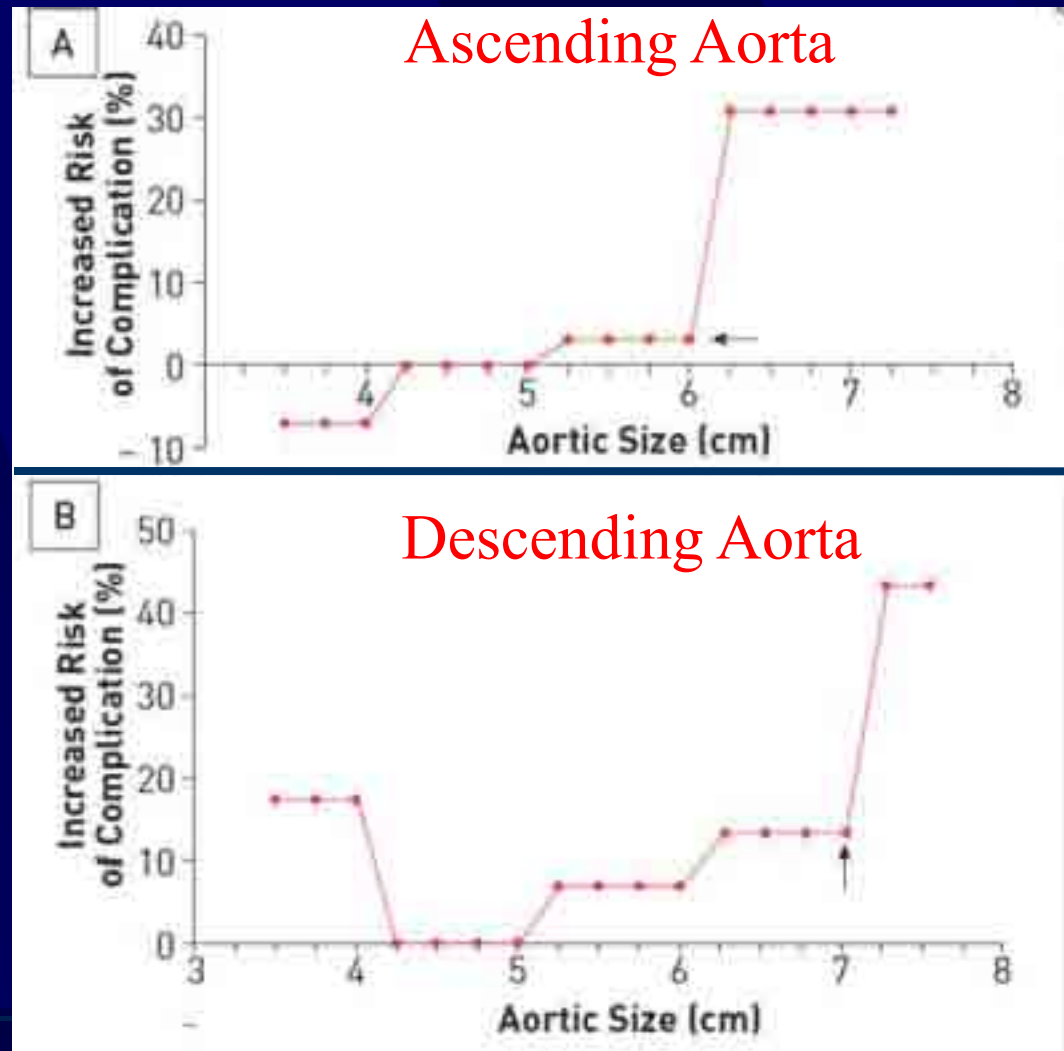
- Becas para congresos (Atcher. Cook in Argentina).
- Familiar; representación de Braile Biomedica en Argentina

# Acute Aortic Syndrome

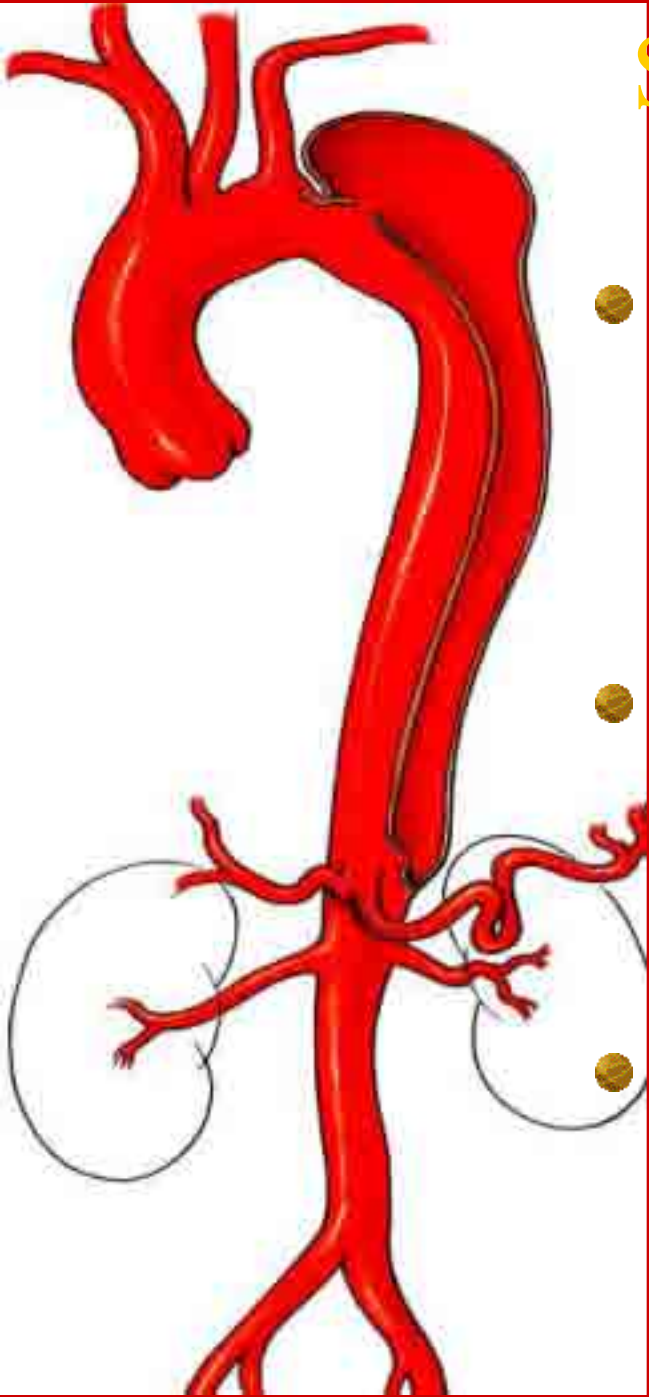
- The term "acute aortic syndrome" (AAS) refers to a spectrum of life-threatening thoracic aortic pathologies including **intramural hematoma**, **penetrating atherosclerotic ulcer**, and **aortic dissection**.
- Clinically, patients often present with characteristic aortic pain.
- AAS often leads to aortic rupture.

# Thoracic Aortic Aneurysm

- Rupture vs. Diameter:



# Standard of Care's MORTALITY



- Medical Treatment for Acute Type B
  - Uncomplicated ~11%
  - Complicated ~30%
  - 5-year survival 50%
  - 4-year expansion 25%
- Surgical for Acute:
  - Type A ~30%
  - Type B ~35%
- Surgical mortality for acute dissection with end-organ ischemia ~50%

# Thoracic Surgery

- High morbidity and mortality rates:

Mortality:

Elective	5-20%
Emergent	~50%

- Morbidity:

Renal and pulmonary failure, Stroke, visceral and cardiac ischemia.  
Paraplegia (5-25%).

- Optimal expertise and large experience available in few centers.
- Surgeons reluctant to operate.

# Endovascular Treatment of Thoracic Aortic Disease

- Aortic disease potentially treated by endovascular approach:

- **Degenerative Aneurysms.**

- **Type B Aortic Dissections. (some Type A).**

- Penetrating Ulcers.

- Intramural hematoma.

- Traumatic injuries.

- Post-operative Pseudoaneurysms.

- Ductus arch aneurysms.

# Endovascular Treatment: Type B Aortic Dissection

Initial approach:

- Medical Treatment (symptoms, HTA)
- Correct Diagnosis
  - TEE
  - CT scan (3-D reconstruction)
  - MR
  - Angio only for coronary or complications



# Endovascular Repair: Team approach!!!!



# TEVAR: Imaging for Diagnosis & Treatment Strategies



VALLINI LUIS  
5430  
Age: 52 years  
M  
06 Nov 2007  
10:28:58

FUNDACION FAVAL  
ANGIO  
DICTADO SCER

VALLINI LUIS  
5430  
Age: 52 years  
M  
06 Nov 2007  
10:28:58

FUNDACION FAVAL  
CT  
ANGIO TAP  
DICTADO SCER



KVP: 120  
mA: 224  
mAs: 500  
mA: 112  
Thk: 0.5 mm  
Aquilon  
Orient: 100°/0°/0°

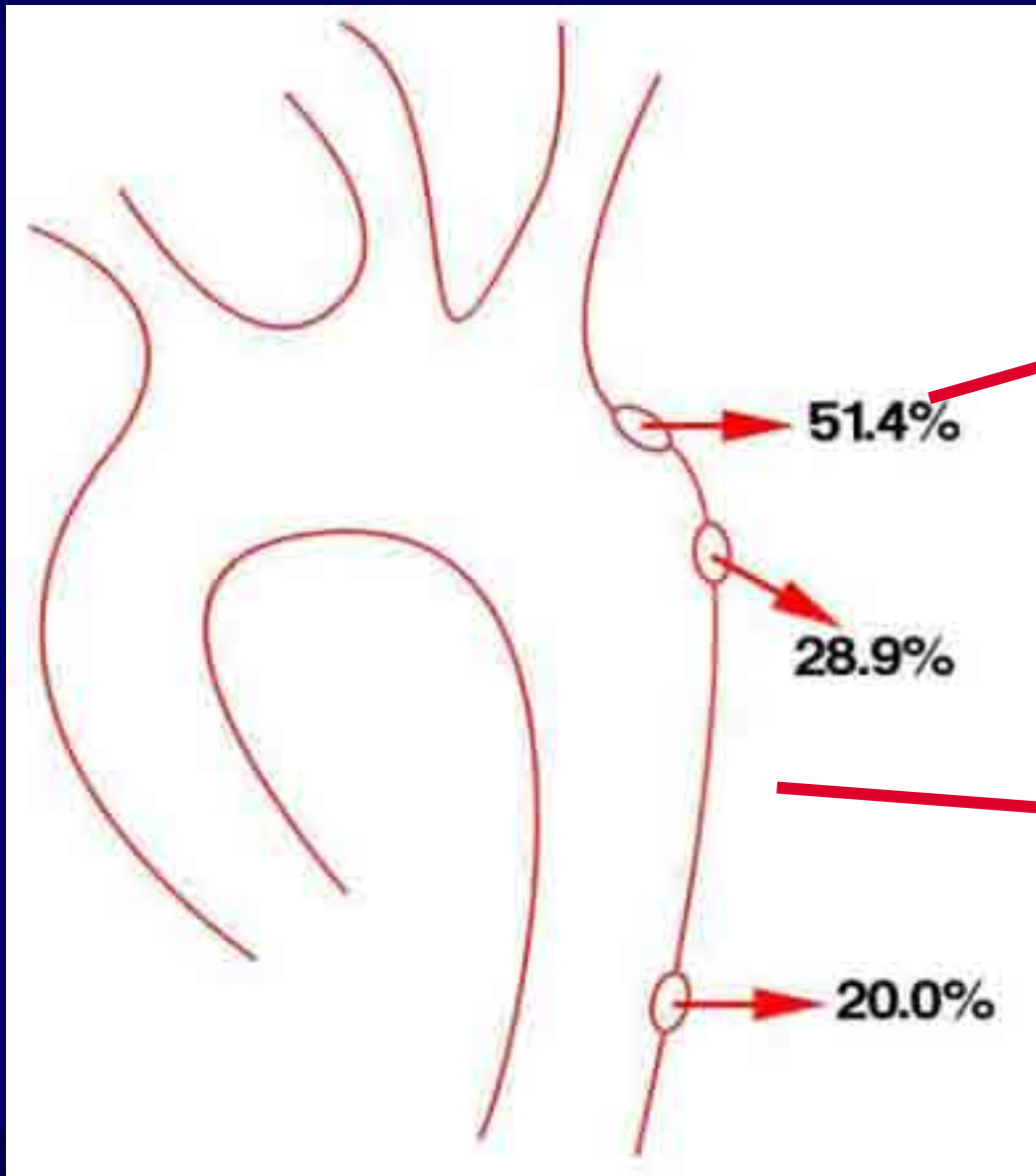
KVP: 120  
mA: 224  
mAs: 500  
mA: 112  
Thk: 0.5 mm  
Aquilon  
Orient: 100°/0°/0°

Vitreax  
WL: 120/230  
Segmented





# Localización de la lesión



78.4% - éxito  
9% - óbito

95% - éxito  
3.5% - óbito

Éxito (  $p=0.1$  )  
Óbito (  $p=0.2$  )

# Endovascular Treatment: Type B Aortic Dissection

## ● Treatment Aims:

- Cover-seal main proximal tear/s
- Re-direct aortic flow to true lumen
- Decompress false lumen
- Induce false lumen thrombosis
- Stabilize dissected aortic wall
- Prevent rupture

# Endovascular Treatment: Type B Aortic Dissection

## ● Strategies:

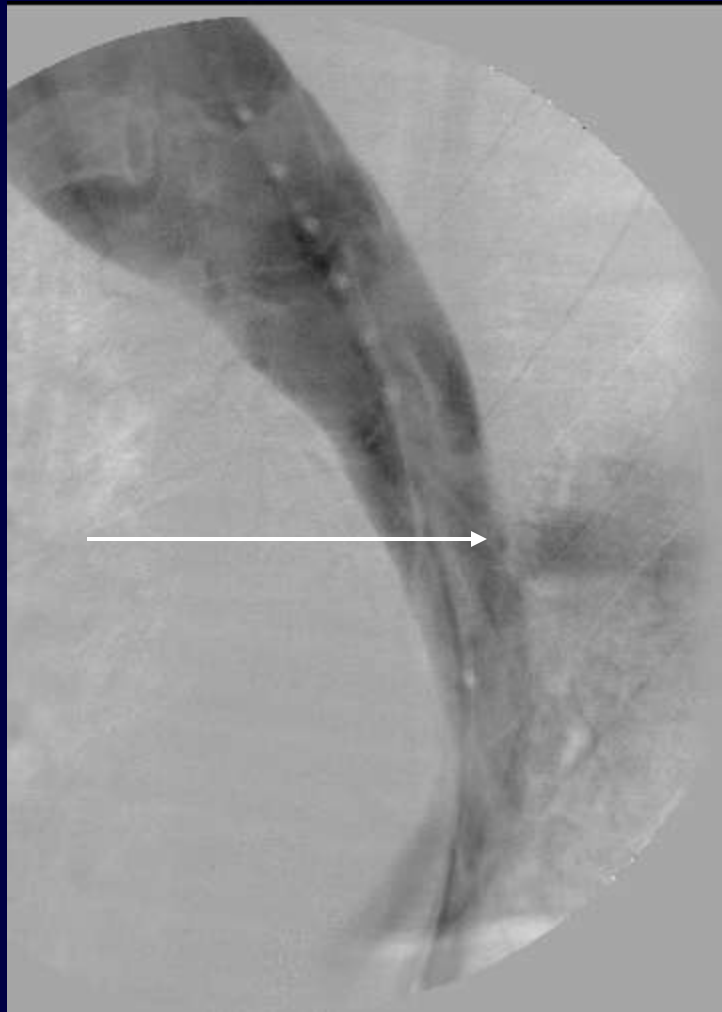
- Stent-Graft sealing main proximal tear/s.
- True lumen reconstruction.
- Fenestration.
- Side branches stenting.

## ● What it is not meant to do:

- Repair the full length of the aorto-iliac dissection
- Cover all distal re-entry sites.

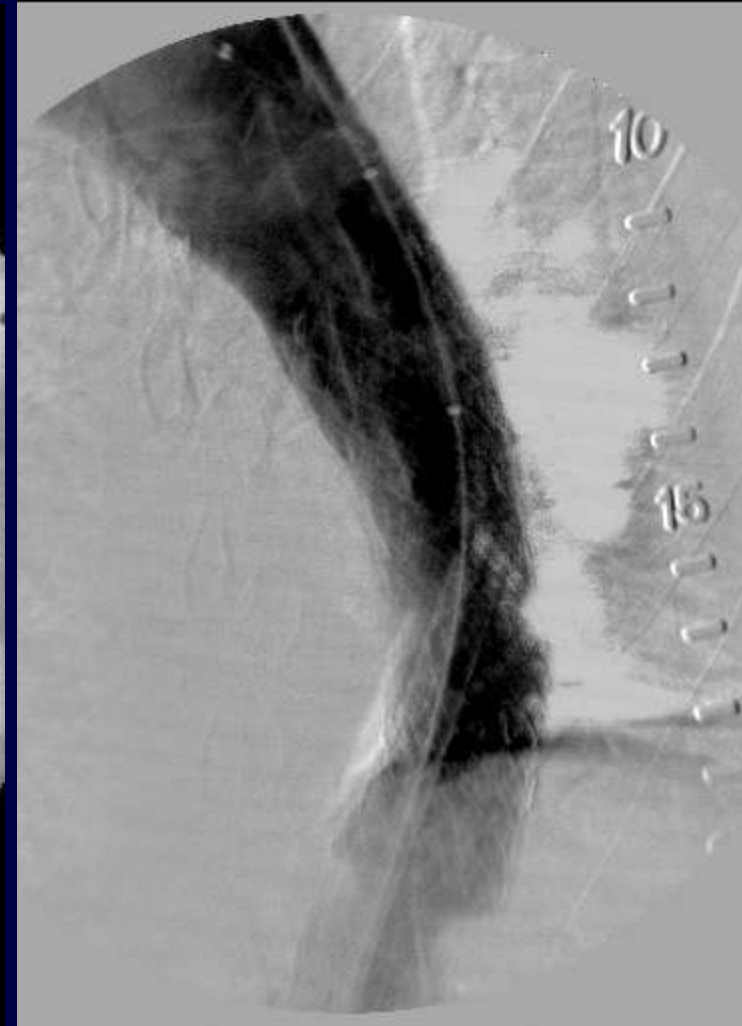
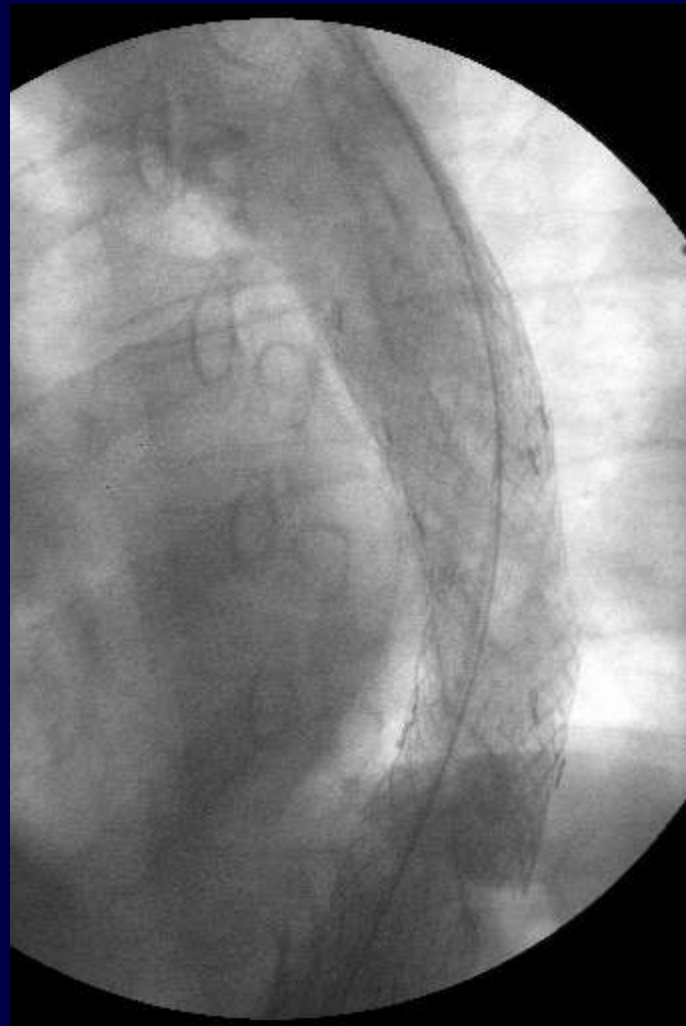
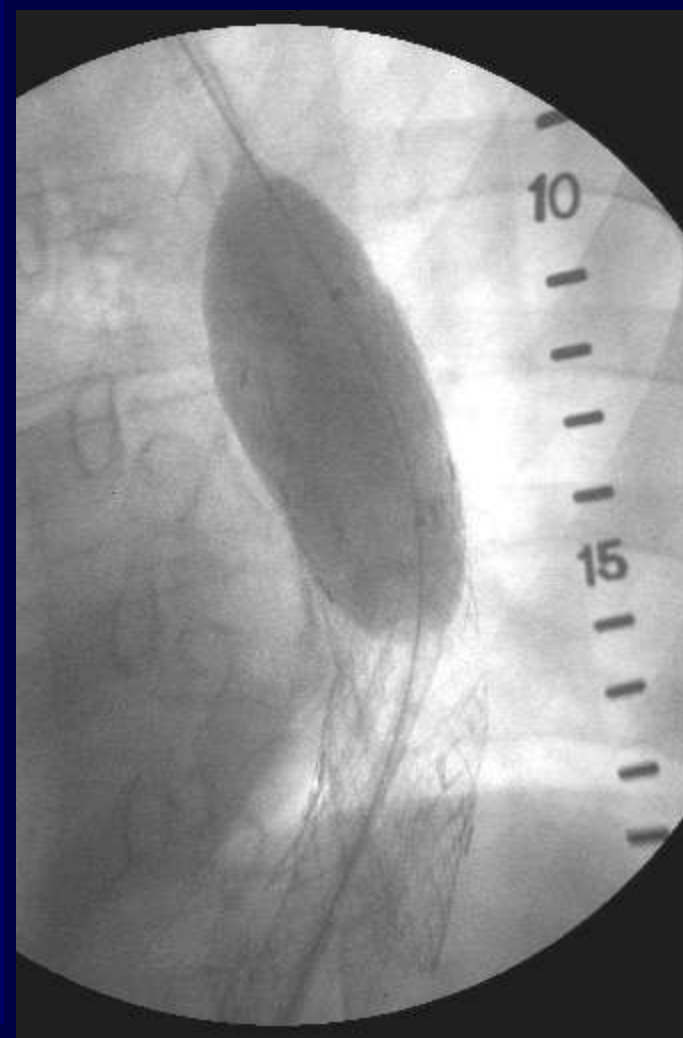
# Acute Aortic Syndrome: Type B Dissection .

Aim: To seal the tear: Balloon Expandable Stent-Graft



# Acute Aortic Syndrome: Type B Dissection

Aim: To seal the tear:, Balloon Expandable Stent-Graft





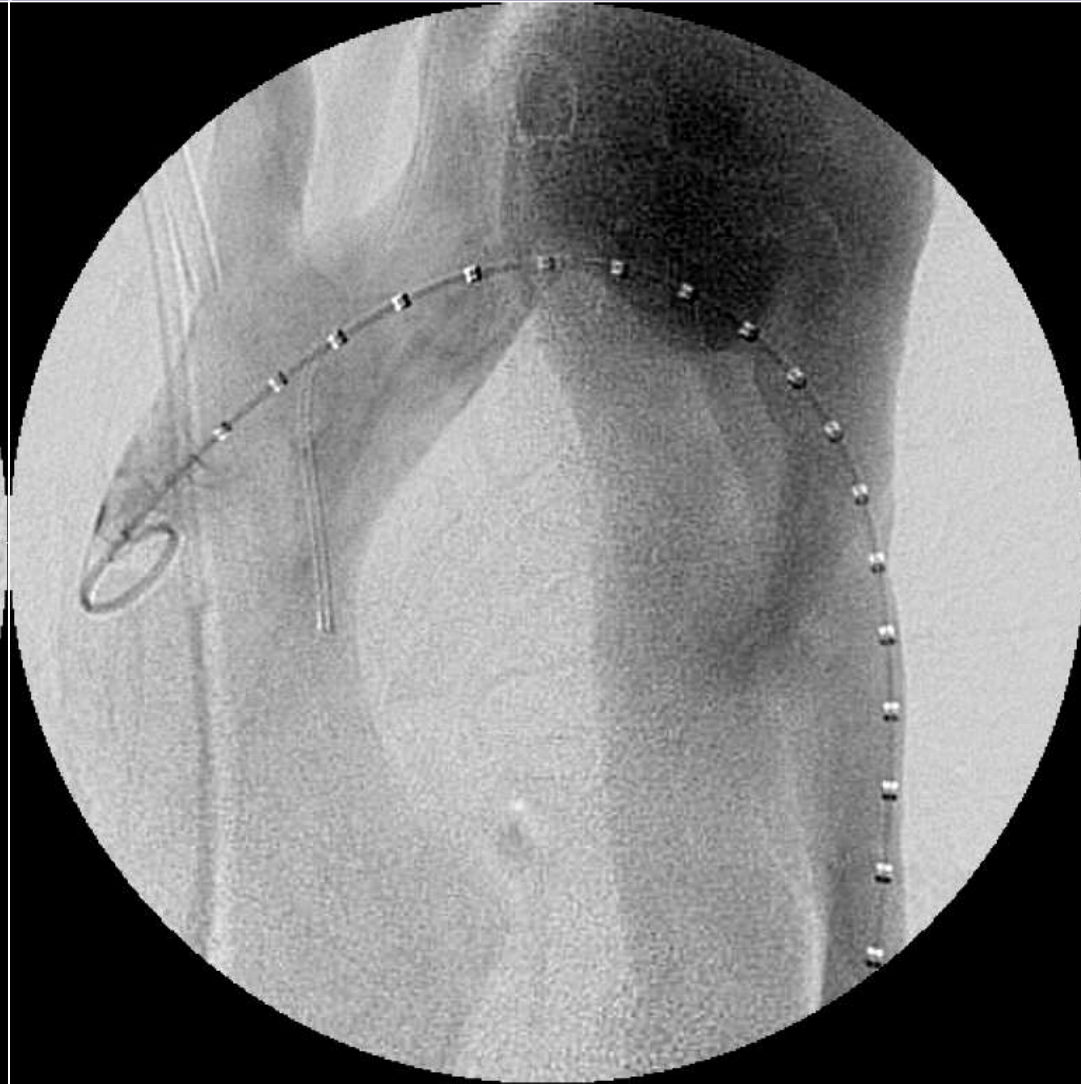
# Type B Aortic Dissection: Renal Ischemia (ARF)

Coverage of main proximal tear, redirection aortic flow to true lumen



Dissección Tipo B Complicada : A- Pre tratamiento. B y C- Pos implante de dos endoprótesis Braile Biomédica

# Complicated Type B Dissection





# Complicated Type B Dissection



# Complicated Type B Dissection



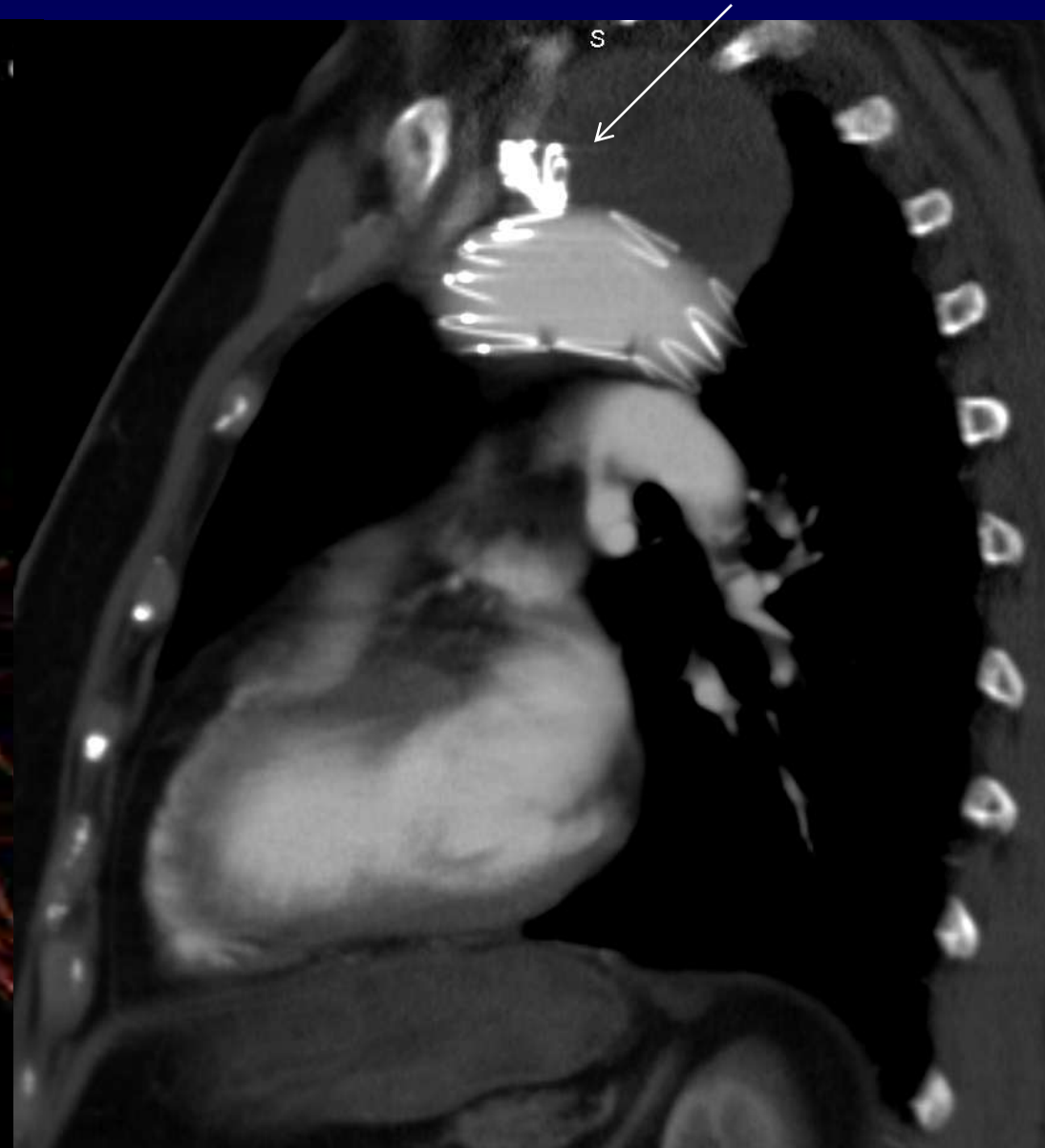
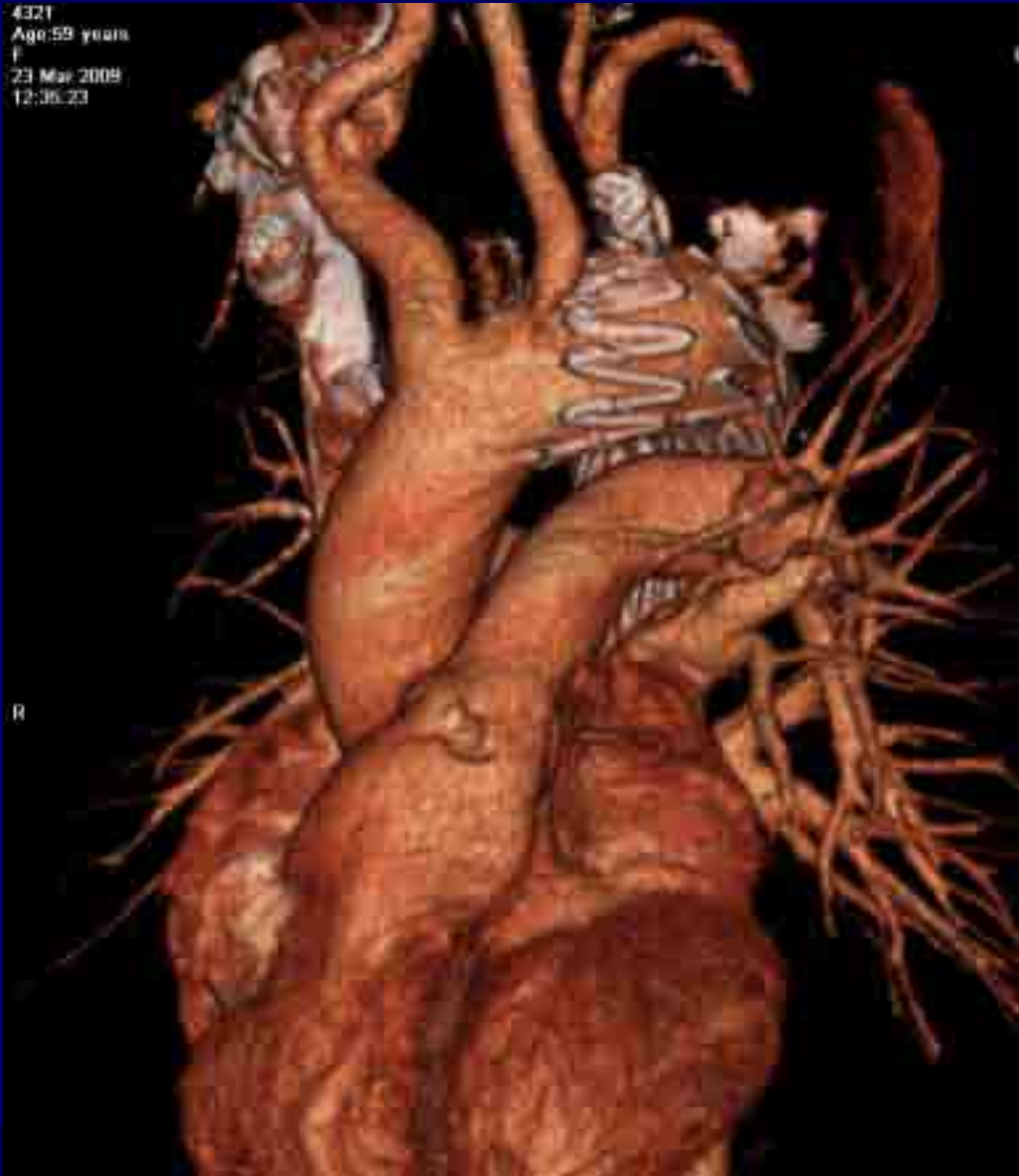
Renal Stenting: Plaque vs. Hematoma true lumen compression



# Combined Approach: “Debranching”



# Combined Approach: “Left Subclavian Embolization”

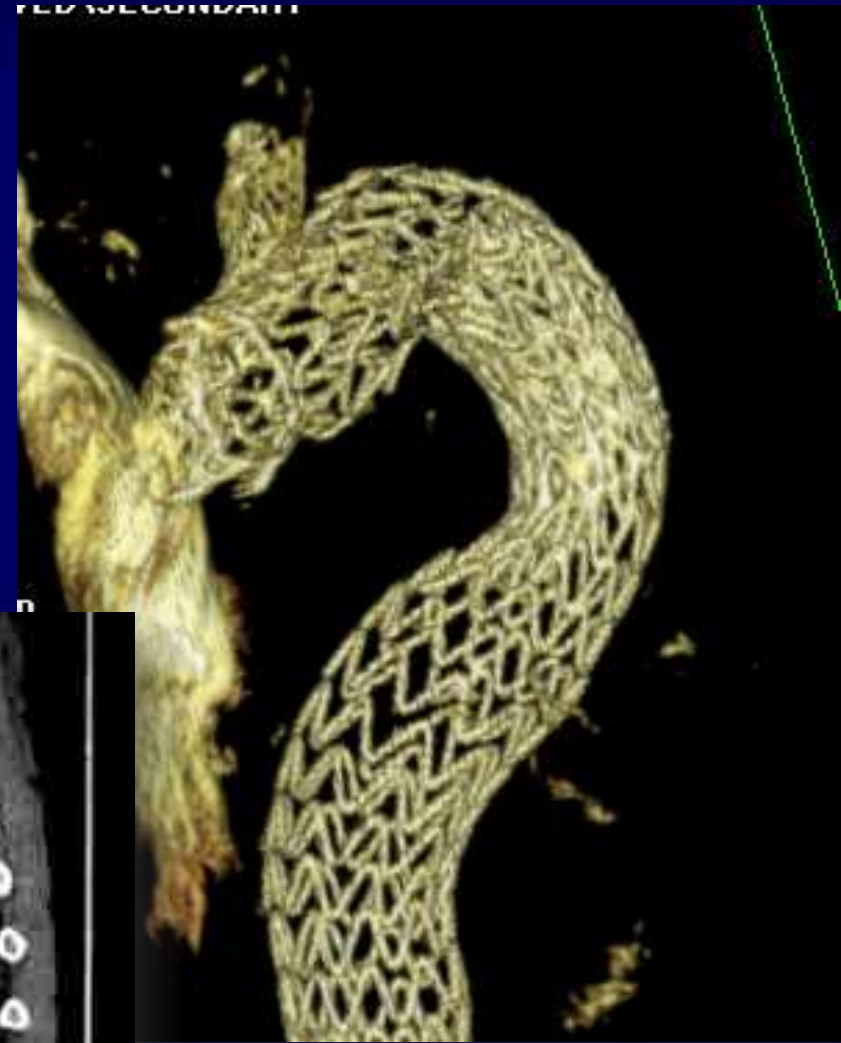
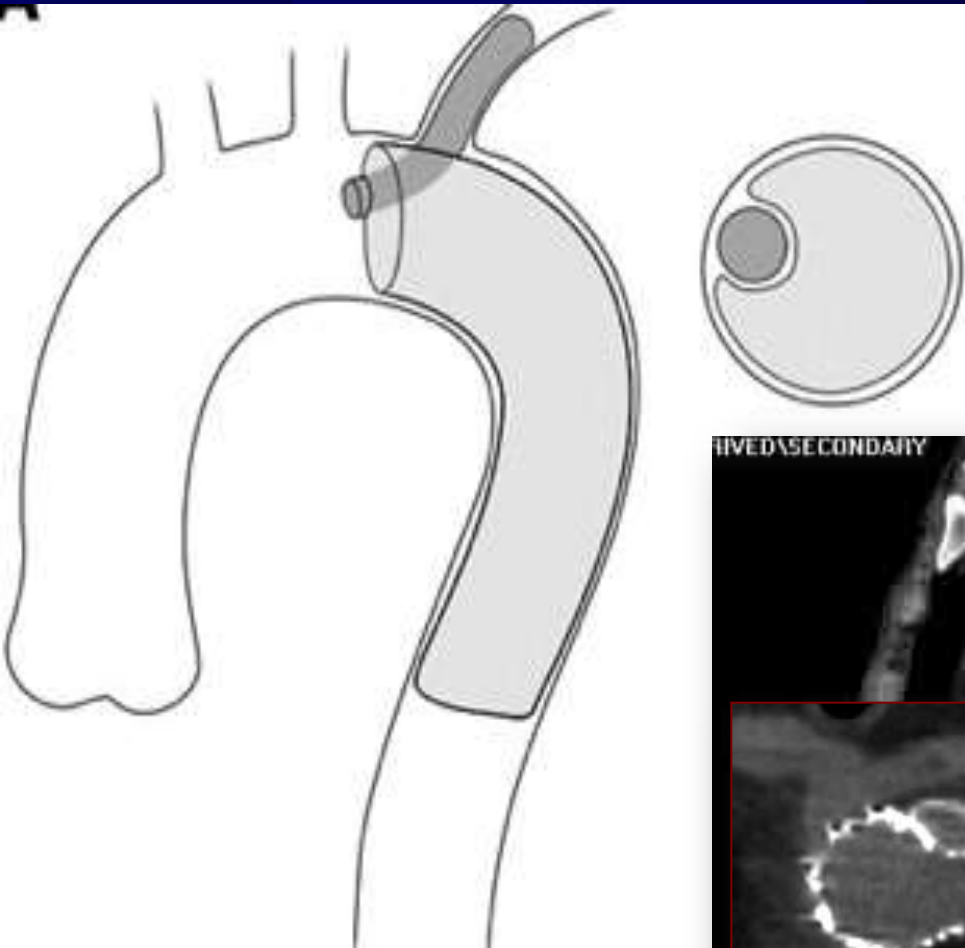


# Endovascular Treatment: Type B Aortic Dissection

- Indications:
- **Urgent: complicated acute/subacute aortic dissection** (persistent pain, rupture, impending rupture, malperfusion, acute aneurismal expansion (DTA>4cm)).
- **Patients with uncomplicated acute/subacute type B aortic dissection** (to avoid late complications ??).
- **Late: aortic expansion**



# Chimney Technique

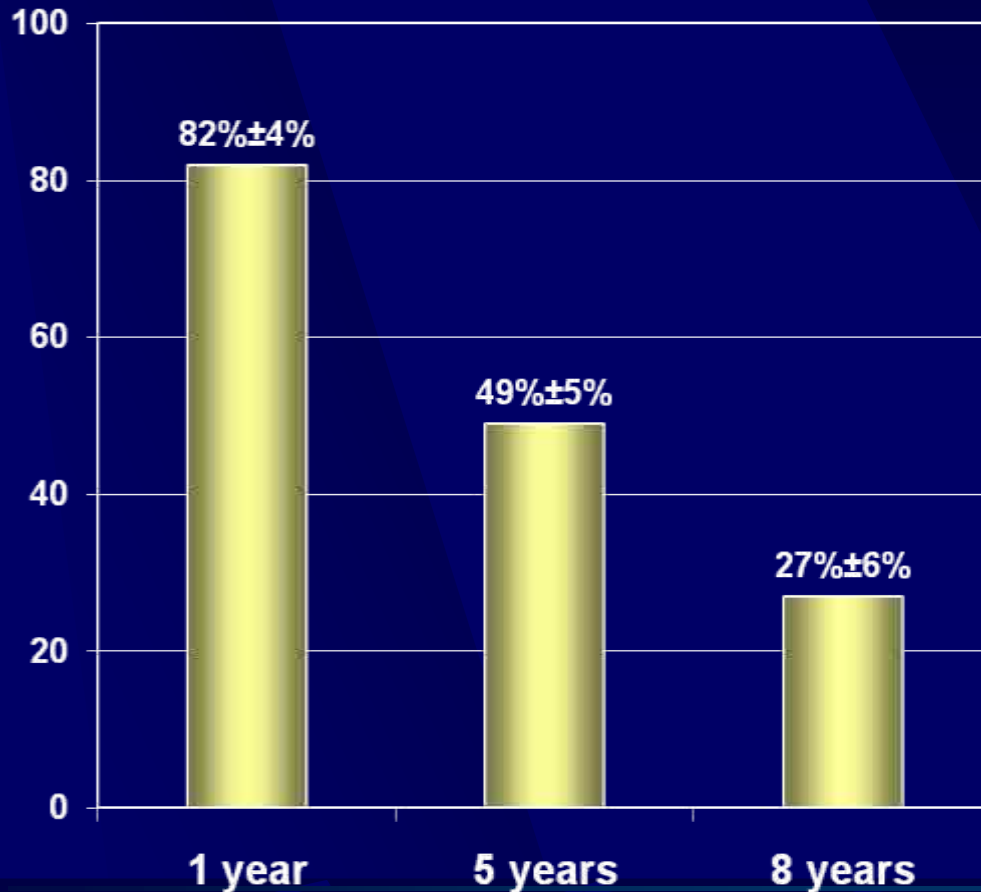




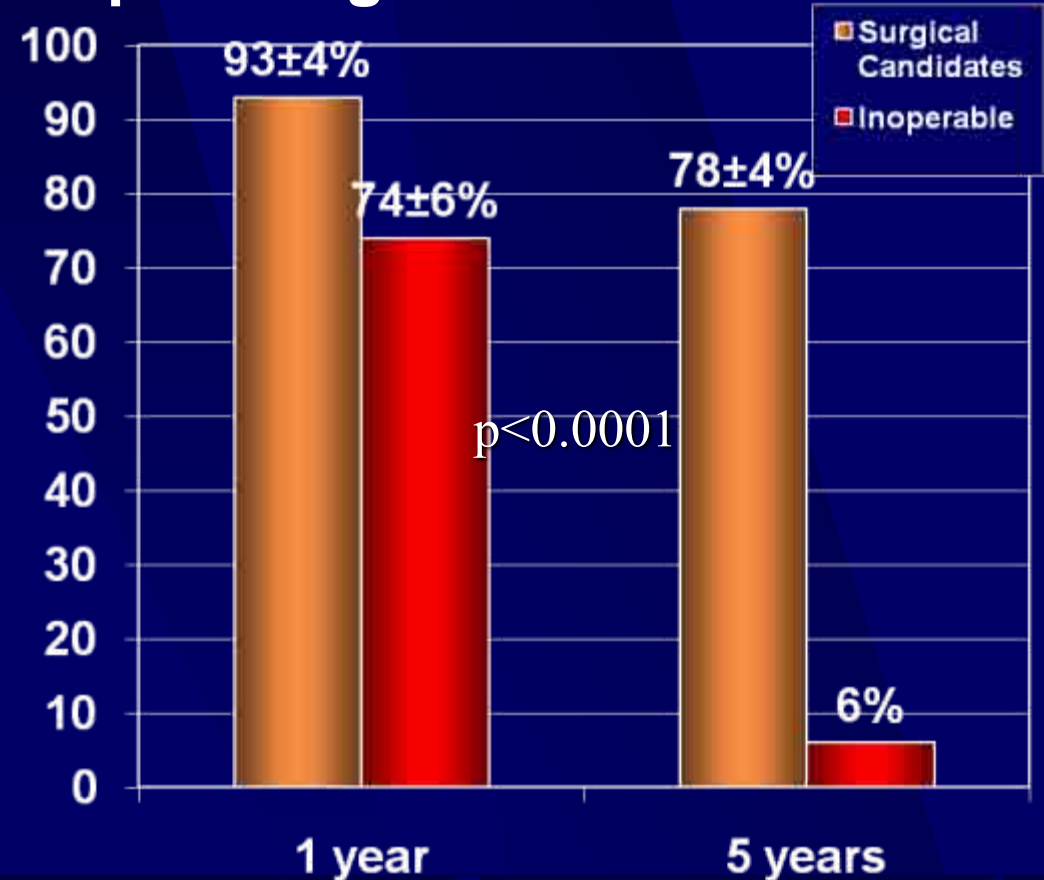
# Midterm Results of First-Generation Thoracic Stent Grafts:

## Actuarial Survival

### Overall

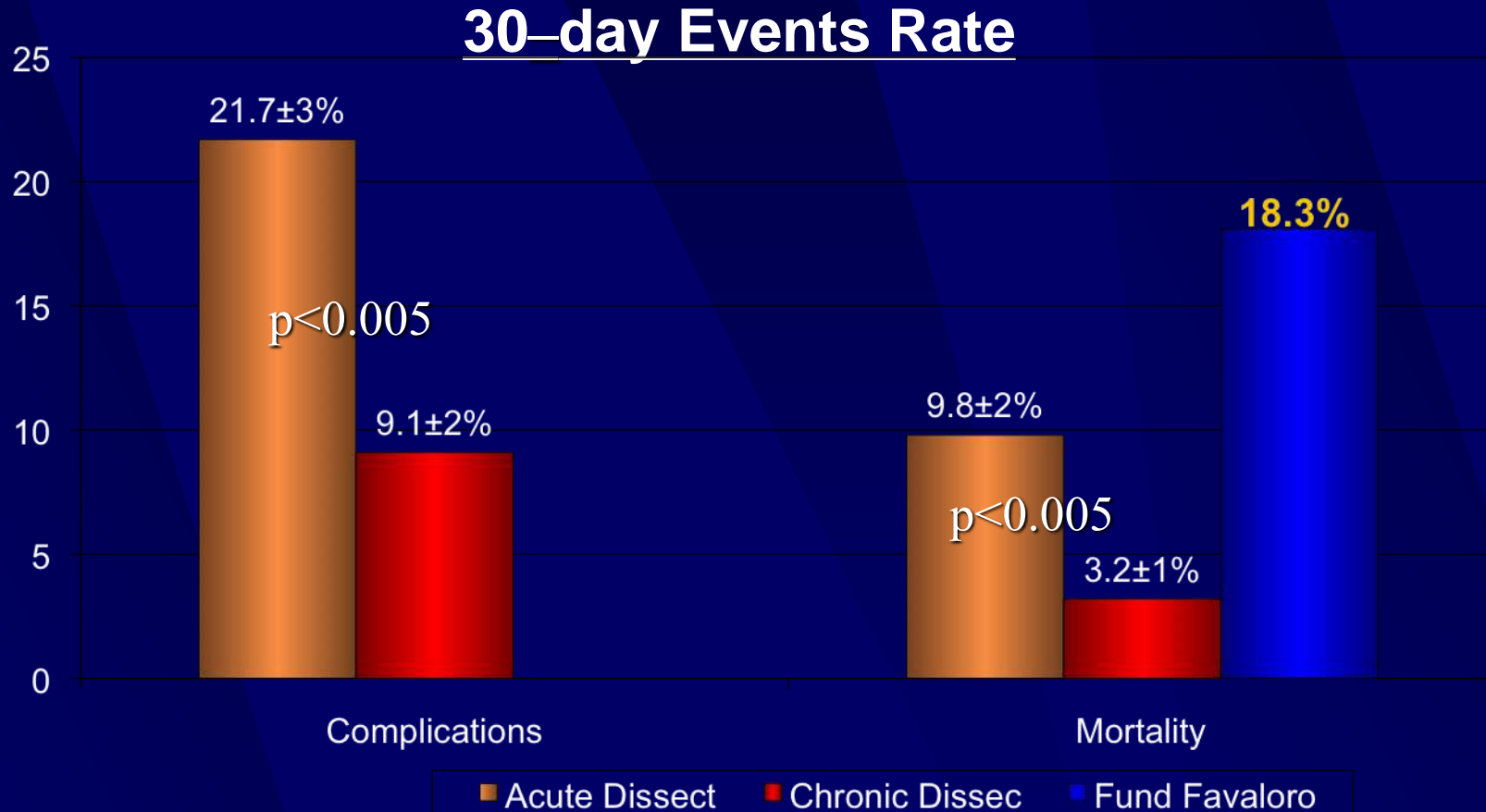


### Open Surgical Candidates



# Endovascular Stent-Graft Placement in Aortic Dissection: a Meta-analysis

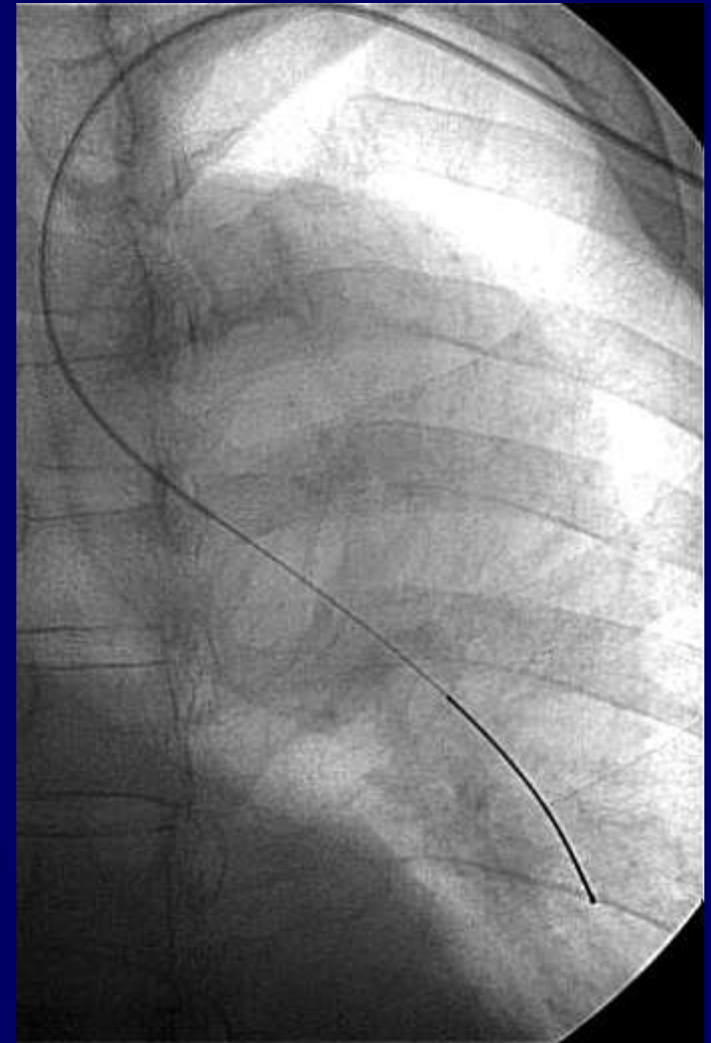
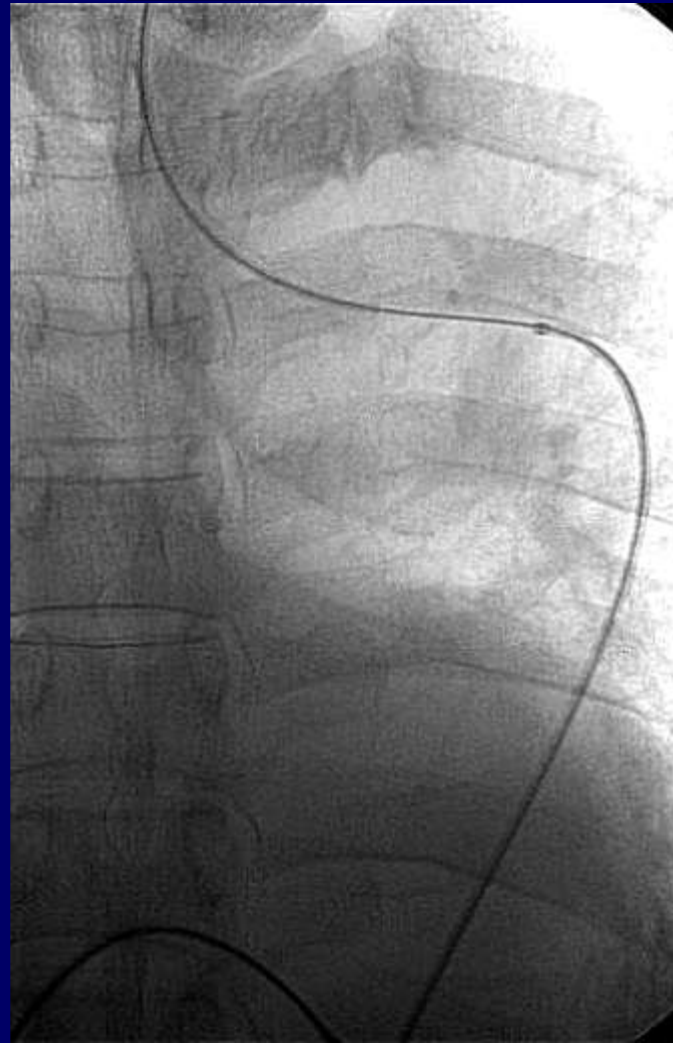
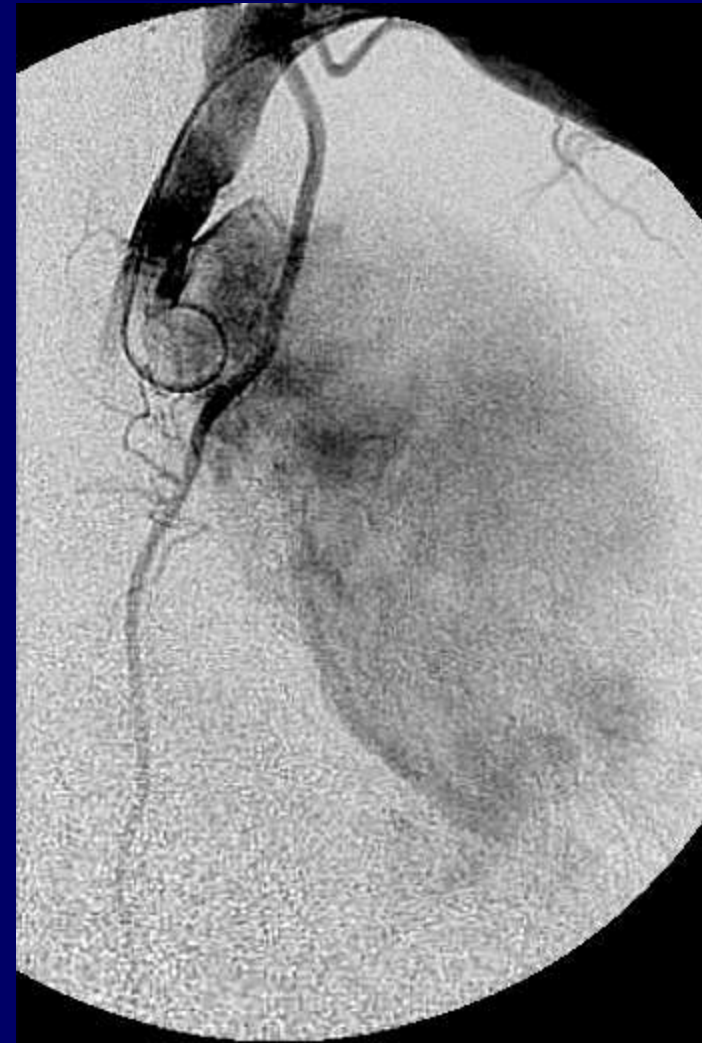
39 studies – 609 patients



# Complicated Type B Aortic Dissection: Antegrade Approach

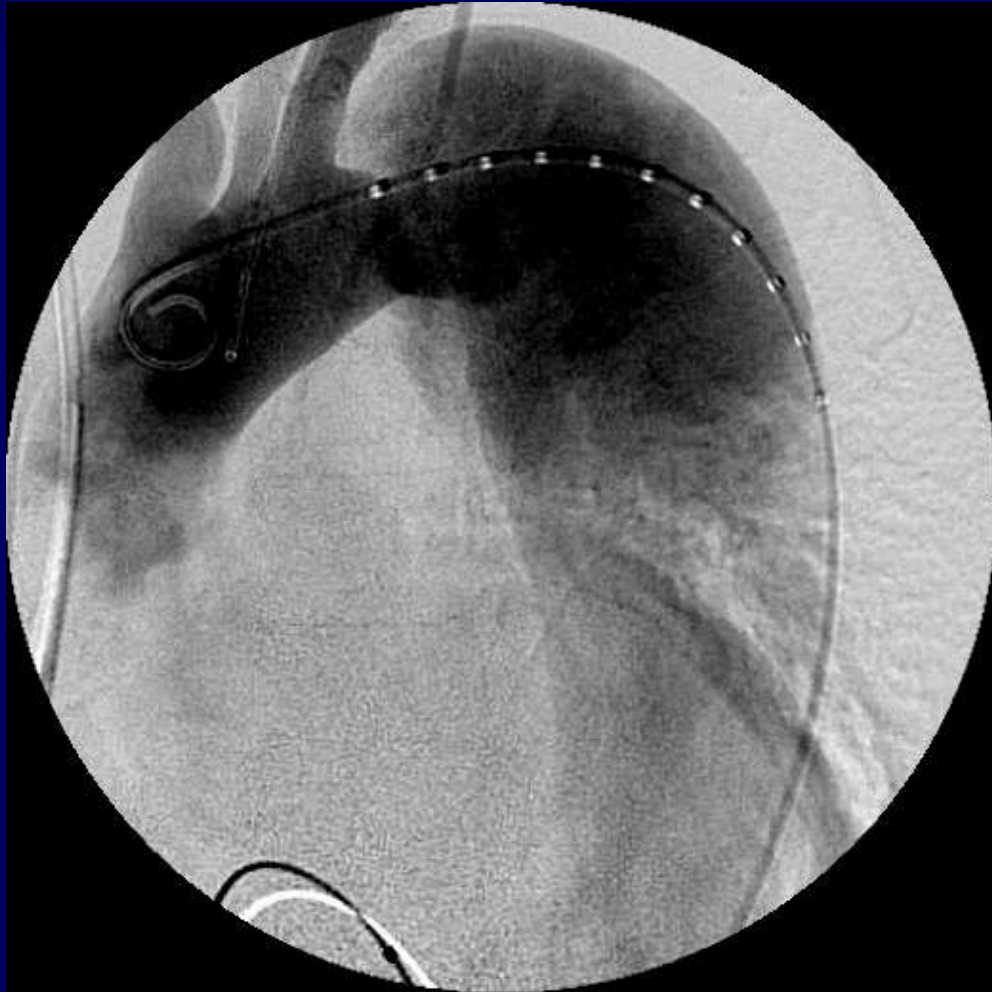


# Complicated Type B Aortic Dissection: Antegrade Approach

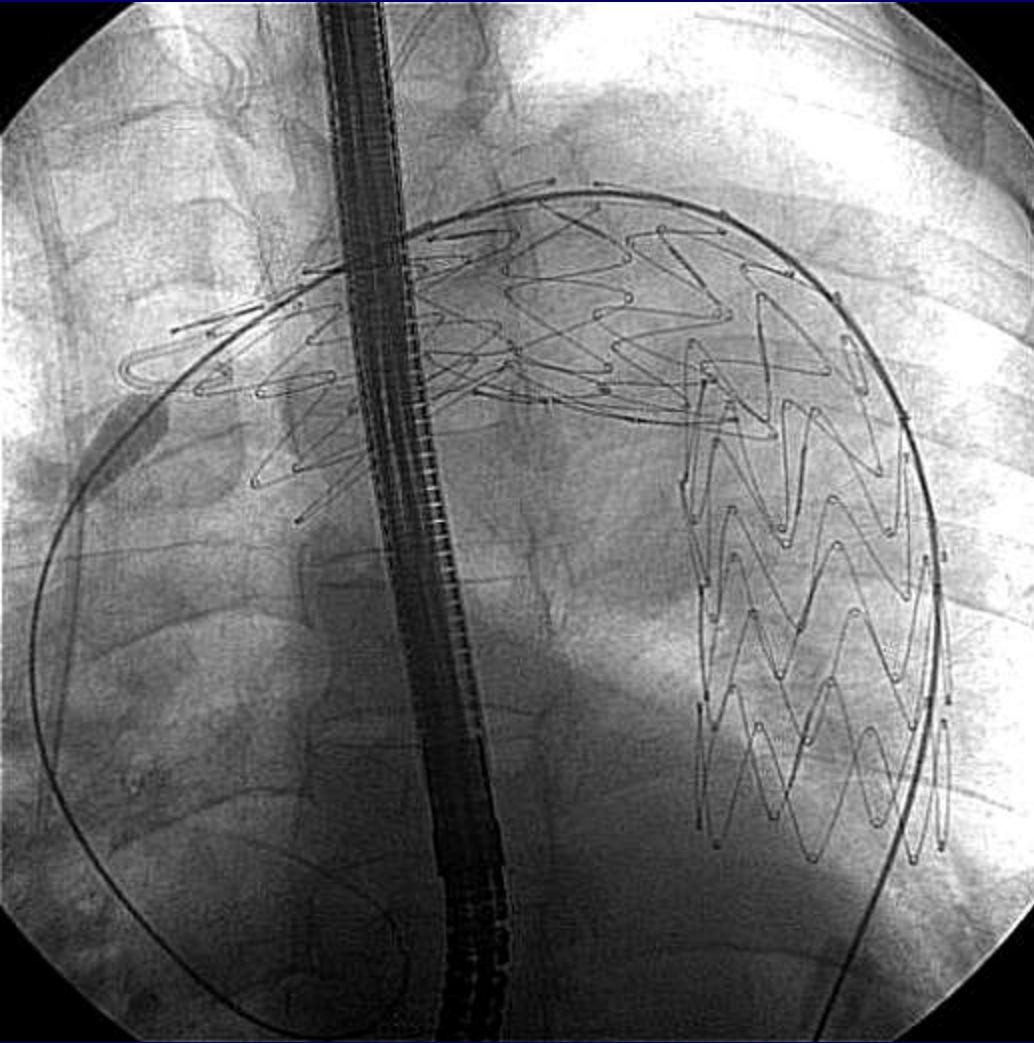




# Complicated Type B Aortic Dissection: Antegrade Approach



# Complicated Type B Aortic Dissection: Antegrade Approach





# Complicated Type B Aortic Dissection: Antegrade Approach



# Flap Fenestration:

*OA Mendiz, MD. Fundación Favaloro - Buenos Aires - Argentina*

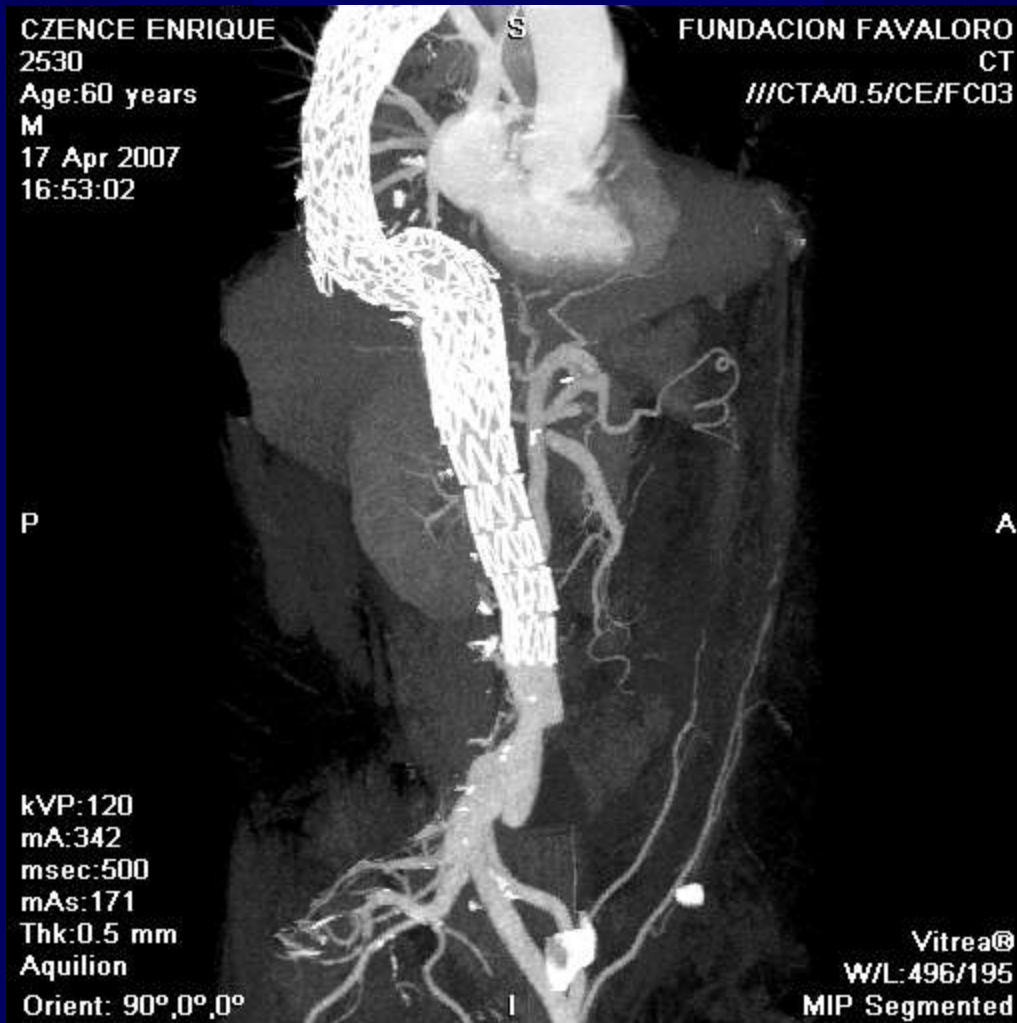




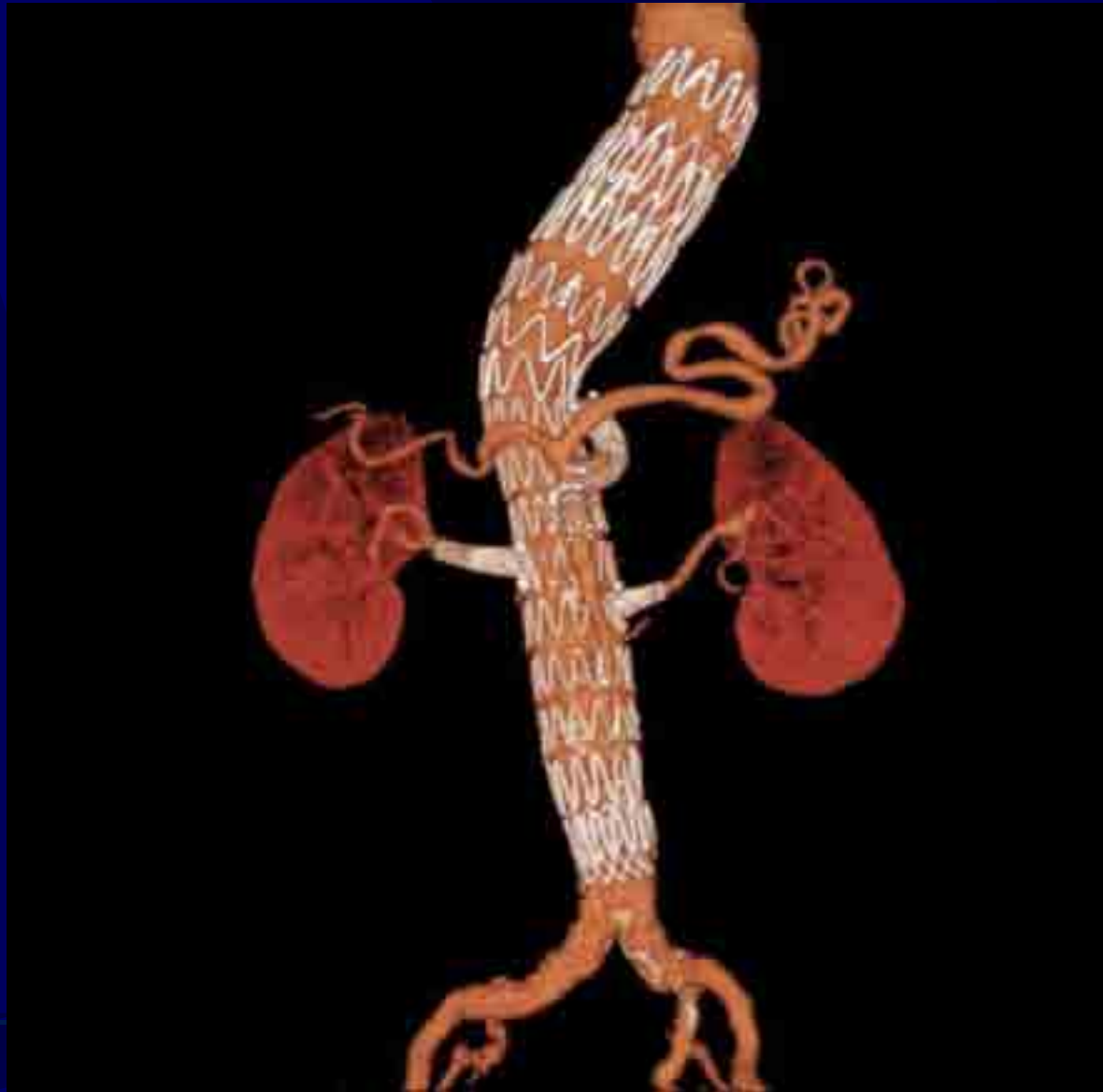
# Disección de Aorta Torácica. Tratamiento Endoluminal.

- Percutaneous Balloon Fenestration and stenting for life-threatening ischemic complications in patients with acute aortic dissection.
- N° Pacientes tratados por Vía Endovascular 40
- Tipo de Disección:
  - Tipo A 10
  - Tipo B 30
  - Isquemia Múltiples órganos 20
- Tratamiento:
  - Stenting del verdadero o falso lumen + fenestración con balón 14
  - Stenting sólo 24
  - Fenestración sólo 2
- Resultados:
  - Revascularización exitosa 93%
  - Muerte Hospitalaria 25%

# Thoracic Stent-Graft: Combined Approach



# Thoracic Stent-Graft: Branched Grafts



# Late Follow-Up: TEVAR

Good Evolution @ 9-year



Late Complication @ 3-year



June 1997 ⇨ 7-12-2006



# Endovascular Treatment of Type B Aortic Dissection: The Challenge of Late Success

Claudia Maria Rodrigues Alves, MD, PhD, José Honório Palma da Fonseca, MD, PhD,

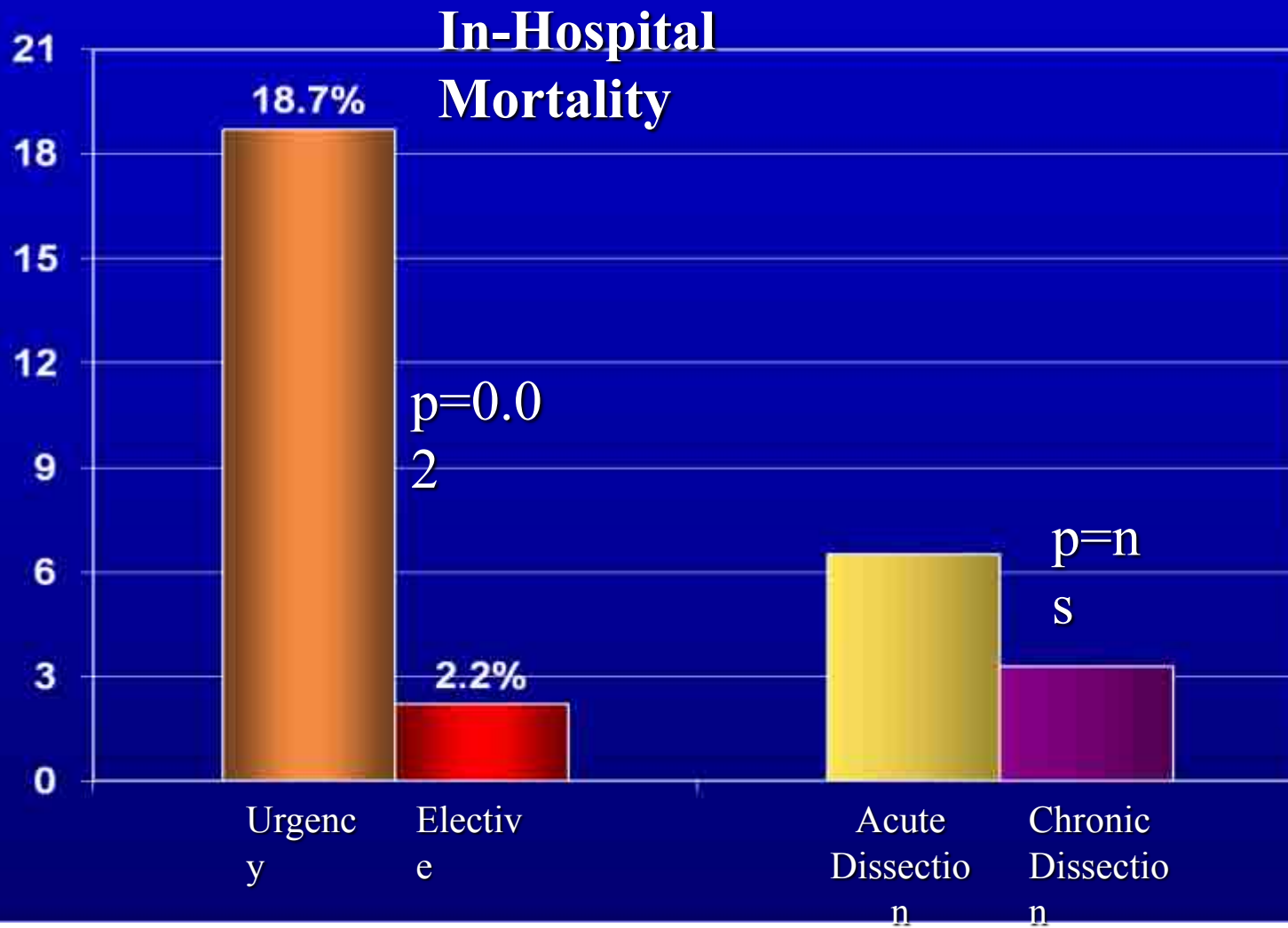
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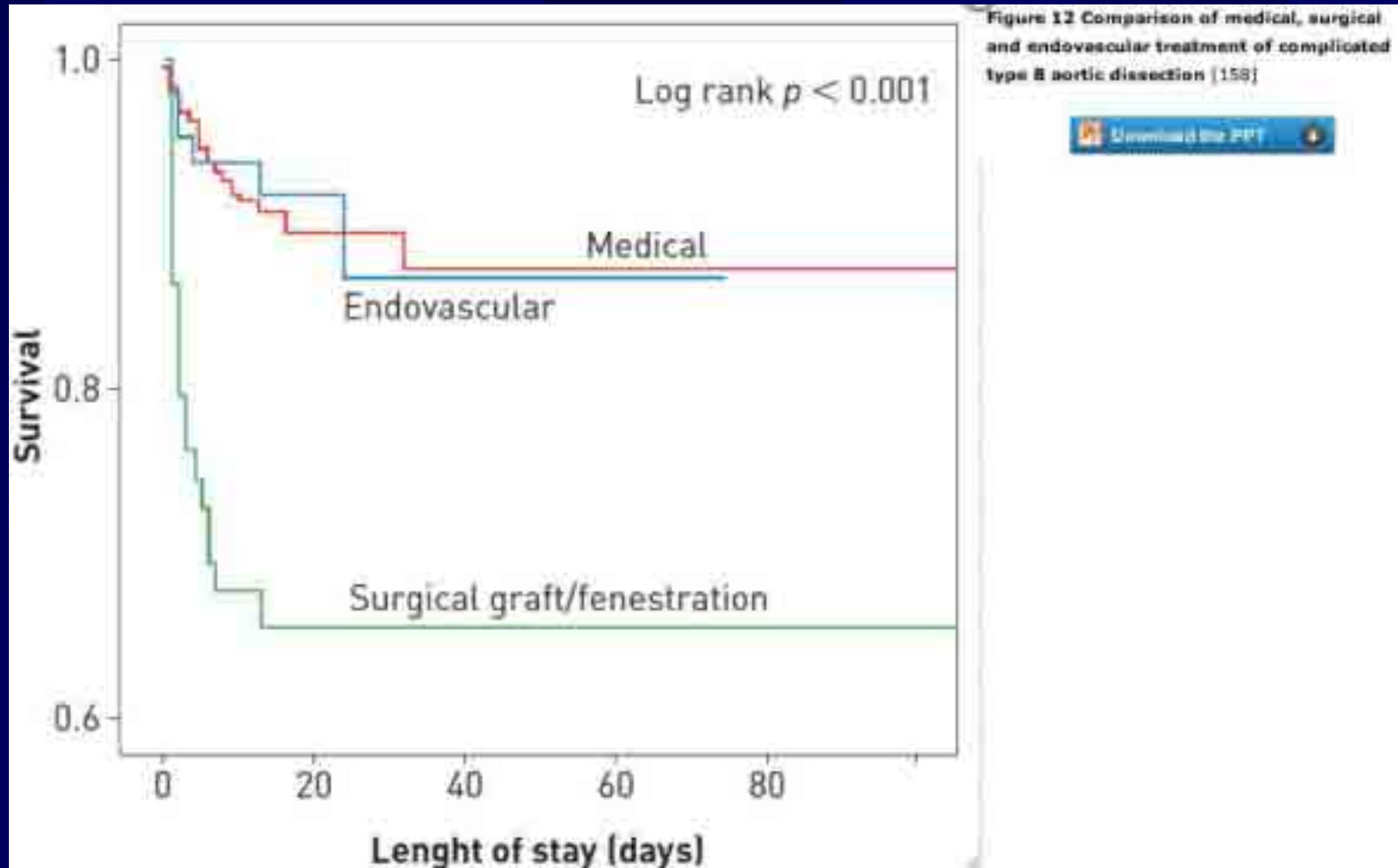


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# IRAD Registry:



# Tratamiento de la disección tipo B por vía endovascular

## Meta-análisis

Reference, First Author	Year	No. of Patients (Characteristics)	Technical Success, %	Retrograde Dissection, %	Stroke, %	Paraplegia, %	30-Day Mortality, %
Eggebrecht <sup>68</sup> (meta-analysis)	2006	609 (Type B: 96%; retrograde type A: 4%)	98	1.9	1.9	0.8	5.3
Leurs <sup>69</sup> (EUROSTAR/UK)	2004	131 (Type A: 7; type B: 106; N/A: 18)	89	N/A	1.5	0.8	8.4
Bortone <sup>70</sup>	2004	43 (Acute type B: 24; chronic type B: 19)	100	5-7	0	0	7
Dialetto <sup>71</sup>	2005	28 (All type B)	100	4	0	0	10.7
Nathanson <sup>72</sup>	2005	40 (All type B)	95	N/A	2.5	2.5	2.5
Eggebrecht <sup>73</sup>	2005	38 (Acute type B: 10; chronic type B: 28)	100	N/A	2.6	0	2.6
Xu <sup>74</sup>	2006	63 (All type B)	95	4.8	1.6	0	3.2
Chen <sup>75</sup>	2006	62 (All type B)	100	4.8	3.2	0	4.8
Schoder <sup>76</sup>	2007	28 (All type B)	86	7.1	0	3.6	10.7

N/A indicates not applicable.

n=28-609

86-100%

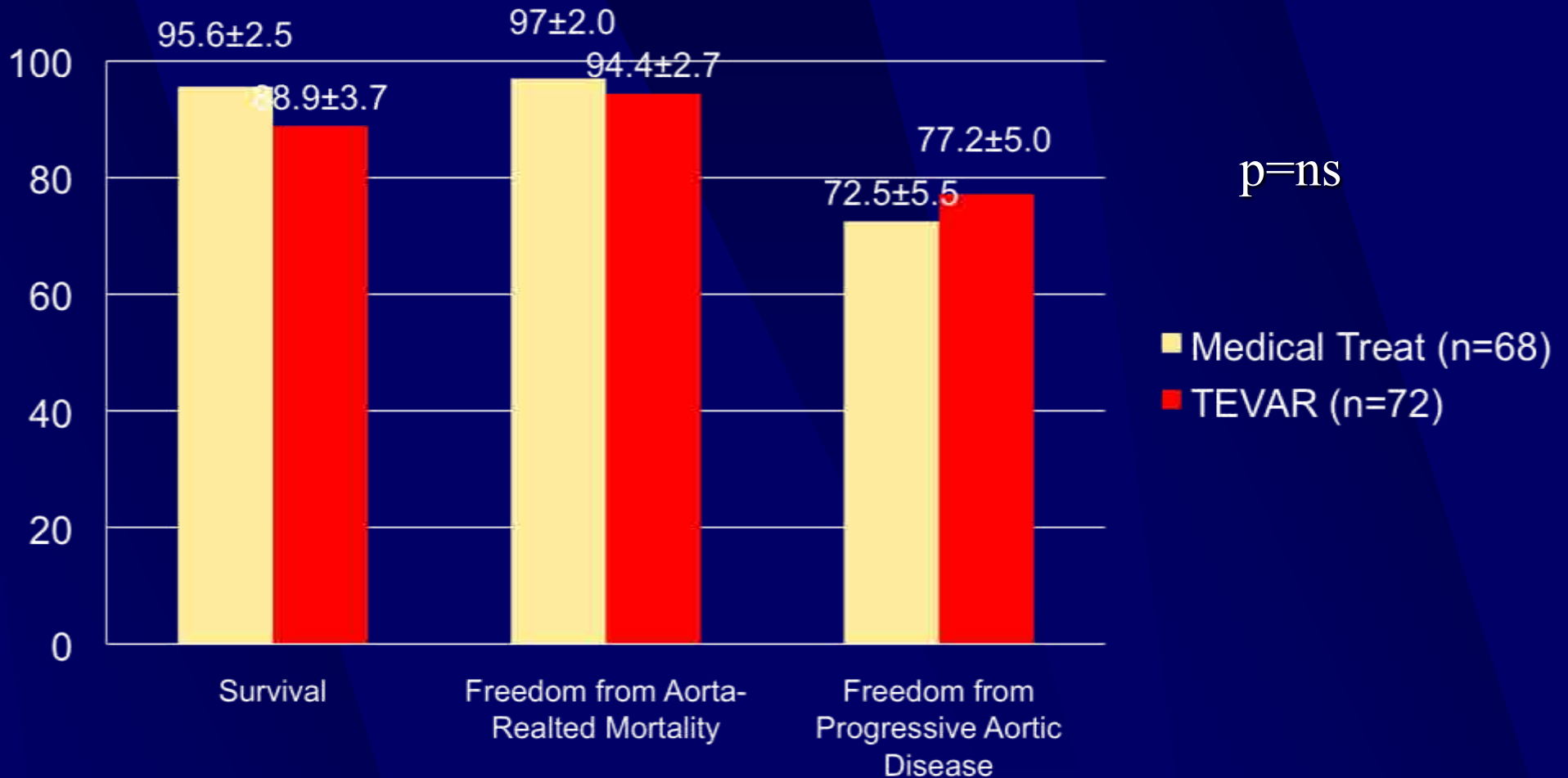
2-8%

2-3%

2-4%

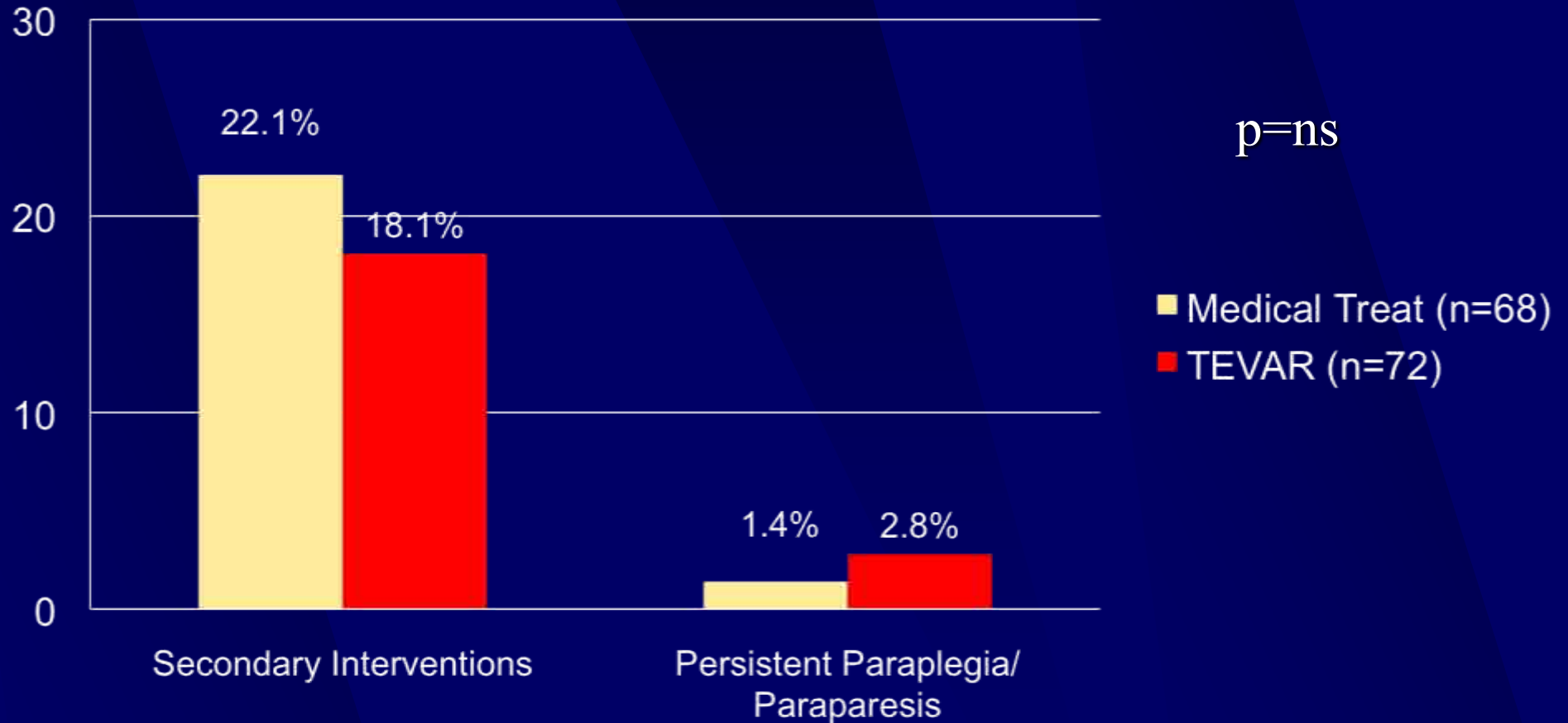
3-11%

# INSTEAD Trial: Outcomes at 2 Years





# INSTEAD Trial: Outcomes at 2 Years



# INSTEAD Trial: Possible Consequences

- Medical Treatment would be kept as Standard of Care for Uncomplicated Type B Aortic Dissections
- Dramatic reduction in number of treated ptes last year.

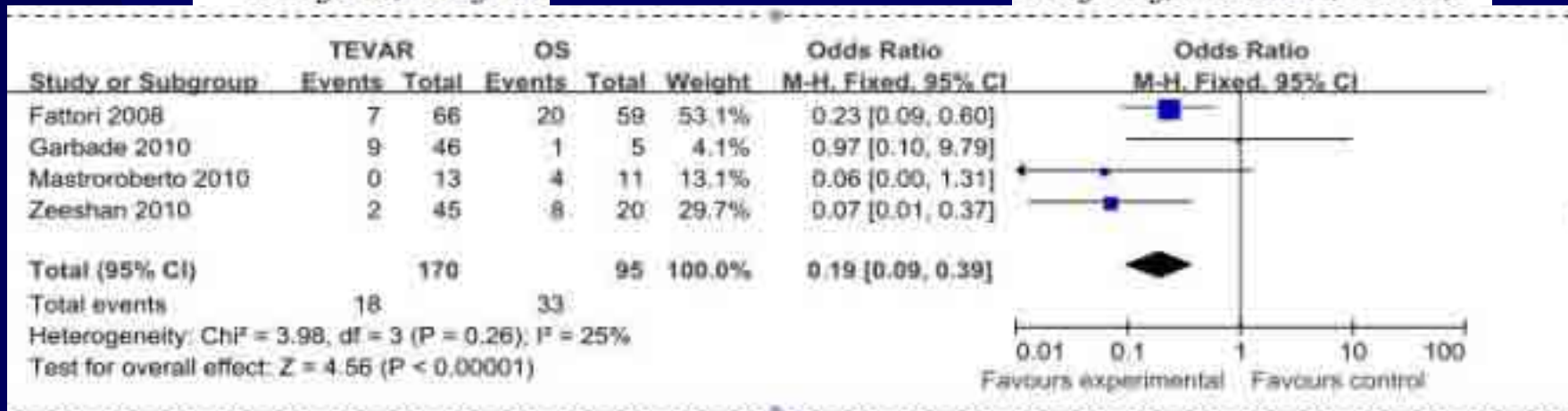
**Diseases of the Aorta**

	<b>TEVAR</b>	<b>Open surgery</b>	<b>p Value</b>
Mortality, 30-day	5.8%	13.9%	<0.00001
Mortality, 1-year	16.0%	21.9%	0.07
Paraplegia/ paraparesis	3.4%	8.2%	<0.0001
Renal Dysfunction	5.9%	15.7%	<0.001
Reoperation for Bleeding	0.01%	6.5%	0.002
Transfusion	3.9%	83.7%	<0.0001
Any Complication	41.4%	69.3%	<0.0001

# Endovascular Stent-Graft Placement or Open Surgery for the Treatment of Acute Type B Aortic Dissection: A Meta-Analysis

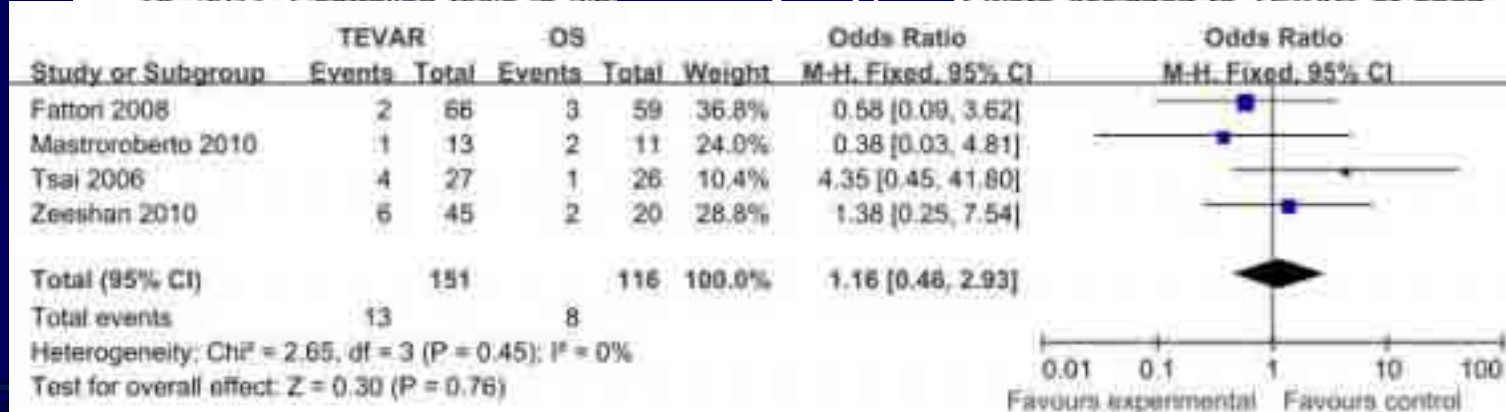
## 30-Day Mortality

Zhang Hao, Wang Zhi-Hong-Bing, and Guo Yi, Wuhan,



(CENTRAL) in The Cochrane Library (2010, issue 4), MEDLINE, EMBASE, CINAHL, Web of Science, and the Paraplegia database for clinical trials until January 10, 2011. Controlled trials in pub...

## Paraplegia



# Endovascular Stent-Graft Placement or Open Surgery for the Treatment of Acute Type B Aortic Dissection: META-ANALYSIS

TEVAR vs. Open

Long-term Mortality

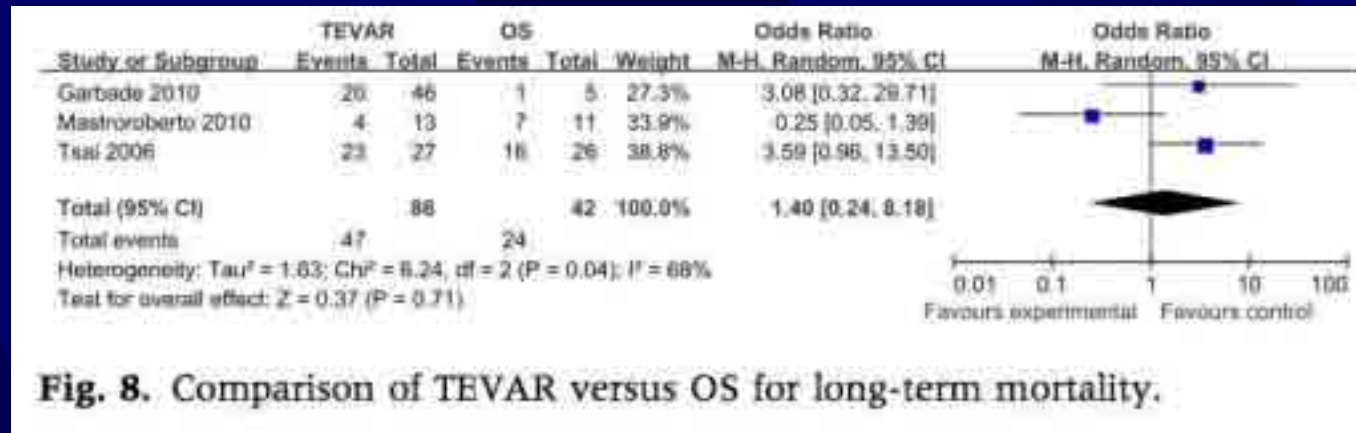


Fig. 8. Comparison of TEVAR versus OS for long-term mortality.

## Reinterventions

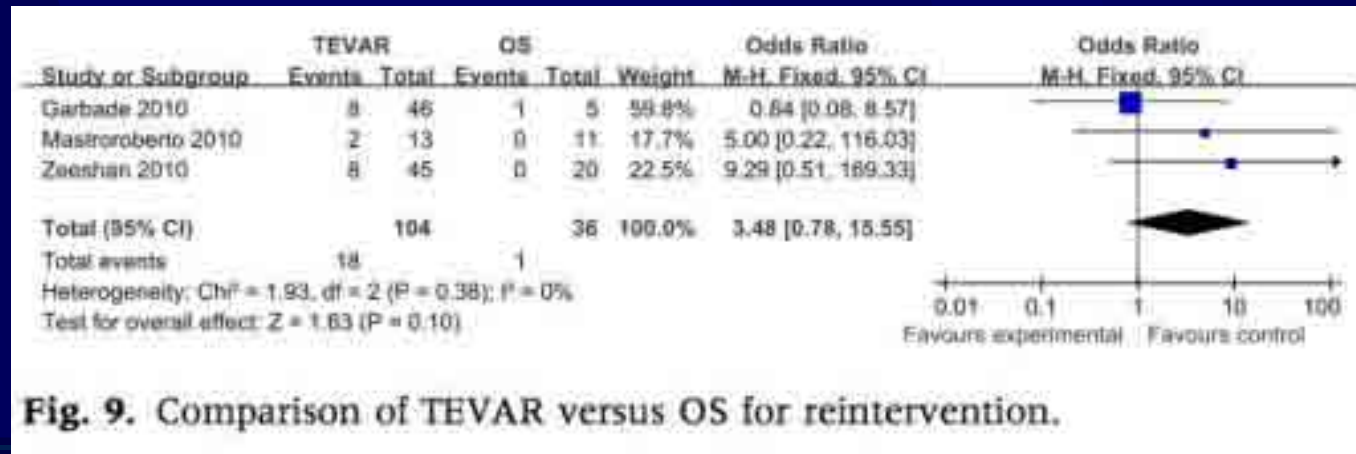


Fig. 9. Comparison of TEVAR versus OS for reintervention.



# Aortic Stent Graft: EVAR-TEVAR.

Favaloro Foundation Experience. December „95–. May ´12

✘ <b>Procedures</b>	<b>451</b>
✘ <b>Stent-Graft Re-interventions</b>	<b>31</b>
✘ <b>Abdominals</b>	<b>16</b>
✘ <b>Thoracias (1 Pte 3 re interve)</b>	<b>14</b>
✘ <b>Patients</b>	<b>420</b>
✘ <b>AAA</b>	<b>315</b>
<b>Atheroembolic (Shaggy)</b>	<b>2</b>
✘ <b>AAA &amp; Thoracic</b>	<b>4</b>
✘ <b>Thoracic</b>	<b>105</b>
<b>Aortic Dissections ( A-B)</b>	<b>49</b>
<b>Atherosclerotic</b>	<b>45</b>
<b>Pseudoaneurysm</b>	<b>6</b>
<b>Penetrating ulcer</b>	<b>5</b>

# Thoracic Aortic Stent-Graft: May 2012

## 30-day outcomes

● Procedures	119
● Implantation Success (%)	117 (98.3)
● Leaks (%)	8 (6.7)
● Related Death (%)	9 (7.5)
● Non Related Death (%)	1 (0.8)
● Urgent Surgery	
● Ascending Aortic Dissection (Three Days post Implantation)	2 (1.6)
● Abdominal Aortic Bleeding (†)	1 (0.8)
● Aortic disecction in cath-lab	1(0.8)
● Right carotid occlusion	1(0.8)
● Paraplegia	2 (1.6)

# Outcome in Acute Aortic Syndromes Vs. Chronic Aneurysm with TEVAR

Follow Up: May 2012

	Acute Aortic Syndromes	Chronic Aneurysm	p
All Patients	60	45	
Follow up patients (%)	54 (90)	41 (91.1)	0.8
Follow up time (Months)	15±8	14,6±12	0.9
Overall Mortality (%)	11 (18.3)	4 (8.8)	0.2
Asymptomatics (%)	37 (86)	31 (83.7)	0.9
Reinterventions	12	2	0.05

# Thoracic Stent-Graft: Follow Up May 2012

● Patients with follow-up (%)	95 (90.4)
● Follow-Up time (Months)	15 ± 11 (1-145)
● Overall Mortality at FU (%)	15 (15.7)
● Related	13 (13.6)
● Non Related Death (%) #	2 (2.1)
● Asymptomatics (%)	74 (92.5)
● Reinterventions	14
● Reinterventions/pte	14/11
● Survival without reinterventions (%)	70 (87.5)

# Acute Aortic Syndrome

**Acute**

**Chronic**

**Complicated**

**NON Complicated**

**Complicated**

**NON Complicated**

**TEVAR  
or  
Surgery**

**Medical Tto.**

**TEVAR  
or  
Surgery**

**Medical Tto.**

TEVAR ?

?





# Síndromes Aórticos Agudos

OA Mendiz, MD. Fundación Favaloro - Buenos Aires - Argentina

- Conclusiones:
- El Tto médico está indicado en de disecciones B no complicadas.
- Tto endovascular es una buen opción en los síndromes aórticos agudos, en especial los complicados
- Se necesitan más estudios a largo plazo para establecer su eficacia en el tiempo.



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