

2011 Imaging Criteria

Magnetic Resonance Imaging (MRI), Foot (Pediatric)^(1, 2)

ICD-9-CM: 88.94

CPT: 73718, 73719, 73720, 73721, 73722, 73723

I/O Setting: Outpatient

INDICATION(S)

- 100 Suspected osteomyelitis
- 200 Soft tissue mass
- 300 Suspected bone tumor
- 400 Suspected stress fracture

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- 100 Suspected osteomyelitis [**Both**]⁽³⁾
 - 110 Findings [**One**]⁽⁴⁾
 - 111 ESR > 30 mm/hr
 - 112 Temperature > 100.4 F(38.0 C)
 - 113 WBC > 10,000/cu.mm(10x10⁹/L)
 - 114 Blood culture positive
 - 115 Penetrating puncture wound by Hx⁽⁵⁾
 - 116 C-reactive protein > 10 mg/L
 - 120 Foot x-ray nondiagnostic for osteomyelitis⁽⁶⁾
 - 200 Soft tissue mass [**Both**]⁽⁷⁾
 - 210 Symptoms [**One**]
 - 211 Foot pain
 - 212 Entrapment neuropathy⁽⁸⁾
 - 220 Findings [**One**]
 - 221 Mass by PE and x-ray nondiagnostic for soft tissue mass
 - 222 Mass by x-ray
 - 300 Suspected bone tumor [**One**]^(9*RIN, 10)
 - 310 Sclerosis by x-ray
 - 320 Periostitis by x-ray
 - 330 Lytic/blastic mass by x-ray
 - 340 Cortical destruction by x-ray
 - 350 Pathologic fracture by x-ray⁽¹¹⁾
 - 400 Suspected stress fracture [**All**]⁽¹²⁾

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- 410 Stress to the area by Hx⁽¹³⁾
- 420 Sx/findings at foot [**One**]
 - 421 Tenderness at site of suspected injury
 - 422 Pain increased by weight-bearing/inversion
- 430 No fracture by x-ray⁽¹⁴⁾
- 440 Continued pain **after** ≥ 4 wks conservative Rx⁽¹⁵⁾

Notes

(1)

The following are examples of relative and absolute contraindications to the use of magnetic resonance imaging:

- Implanted devices that are electrically or magnetically activated (e.g., cardiac pacemakers, automatic cardioverter defibrillators, drug infusion pumps, cochlear implants)
- Ferromagnetic metal objects (e.g., cerebral aneurysm clips, intraocular metallic foreign body, prostheses, screws)
- Pregnancy, first trimester
- Renal insufficiency in cases when magnetic resonance imaging is performed with gadolinium-based contrast

(2)

Many bones may not be completely ossified. MR imaging is often needed to provide additional information to assist in the management of congenital and acquired lesions in the foot.

(3)

Osteomyelitis in the pediatric population may be difficult to detect and even clinically silent in the neonate and infant. MRI allows for the early detection and prompt treatment of osteomyelitis, and therefore decreases the rate of complications and morbidity associated with this condition (Balassy and Hormann, Eur J Radiol 2008; 68(2): 245-258).

(4)

If the patient is immunocompromised, fever may not be present and the WBC may be unchanged or low.

(5)

Stepping on nails is a common history for osteomyelitis in a child. The patient may be afebrile, and the labs may be normal.

(6)

Although plain film radiography should be performed to initially evaluate the presence of infection, abnormalities of the foot may not be seen on x-ray until 2 to 4 weeks (Kapoor et al., Arch Intern Med 2007; 167(2): 125-132).

(7)

Although neither x-ray nor MRI is able to reliably determine whether a soft tissue mass is benign or malignant, MRI can localize and determine the extent of a soft tissue lesion (Balassy and Hormann, Eur J Radiol 2008; 68(2): 245-258).

(8)-DEF:

The nerves of the foot include the superficial peroneal, deep peroneal, tibial, sural, and saphenous. The saphenous nerve originates from the femoral nerve, whereas the other four nerves originate from the sciatic nerve.

(9)-RIN:

This indication addresses the initial diagnosis of a bone tumor, not the assessment of response to therapy. For suspected metastatic disease (pain at multiple sites, cancer by history) a bone scan provides information about occult metastases at other sites and is the appropriate initial study. For suspected metastatic disease, see the "Bone Scan" criteria subset.

(10)

MRI is needed in addition to x-ray to evaluate the extent of the tumor and associated soft tissue involvement, as well as in staging for resection (Balassy and Hormann, Eur J Radiol 2008; 68(2): 245-258).

(11)

A pathological fracture commonly presents in the calcaneus as unicameral bone cysts.

(12)-DEF:

A stress fracture is a partial or complete fracture of a bone due to repetitive loading. It may be further categorized as a fatigue fracture where histologic normal bone subject to repetitive stress fails or an insufficiency fracture that occurs when histologic abnormal bone, such as that found in an osteoporotic individual, fails from relatively normal stress (Joong and El-Khoury, Am Fam Physician 2007; 76(7): 975-983).

(13)

Activities (e.g., running, jumping, sprinting), foot anatomy, female gender, and age are all factors in the development of stress fractures. Individuals will frequently present with an insidious onset of vague, aching pain. Often a change in activity, such as increasing the duration or intensity of an exercise program, will cause enough stress to result in fatigue fractures, while routine activities may result in insufficiency fractures (DeLee et al., DeLee & Drez's orthopaedic sports medicine : principles and practice, 3rd ed. 2009.).

(14)

MRI may reveal stress fractures not visualized by radiographs. Initial radiographs to evaluate stress fractures of the foot are frequently negative, since changes may not be seen for 2 to 4 weeks after clinical symptoms present (Joong and El-Khoury, Am Fam Physician 2007; 76(7): 975-983).

(15)

Conservative therapy for this condition may include activity modification, immobilization, and NSAIDs.