Current Management of Aortic Arch Lesions with Hybrid Procedures: What Are Key Details and Precautions?

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Disclosures

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Aortic Arch Surgery in CLE

Since 2013, ~½ Are Hybrid
Reop
Primary

14% Emergency
3.8% Operative Mortality
3% Stroke

Hybrid Arch Classification

Type I
Beating Heart
On or Off Pump

Type II
Cardiac Arrest Only

Type III
Circulatory Arrest (incl FrozenET and EEC)

81y/o acute hoarseness, CP → CAD + Ruptured Arch Aneurysm

• Inferior wall ischemia
• Cath → 70% PLCx and RCA
• CT → Large arch aneurysm, Leak
• s/p PPM, Jehovah’s Witness
• Hybrid Arch Type 1s
  – Beating heart debranching, Antegrade TEVAR

CABG and Debranching 1st
Hybrid Arch Type 1 Issues

- Side-biting clamp on diseased ascending
- Ascending diameter disparity - often large
- Landing zone less reliable, relatively short
- Partial/full sternotomy
  - Extra-anatomic bypass patency
  - Limited options for multi-component procedure

Stroke and TEVAR

- Incidence of 2.3 – 8.2%
- Risks Factors:
  - Proximal descending coverage
  - Atheroma
- Serious complication
  - 1/3rd of strokes post TEVAR died

Ascending Often Dilated / ing

- Type 1 Endoleak ~ 10% (up to 19%)
Proximal / Retrograde Dissection
• Post TEVAR ~ 1-8%
  especially dissection and CTD

Higher Post Hybrid:
11% native, Andersen, Hughes, et al. JVS ’13
24% h/o dissx, Cochennec, et al. JVS ’13

Type A after previous Type B
Disease Progression?

Should we limit hybrid debranching to those with an ascending graft?

Grafts Often Short

Reops After Type A
n = 305
False Lumen Patency 2/3rd

Frozen Elephant Trunk
• Sternotomy
• Circ Arrest
• +SABP

86y/o asc an, chronic disx

Completion CT

Simplified Technique for Acute Dissection

- Size 1:1 Outer wall diameter @ level b/w LCC & LSA

Evolving Procedure / Devices

Modified Frozen Elephant Trunk with On Table Fenestration

Modified Frozen Elephant Trunk with On Table Fenestration
Modified Frozen Elephant Trunk with On Table Fenestration

ET then Endovascular Completion / Extension (Hybrid 3d)

Advantage of Staging
• Limits the insult & Allows for collateral adaptation
• Adjuncts protective, Biggest predictor SCI: length treated

Emergency: e.g. Ruptured arch
• Moderate risk patient: Circ arrest w/ SABP + FET
  (i.e. Hybrid type 3s)
• High risk patient: Debranching + TEVAR
  (i.e. Hybrid type 1s or 2s)

Elective: e.g. Chronic disx an
• Moderate risk patient:
  ET ± Frozen ± Distal fenestration ± Staged TEVAR
  (Hybrid 3s or 3d)
• High risk patient:
  Endovascular branched device