

Delegates:
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Editor:

F- 30 - BONE BX TECHNIQUE

F- 30 - What is the optimal method to perform bone biopsy (method, location, imaging use) for patients with infected foot and ankle?

Response/Recommendation:

A bone biopsy should generally be performed in a percutaneous fashion, particularly in cases where surgical debridement is not considered necessary. If surgical debridement is considered necessary, than an open biopsy can be performed as part of the debridement. Percutaneous biopsy should be performed under sterile conditions by an interventional radiologist or other physician trained on image-guided techniques. The location of the biopsy will depend upon the clinical and radiographic evaluations, with a goal of maximizing the yield of the biopsy while minimizing the risk of injury to surrounding and/or overlying soft tissue structures.

Strength of Recommendation: Consensus

Rationale:

Infection in the foot and ankle bone or soft tissues can be associated with significant morbidity and even mortality. Prompt diagnosis and treatment is paramount. Often, diagnosis can be made based on a combination of clinical examination, radiographic imaging and laboratory data. Bone biopsy is considered the gold standard for the diagnosis of osteomyelitis.¹⁻⁵

Bone biopsy can be particularly helpful when the clinical exam, radiographic imaging and laboratory data are not clearly confirmatory of an underlying infection. Additionally, a bone biopsy can allow for identification of the infecting organism(s) and therefore, allow for a more tailored treatment regimen. It can also exclude rarer causes of bone disease, such as malignancy or osteonecrosis.^{6,7}

A percutaneous bone biopsy is generally preferable to an open biopsy, particularly in cases where surgical debridement is not considered necessary. Percutaneous techniques are less invasive, less costly, and associated with less morbidity.⁷⁻¹⁰ A percutaneous bone biopsy should be carried out under image guidance, generally either fluoroscopy or computed tomography (CT), and should be performed by an interventional radiologist or other physician trained on image-guided techniques. Image-guidance allows for specimens to be obtained from specific targeted areas. The choice of imaging technique used to guide the biopsy depends on the anatomic location, availability and practitioner preference. Fluoroscopy can be used for more superficial lesions and allows for real-time guidance. Its main limitation is its two-dimensional nature. CT guidance provides visualization of not only osseous structures but also important soft tissue structures, such as neurovascular

structures, within a three-dimensional framework. Its main limitation is the increased radiation exposure in comparison to fluoroscopy. There are reports in the literature regarding magnetic resonance (MR) guided percutaneous bone biopsies, but the availability of MRI-compatible instruments and accessories limits its use.^{11,12}

The choice of anatomical region to perform a biopsy will depend on the state of the overlying soft tissues and the radiographic findings. The goal should be to increase the yield of the biopsy, while minimizing potential risk to nearby soft tissue structures. In general, more superficial areas of concern are targeted. If multiple areas of concern exist, one will also want to prioritize the site which is likely to provide the highest diagnostic yield. The procedure should be performed under sterile conditions to reduce the risk of contamination of skin flora. If possible, multiple samples should be obtained utilizing multiple trajectories within the bone to increase the diagnostic yield of the procedure.

References:

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