

CAROTID SUBCLAVIAN BYPASS VS TRANSPOSITION FOR TEVAR – IS ONE BETTER THAN THE OTHER?

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WVES

PRESENTER DISCLOSURE

- I have no current relationships with commercial entities.

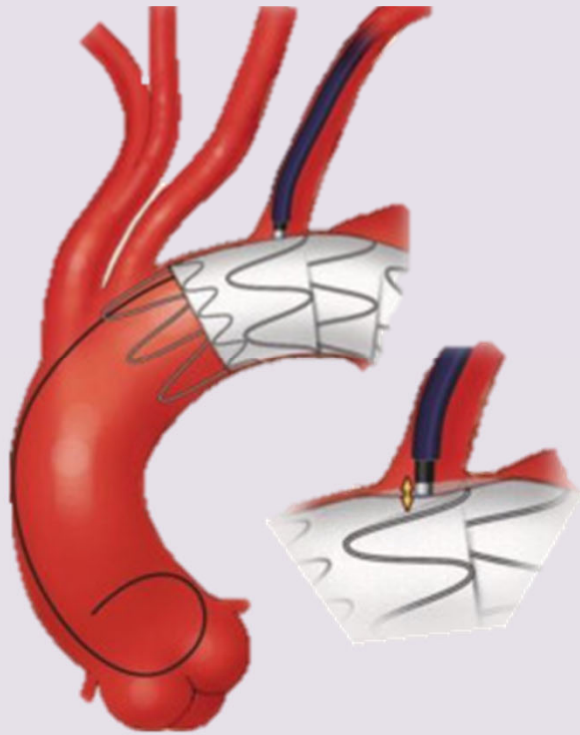
AGENDA

- Introduction
- Carotid-Subclavian Bypass
- Carotid-Subclavian Transposition
- The data
- Conclusion

INTRODUCTION

- TEVAR for thoracic aortic pathology often requires zone 2 coverage for adequate proximal seal
- Left subclavian revascularization is not always necessary but recommended whenever possible, particularly in elective cases
- Multiple open revascularization options exist
 - Carotid-subclavian bypass
 - Carotid-subclavian transposition
- Let's explore these options

THE ELEPHANT IN THE ROOM

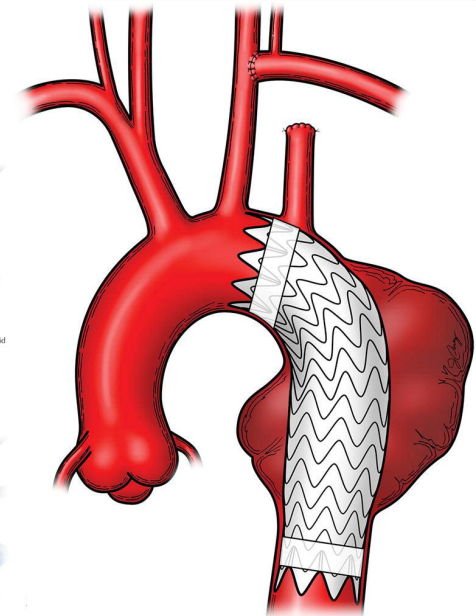
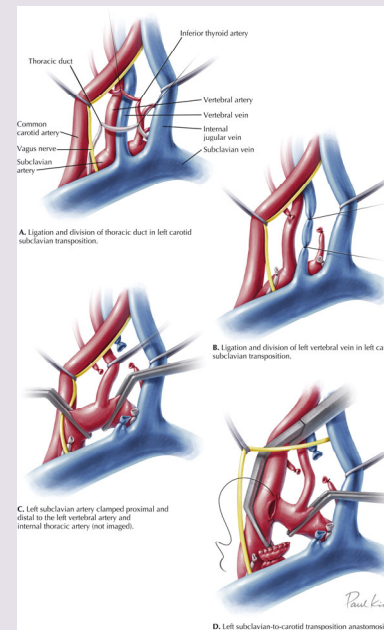


WHICH TECHNIQUE DO YOU MOST OFTEN PERFORM?

- Carotid-Subclavian Bypass
- Carotid-Subclavian Transposition
- I'll take the elephant every time

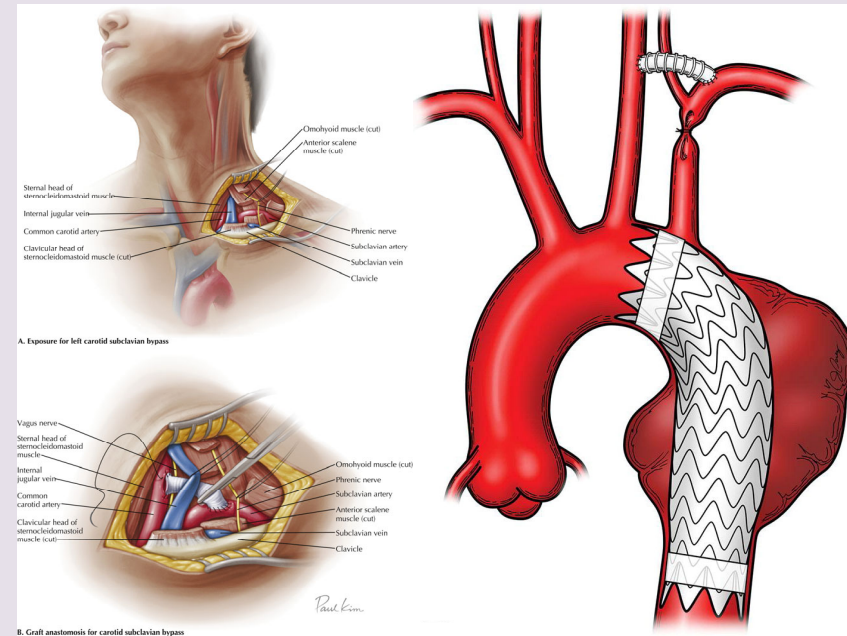
CAROTID-SUBCLAVIAN TRANSPOSITION

- Generally contraindicated with ipsilateral LIMA graft or ipsilateral vertebral to PICA
- Length of LSCA and dissecting proximal to the left vertebral artery represent possible challenges
- No prosthetic → infection durability
- Risk of stump retraction












CAROTID-SUBCLAVIAN BYPASS

- LIMA graft & unilateral vertebral artery are not contraindicated
- Prosthetic graft commonly used
 - Can interfere with jugular vein
- Theoretical higher risk of endoleak



COMPLICATIONS

- Neck hematoma
- Graft occlusion
- Pseudoaneurysm
- Lymph leak
- Stroke
- Spinal cord ischemia
- Nerve injury
 - Phrenic nerve
 - Recurrent laryngeal nerve
 - Axillary nerve, vagus nerve...

Injury Type	Preoperative imaging	Postoperative imaging	Late follow up imaging
1 Mild injury with recovery			33 days 
2 Severe injury with recovery			211 days 
3 Severe injury without recovery			1488 days 

WHAT ARE PEOPLE ACTUALLY PERFORMING?

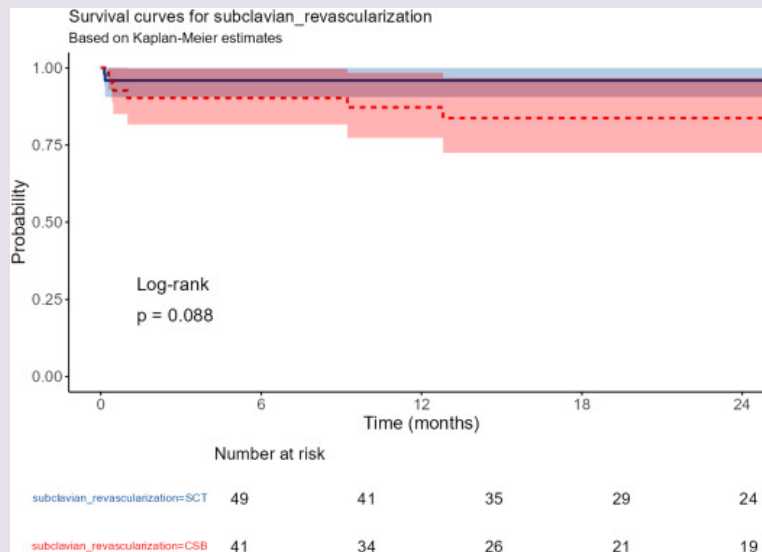
Study	Carotid-Subclavian Transposition	Carotid-Subclavian Bypass
<i>Udwadia et al</i>	51.2%	48.8%
<i>Madenci et al</i>	58.1%	40.9%
<i>Gatinot et al</i>	54.4%	45.6%
<i>Brusa et al</i>	48%	52%

REVASCULARIZATION PATENCY

Study	Carotid-Subclavian Transposition	Carotid-Subclavian Bypass
Udwadia <i>et al</i> (2-5 year patency)	100%	100%
Voigt <i>et al</i> (5 year patency)	-	97%
Sterpetti <i>et al</i> (7 year patency)	100%	86%
Gatinot <i>et al</i> (2 year patency)	100%	92.1%

LEFT VERTEBRAL ARTERY PATENCY

Study	Carotid-Subclavian Transposition	Carotid-Subclavian Bypass
Gatinot <i>et al</i> (2 year patency)	95.9%	83.7%



Gatinot *et al.*

30-DAY MORTALITY

Study	Carotid-Subclavian Transposition	Carotid-Subclavian Bypass
<i>Udwadia et al</i>	6.5%	5.1%
<i>Voigt et al</i>	-	5%
<i>Madenci et al</i>	5.8%	8.3%
<i>Gatinot et al</i>	0%	0%

30-DAY STROKE RATE

Study	Carotid-Subclavian Transposition	Carotid-Subclavian Bypass
Udwadia <i>et al</i>	8.1%	6.8%
Madenci <i>et al</i>	3.9%	8.3%
Gatinot <i>et al</i>	2%	2.4%
Brusa <i>et al</i>	4.3%	12%

NERVE INJURY

Table VI. Mid- to long-term outcomes

Variable	SCT (n = 62)	CSB (n = 59)	P-value ^a
Follow-up time, days	901 (319-1911)	1677 (463-2967)	.03 ^b
Endoleak (including false lumen filling) ^c	11 (17.7)	15 (25.9)	.28
Subclavian revascularization reintervention	0	2 (3.4)	.24 ^d
Occlusion/thrombosis of LSA revascularization	0	0	–
Hoarseness	23 (37.1)	8 (13.6)	.003
Dysphagia	4 (6.5)	3 (5.1)	.99 ^d
Hoarseness at 6 months	6 (9.7)	2 (3.4)	.27 ^d
Vocal cord intervention (injection)	8 (12.9)	5 (8.5)	.43
Transient phrenic nerve injury	0	2 (3.4)	.24 ^d

NERVE INJURY

Postoperative early and late complications

Parameters	Subclavian-carotid transposition (<i>n</i> = 49). No (%) or mean \pm SD	Carotid-subclavian bypass (<i>n</i> = 41). No (%) or mean \pm SD	<i>p</i>
Overall complications ^a	4 (8.2)	10 (24.4)	
Stroke	1 (2)	1 (2.4)	1
Spinal cord ischemia	1 (2)	2 (4.9)	0.59
Lymphocele	0	1 (2.4)	0.46
Peripheral nerve injury ^b	1 (2)	4 (9.8)	0.17
Claude Bernard Horner syndrome	1 (2)	0	1
Recurrent nerve injury	0	3 (7.3)	0.09
Vagus nerve injury	0	1 (2.4)	0.46
Phrenic nerve injury	1 (2)	1 (2.4)	1
Thoracic canal injury	1 (2)	0	1
Upper limb ischemia	0	1 (2.4)	0.46
Reintervention related to initial LSA revascularization	1 (2)	3 (7.3)	0.33
Median follow-up time in months	24.8	27	

Gatinot *et al.*

NERVE INJURY

Nerve Injury	Carotid-Subclavian Bypass	Carotid-Subclavian Transposition
Recurrent Laryngeal	4%	13%
Phrenic	8%	0%
Sympathetic Chain	0%	13%

OTHER COMPLICATIONS

- Significantly shorter OR time & blood loss for transposition
- Patient who received transposition were significantly more likely to have a home discharge
- No difference in medical complications in bypass vs. transposition
- Low rates of neck hematoma, re-exploration and bypass late pseudoaneurysms

WILL YOU CHANGE YOUR PRACTICE?

- Absolutely not, the way I do it is the right way!
- You've convinced me!
- The second you mentioned there's no endo in this talk, I started checking emails...

CONCLUSION

- Open revascularization is still commonly performed
- Carotid subclavian bypass & transposition are both good options
- Carotid subclavian transposition may have higher patency rates, although it is a more technically challenging surgery
- Best decision is dependent on patient and surgeon factors

THANK YOU

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