Treating challenging aortic anatomies: Are new devices the answer to overcome the current limitations?

Dittmar Böckler
Department of Vascular and Endovascular Surgery
University of Heidelberg
Germany
Disclosures

• **Consultant**
  – Endologix, Endomax, **Gore**, Medtronic

• **Research Grant /research support**
  – **Gore**, Maquet, Medtronic, Siemens

• **Advisory Board**
  – Endologix, **Gore**, Medtronic, Siemens

• **Paid speaker**
  – Endologix, **Gore**, Maquet, Medtronic, Siemens

• **Major stakeholder**
  – none
TEVAR is Challenging – more than EVAR
Current Limitations Performing TEVAR

- Profile (up to 24Fr.)
- Inner wall apposition in the arch (Zone 0 & 1)
- Control during deployment (hemodynamic forces)
- Preservation of aortic branches
- Longterm durability (migration)
- Clinical AE e.g. stroke, EL, Paraplegia
- etc.
19 Years of Stent Graft Evolution

TAG
1998

Conformable TAG
2009

CTAG with active control
2017
Current CTAG Deployment Sequence

- One step deployment
- Mid to both ends
3 important steps before deployment

Eliminate stored energy by pulling the device back into intended landing zone.

(double) curved wire
In the ascending

Push stiff wire = device
to the outer curve
Refinements for Device Accuracy

- Maintain conformability of Conformable GORE® TAG®
- Precurved olive for self orientation
- New delivery system to 1. enhance control
  2. vessel wall apposition
CTAG with **ACTIVE CONTROL** System

- **Staged deployment** enables adjustment of placement and angulation
- Continuous blood flow ensures **hemodynamic stability**
- Opportunities to visualize & **refine device placement**
  - C-arm parallax correction
  - Device placement
Intuitive deployment system allows physicians to focus on the patient, not the deployment system.

- **Optional steps** can be skipped.

- **Lockwire keeps stent graft attached** to catheter throughout the procedure, enhancing control of the stent graft.
CTAG with ACTIVE CONTROL System
Limited Launch in Europe
Since July 2017 in 20 sites

Implants in Europe $n=100$
Impants in Heidelberg $n=13$
TEVAR Experience Heidelberg (n=532)
March 1997 – November 2017

- 532 TEVAR Procedures
- 190 Pat. (male 58%; mean age 66 yrs.)
- 295 CTAG devices
- Mean 1.5 devices per patient
- 80% arch involvement (Zone 0-3)
Early Heidelberg Experience since July ‘17
(n = 13 patients, 20 devices)

N=6 PostCoA - Aneurysm
B-Dissection
PAU

N=2 DTA aneurysm
B-Dissection

N=4 TEVAR Redo
distal Extension
TAA- chronic B-Diss.

N=1 Arch Aneurysm
(out of recent IFU)
Early 30 day results (n=13)

- Technical success: 13/13
- Optional angulation used: 6/13
- Accuracy: 13/13
- Inner wall apposition: 13/13
- Access problems (24Fr.): 1/13
- Endoleak 1 & 3: 0/13
- Mortality: 0/13
- Stroke / SCI: 0/13
- Reintervention: 2/13
Early 30 day results (n=13)

- **Technical success**: 13/13
- **Optional angulation used**: 6/13
- **Accuracy**: 13/13
- **Inner wall apposition**: 13/13
- **Access problems (24Fr.)**: 1/13
- **Endoleak 1 & 3**: 0/13
- **Mortality**: 0/13
- **Stroke / SCI**: 0/13
- **Reintervention**: 2/13
Early mean 3 mths. FU results (n=13)

- Technical success: 13/13
- Optional angulation used: 6/13
- Accuracy: 13/13
- Inner wall apposition: 13/13
- Access problems (24Fr.): 1/13
- Endoleak 1 & 3: 0/13
- Mortality: 0/13
- Stroke / SCI: 0/13
- Reintervention: 0/13
Case Example (first patient treated)

Male 40 yrs.
Asymptomtatic
Post Coarctation Aneurysm
4 cm Diameter
Twice open repair 20 and 10 yrs.
Prophylactic indication
Device Sheath Insertion
1. Angio CTAG in Place
Optional Angulation Control
Full deployment
Intraop Dyna CT Scan
Distal accuracy due to deployment sequence
Distal accuracy due to deployment sequence
Strategy Change with CTAG Active Control

Liberal overstentig of supraaortic branches with bares stents

Not with active control due to second sleeve
Why is this new CTAG my first choice!

1. approved for aneurysms, dissections and trauma
2. radial force adapted to underlying disease
3. highly conformable > ideal for aortic arch pathologies
4. short precurved nose cone > zone 0 (ascending !)
5. unsheathed > multiple devices with one access
6. partial deployment > paralaxis correction, no rapid pacing
7. fixed on stent graft system, total placement control
8. deployment distal to proximal > accurate at celiac trunk
9. time to optimize accuracy, angulation and apposition
10. good for teaching
Summary

- CTAG with additional features:
  - Staged deployment
  - New deployment sequence
  - Optional angulation
- Early experience is convincing
- New CTAG is about to overcome existing limitations
- Surpass Registry started to gain more data
Treating challenging aortic anatomies: Are new devices the answer to overcome the current limitations?

Dittmar Böckler
Department of Vascular and Endovascular Surgery
University of Heidelberg
Germany