Endovascular Treatment for Thoracic Aortic Trauma

Prof Cristina Riguetti-Pinto

Dpt of General Surgery – Vascular and Endovascular Surgery

Universidade do Estado do Rio de Janeiro

Endocurso – Formação em Técnica Endovascular

Rio de Janeiro - Brasil
Disclosure

Speaker name:
Cristina Riguetti Pinto

I have the following potential conflicts of interest to report:

- Consulting physician for Medtronic, Cook, Cordis and Boston
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest
Ethiology

- **Blunt Thoracic Trauma:**
  
  *Vertical/horizontal deceleration*

- **Penetrating Trauma:**
  
  *Shotgun*
  
  or *Stab wounds*

- **Iatrogenic:**
  
  *Puncture, Angioplasty, Stenting and Anastomotic rupture*
Anatomic Site Classification

Schumacher at al

- Isthmus:
  \[\text{IIC} \quad 70-90\%\]

- Ascending Aorta:
  \[\text{I e IIb} \quad 10-15\%\]

- Descending Aorta:
  \[\text{IIIa e IIIb} \quad 5-10\%\]
Blunt Thoracic Aortic Injury

3rd most frequent blunt trauma case
0.3% of trauma admission
2nd death cause after head injury
Pre admission mortality 85%

Teixeira et al. J Trauma 2011;70:197-202
Endovascular Treatment

2005 – 2015

TEVAR allows other traumatic injuries treatment
Cardiopulmonary Bypass
Thoracotomy
Blood loss
Systemic Heparinization
Risk of Paraplegia (19% to 1.6%)
Early Operative Mortality 22% - 13%
30-D all cause Mortality 8% (0-15%)

Demetriades et al. J Trauma 2008;64:1415-8
Endovascular Treatment

• **Why?**

  - Morbidity and Mortality
  - Paraplegia
  - Heparinization
  - Anesthesia/Extracorporeal Circulation

• **When?**

  - Early X Late

• **How?**

  - Thoracic Endograft, Cuff, Iliac Extension, Balloon Expandable Stentgraft, Bare Metal Stent
Blunt Thoracic Aortic Injury

Classification

GRADE I
Intimal Tear

GRADE II
Intramural Hematoma

GRADE III
Pseudoaneurysm

GRADE IV
Rupture

Blunt Thoracic Trauma + Multiple Injuries

- 28 yo diver, motorcycle accident
- Hemodinamic instability
- 7º day
Overall Picture of Blunt Aortic Trauma

Young patients
Motor vehicle collisions
Grade III injuries
Aortic isthmus (IIC)
Arch angle > 60°
Short and small landing zone – 22-24mm
Young Trauma Patients **Critical Issues**

Aortic Arch Curvature Narrow Radius
Zones II and III Severe Angulation
Hyperdynamic Hemodynamics
Intravascular Vol Status Significant Variations
Small landing zones diameters

*Stent Graft Malapposition, Oversizing and Collapse!!!*

Endograft Infolding and Collapse

Anatomic characteristics:
- Small diameters
- High lesions
- Steeply Angulated Arch

Graft characteristics:
- Spine fractures
- Packaging – Release
- Poor apposition

Left Subclavian Artery Coverage

80% aortic isthmus
10/20mm neck
First Uncovered Stent
LSA cath
Revascularization Technique:
* LSA ending in PICA
* Coronary bypass
* Late left arm claudication
* Long aortic coverage
* Prior EVAR

*Freezor et al. J Endovasc Ther 2007;14:568-73*
Acute Aortic Rupture

Aortic Coarctation
Thank you!
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