How To Use EndoAnchors To Treat Type Ia Endoleaks After TEVAR and EVAR

Colin D. Bicknell, MD, FRCS
Clinical Senior Lecturer
Imperial College London
Consultant
Imperial College Healthcare NHS Trust
London, United Kingdom

LONG TERM FAILURE OF of TEVAR and EVAR

Migration
Neck dilatation
Bird beaking
Type 1a endoleak
Type 1b endoleak
Type 1a endoleak

Indications for intervention in endoleaks

Not all endoleaks are the same...
- Inadvertent creation of a leak channel
- Hostile landing zone anatomy compromising seal or stent-graft alignment
- Excessive oversizing creating gutters
- Non-circular or angulated neck – conformability challenges
- Endograft mis or mal deployment
- Migration and loss of seal
- Others
- Excessive thrombus/calcium in seal zone
- Insufficient apposition due to aortic expansion or undersizing of stent graft

Disclosures

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;
Imperial College London:
Institutional level funding from Orzone

ANCHOR Registry – Therapeutic Use for Proximal ELs

PROCEDURAL SUCCESS
Technical success without type Ia endoleak at completion arteriography
84.4% Intra-op T1 EL
86.6% Revision

Kaplan-Meier Estimates

3 Year

Freedom from ACM 60.9%
Freedom from ARM 91.1%
Freedom from 2nd Procedures for Type Ia endoleak 87.6%

3 Year

Freedom from ACM 80.3%
Freedom from ARM 98.4%
Freedom from 2nd Procedures for Type Ia endoleak 97.4%

HOSTILE NECK ANATOMY AND CONFORMABILITY: CHALLENGES OF INTRAOPERATIVE TYPE 1 ENDOLEAK

Intra-operative T1 EL
Revision
**DISTAL THORACIC CONICAL NECK: ENDOSTACK ANCHOR FOR INTRAOPERATIVE TYPE 1 ENDOLEAK**

**TREATING LEAK CHANNELS - STRATEGY**

- CT evaluation is essential if possible, consider more detailed imaging to triangulate leak channel with angiography if not.
- Fix side away from endoleak first.
- Row of staples across endoleak and often another row below.

- Identify leak channel and then create a "future line" along vas.
- Nuna C-Arm in 15-20° transverse.
- Row of 1cm staples for marker placement and position.
- Place EndoAnchors around the neck circumference before or after T1 EL treatment is reinstalled.

**CONFORMABILITY CHALLENGES AND ENDOLEAK CHANNEL**

**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 (0-15 LAO).
- Put in the sup/inf ones two rows (or more).
- Then to move around the area 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.
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 Aortic and Peripheral Vascular Magazine
http://www.endovascularmagazine.eu/

LEARNING CURVE

- Some experience necessary to attain good endoanchor placement
- Start with infrarenal segment prophylactic cases
  - Conical neck
  - Dilated necks
- Thoracic segment after proficiency
  - Unlike different guides for arch
  - 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
- 12 mm Guide

MIGRATION – Prevention of progression

- EXCESSIVE THROMBUS IN AORTA
  1. Not recommended in proximal necks where thrombus, calcification and/or plaque is greater than 180° in target area
  2. Irregular or eccentric thrombus, calcification and/or plaque that may compromise EndoAnchor™ implant penetration
  3. Bridging an endoleak gap if the native aorta has dilated beyond the maximum diameter of the endograft
  4. Attaching multiple components and/or layered endografts without aortic wall penetration

MIGRATION – Descending thoracic aorta, prevention of recurrence

- EXCESSIVE CALCIFICATION IN AORTA

Limitations of endoanchor™ implants

- AORTA DILATED BEYOND ENDOGRAFT

CONCLUSIONS – TYPE 1 ENDOLEAK STRATEGIES

- There is a learning curve, start with some prophylastic cases
- Not all endoleaks are the same, the strategy varies dependent on cause and anatomy of leak
- Don’t get tricked into trying to create a landing zone when there isn’t - There are cases where endoanchors will not work but The majority of Type I endoleaks after EVAR and TEVAR can be successfully treated using Heli-FX EndoAnchors
- Type I endoleaks should be treated with EndoAnchors at the index procedure when detected intraoperatively, both in TEVAR and EVAR
- In case of re-interventions, careful preplanning is mandatory to determine where to place EndoAnchors and the associated C-arm projections - CT evaluation for all cases
- Target endoleak effectively, come prepared to open more guides in the arch
- Expect to place multiple rows cranially/caudally, have patience
- If you have one of the 13.4% failures, then just remember the use of EndoAnchors to treat Type Ia endoleaks doesn’t preclude any further reinterventions, if needed