Progress in Civilian and Military Vascular Trauma Care – Endovascular and Open

Joe DuBose MD, FACS FCCM
Colonel, USAF MC
Professor of Surgery
Uniformed Services University of the Health Sciences
Director, Baltimore Center for the Sustainment of Trauma and Readiness Skills (CSTARS)

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Vascular Trauma
• Vascular injury incidence 12% of trauma in recent conflicts
• Hemorrhage is 2nd highest cause of death in trauma
• Majority is non-compressible torso hemorrhage

Thoracic Aortic Injury = An Endovascular Success Story in Trauma

Open and Endovascular Surgery in Trauma
• Significant shift in elective and emergency vascular work towards endovascular surgery
• Hybrid OR development
• Surgeon / IR comfort with technology and equipment
• No trials to prove either practice is better in trauma
Aortic Trauma Foundation Study
Repair: TEVAR (vs. Open Repair)

• Lower transfusion requirements:
  • (Mean 3.1 vs. 5.9, p = 0.002)

• Lower overall mortality:
  • (8.6% vs. 19.7%, p = 0.021)

• Lower aortic-related mortality:
  • (2.5% vs. 13.1%, p = 0.003)

Literature Review

1994-2008
113 carotid stents
Initial successful placement = 76.1%
Follow up range 2 weeks – 2 years
Patency 79.6%
New neurologic deficits after stent = 3.5%

Axillo-Subclavian Injuries
Outcome comparison between open and endovascular management of axillo-subclavian arterial injuries

• Branco BC, et al. - 2016
  • J Vasc Surg, Mar;63(3):702-9

- Endovascular repair associated with:
  - Significantly lower mortality (5.6% vs. 27.8%, p = 0.40)
  - Lower rates of surgical site infections
  - Trend towards lower sepsis rates

Increasing endovascular utilization at a variety of locations

Trends and Outcomes of Endovascular Therapy in the Management of Civilian Arterial Injuries
Bernardino C. Branco, MD, Joseph J. DuBose, MD, John D. Hughes, MD, Aaron E. Gashwiler, MD, Magdalene Trinidad-Hernandez, MD, Peter Rhue, MD, Joseph L. Mills Sr., MD
J Vasc Surg 2014;60:1297-307
NTDB Study

- 9-year analysis; 43,964 vascular injuries
- Significant increase of endovascular procedures
  - 2002 = 0.3%
  - 2010 = 9.0%
- Endovascular repair:
  - Lower in-hospital mortality following endovascular intervention
  - Lower complication rate trends

Use of Open and Endovascular Surgical Techniques to Manage Vascular Injuries in the Trauma Setting: A Review of the AAST PROOVIT Registry


Major Rob Faulconer FRCS RAMC
- David Grant USAF Medical Center, Travis AFB
- UC Davis Medical Center, Sacramento

Faulconer et al. PROOVIT Registry - Conclusions

- Favorable outcomes when arterial injury at Non-Compressible sites of truncal hemorrhage (NCTH) managed with endovascular approaches

- Endovascular group
  - Higher ISS
  - Lower mortality
  - Lower PRBC requirement

HYBRID Endovascular Applications?

Unresolved issues

- Patient Selection
- Natural history not well established
- Young age, small vessels
- Antiplatelet / Anticoagulation?
- Defined role for endovascular at various locations?
Prospective multi-center observational

- Comprehensive admission / in-hospital data points collected by on-site coordinators

- Follow-up module (8 questions)

American Association for the Surgery of Trauma (AAST) PROOVIT Registry

- November 2018 – 4071 patients, 27 centers

- Follow-up data for 2607 visits, 16 centers

- Issues examined
  - Anticoagulation in vascular injury repair
  - Endovascular vs. open arterial injury repairs
  - Shunt utilization in arterial trauma
  - Popliteal artery injuries
  - Blunt cerebrovascular injuries
  - Pediatric vascular injuries

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