Upward (Cranial) Migration Of Thoracic Endografts: Etiology And How To Prevent And Treat It

Vincent Riambau, MD, PhD
Professor and Chief of Vascular Division
Cardiovascular Institute
Hospital Clinic, University of Barcelona
Speaker name: V. Riambau

I have the following potential conflicts of interest to report:

- [x] Consulting (Bolton Medical/ Medtronic/ Cordis/ iVascular)
- [ ] Employment in industry
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• Scope of the problem
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• Summary
• **Durability** of thoracic endografting remains a concern

• **Cranial migration**, from the distal attachment, is part of it (specially with distal neck length <3cm)

• It is an **under-reported** complication
Scope of the problem

4 years later
Pivotal Trials | Migration rates
---|---
Gore TAG J Vasc Surg 2005 | 4.0% @ 2y
VALOR J Vasc Surg. 2008 | 2.4% @ 1y
TX2 J Vasc Surg. 2008 | 2.8% @ 1y

- In our experience, before 2006, for distal neck lengths 1.5-3cm, 60% cranial migration rate was registered at 5 years

- Cranial migration of TEVAR is underreported, specially in long follow-up
• Definition
• Biomechanics in Distal DTA
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• Summary
Abdominal pull out forces

CA Figueroa et al, SITE 2011
Thoracic pull out forces

CA Figueroa et al. J Endovasc Ther 2011
The consequence: up cranial migration & Type Ib endoleak

CA Figueroa et al. J Endovasc Ther 2011
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Preventive actions
How to improve distal fixation and sealing?

Wrapping
Occluded CT
Debranching
Scallop
Periscope
Branched
Hooks
Endoanchors
Our Approach

Regular endograft

(=3cm +/- endoanchors*)

Distal neck length

≥3cm Regular Straight

* If angulated or long life expectancy
Our Approach

Preventive actions

Distal neck length

- **≥3cm**
  - Regular endograft
    - (=3cm +/- endoanchors*)

- **1.5-3cm**
  - Scalloped endograft
    - +/- endoanchors

* If angulated or long life expectancy
Heli-FX™ System:
Applier + Guide + 10 EndoAnchor™ Implants

Cross Bar

3 mm

1.0 mm

3.5 mm

18Fr OD,
90cm Working Length
Example # 1

Distal neck = 3cm, 63 yo lady
Distal neck 2cm, 67 yo man
Our Approach

- Regular endograft
  (=3cm +/- endoanchors*)

- Scalloped endograft
  +/- endoanchors

- Fenestrated and/or branched endografts

* If angulated or long life expectancy
Example # 3

Distal neck <1.5cm, 68 yo man
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• Summary
• Durability of thoracic endografting remains a concern
• Cranial migration is a consequence of biomechanical forces of the thoracic aorta and it is underreported
• The proximal and distal necks deserve equal attention
• Many different approaches have been suggested to avoid cranial migration
• Endoanchors, scallops, fenestrations and branched endografts should be applied more often
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