

## The Relationship between Bone Biopsy and Bone Culture results in Patients with Osteomyelitis from Pressure Ulcers

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**Citation:** Vani K, Thomas R, Finnegan M, Levin J (2016) The Relationship between Bone Biopsy and Bone Culture results in Patients with Osteomyelitis from Pressure Ulcers. *Plast Surg Mod Tech* 1: 105. DOI: 10.29011/2577-1701.100005

**Received Date:** 31 October, 2016; **Accepted Date:** 29 November, 2016; **Published Date:** 5 December, 2016.

### Abstract

Osteomyelitis is an infectious process of the bone caused by prolonged immobility, bacterial dissemination through blood, immune-suppression, trauma, or vascular insufficiency. The diagnosis of osteomyelitis is made by multiple modalities. Some of these include bone cultures, bone biopsy, imaging, and clinical determination [1]. In this study we plan to chronicle patients with suspected osteomyelitis secondary to prolonged immobility resulting in pressure ulceration. Our aim is to find correlations between bone cultures and biopsy findings of the bone. The relationship between the two entities can help guide extended antibiotic therapy.

### Methods

In this retrospective study, we analyzed data on 79 patients (N=79) who suffered from sacral, ischial, and hip ulcers spanning from 2014-2015. These patients received bone cultures, bone biopsies, or both. All patients with positive cx or pathology were treated with antibiotics for an extended period with the diagnosis of osteomyelitis. These patients were selected via billing codes associated with the diagnosis of pressure ulcers and those with either positive bone culture and/or pathology were included in this study. Patients who received a biopsy were taken to the operating room for sharp debridement under sterile conditions.

### Results

After reviewing the data, we found that 63 of the 79 patients had positive bone culture findings (79.7 %). 40 patients had positive bone pathology confirming a diagnosis of osteomyelitis (50.6 %). 35 patients out of the 79 had both positive culture and positive pathology (44.3 %). 5 patients had negative cx as well as negative pathology (6.3%). Of the patients with positive pathology, 33 had findings of positive bone cultures (82.5%), however of the patients with positive bone tissue cultures only 59% of patients had positive bone pathology.

### Discussion

The diagnosis of osteomyelitis is initially guided by clinical

suspicion. Lab values (ESR/WBC count), CT/MRI imaging may be helpful in guiding the diagnosis; however confirmation of osteomyelitis is based generally on bone cultures and bone biopsy [2]. As evidenced by Zuluaga et al 94 % of bone cultures were shown to grow organisms in patients with suspected Osteomyelitis [2,3]. In this study we attempted to correlate bone cultures and bone biopsy findings as a method to assist treatment course. We discovered, of the majority of patients with a clinical diagnosis of osteomyelitis, at least 79.7 % of patients had positive bone cultures and 50 percent had positive bone biopsy findings. These findings help to confirm that initial clinical suspicion of osteomyelitis warrants necessity for a bone biopsy. These findings also show that in the majority of patients with positive pathology, cultures were shown to grow organisms. Patients with positive culture findings received extended antibiotic therapy approximately 2 weeks in length while patients with positive pathology received antibiotics on average for 6 weeks (time it takes for debrided vascular tissue to cover bone) [2]. Treatment duration should not be taken lightly as long term antibiotics have significant side effects and therefore it is important to delineate between cultures and pathology. The ability to correlate culture and pathology findings can help guide the duration of antibiotic therapy. The limitations of the study include false negative bone pathology secondary to surgical technique. This may artificially lower the percentage of positive bone biopsies. In our follow up study, We will be assessing treatment outcomes with the extended antibiotic therapy courses for the patients reviewed in this study.

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