Managing the Left Subclavian Artery Associated with Thoracic Endovascular Graft

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THE PERIPHERAL EVENT OF THE YEAR

The Medical Center of Plano
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Disclosures

I have no financial relationship to disclose.
• TEVAR graft placement requires 2 cm proximal landing zone.
• 35-40% descending thoracic aneurysms extend into LSA territory.
• Traditional TEVAR graft placement is often associated with LSA coverage which increases the risk for stroke, paraplegia & mortality.
• Different surgical and endovascular options are now available to avoid this complication.
Landing Zone
First approved in 2005.
Commercially available in USA

A. COOK TX2
B. GORE TAG
C. MEDTRONIC Talent
D. Bolton Medical
Challenges of Thoracic Endovascular Graft Placement

- Short Parking Place
- Curved Geometry
- Non Cylindrical Shape
- Large Diameter
- Frequent Neck Mismatch.
- Origin of Great Vessels
- Increased Flow and Enhanced Compliance
- Proximal Aortic Movement
- Cardiac Dynamics, Resp. Motions
Risk Associated with LSA Coverage

- 6% Arm Ischemia
- 4% Spinal Cord Ischemia
- 2% Vertebral Ischemia
- 5% Anterior Circulation CVA
- 6% Death

- GORE Registry
- MEDTRONIC Registry (MOTHER)
Conditions which can Increase LSA Complications

- Presence of a patent left internal mammary artery to coronary artery bypass graft.
- Termination of the left vertebral artery at the posterior inferior cerebellar artery or other discontinuity of the vertebrobasilar collaterals.
- Absent or diminutive or occluded right vertebral artery
- A functioning arteriovenous shunt in the left arm
- Prior infrarenal aortic repair with ligation of lumbar and middle sacral arteries
- Planned long-segment (≥ 20cm) coverage of the descending thoracic aorta where critical intercostal arteries originate.
- Hypogastric artery occlusion
- Presence of early aneurysmal changes that may require subsequent therapy involving the distal thoracic aorta.
SVS Recommendations

• Recommendation 1: In patients who need elective TEVAR where achievement of a proximal seal necessitates coverage of the LSA, we suggest routine preoperative revascularization despite the very low-quality evidence (GRADE 2, level C).

• Recommendation 2: In selected patients who have an anatomy that compromises perfusion to critical organs, routine preoperative LSA revascularization is strongly recommended despite the very low-quality evidence (GRADE 1, level C).

• Recommendation 3: In patients who need very urgent TEVAR for life-threatening acute aortic syndromes where achievement of a proximal seal necessitates coverage of the LSA, we suggest that revascularization should be individualized and addressed expectantly on the basis of anatomy, urgency, and availability of surgical expertise (GRADE 2, level C).
Surgical Options to Save LSA

Hybrid Procedure

*TEVAR followed by*

Either Bypass

Or

Transposition

Depending upon anatomy and affected vessels, this was the common approach before endovascular revascularization became standard of care.

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Surgical Options to Save LSA (contd.)

- Axillo-Axillary Bypass
- Carotid-Subclavian Bypass
- Carotid-Subclavian Transposition
Endovascular Options

CHIMPS
- Chimney Technique
- Periscope Technique
- Snorkel Technique

• **CHIMPS** is a bail out procedure to revascularize covered LSA, using expandable stent or stent graft.
• Also known as **ChEVAR**
• Usually performed via Tranbrachial approach.
• Can also be done during TEVAR procedure or stage procedure afterwards if necessary.

Continued to the next slide
Endovascular Options (contd.)

Chimney Technique
Future

Branched Grafts
or
Fenestrated Endovascular Aortic Repair (FEVAR)

- Not FDA approved yet
- Initial trials showed excellent technical success & short term outcome.
- First one from Gore, now every company follow the lead
Future (contd.)

Different Types of Branched Grafts
Thank you!!

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