

Safety of Anticoagulation for the Treatment of Cerebral Venous Sinus Thrombosis in Adult Trauma Patients

David S. Hersh MD; Erik Hayman MD; Bizhan Aarabi MD; Deborah Stein MD; Cara Diaz; Jennifer Massetti; Gary Thomas Schwartzbauer MD, PhD

University of Maryland School of Medicine and R Adams Cowley Shock Trauma Center

Introduction

Cerebral venous sinus thrombosis (CVST) is a potential complication of closed head trauma with devastating neurological outcomes. Guidelines recommend anticoagulation in adults with spontaneous CVST. While intracranial hemorrhage from a sinus thrombosis is not considered a contraindication to treatment, there is little evidence regarding the safety of treating CVST in patients with acute traumatic brain injury who have intracranial hemorrhages unrelated to the thrombosis.

Methods

A prospectively collected database at a level 1 trauma center was retrospectively reviewed. Demographic, clinical, radiographic, and follow-up data were collected for adult patients with one or more skull fractures in the setting of blunt trauma who underwent venous imaging. Patients admitted from January 2004 through December 2013 were included.



Representative patients with skull fractures and intact venous anatomy, cerebral venous sinus thrombosis, and external cerebral venous sinus compression.



Algorithm that was developed for the management of inpatients with cerebral venous sinus pathology.



Algorithm that was developed for the management of outpatients with cerebral venous sinus pathology.



(A-B) A non-displaced occipital fracture is visualized.
(C) MRV shows an occlusive thrombus in the superior sagittal sinus.
(D) Pre- and (E) post-treatment head CTs demonstrate a new pontine hemorrhage after initiating IV heparin.

Results

Of 541 patients with skull fractures, 113 (21%) patients underwent venous imaging in order to assess the patency of the venous sinuses. Fifty-six (49%) of these patients had no evidence of venous sinus injury, 38 (34%) had a CVST and 19 (17%) had external compression of a sinus by an extraaxial hemorrhage. Of the 38 patients with CVST, 22 (58%) patients were treated with anticoagulation. The mean duration of anticoagulation was 3.4 months (range 0.1-8.6 months). The thrombosis resolved by 3 months in 11 (50%) patients, and was stable at 6 months in 3 (14%) patients. Three (14%) patients developed GI bleeding, while 3 (14%) patients developed new or worsening intracranial hemorrhage, resulting in one mortality.



 (A-B) A nondisplaced left occipital fracture is seen, associated with an occlusive sigmoid/jugular bulb thrombosis. (C) Preand (D) post-treatment head CTs
 demonstrate expansion of a pre-existing contusion after initiating IV heparin.

Conclusions

Skull fractures resulting from blunt trauma should prompt a high index of suspicion for underlying venous sinus pathology. In cases of CVST, patients on anticoagulation must be monitored closely and undergo repeat imaging. A high index of suspicion must be maintained for new or worsening intracranial hemorrhage.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Discuss the risks/benefits of treating CVST in adult trauma patients, and 2) Identify strategies for reducing the risk of new or worsening intracranial hemorrhage in this population.