Important Note
The intent of the Albany Medical Center Best Practices Guidelines is to provide health care professionals with evidence-based recommendations regarding care of the trauma patient. The Best Practices Guidelines do not include all potential options for prevention, diagnosis, and treatment and are not intended as a substitute for the provider’s clinical judgment and experience. The responsible provider must make all treatment decisions based upon his or her independent judgment and the patient’s individual clinical presentation. Albany Medical Center and any entities endorsing the Guidelines shall not be liable for any damages, including without limitation any direct, indirect, special, incidental, consequential or punitive damages, related to any use of the information contained herein. Albany Medical Center may modify the Best Practices Guidelines at any time without notice.
AMC Trauma Practice Management Guideline: Blunt Cerebrovascular Injury

PURPOSE: Outline an evidence based, protocoleed approach to diagnosis and management of blunt cerebrovascular injury (BCVI)

PROBLEM: Blunt cerebrovascular injury is diagnosed in less than 0.1% of trauma patients unless a screening system has been developed. However, when diagnosed late there is significant associated neurologic morbidity and mortality. With a screening methodology early detection can be achieved and places the true incidence in trauma patients to about 1% or as high as 2.7% in those with ISS>16. Issues involved in the treatment of BCVI include detection, treatment, and follow-up.

Recommendations:

Screening:
Level 1:
No level 1 recommendations can be made

Level 2:
A. Any patient with a neurologic exam not explained by a diagnosed injury should be evaluated for BCVI
B. Blunt trauma patients with epistaxis from a suspected arterial source should be evaluated for BCVI

Level 3:
A. Screening should be considered in asymptomatic patient with significant blunt head trauma or with associated injuries including:
   a. GCS<8
   b. DAI
   c. Le Fort fracture II of III
   d. Base of skull fracture involving the carotid canal
   e. Base of skull fracture involving petrous portion of temporal bone
   f. Cervical spine fracture involving C1-C3 and/or transverse foramen
   g. Near hanging with hypoxic-ischemic brain injury
   h. Seat belt sign on the neck
B. Pediatric trauma patients should be evaluated using the same criteria as adults

Modality of screening:
Level 1:
A. No level one recommendation can be made

Level 2:
A. Diagnostic four-vessel cerebral angiography (FVCA) is gold standard
B. Duplex US is not adequate for screening
C. CTA with four or less slice multidetector is neither sensitive or specific for screening for BCVI

Level 3:
A. Multi slice (eight or greater) multidetector CTA has a similar rate of detection of BCVI when compared to historical controls of FVCA
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Treatment of BCVI:

Grading scheme proposed by Biffl et al:
Grade I: intimal irregularity with <25% narrowing
Grade II: dissection or intramural hematoma with >25% narrowing
Grade III: pseudoaneurysm
Grade IV: occlusion
Grade V: transection with extravasation

Level I:
A. No recommendations can be made

Level II:
A. Grade 1 and II injuries should be managed with antiplatelet agent unless contraindicated

Level III:
A. Either antiplatelet therapy or anticoagulation can be used with seemingly equivalent results
B. If systemic anticoagulation with heparin is used, a bolus dose should be administered when beginning; no PTT goal has been determined
C. Grade III injuries rarely resolved and invasive therapy should be considered
D. If patient has an early neurologic deficit and accessible carotid lesion, operative or interventional repair to restore flow should be considered

Implementation:

Screening:
A. Screening for BCVI should be performed in:
   a. Mental status not consistent with head CT findings
   b. Near hanging
   c. Cervical spine fractures including the transverse foramen and/or involving C1-C3
   d. Seat belt sign on neck
B. Screening for BCVI should be highly considered in the following patients/injuries
   a. GCS<8
   b. DAI
   c. Le Fort fracture II of III
   d. Base of skull fracture involving the carotid canal
   e. Base of skull fracture involving petrous portion of temporal bone

Treatment:
A: Neurosurgical consult +/- vascular consult for all diagnosed injuries
B: Antiplatelet therapy should be initiated for Grade I and II injuries when feasible
C: Operative/interventional interventions should be considered in conjunction with consultants in Grade III and greater injuries

REFERENCES
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