

Evidence Discussion (MS-5)

The vast majority of acute fractures can be easily diagnosed via plain radiography. Therefore, it is widely accepted that the initial imaging for a patient with a suspected fracture should be plain radiographs. [1-6] For patients noted to have a complex fracture (comminuted or displaced) on initial plain radiographs, CT can provide detailed bony information to allow further evaluation and treatment planning. [7-10]

Initial imaging for a suspected stress fracture should begin with plain radiographs. Although initial x-rays may not identify the fracture, repeat x-ray imaging in 10 – 14 days is supported by the American College of Radiology Appropriateness Criteria for Stress (Fatigue-Insufficiency) Fracture Including Sacrum Excluding Other Vertebrae (revised 2024). [11] Repeat radiographs may show osseous reaction confirming the presence of an occult or stress fracture. However, if repeat x-rays remain negative and there is still suspicion of an occult or stress fracture, MRI is recommended as it has been shown to be the most sensitive and specific imaging modality for workup of suspected stress injuries. [12,13] CT, Bone scan, SPECT and SPECT/CT are also considered as options per American College of Radiology Appropriateness Criteria for Stress (Fatigue-Insufficiency) Fracture Including Sacrum Excluding Other Vertebrae (revised 2024). [11]

There exists a subset of occult/stress/insufficiency fractures that have an increased risk of fracture progression, delayed healing, non-union and avascular necrosis. For these high risk injuries, advanced imaging is recommended if initial x-rays are negative or indeterminate as these injuries require early diagnosis and immediate treatment. [14-16]

The evaluation of patients with suspected shin splints/medial tibial stress syndrome includes a detailed history, physical examination and plain x-rays. [17] Most patients will improve with conservative care, however, MRI is recommended if the patient fails to respond to an adequate trial of conservative treatment. [17]

For the assessment of bony healing, serial x-ray imaging is usually sufficient. However, if there are still concerns for delayed union or non-union, CT scanning can provide detail as to the presence or absence of bridging callus. [18] MRI can also assist in the evaluation of bone healing. [18]

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