MANAGING THE LEFT SUBCLAVIAN ARTERY
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CONFLICTS
• No direct reimbursement to the speaker
• All agreements between PHUSCMG and corporate entities
• Consultant for:
  • Boston Scientific
  • Endologix
  • Medtronic
  • Endologix
  • Symbion
  • Limflow
  • DSMB member
  • Bard
  • Elastimed

TOM MALDONADO

DAPPER AND SUAVE

MAN OF MYSTERY

JETS FAN

SORRY TOM
COCHRANE DATABASE REVIEW 2016

- Answer the controversy regarding left subclavian revascularization
- Review randomized controlled trials comparing routine vs selective or never revascularize
- Found no data
- No analysis
- Unable to reach conclusion regarding optimal strategy
- Recommend randomized trial

CRITICAL ORGANS

- Presence of a LIMA graft for CAD
- Discontinuity of the vertebrobasilar collaterals
- Absent or diminutive or occluded right vertebral artery
- Functioning AV fistula or graft in the left arm
- Prior infrarenal repair with ligation of lumbar and middle sacral arteries
- Planned long segment (>20 cm) 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

SYSTEMATIC REVIEW

- Coverage of the LSA associated with:
  - trend toward increased risk of paraplegia (odds ratio 2.69)
  - trend toward increased risk of anterior circulation stroke (odds ratio 2.58)
  - Significant increased risk of arm ischemia (odds ratio 47.7)
  - Significant increased risk of vertebrobasilar ischemia (odds ratio 10.8)
- Risk for subclavian revascularization
  - 4.4% incidence of phrenic nerve injury
  - No association with increase in death, MI, TIA

REVIEW OF NEURO COMPLICATIONS AFTER LSA COVERAGE

- Risk of stroke increased in those with LSA coverage
  - Without revascularization – 4.7% vs 2.7%
  - With revascularization – 4.1% vs 2.6%
- Risk of SCI increased with LSA coverage alone 2.8% vs 2.3%
- Risk of SCI NOT increased with LSA coverage after revascularization
  - 0.8% vs 2.7%
- Neuro events increased after LSA coverage
- LSA revascularization offers no protection against stroke
- LSA revascularization may reduce the risk of SCI

MEDICARE POPULATION REVIEW OF LSA REVASCULARIZATION WITH TEVAR (2006-2007)

- 2676 TEVAR
  - 869 (32.5%) with subclavian coverage
  - 128 (14.7%) with subclavian coverage and revascularization (pre- (81) or intra - (47) operatively)
  - 17 patients of 733 not revascularized (2.3%) required bypass within one year of TEVAR


- Low quality data
  - 1. suggest routine pre-op revascularization when LSA coverage mandated to achieve adequate seal (Grade 2, level C)
  - 2. with compromised perfusion of critical organs, routine pre-operative LSA revascularization is strongly recommended (Grade 1, level C)
  - 3. Urgent TEVAR with LSA coverage suggest revascularization be individualized and addressed expectantly on the basis of anatomy, urgency and availability of surgical expertise (grade 2, level C)

**STUDY PROBLEMS**

- Only information from 30 days prior to TEVAR
- Very small number of patients revascularized
- No characterization of aortic pathology
- Incredibly high in-hospital mortality for TEVAR
- Should unacceptable care define recommendations?

**NSQIP REVIEW**

- Sample from 2005-8
- TEVAR / TEVAR with LSA coverage (TEVAR with LSA coverage and revascularization)
- 733 TEVAR / 279 LSA coverage (28 intraop revascularization)
- Stroke/Mortality 5.7% vs 7.0%
- Increased risk of stroke with LSA coverage.
- Not clear if revascularization protective

**MEDTRONIC MOTHER REGISTRY**

- 1002 patients / 5 studies and 1 institutional series 2002-2010
  - 537 no LSA coverage
  - 322 LSA covered no revascularization
  - 143 LSA covered and revascularized (12 excluded from analysis as sternotomy and extensive debranching)
- When LSA covered stroke risk increases
- Posterior stroke increased with LSA coverage and no revascularization vs revasc (3.8% vs 0.7%)
- Anterior stroke risk similar in the two groups
HIGH-VOLUME CENTER REVIEW 2000-2010

- 1189 TEVAR
- 394 LSA coverage
- 180 (46%) revascularized
- No difference in stroke or paraplegia rates
- Trend toward reduced mortality in those revascularized (p=0.08)
- Authors conclude no benefit conferred by revascularization


VQI REVIEW OF TEVAR OUTCOMES

- Review of VQI database 2011-14
- 2063 TEVAR
  - 508 with LSC coverage
  - 58.9% undergo revascularization
  - Multivariable analysis - independent association between left subclavian artery coverage without revascularization and the incidence of spinal cord ischemia (adjusted odds ratio (95%CI): 2.29(1.03–5.14) P=0.043).


HOW TO PUT ALL THIS TOGETHER?

- Patients divided into groups
  - Emergent vs elective
  - Absolute indication / relative indication / no indication for revascularization
  - Emergent
    - Hemodynamic instability – no revascularization unless indication – post-TEVAR
HOW TO PUT ALL THIS TOGETHER?

- For all other patients:
  - Revascularization for absolute indications
    - LIMA graft
    - Ax-fem graft
    - Dialysis access
    - Discontinuity of the vertebrobasilar collaterals
    - Absent or diminutive or occluded right vertebral artery
  - Revascularization for relative indications
    - Long segment of coverage
    - Poor hypogastric artery circulation
    - Likely future need for more extensive repair
    - Prior AAA repair

WHO DOES THIS LEAVE?

- Short segment proximal coverage
- For these patients if revascularization can be achieved with low risk, it likely should be performed to reduce risk of stroke

Thank-you