Comparison Of Left Carotid Subclavian Bypass And Transposition: Pros And Cons Of Each For Primary Subclavian Disease And With TEVAR

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Disclosures
W.L. Gore:
TEVAR Training—course director

Prairie Research (Bard):
LEVANT-2—consultant

Silkroad:
Silkroad—consultant

Background: Bypass v Transposition

Bypass:
Two anastomosis
Prosthetic preferred
Phrenic injury
No Horner’s syndrome
No learning curve

Transposition:
Single anastomosis
No prosthetic
Phrenic injury low
Horner’s syndrome
Learning curve

Carotid-Subclavian Bypass: Technique

• Supraclavicular incision
• Subplatysmal flaps
• Dissect lateral to SCM
• Ligate thoracic duct
• Anterior to vagus/phrenic posterior to IJ
• Side-side anastomosis
• Prosthetic (8mm) or vein

Transposition: Technique

• Oblique cervical incision
• Subplatysmal flaps
• Dissect between two heads of SCM
• Ligate thoracic duct
• End-side anastomosis

Indications: Occlusive disease

Asymptomatic:
• > 80% stenosis

Symptomatic (>50%):
• Posterior stroke
• “Drop attacks”
• Arm fatigue
• Dialysis access
• Coronary steal (after prior CABG)
**Bypass v Transposition: OD review**

- Systematic review (1966-2000)
- Bypass n= 507 and Transposition n=511
- 30-day stroke rates
  - 6.6% (Bypass) v 4.4% (Transposition)
- 30-day nerve injury rates
  - 9.2% (Bypass) v 11.2% (Transposition)
- 5-year patency
  - 84% (Bypass) v 99% (Transposition)
  - 86% prosthetic v 74% venous conduit

*Better long-term patency with transposition*

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**C-S Bypass: Occlusive disease review**

- Single center (1965-2010)
- Only symptomatic patients (n=287)
- All prosthetic conduits
- 30-day stroke rates
  - 2.1%
- 5-year patency
  - 94%

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**Transposition: Occlusive disease review**

- Single center (1995-2013)
- Symptomatic patients (n=126)
- 30-day stroke rates
  - 2.4%
- Permanent nerve injury rates
  - Horner’s 3.2% and recurrent laryngeal 3.2%
- 4-year patency
  - 96%

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**Indications: In conjunction with TEVAR**

**Absolute indication:**
- Existing LIMA-based CABG

**Relative indications:**
- Reduce posterior stroke risk
- Reduce paraplegia risk
- Reduce arm ischemia risk
- Reduce subclavian steal risk
- Reduce type Ia/II endoleaks

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**SVS Practice Guidelines**

- Suggest routine revascularization
- Recommend revascularization in circumstances where collateral perfusion may be compromised (LIMA-coronary bypass, dominant left vertebral, patent AVF, extensive coverage, prior abdominal aortic surgery)
- Emergent cases are individualized

*Prudent to preserve antegrade flow in the left subclavian artery*

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**Summary**

**Occlusive Disease:**
- Comparable stroke and nerve injury rates
- Better long-term patency with transposition

**Adjunct to TEVAR:**
- Comparable stroke and nerve injury rates
- Marker of more complex disease process
Conclusions

Left subclavian artery revascularization is recommended for symptomatic occlusive disease

Left subclavian artery revascularization recommended at least selectively for TEVAR

Carotid-subclavian bypass and transposition have nearly equivalent outcomes/patency