

Patient Safety Tip of the Week

June 5, 2012

Minor Head Trauma in the Anticoagulated Patient

In our April 16, 2007 Tip of the Week "[Falls With Injury](#)" we discussed falls with injury, with particular emphasis on what the first responder to a fall needs to do. We pointed out that the responder needs not only to assess the patient for injuries but also to do an assessment of the reason for the fall. Having a checklist to help the medical responder is a good way to ensure that the injuries are attended to and the cause of the fall is considered.

But the medical provider responding also needs to assess the patient for injuries related to the fall. That includes looking for lacerations, soft tissue injuries, internal injuries and head injuries. In our July 17, 2007 Patient Safety Tip of the Week "[Falls in Patients on Coumadin or Heparin or Other Anticoagulants](#)" we highlighted the problem of delayed hemorrhage after falls in patients on anticoagulants. Specifically we discussed the patient who falls and has minor head trauma, has a negative CT scan of the head, and then later develops a subdural hematoma (or other intracranial hemorrhage). The example we gave was an elderly patient with a cardiac condition on full-dose heparinization while an inpatient who had an unwitnessed fall in the hospital one evening. He did not lose consciousness and was alert and fully oriented when the medical resident examined him after the fall. He had a mild ecchymosis on his right forehead but no focal neurological signs and no evidence of trauma elsewhere on the body. Because the patient was fully anticoagulated, the resident ordered an emergency head CT scan, which was normal. No changes were made in his heparin regimen. The following morning the patient was more somnolent than usual and a repeat CT scan showed a sizeable subdural hematoma that required surgical evacuation.

Many good clinical decision rules for minor head injury already used in your emergency rooms, such as the Canadian CT Head Rule ([Stiell 2001](#)), do not apply to patients who have a bleeding disorder or who are on anticoagulants.

So the timing of a CT scan may be important in the patient who is anticoagulated. The accumulation of a subdural hematoma after minor head trauma may be slow in a patient on anticoagulants. But the optimal time to scan such patients remains unclear.

Some new studies from the emergency medicine literature shed some light on the risks of delayed hemorrhage after minor head trauma in patients taking anticoagulants. A study from Italy ([Menditto 2012](#)) reported on implementation of recommendations from the

2002 guideline from the European Federation of Neurological Societies. That protocol called for an initial CT scan on anticoagulated patients with minor head trauma, admission for 24 hours of close neurologic observation, then a second CT scan before discharge.

Menditto et al. enrolled 97 consecutive patients on anticoagulation who had minor head trauma and had an initial negative CT scan and observed them for 24 hours. 10 refused a second CT scan and were discharged and did well. Of the remaining 87 patients 5 had intracranial hemorrhage on their second CT scan. In addition, 2 patients who were discharged after two negative CT scans returned within 8 days with subdural hematomas.

The biggest predictor of delayed intracranial hemorrhage was an INR > 3.

The second study ([Nishijima 2012](#)) looked at over 1000 patients who were on either warfarin or clopidogrel and had minor head trauma. The prevalence of intracranial hemorrhage on immediate CT scan was 12% in those on clopidogrel and 5.1% in those on warfarin. However, none of the clopidogrel patients developed delayed intracranial bleeding compared to 0.6% of patients on warfarin. They suspect one reason for the higher prevalence of intracranial bleeding in the clopidogrel patients may have been more frequent aspirin use compared to those on warfarin. They conclude that since the overall risk of delayed intracranial hemorrhage in patients on warfarin or clopidogrel is low, discharge of such patients after a negative CT scan is reasonable but appropriate instructions regarding possible delayed bleeding are required. However, it should be noted that 2 of the 4 patients on warfarin with delayed intracranial hemorrhage died as the result of massive intracranial hemorrhages within one week.

A previous study ([Kaen 2010](#)), using basically the same guidelines as the Menditto study, found only 2 cases of delayed intracranial hemorrhage in 137 consecutive mostly elderly patients on either warfarin or heparin who had minor head trauma. Neither needed neurosurgical intervention. Both were also on antiplatelet agents and both had lost consciousness at the time of head trauma. They provided references to the case reports and small case series in the literature of anticoagulated patients with delayed intracranial hemorrhage after minor head trauma and noted that neurological deterioration in most such cases takes place in the first few hours after the injury. They argued that the need for the “control” (i.e. the second) CT scan before discharge is unnecessary in patients who remain neurologically intact.

Note that none of these studies answers the question “What is the optimal timing of imaging in anticoagulated patients with minor head trauma?”. When Menditto et al. put their series together they excluded 16 patients who had intracranial hemorrhage on the initial CT scan. We are not told how those patients did clinically. But one might make an argument in this patient population, assuming they will indeed get close neurological checks while under observation, to simply hold off on the first CT scan until 24 hours if they are initially neurologically intact. That might be more cost-effective. But keep in mind that deterioration can take place rapidly. The editorial accompanying the Menditto study ([Li 2012](#)) describes a case in which such a patient went from neurologically normal

with a normal CT scan to having a massive subdural hematoma requiring surgical evacuation in a 3-hour time span.

So we also emphasize the need for good instructions for the patient (and perhaps more importantly for the caregivers) when such patients are to be discharged. The major initial symptoms and signs of subdural hematomas are usually related to changes in the level of consciousness or cognition rather than “focal” neurological signs. These can be subtle. That’s why we previously warned in our July 17, 2007 Patient Safety Tip of the Week “[Falls in Patients on Coumadin or Heparin or Other Anticoagulants](#)” that the “neuro checks” must be carried out as ordered. We’ve often seen in that past that there is a tendency for “neuro checks” to be overlooked when the patient is asleep – which is exactly when neuro checks are most important!

Note also that none of the studies includes patients on the new generation of oral anticoagulants that have just begun being used in the last year or so. Also we suspect the same may apply to bleeding in other spaces in patients fully anticoagulated. A good example is retroperitoneal bleeding, which may present with no signs until a drop in hemoglobin is found or flank ecchymoses are noted.

So when you put together your checklist for the medical provider who responds to a hospitalized patient with a fall, make sure you include some guidance on what to do in the patient who is anticoagulated.

See updates: Patient Safety Tips of the Week July 8, 2014 “[Update: Minor Head Trauma in the Anticoagulated Patient](#)” and August 21, 2018 “[Delayed CT Scan in the Anticoagulated Patient](#)”

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