

Journal Club Block 7: Jan 5, 2016

Disposition for Anticoagulated Head Injuries with Negative CT

Hosted by Drs. Roy Johnson and Nick Brautigam

Clinical Scenario: You walk into the hospital and see your attending's smiling face... You sigh, logon, and see there are 3 patients waiting for you. You assign yourself and see that the previous attending has already ordered a head CT on all 3 of them as they are "anti-coagulated head injury" patients. (We have metrics to worry about you know!) You review their chart and imaging prior to seeing them and see that there are no acute intracranial hemorrhages identified on all 3 patients. You eagerly make your way to the first patient and overhear an attending on the med-control radio.

Apparently, a bus full of hemophiliacs has just crashed into a glass factory. You realize you must quickly disposition these 3 patients as you will need the beds shortly. You continue to the first patient's room and ask yourself, "Did all 3 of these patients really need to be imaged in the first place and, perhaps more importantly, do I need to admit them for observation and repeat imaging or can they go home?"

Patient #1: 65 yo male with h/o atrial fibrillation, on Coumadin, who tripped while walking his dog and struck his head on the concrete. He denies any LOC. On presentation his GCS is 15. Neuro exam is normal. Small abrasion to the forehead. Otherwise, unremarkable exam. INR is 1.5. CT of the head and C spine are unremarkable.

Patient #2: 75 yo male with h/o Stroke and MI, on Coumadin and Clopidogrel, who fell out of bed, striking his head on the night stand. He denied LOC. On presentation his GCS is 14, -1 for mild confusion. Neuro exam revealed some mild RUE weakness, which the patient states is his baseline since the stroke. There is a 3 cm laceration to the occipital scalp, without obvious skull fracture. INR is 2.5. CT of the head and C spine are negative for acute traumatic injuries.

Patient #3: 55 yo female with h/o PE, on Coumadin, who tripped while jogging and struck her head on the sidewalk. She denies LOC. There is a small abrasion to the forehead. GCS is 15. Neuro exam is normal. INR is 3.7. CT of the head is normal.

Clinical question: What is the risk of initially undetected traumatic intracranial hemorrhage in varying types of anticoagulated patients and does that risk warrant an observation period and repeat head CT prior to discharge.

Introduction: With anticoagulation becoming much more commonplace we often find ourselves with patients classified as "anticoagulated head injury" patients. We know anticoagulation/antiplatelet therapies are associated with significantly increased risk of traumatic intracranial hemorrhage, but how often does the hemorrhage go undetected in the initial CT and what anticoagulation/antiplatelet therapy is associated with higher risk of delayed hemorrhage? What patient population and clinical scenarios should we be admitting for periods of observation and repeat head CT?

Background Articles:

1. Falzon C, Celenza A, Chen W, Lee G. Comparison of outcomes in patients with head trauma, taking preinjury antithrombotic agents. *Emergency Medicine Journal*. n.d.;30(10):809-814.
2. Pearl C, Fary K. Mild traumatic brain injury presenting with delayed intracranial hemorrhage in warfarin therapy: a case report. *Journal Of Medical Case Reports*. August 2015;9(1):1-5.
3. Nishijima D, Offerman S, Holmes J, et al. Risk of traumatic intracranial hemorrhage in patients with head injury and preinjury warfarin or clopidogrel use. *Academic Emergency Medicine: Official Journal Of The Society For Academic Emergency Medicine*. February 2013;20(2):140-145

Discussion Articles:

1. Cohn B, Keim S, Sanders A. Can Anticoagulated Patients be Discharged Home Safely from the Emergency Department after Minor Head Injury?. *Journal Of Emergency Medicine (0736-4679)*. March 2014;46(3):410-417 8p.
2. Schoonman G. Low risk of late intracranial complications in mild traumatic brain injury patients using oral anticoagulation after an initial normal brain computed tomography scan: education instead of hospitalization. *European Journal Of Neurology [serial online]*. July 2014;21(7):1021-1025.
3. Beng Leong L, Manauis C, Asinas-Tan M, Lim B. Outcomes of warfarinized patients with minor head injury and normal initial CT scan. *American Journal Of Emergency Medicine*. January 2016;34(1):75-78.

The Cohn article was a review article that had a very similar clinical question as ours. This article reviewed four articles addressing this very topic. The primary conclusion was that the previous evidence of delayed ICH was somewhat skewed by the mere presence of delayed ICH and estimated the incidence to be 6%. However this article showed that the incidence of clinically significant delayed ICH is closer to 1%. Ultimately this article suggests that not all patients warrant observation, but elderly patients and patients with elevated INR or concomitant antiplatelet therapy warrant observation and repeat CT.

The Schoonman article focused on the utility of a 24-hour mandatory observation period and its benefit if any. The conclusion of this article was that of the 211 observed patients only 5 developed any clinical deterioration, of which only 1 patient showed symptoms within the 24-hour observation period. The others didn't show symptoms until between 2-28 days after injury. This article suggests that a mandatory 24-hour observation period is not worth the cost or other hospital associated risks to the majority of patients with mild TBI while on anticoagulation therapy.

The Beng Leong article highlighted an important complication of observation periods for patients which are hospital-associated complications. This article showed a 0.3% incidence of delayed ICH necessitating neurosurgical intervention. However, 1% of the observed population died of nosocomial pneumonia. This article also concluded, as the review article did, that the population at risk are the elderly, patients with elevated INR, and patients taking concomitant antiplatelet therapy.

Discussion: The journal club discussion focused on several topics. One of which was the surprising support the data showed that isolated antiplatelet therapy was a greater risk factor for ICH when compared to isolated anticoagulation therapy. However this was not pertinent to our discussion of delayed ICH.

The overall conclusion was that a mandatory observation period for mild TBI and therapeutically anticoagulated patients is not only unnecessary from a cost perspective but incurs significant hospital associated risks which outweigh the risk of clinically significant ICH. There is a small subset of patients with increased risk, which may warrant observation. Those patients are the elderly, patients with supratherapeutic INRs, and patients on concomitant antiplatelet therapy. Also, the majority of clinically significant delayed ICH occurred beyond 24 hours, further supporting that observation is not beneficial for the large majority of patients, but education and close follow up are a far better approach.

Lastly, it was discussed that there are considerable shortfalls in the literature thus far. Primarily there is a lack of prospective studies. Further studies need to look at not only warfarin and antiplatelet therapy, but also novel oral anticoagulants, as these drugs are becoming much more popular. Additionally, there need to be more studies looking at the risk vs. benefit of anticoagulation reversal. Finally, a clinical decision tool might be helpful.

Bottom line: The large majority of anticoagulated patients with mild TBI do not warrant periods of observation, as there are data showing the risk associated with hospitalization outweighs that of a clinically significant delayed ICH. However, elderly patients, patients with supratherapeutic INR levels, patients with concomitant antiplatelet therapy, and patients with neurologic findings on exam should prompt you to consider admission for observation.