

# Mixed evidence regarding coverage of the LSA

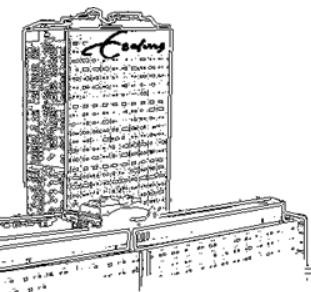


**Hence JM Verhagen, MD PhD**

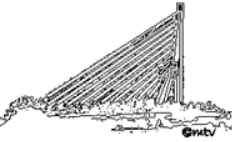
Professor and Chief of Vascular Surgery

Erasmus University Medical Center

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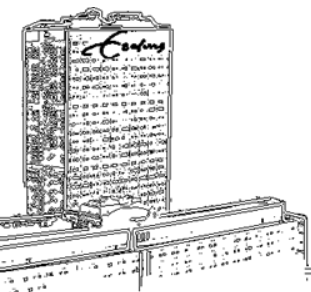


# To cover or not to cover ....



- Debated since the first TEVAR
- Up to 40% of TEVAR patients have pathology near the LSA
- Revascularize:
  - some surgeons do so routinely
  - some never
  - some restrictive (?)
- Is there any evidence ?

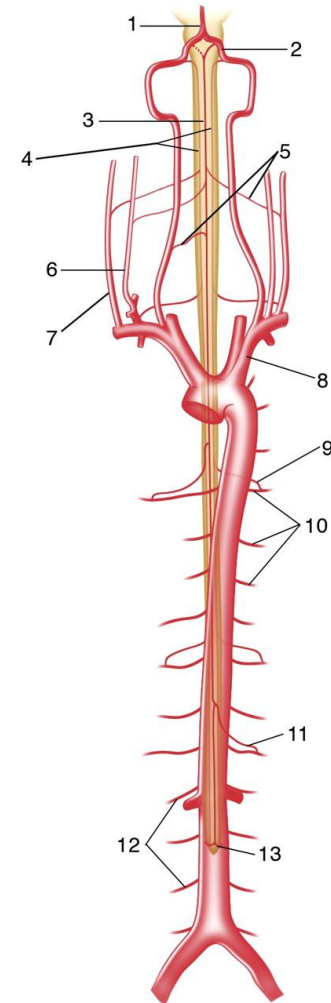


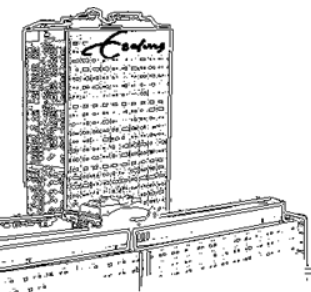


# To cover or not to cover ....



- Obvious potential problems:
  - Arm ischemia

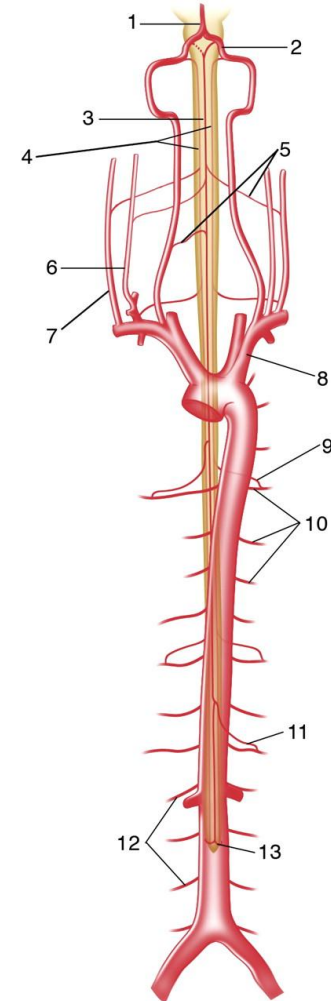


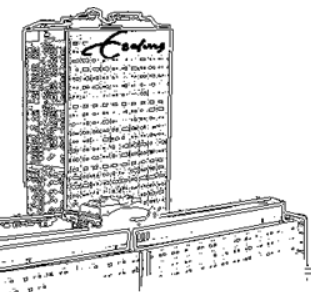


# To cover or not to cover ....

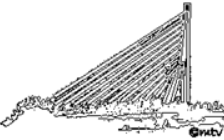


- Obvious potential problems:
  - Arm ischemia
  - Vertebrobasilar ischemia



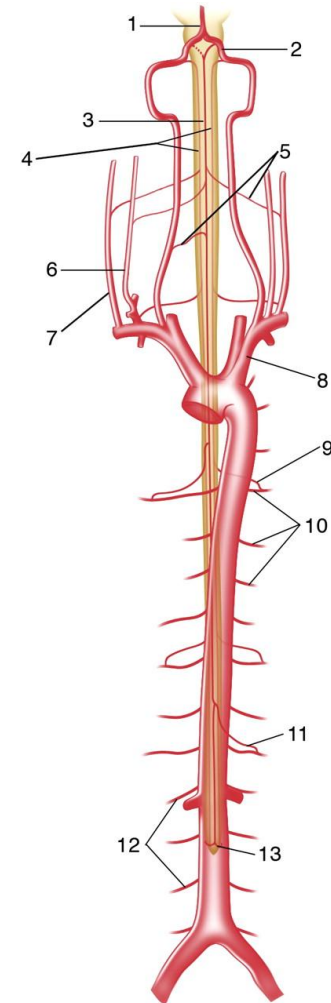


# To cover or not to cover ....

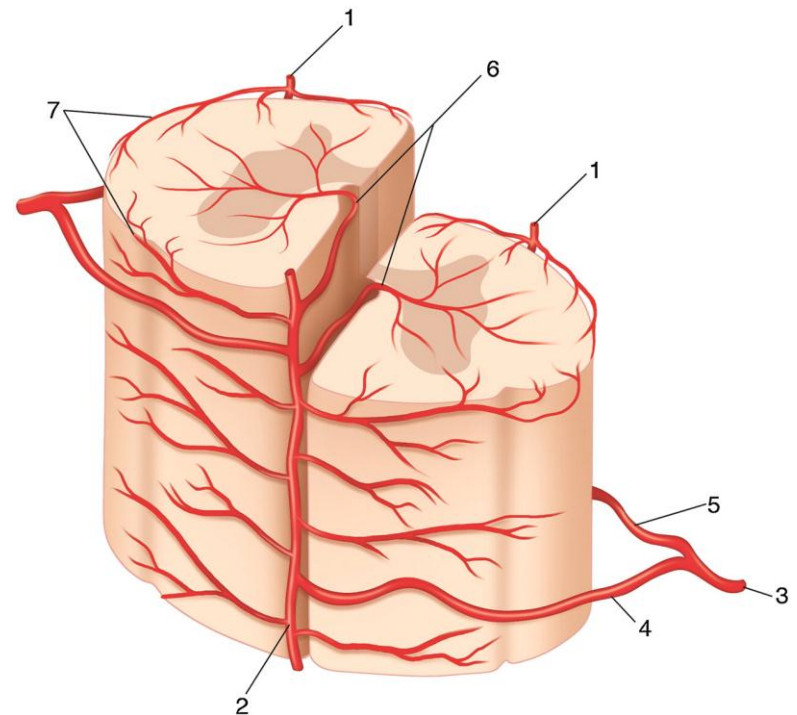
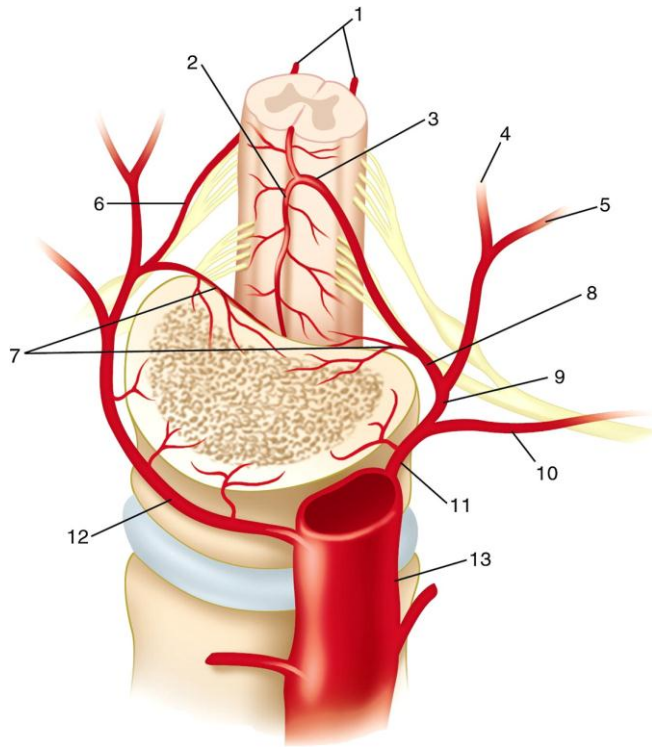


- Obvious potential problems:

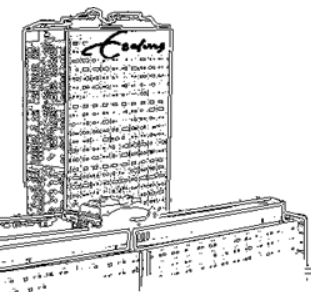
- Arm ischemia
- Vertebrobasilar ischemia
- Paraplegia



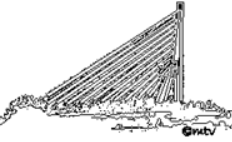
# Vascular anatomy of the spinal cord







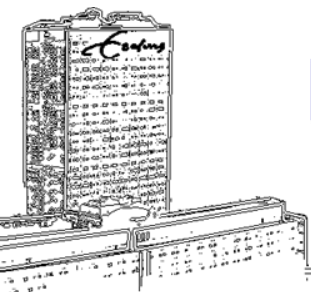
# Evidence from literature



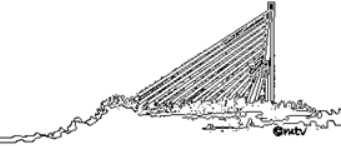
- ***Problem:***

- Mixed group of patients
- Mixed group of pathologies and treatment lengths
- “Impossible” to analyse whether revascularization of the LSA improves results





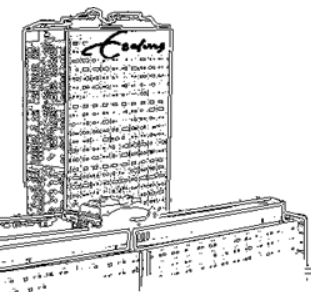
# Relatively obvious indication for pre-op LSA revascularization



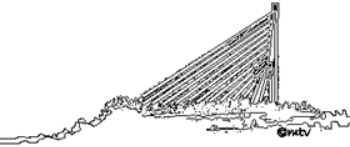
- Patent LIMA to CABG
- Absent or occluded right vertebral artery
- Discontinuity of the vertebrobasilar collaterals (circle of Willis)
- Functioning AV-shunt in left arm
- Prior infrarenal aortic repair
- Hypogastric artery occlusion (severe stenosis)
- Planned long-segment (> 20 cm) coverage of DTA



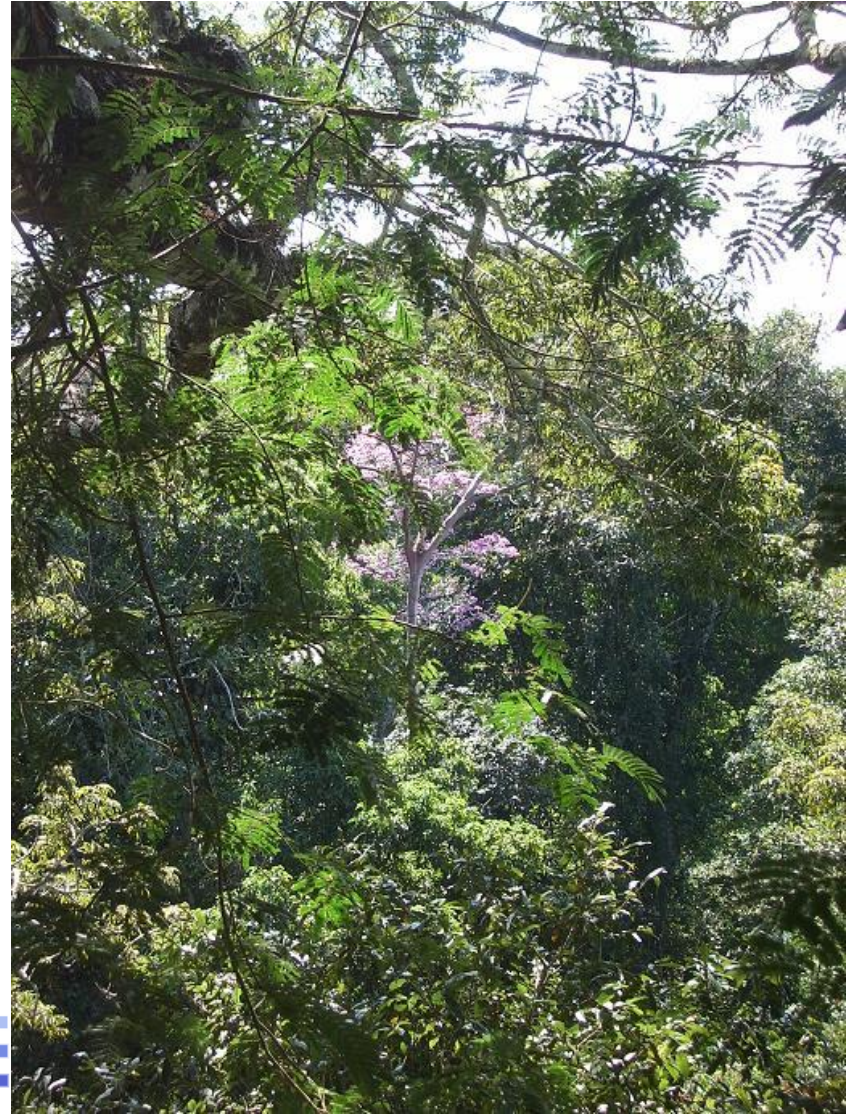




**To cover or not to cover ....**  
**To revascularize or not ....**



**It's a jungle out there !**





# Systematic review & meta-analysis

Rizvi et al.

*J Vasc Surg* 2009;50:1159-69.

- Effect of LSA coverage:

- Arm ischemia 6%
- Vertebrobasilar ischemia 2%
- Paraplegia 4%
- Anterior circulation stroke 5%




# Systematic review & meta-analysis

Cooper DG et al.

*J Vasc Surg* 2009;49:1594-1601.



## • Neurological complications:

- CVA after TEVAR without coverage of LSA: 2.7 %
  - CVA after TEVAR with coverage of LSA: 4.7%  
(OR = 2.28 (1.28-4.09), P=.005)
  - CVA after TEVAR without coverage of LSA: 2.6 %
  - CVA after TEVAR with coverage + revasc of LSA: 4.1%  
(OR = 3.18 (1.17-8.65), P=.002)
- 



# Systematic review & meta-analyse

Cooper DG et al.

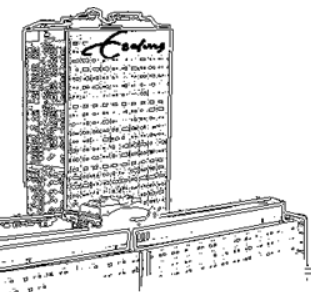
*J Vasc Surg* 2009;49:1594-1601.



- Neurological complications:

- SCI after TEVAR without coverage of LSA: 2.3 %
- SCI after TEVAR with coverage of LSA: 2.8%  
(OR = 2.39, P=.005)

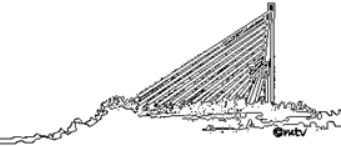
- No significant difference in SCI between TEVAR without coverage and TEVAR with coverage + revasc of LSA



# Retrospective on 739 TEVARs

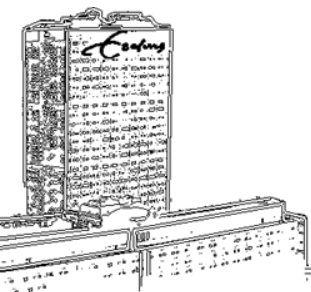
Chung J. et al.

*J Vasc Surg* 2011;54:979-984.

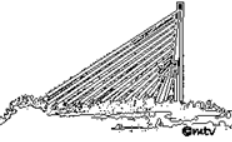


- From national database (ACS-NSQIP):
  - 454 without LSA coverage, 279 with LSA coverage
  - 30 day stroke rate was associated with LSA coverage  
(OR = 2.17, P=.019)
  - pre-op revascularization does not protect from stroke





# Evidence from literature

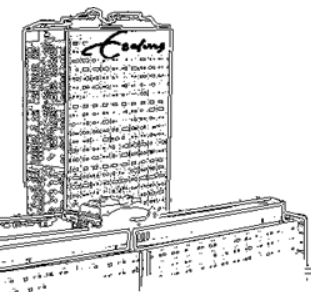


## • ***Conclusions:***

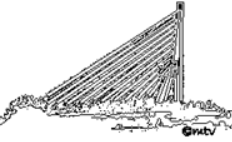
- Covering LSA
  - increases chance of neurological complications (CVA/SCI)
  - increases the risk of arm ischemia (rare !)
  - Increases the risk of vertebrobasilar ischemia
- Pre-op revascularization may lower SCI, not CVA







# Evidence from literature

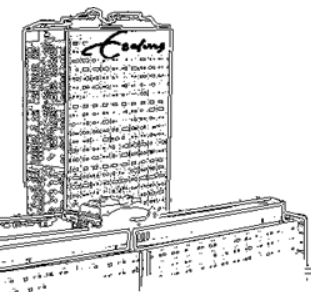


## • ***Problem:***

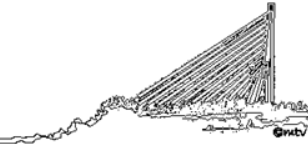
- Mixed group of patients
- Mixed group of pathologies and treatment lengths







# SVS Practice Guidelines.

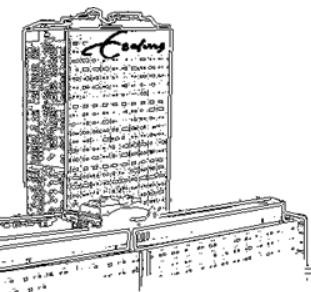


## The Society for Vascular Surgery Practice Guidelines: Management of the left subclavian artery with thoracic endovascular aortic repair

Jon S. Matsumura, MD,<sup>a</sup> W. Anthony Lee, MD,<sup>b</sup> R. Scott Mitchell, MD,<sup>c</sup> Mark A. Farber, MD,<sup>d</sup> Mohammad Hassan Murad, MD, MPH,<sup>e</sup> Alan B. Lumsden, MD,<sup>f</sup> Roy K. Greenberg, MD,<sup>g</sup> Hazim J. Safi, MD,<sup>h</sup> and Ronald M. Fairman, MD,<sup>i</sup> for the Society for Vascular Surgery, *Gainesville, Fla; Palo Alto, Calif; Chapel Hill, NC; Rochester, Minn; Houston, Tex; Cleveland, Ohio; and Philadelphia, Pa*

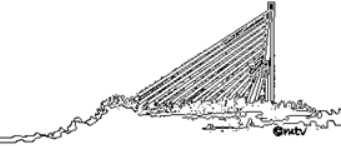
The Society for Vascular Surgery pursued development of clinical practice guidelines for the management of the left subclavian artery with thoracic endovascular aortic repair (TEVAR). In formulating clinical practice guidelines, the society selected a panel of experts and conducted a systematic review and meta-analysis of the literature. They used the grading of recommendations assessment, development, and evaluation (GRADE) method to develop and present their recommendations. The overall quality of evidence was very low. The committee issued three recommendations. *Recommendation 1:* In patients who need elective TEVAR where achievement of a proximal seal necessitates coverage of the left subclavian artery, 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 urgent TEVAR for life-threatening acute aortic syndromes where achievement of a proximal seal necessitates coverage of the left subclavian artery, 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). (J Vasc Surg 2009;50:1155-8.)





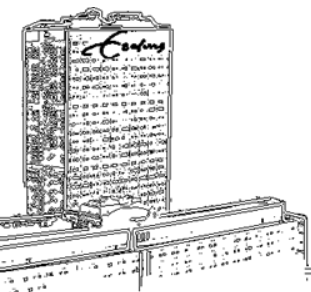
# SVS Practice Guidelines

## Recommendations



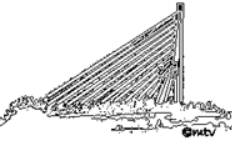
- 1 In elective TEVAR, routine revascularization of the LSA is suggested
- 2 In patients with compromised perfusion to critical organs, routine revascularization of the LSA is strongly recommended
- 3. In urgent TEVAR, an individualized strategy of revascularization of the LSA is suggested





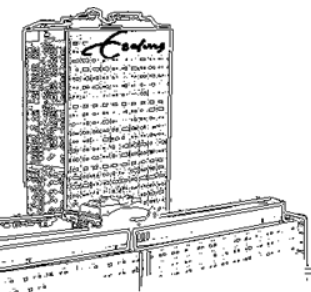
# SVS Practice Guidelines

## Recommendations



- All based on very low-quality evidence
- Level C (lowest level)





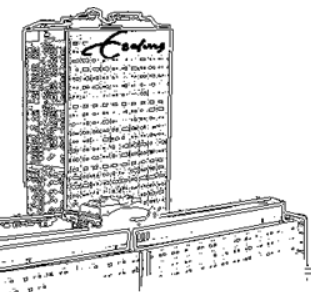
# My practice



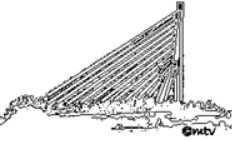
## ***Traumatic Aortic Rupture:***

- Usually cover LSA
  - Lower risk on Birds Beak
  - Sufficient seal inner curve
- No revascularization





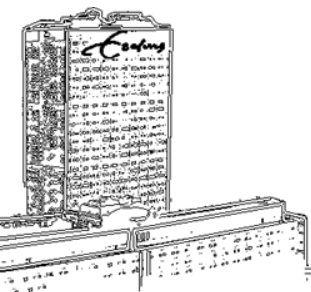
# My practice



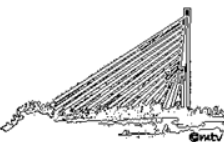
## ***Complicated Acute Type B dissection:***

- Usually cover LSA
  - Cover entry tear
  - Potentially lower risk of retrograde dissection
  - Seal in “healthy” part of arch
  
- No revascularization





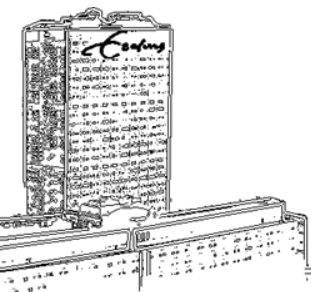
# My practice



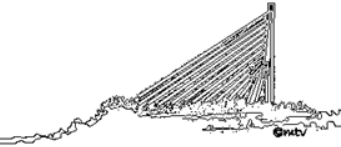
## ***Elective Thoracic Aneurysm:***

- Don't compromise seal
- Cover LSA if necessary
- Liberal with LSA  
revascularization
- Rupture: No revascularization





# Conclusion



- ***Except for the obvious indications, pre-operative revascularization of the LSA before TEVAR is basically .....***





**Thank you for your attention**

