Advances in Ascending Aortic and Arch Endografting

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Disclosures
Abbott Speaker, Investigator
Cook Speaker, Investigator
Cryoprobe Consultant, Investigator
Edwards Consultant, Speaker
Gore Consultant, Investigator
LivaNova Consultant, Investigator
Medtronic Speaker, Investigator
Terumo Aortic Speaker, Investigator

Off-label and Investigational use of devices discussed

Endovascular Proximal Aortic Repair is the Next Frontier

Two Critical Questions:
1) Should we?
2) Can we?

Mortality
Elective Thoracic Aorta Surgery

Observed
Expected

O/E Ratio = 0.08

0.3%
3.8%

University HealthSystem Consortium (UHC) Comparative Database, January through November 2017 discharges

Unmet Need in Dissection: High Risk Type A

4% Type A Op; 4.5% Type B
All Surgical (n=114)
All Medical (n=58)
Bilateral (n=57)
Medical (n=35)
All Patients (n=259)

Inoperable Type A Patients (2005-2015)
n = 53 / 686 (7.7%)

Prohibitive
Very High-Risk

Mean 78y/o
63% DeBakey Type I
STJ to Tear 21mm
79% Coverable

66%
Aortic Arch Surgery in CLE

- Since 2013, > 2/3 Are Hybrid
- ~20% Emergency
- 3.8% Op Mortality
- 3% Stroke

Risks and Benefits Must be Tailored to the Patient

- Aortic Details
- Non-aortic Comorbidities
- Pt
- Surgical Results
- New Tx

Arch Branch Procedures Have Arrived

- Fusion Imaging
- Arch Single Branch Devices
- Mona
- LSA
- TBE
- Investigational Devices

Configurations with Single Branch Devices

- Zone 2
- Zone 1
- Zone 0

Arch Double Branch Devices

- Three-Branch Devices In R and D Phase
- Cook
- Terumo
- Nitrox
Arch Branch Limitations

- Proximal Seal Zone Length
- Angulation

High Risk Ascending TEVAR

2006-2014
N = 22
Thru 2017
N = 42
Current
N = 48

- Acute Type A Dissection 9
- IMH with PAU 2
- Pseudoaneurysm 9
- Complicated Chronic Dissx 2

Roselli EE, et al. JTCVS, ’15; JTCVS, ’17; Unpublished.

Coaxiality is Crucial for Success

Unanswered Questions @ Ascending Stentgrafting
(Mechanical Solution to a Biochemical Problem)

- Device / Patient Interface
  - Boundary conditions: aortic compliance / elasticity
- Role: Staged versus definitive tx
- Reverse Remodeling Post Repair
New Ascending Stent Graft (ASG)

- GORE® ASG FDA IDE Q4 2017
- ARISE EFS
- Site specific design
- Staged deployment
- Proximal angulation control

83 y/o Female, Acute DeBakey Type 2 CRI, COPD, Frail

First Stage

- Transfemoral Delivery
- Proximal piece 45mm x 8cm
- Distal piece 45mm x 8cm
- Partial Deploy

Second Stage: Shaping the Lesser Curve

3rd and 4th Stage:
Full Expansion and Fine-Tune Angling

3rd: Rapid Ventricular Pacing
4th: Optional additional curvature

Post-op CT
Ascending Plus Branched Devices for Extension

Persistent False Lumen Perfusion in Chronic Disx

Most Ascending Disease is Fusiform with Very Limited Landing Zone at the STJ

Endo Composite Valve Graft

CORONARIES CAN BE TREATED WITH COVERED STENTS

ISSUES:
1) Proximal Fixation AND SEAL
2) Coronary Patency

Coronaries Can be Treated with Covered Stents

Improving, but Mild PVL is routine and ≥ Mild ~12%
Redefining Zone Zero

Zone 0

C: RtPA to Innom
B: Core to RtPA
A: Annulus to Aors

Cleveland Clinic
Roselli EE, et al. JTCVS, '18.