Adherence to Blunt Cerebrovascular Injury Trauma Guideline: A Performance Improvement Project

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Introduction

- BCVI is a significant complication for 1% of patients admitted to trauma centers.[3]
- A diagnosis of BCVI increases morbidity and mortality
- A large Level I trauma center with a blunt trauma rate of approximately 89% implemented facility specific guideline for the assessment, diagnosis and treatment of BCVI

Objectives

- An understanding of the mechanism and associated morbidity and mortality due to BCVI
- The steps undertaken in the creation and implementation of an evidence-based practice algorithm
- Be able to discuss the post-implementation review of the data associated with algorithm adherence

Project Design

- A review of EMR from January 2021 through June 2021 was completed
- But adult and pediatric reviewed
- Qualifying criteria were established: 1) Neck artery injury, 2) Fall from height, 3) GCS <6, 4) Facial fractures, 5) Cervical spine fracture, 6) Skull fractures, 7) Hanging

Signs/Symptoms of BCVI:

- Potential arterial hemorrhage from neck/nose/mouth
- Cervical bruit (<50 yo)
- Expanding cervical hematoma
- Focal neurological deficit
- Neurological deficit inconsistent with head CT
- Stroke on CT or MRI

Risk factors for BCVI:

- High-energy transfer mechanism
- Displaced midface fracture
- Mandible fracture
- Complex skull or occipital condyle fracture
- Severe TBI with GCS <6
- Cervical spine fracture, subluxation, or ligamentous injury at any level
- Near hanging with anoxic brain injury
- Clothesline type injury or seat belt abrasion with swelling
- TBI with thoracic injuries
- Scalp degloving
- Thoracic vascular injuries
- Blunt cardiac rupture
- Upper rib fractures

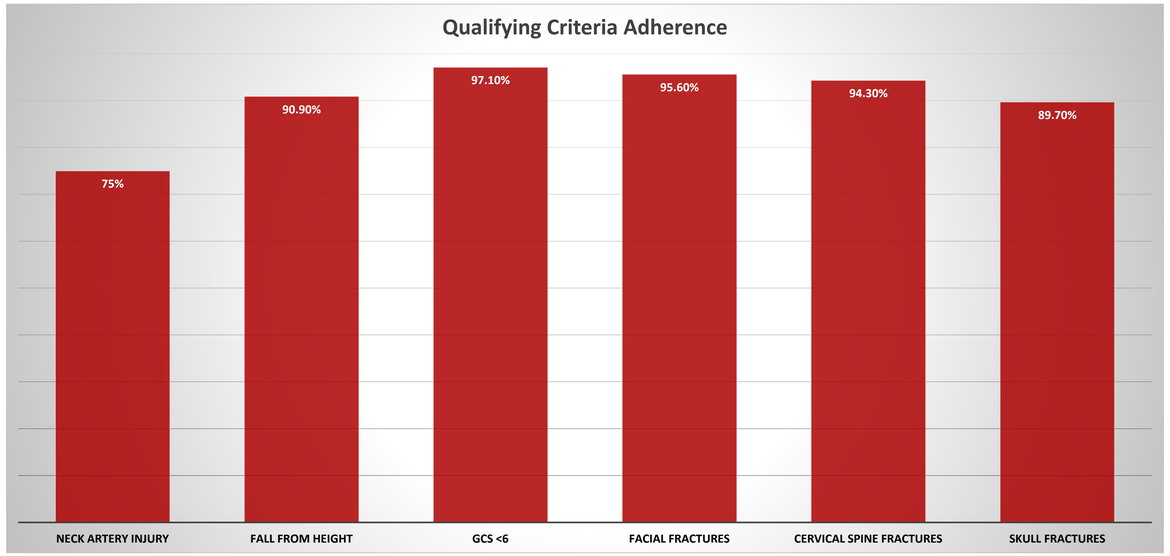
CTA of neck

Denver BCVI grading scale:

1. Luminal irregularity or dissection with <25% luminal narrowing
2. Dissection or intramural hematoma with >25% luminal narrowing, intraluminal thrombus, or raised intimal flap
3. Pseudoaneurysm
4. Occlusion
5. Transection with free extravasation

Consult Neurointerventional team

- Consider treatment options: antithrombotic Rx, surgery, stenting
- In most cases, repeat CTA is performed 7-10 days to evaluate for resolution/evolution of the injury



Discussion/Future Steps

- Common themes were found to be related to fall outs from guideline adherence
  - Lack of Neurointerventionalist Consult
  - Missing CTA both initial and repeat
- Overall, average algorithm adherence was approximately 77.5% for the qualifiers assessed
- The project was limited by a small sample size related to hanging and neck artery injury with a total of 18 pts between the two
- In the future we would exclude patients were treatment was halted with a palliative or hospice disposition

Conclusions

- Further studies are needed to stablish a baseline goal for algorithm adherence
- A previous goal of 50% was established by Farrell et al[4]
- Further studies are needed to assess the goal rate of algorithm adherence and its direct effect on morbidity and mortality

References