

Imaging Modalities for Acute Hip Fracture in the ED

Case

75 year-old female, PMHx DM and HTN, presents for right hip pain. Pt was at home and slipped on a spot of water on the wood floor landing directly on her right hip. Since the injury, the patient has been unable to ambulate or move the right hip. Denies any other injury or LOC. Physical exam only pertinent for tenderness over the R hip joint with a large area of ecchymosis over the same area.

Clinical Question

What is the imaging modality of choice for patients with a high pre-test probability for a hip fracture?

Evidence

Hip pain after falls is commonly seen in emergency departments with hip fractures alone resulting in >300,000 visits every year. These fractures are much more common in adults over the age of 65 and have a significant impact on mortality in the population with 20% of patients with a hip fracture dying within the next year. A recent review article suggested that patients with a high likelihood of fracture and negative plain radiographs should also receive advanced imaging as **11% of hip fractures can be missed on plain radiographs alone**¹. This is validated with several other studies that show on average **10%** of hip fractures missed on plain radiographs³. A retrospective cohort study in 2005 looked at 764 patients who presented with hip pain. Out of the 545 patients with negative plain films, 62 patients had subsequent MRI imaging to evaluate for an occult fracture. Of these, 24 had a hip fracture on MRI; therefore, in their study **3-6.5%** patients had a positive hip fracture on MRI after a negative plain film².

In terms of what advanced imaging to get, CT, MRI, and bone scans have been suggested. CT is more sensitive but still misses approximately 2% of all hip fractures. On the other hand, **MRI** has been shown to accurately detect 99.4% of all hip fractures. The gold standard for a hip fracture would be a bone scan but this imaging is rarely used due to its low availability in the acute setting and that the diagnosis will not be made for 2-3 days after the initial presentation. Moving forward, current studies are underway looking at using US to identify hip fractures and so far have shown US to be at least as sensitive as plain films, if not more¹.

Summary

For patients with a high pre-test probability for a hip fracture, plain radiographs alone are not sufficient to rule out a fracture. In these cases, if the plain radiographs are negative, ideally an MRI would be performed, but if not available CT is still much more sensitive for ruling out hip fracture.

References/Further Reading

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4. <http://pubmed.org/pubmed/22459594>