Inner Branched Arch Endografts following Ascending Open Repair

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Disclosures

• Research support, Consulting
  – Cook Med, GE Healthcare
OPEN SURGERY
Open Surgery
Hybrid Repair
PROXIMAL SEAL
No Compromise!

- Asc Aorta diam < 38mm
- Prox neck length > 25mm
- Type B dissections
Preoperative measurements with CPR on workstation
Access Tortuosity/Calcification
Endovascular Aortic Repair - Edited by Gustavo Oderich, Springer
Type A Dissection Follow-Up

- 72 year-old female
- Previous condition
  - Acute type A dissection: Open Ascending Aorta repair in 2008
  - Essential Hypertension
  - Renal impairment
  - Severe COPD
Global experience with an inner branched arch endograft

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Background: Branched endografts are a new option to treat arch aneurysm in high-risk patients.

Methods and results: We performed a retrospective multicenter analysis of all patients with arch aneurysms treated with a new branched endograft designed with 2 inner branches to perfuse the supra aortic trunks. Thirty-eight patients were included. The median age was 71 years (range, 64-74 years). An American Society of Anesthesiologists score of 3 or 4 was reported in 89.5% (95% confidence interval [CI], 79.7-99.3) of patients. The 30-day mortality rate was 13.2% (95% CI, 2.2-24.2). Technical success was obtained in 32 patients (84.2% [95% CI, 72.4-92.2]). Early secondary procedures were performed in 4 patients (10.5% [95% CI, 0.7-20.3]). Early cerebrovascular complications were diagnosed in 6 patients (15.8% [95% CI, 4.0-27.6]), including 4 transient ischemic attacks, 1 stroke, and 1 subarachnoid hemorrhage. The median follow-up was 12 months (range, 6-12 months). During follow-up, no aneurysm-related death was detected. Secondary procedures during follow-up were performed in 3 patients (9.1% [95% CI, 0.0-19.1]), including 1 conversion to open surgery. We compared the first 10 patients (early experience group) with the subsequent 28 patients. Intraoperative complications and secondary procedures were significantly higher in the early experience group. Although not statistically significant, the early mortality was higher in the early experience group (30% [95% CI, 0.0-60.0]) versus the remainder (7.1% [95% CI, 0.0-16.9]; P = .066). Being part of the early experience group and ascending aortic diameter ≥38 mm were found to be associated to higher rates of combined early mortality and neurologic complications.

Conclusions: Our preliminary study confirms the feasibility and safety of the endovascular repair of arch aneurysms in selected patients who may not have other conventional options. Clinical trial registration information: Thoracic IDE NCT00583817, FDA IDE# 000101. (J Thorac Cardiovasc Surg 2014;■1:1-8)
#### Aortic arch aneurysms

Prevalence of thoracic aneurysms: 10.4 for 100,000 pers/year
Aortic arch aneurysm = 10% of thoracic aneurysms

<table>
<thead>
<tr>
<th></th>
<th>Mortality rate</th>
<th>Stroke rate</th>
<th>TYPE 1 EDL</th>
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<tbody>
<tr>
<td><strong>OPEN SURGERY</strong></td>
<td>2% - 16.5%</td>
<td>2% – 18%</td>
<td>-</td>
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<td>Moon et al, 2007</td>
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<tr>
<td><strong>HYBRID REPAIR</strong></td>
<td>0 - 15%</td>
<td>0 - 11%</td>
<td>20%</td>
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## Risk Factors for Early Mortality and Neurologic Events

<table>
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<tr>
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<th>EE (n = 10)</th>
<th>AAD ≥38 mm (n = 11)</th>
<th>PAAS (n = 12) versus no PAAS (n = 26)</th>
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<tbody>
<tr>
<td></td>
<td>versus LE (n = 28)</td>
<td>versus AAD &lt;38 mm (n = 27)</td>
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<td>Early mortality and neurologic events (n = 11)</td>
<td>6 (60.0; 28.1-91.9) vs 6 (54.5; 13.7-85.3) vs 2 (16.7; 5.5-38.7) vs 9 (34.6; 16-53.2)</td>
<td>5 (17.9; 3.4-32.4) vs 5 (18.5; 3.6-33.4)</td>
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<td>$P$ value</td>
<td>.019</td>
<td>.026</td>
<td>.23</td>
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Values are given as n (%; 95% confidence interval). Boldface indicates $P$ values < .05. EE, Early experience (first 10 patients); LE, late experience (later 28 patients); AAD, ascending aorta diameter; PAAS, prior ascending aortic surgery.
Editor’s Choice — Subsequent Results for Arch Aneurysm Repair with Inner Branched Endografts,


Aortic Centre, CHRU Lille, France
Vascular Surgery, Jikei University, Tokyo, Japan
German Aortic Center, University Heart Center Hamburg, Germany

WHAT THIS STUDY ADDS
This study reports early outcomes following endovascular repair of arch aneurysms in patients unfit for open surgery and is the first evaluation of arch aneurysm endovascular repair performed after the initial learning curve.
ESVS 2015

- 27 patients
- Technical success always achieved
- No patients died during the 30-day postoperative period
- Early neurologic events:
  - 2 major and one minor strokes (11%)
Post Type A Repair
• Male 36yo

• Marfan syndrome

• Tirone David

• Redo sternotomy with aortic valve replacement

• Respiratory failure requiring tracheotomy, endocarditis, acute renal failure requiring transient dialysis

⇒ Multidisciplinary decision of endovascular treatment
Device advanced in the introducer sheath
Deployment of bridging stent in left common carotid branch
1 month CT scan

1 year CT scan

48.5 mm

59.5 mm
Ascending Aorta and Arch

Endovascular Approaches to Acute Aortic Type A Dissection: A CT-Based Feasibility Study

SUITABILITY FOR INNER BRANCH GRAFT

• Post Type A Open Repair

• TOTAL CASES: 74
  – Tyrone David Repair - 41 (55.4%)
  – Bentall Repair - 32 (43.2%)
  – Unknown - 1 (1.4%)
LANDING ZONE SUITABILITY

• ASCENDING AORTIC GRAFT LANDING

• ZONE SUITABLE: 54 (73%)
  – Major reasons for exclusion were landing zone too short or major graft kink
CONCLUSION

✓ Conventional surgery: «gold standard» but not in « high risk patients »

✓ Hybrid technique: redo sternotomy?

✓ Total endovascular repair:
  ✓ Seal in Ascending Aorta?
  ✓ Type A dissection Follow-up