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Aortic Arch Endovascular Repairs: Which Device Is Best For Degenerative Aneurysms And For Dissection: Technical Tips

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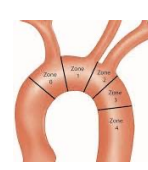
Disclosures

- Educational Grants/Support: Cook, Gore, Medtronic, Terumo aortic
- Advisory board consultant for Medtronic and Endologix

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Background

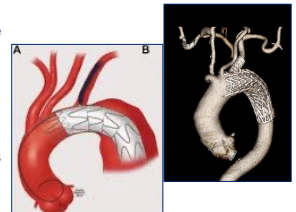
- Endovascular aortic arch repair has evolved in the recent years
- Multiple reports of successful use in aneurysms and dissections
- Proximal arch (zone 0) and distal arch (zone 1/2) are dealt with differently



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Distal Arch (Zone 1/2)

- Single arch branch /fenestrated device
 - Gore TBE
 - Cook Fenestrated TEVAR
 - Inoue
- TEVAR with carotid subclavian bypass
- TEVAR with in situ laser fenestration



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Gore TBE Trial Data for Aneurysms

Zone 2 aneurysm — Primary endpoint¹

	Endovascular procedure	Post procedure	1 Month	6 Months	12 Months	Total (Through 12 Months)
Number of enrolled subjects ²	84	84	84	84	84	84
Number of subjects with imaging at follow-up window	-	13	75	74	83	84
Subjects with primary endpoint assessment ³	-	13	75	74	83	84
Device technical success rate ⁴	834 (15.7%)	-	-	-	-	1,274 (16.2%)
Access to distal aortic bifurcation	738 (13.3%)	-	-	-	-	738 (8.7%)
Access to distal aortic bifurcation	834 (15.7%)	-	-	-	-	834 (9.9%)
Device delivery system removal failure	158 (1.2%)	-	-	-	-	158 (1.2%)
Primary failure	834 (15.7%)	-	-	-	-	834 (9.9%)
Leakage related mortality	834 (15.7%)	-	-	-	-	834 (9.9%)
Stroke	834 (15.7%)	-	-	-	-	834 (9.9%)
Paraplegia	834 (15.7%)	-	-	-	-	834 (9.9%)
Aortic rupture	834 (15.7%)	-	-	-	-	834 (9.9%)
New dissections	834 (15.7%)	-	-	-	-	834 (9.9%)
Unintended aortic procedure related to dissection ⁵	834 (15.7%)	-	-	-	-	834 (9.9%)

Lesion related mortality – 0%
Stroke – 3.6%
Paraplegia – 1.2%
Aortic rupture – 0%
New dissections – 8.3%

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Gore TBE Trial Data for Dissections

Zone 2 dissection — Primary endpoint¹

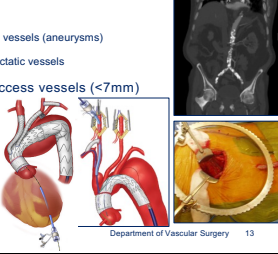
	Endovascular procedure	Post procedure	1 Month	6 Months	12 Months	Total (Through 12 Months)
Number of enrolled subjects ²	124	124	124	124	124	124
Number of subjects with imaging at follow-up window	-	12	108	108	114	124
Subjects with primary endpoint assessment ³	-	12	108	108	114	124
Device technical success rate ⁴	813 (2.3%)	-	-	-	-	813 (6.5%)
Access to distal aortic bifurcation	813 (2.3%)	-	-	-	-	813 (6.5%)
Access to distal aortic bifurcation	813 (2.3%)	-	-	-	-	813 (6.5%)
Device delivery system removal failure	213 (1.6%)	-	-	-	-	213 (1.7%)
Primary failure	813 (2.3%)	-	-	-	-	813 (6.5%)
Leakage related mortality	813 (2.3%)	-	-	-	-	813 (6.5%)
Stroke	813 (2.3%)	-	-	-	-	813 (6.5%)
Paraplegia	813 (2.3%)	-	-	-	-	813 (6.5%)
Aortic rupture	813 (2.3%)	-	-	-	-	813 (6.5%)
New dissections	813 (2.3%)	-	-	-	-	813 (6.5%)
Unintended aortic procedure related to dissection ⁵	813 (2.3%)	-	-	-	-	813 (6.5%)

Lesion related mortality – 2%
Stroke – 0.8%
Paraplegia – 0%
Aortic rupture – 0.8%
New Dissections – 10.6%

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Technical Considerations: Access Vessels

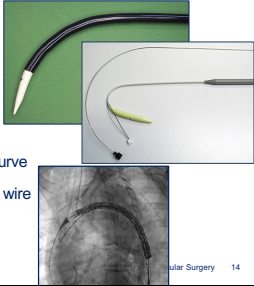
- Larger caliber sheath size (22-26Fr)
 - Use lower profile devices for smaller/ calcified access vessels (aneurysms)
 - Dissection related aneurysms generally have larger/ectatic vessels
- Consider conduit in small/tortuous/calcified access vessels (<7mm)
- Transfemoral/ axillary/ brachial access
- Carotid/cervical access
- Transapical access for wire externalization



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Technical Considerations: Device Alignment


- Self-aligning features, built-in pre-curve
- Reduces need for manipulation in aorta
- Controlled release for precise deployment
- Cook and Terumo devices have built-in pre-curve
- Gore and Nexus rely on through and through wire access and nose cone for alignment



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Technical Considerations: Aortic Valve Management

- Minimize device interaction with aortic valve given proximity
- Softer tips that do engage with the valves
- Choice of wires/catheters that need to cross the valve
- Minimize the need to cross multiple times
- Avoid in mechanical valves



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Challenges with Endovascular Approach

- Anatomic suitability
- Stroke risk (0-11%), approx. 50% silent brain infarctions
- RTAD (0-3%)
- Increased pressure/pulsatility and migration forces
- Branch vessel motion - stent fatigue/kinks
- Need for RVP, cardiac output reduction maneuvers


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Conclusion

- Endovascular arch repair can be performed safely in degenerative and dissection aneurysms in **carefully selected patients**
- Multidisciplinary Aortic team approach
- Several technical considerations are necessary for successful technical results, minimize adverse events especially neurologic events, optimize long-term durability

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Thank You



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