Prevention and revision of TEVAR utilising EndoAnchors to reduce and treat endoleaks

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I have the following potential conflicts of interest to report:

Consulting – Medtronic, Bolton Medical, Orzone

Other(s) – Speaker, travel and conference fees from Medtronic and Bolton and Gore;

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LONG TERM FAILURE OF TEVAR
Heli-FX Abdominal and Thoracic System

Heli-FX Thoracic EndoAnchor System

Heli-FX EndoAnchor System

16Fr OD, 62cm working length

18Fr OD, 90cm working length
Transmural Fixation of EndoAnchor™ Implants Has Unique Benefits - Mechanism of Action

Establishes the strength of a sutured anastomosis:

- Displacement Force (Newtons)

- Talent™, Anaconda™, Zenith™, Endurant™, Hand Sewn

- No EndoAnchor™ Implants
Mechanically resist neck dilatation:
EndoAnchor™ implants, which secure the aorta to the endograft, have a protective effect against neck dilatation

Aortic diameter and graft oversizing appear to be independent risk factors for early aortic neck dilatation
• Endoanchors have a protective effect on neck dilatation at their usual level of deployment
Transmural Fixation of EndoAnchor™ Implants Has Unique Benefits - Mechanism of Action

Promotes increased rate of sac regression:
In a propensity-matched study design, significantly greater AAA sac regression with EndoAnchor™ fixation at 2 years post-EVAR


Methodology
- Pre-EVAR CTs core lab evaluated
- 2 cohorts:
  - 99pts EVAR
  - 99pts EVAR+EndoAnchor™
- Propensity matching on 19 variables

A more competent proximal seal may induce enhanced AAA remodeling
• Utilise in right circumstances
• Indications:
  • Arch to augment sealing/prevent bird beaking and seal endoleaks
  • Conical distal neck
  • Ensure repair fixation
Indications

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DEGENERATION AND DILATATION AND UPWARD DISTRACTION OF THE GRAFT LEADS TO TYPE 1B ENDOLEAK OVER TIME
FORCES ON THE GRAFT ARE CRANIAL, NOT IN THE DIRECTION OF BLOOD FLOW, AND INCREASED WITH LARGER GRAFTS AND INCREASED PRESSURE

“A 36-mm endograft in the mid-descending aorta had a peak systolic DF of 27.8 N and an end-diastolic DF of 16.7 N.”

“The orientation of the DF varies depending on curvature and location of the endograft, but in all instances, it is in the cranial rather than caudal direction.”

Magnitude and Direction of Pulsatile Displacement Forces Acting on Thoracic Aortic Endografts
Figueroa et al
J ENDOVASC THER
2009;16:350–358
Distal thoracic applications – conical neck
Distal thoracic applications – conical neck
• Utilise in right circumstances
• Indications:
  • Arch to augment sealing/prevent bird beaking and seal endoleaks
  • Conical distal neck
  • **Ensure repair fixation**
Planning – ARCH

For emergencies or treating a type 1 endoleak on table

- Align the C arm so that you have the markers lined up with the lateral projection (40-50 LAO)
- Put in the superior/inferior ones two rows (or more)
- Then to move around the aorta you need to tilt the C-Arm cranio-caudal and caudo-cranial (0CRA-15CRA-30CRA-15CAU-30CAU)
- Adjustment of the lateral projection in order to align markers of the device
Dedicated arch planning for EndoAnchors

Planning – ARCH

Otherwise plan case beforehand, dedicated C arm angles needed for planning

3Mensio to estimate the projections of the C-Arm (or a software with markers that you can see in the 3D).

H Rousseau
Medtronic APV Magazine
http://www.endovascularmagazine.eu/
Some experience necessary to attain good EndoAnchor placement

Start with infrarenal segment
  • Conical neck
  • Dilated necks

Thoracic segment after proficiency

Utilise different guides for arch

Zipper technique

Place in rows

PATIENCE

Use of the 22 mm Guide can facilitate EndoAnchor placement on outer radius of the aortic arch

Guide selection can dictate EndoAnchor placement on the inner radius in the aortic arch

-32 mm Guide
...unless you are a genius and can do this

J Panneton
Endoleaks

Utilise experience from infrarenal segment
• Extend if you can
• Identify leak channel
• Fix contralateral side
• Rows of Anchors around leak channel
• It isn’t magic, it wont make you a landing zone

- Identify leak channel and then create a “suture line” along wall.
  - Move C-Arm in 15-20° increments

Example of C-arm orientations for treating leak channel at left posterior

1. Leak channel at left posterior
2. C-arm at 30° LAO
3. C-arm at 45° LAO
3. C-arm at 60° LAO

Approximated location of type 1 endoleak

- Placement of EndoAnchors around the neck circumference before or after T1 EL treatment is recommended

Note: These positions assume EndoAnchors can penetrate vessel wall
Endoleaks

Images courtesy of Firas Mussa MD, Bellevue Hospital: New York, NY
Conclusions

LIMITATIONS OF ENDOANCHOR™ IMPLANTS

Get the right indication and utilise for limited, effective circumstances
Utilise different placement strategies for different indications
Arch planning important, have patience in placing accurately, get through the learning curve first

Target endoleak effectively
Expect to place multiple rows cranially/caudally
Don’t get tricked into trying to create a landing zone when there isn’t