Antibiotic Prescription following Diabetic Foot Infection Bone Resection:
Differences in Treatment Recommendations between Foot and Ankle Surgeons and Infectious Disease Specialists

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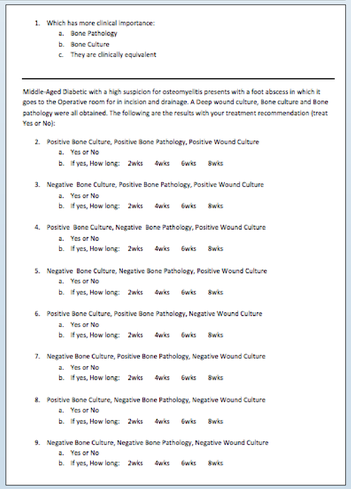
Statement of Purpose and Literature Review

Osteomyelitis in the diabetic foot is a diagnosis which carries substantial clinical, surgical, functional and financial implications. Although it should probably not be considered a "gold standard", bone biopsy likely remains the most effective diagnostic test [1-3]. However, the term "bone biopsy" might refer to either the microbiologic or histopathologic analysis of a bone sample, and several studies have demonstrated relatively low rates of agreement between these tests [4-6].

The objective of this investigation was to evaluate preferences for similarities and differences between foot and ankle surgeons and infectious disease physicians with respect to antibiotic therapy in diabetic foot infections based on pathology and culture results.

Methodology

A survey was developed presenting a clinical scenario of a patient with diabetes and a foot infection involving bone that underwent excisional surgical debridement to apparently viable tissue. The incision was primarily closed in the scenario, and the procedure involved the performance of a bone culture, bone pathology specimen, and a deep wound culture. The survey initially queried participants which post-procedural test had the most clinical importance for them (bone pathology vs. bone culture), and then further asked for post-procedural antibiotic treatment recommendations based on varying outcomes. The survey was subsequently completed by a group of foot and ankle surgeons and infection disease specialists.



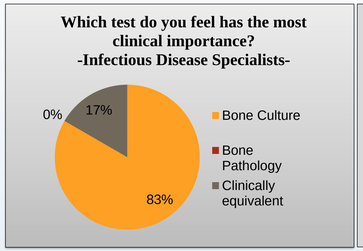
1. Which has more clinical importance:
   a. Bone Pathology
   b. Bone Culture
   c. They are clinically equivalent

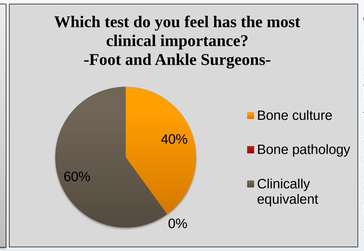
Middle-Aged Diabetic with a high suspicion for osteomyelitis presents with a foot abscess in which it goes to the Operative room for in incision and drainage. A Deep wound culture, Bone culture and Bone pathology were all obtained. The following are the results with your treatment recommendation (treat Yes or No):

2. Positive Bone Culture, Positive Bone Pathology, Positive Wound Culture
   a. Yes or No
   b. If yes, How long: 2wks 4wks 6wks 8wks
3. Negative Bone Culture, Positive Bone Pathology, Positive Wound Culture
   a. Yes or No
   b. If yes, How long: 2wks 4wks 6wks 8wks
4. Positive Bone Culture, Negative Bone Pathology, Positive Wound Culture
   a. Yes or No
   b. If yes, How long: 2wks 4wks 6wks 8wks
5. Negative Bone Culture, Negative Bone Pathology, Positive Wound Culture
   a. Yes or No
   b. If yes, How long: 2wks 4wks 6wks 8wks
6. Positive Bone Culture, Positive Bone Pathology, Negative Wound Culture
   a. Yes or No
   b. If yes, How long: 2wks 4wks 6wks 8wks
7. Negative Bone Culture, Positive Bone Pathology, Negative Wound Culture
   a. Yes or No
   b. If yes, How long: 2wks 4wks 6wks 8wks
8. Positive Bone Culture, Negative Bone Pathology, Negative Wound Culture
   a. Yes or No
   b. If yes, How long: 2wks 4wks 6wks 8wks
9. Negative Bone Culture, Negative Bone Pathology, Negative Wound Culture
   a. Yes or No
   b. If yes, How long: 2wks 4wks 6wks 8wks

Results

Results are displayed in the following tables and figures.





These results indicate that although both groups tended to place more clinical importance in the bone culture over the bone pathology, foot and ankle surgeons were more likely to view bone culture and bone pathology as being clinically equivalent (60%). Infectious disease specialists tended to view place much greater clinical importance on the bone culture (83%), as might be expected.

Table 1: Infectious Disease Specialist specific survey responses

	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9
Respondent 1	Yes, 6 weeks	Yes, 2 weeks	Yes, 6 weeks	Yes, 4 weeks	Yes, 6 weeks	No	Yes, 6 weeks	No
Respondent 2	Yes, 6 weeks	No	Yes, 6 weeks	No	Yes, 6 weeks	No	Yes, 6 weeks	No
Respondent 3	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 2 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	No
Respondent 4	Yes, 6 weeks	Yes, 2 weeks	Yes, 6 weeks	No	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	No
Respondent 5	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 2 weeks	Yes, 6 weeks	No	Yes, 6 weeks	No
Respondent 6	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 2 weeks	Yes, 4 weeks	Yes, 4 weeks	Yes, 4 weeks	Yes, 4 weeks

Table 2: Foot and Ankle Surgeon specific survey responses

	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9
Respondent 1	Yes, 4 weeks	Yes, 4 weeks	Yes, 4 weeks	Yes, 2 weeks	Yes, 2 weeks	Yes, 2 weeks	Yes, 4 weeks	No
Respondent 2	Debride further	Yes, 2-4 weeks	Yes, 2-4 weeks	Yes, 2-4 weeks	Yes, 2-4 weeks	Yes, 2-4 weeks	Yes, 2-4 weeks	2-5 days
Respondent 3	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 2 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 2 weeks
Respondent 4	Yes, 6 weeks	Yes, 4 weeks	Yes, 6 weeks	Yes, 2 weeks	Yes, 6 weeks	Yes, 4 weeks	Yes, 6 weeks	No
Respondent 5	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 2 weeks	Yes, 6 weeks	Yes, 6 weeks	Yes, 6 weeks	No

82% of all physicians reported that they would treat patients with at least 6 weeks of antibiotics if all three tests came back positive (bone culture, bone pathology and deep wound culture), while **72.7%** of all physicians reported that they would not treat patients with any sustained post-operative antibiotics if all three test came back negative. A wide range of responses were observed with respect to treatment route and duration when there was disagreement between the three tests **(Table 1 and 2).**

Discussion

As with any scientific investigation, critical readers are encouraged to review the study design and results and reach their own conclusions, while the following represents our conclusions based on the specific results. As scientists, we also never consider data to be definitive, but do think that these results are worthy of attention and future investigation.

-First, we observed some similarities but also considerable clinical variation with respect to preferences for antibiotic regimens of diabetic foot infections between foot and ankle surgeons and infectious disease specialists. Since these two specialties often work-side-by side in developing a treatment plan for these high-risk patients, it is probably important to reduce this degree of apparent variation in clinical practices.

-One potential problem with this clinical topic is the differing post-procedural results often observed between bone pathology, bone culture and deep wound cultures. It is unclear which, if any, is or should be considered of greater clinical significance.

-Another potential problem is the host of confounding variables observed with the diabetic foot including, but not limited too: the likely continuous nature of peripheral arterial disease, severity and specificity of the likely multiorganism infecting agents, glycemic control, ability to off-load, etc.

It is our hope that this information adds to the body of knowledge with respect to the diagnosis and treatment of diabetic foot disease.

References

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