

Bacterial cultures from sinus track and bone in Nigerians with chronic osteomyelitis

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Abstract

Chronic osteomyelitis of the long bones is common in the tropics, despite advances in antimicrobial therapy and surgical treatment. Attempts to isolate the causative pathogen are often done by surface swabs from the discharging sinuses and findings may differ from bone sampling isolates. This study aimed to establish the correlation between sinus and bone culture. A 2-year prospective study was under taken at

Federal Medical Centre Owo, Nigeria, from May 2002 to April 2004. Of 25 patients, bacteria were cultured from 11(44%) sinus tracks and 7(28%) bone samples with only 45% concordance between the cultures. The isolation of a single organism especially *Staphylococcus aureus* from the bone correlated well with that of sinus track culture.

Introduction

Chronic osteomyelitis (COSM) of the long bones is still a common problem in the tropics. While in the developed world the cause is now usually post-traumatic, in our setting poorly treated acute haematogenous osteomyelitis remains the leading cause.^{1,2} The bacteriology of chronic osteomyelitis had not changed significantly, though within different hospital settings different patterns have been reported.³ *Staphylococcus aureus* remains the predominant single pathogen isolated from sinus track culture. The isolation of the organism through this method, although common practice, is problematic because of the increased chance of contamination compared to intra-operative bone sampling. This study aimed to compare these two methods of sampling.

Patients and Methods

From May 2002 and April 2004, all patients with COSM of long bone were recruited in to the study. Only patients with discharging sinuses were included. Pre-operative sinus track specimens and intra-operative specimens from fluid in the bone marrow were sent for aerobic culture. Cierny and Mader classification of chronic osteomyelitis was used to categorize the patients. Test of significant association was used Chi square test.

Results

Average age of the patients was 16 years with range of 3 to 36years. Male-to-female ratio was 3 to1. The duration of symptoms ranged from 5 to 48 months with average of 18 months. There were 25 long bones involved in 24 patients. The femur was the commonest long bone affected (10), followed by humerus (8), tibia (6) and radius in one patient. The cause of COSM was poorly treated acute haematogenous osteomyelitis in all 24 patients. The COSM in the long bone fell into the following classes using the Cierny and Mader classification; Type IIA in 5(20%) patients, type III in 19(76%) and type IV in one (4%) patient. Of type III, 18patients were class A host and one patient had class B host.

Isolates were identified from 11(44%) of the sinus track and 7(28%) of the intra-operative bone specimens. Fourteen (58%) of the 24 patients had taken two or more different antibiotics preoperatively. *S. aureus* was the commonest pathogen isolated from both samples, accounting for 14 of 19 isolates in total (Table). There was 45 % (4 of 9) concordance for isolation of *S.aureus* between the sinus track and bone sites. Four of the 5 of those with *S. aureus* isolated from bone also had it isolated from

sinus tracks.

Discussion

Eradication of chronic infections of bones is difficult as the dead bone and relatively avascular soft tissue continue to serve as good nidus for the perpetration of the infective process. The identification of offending organisms is an important step in management and will guide use of appropriate antibiotics. Earlier studies report on the poor correlation between sinus track and bone sampling techniques for culture and support the use of intraoperative specimen.^{4,6}

S. aureus was the commonest pathogen identified from either site in this study, in agreement with findings earlier studies in Nigeria.^{1,2,7} Though there was poor correlation between the sinus track culture and intra-operative specimen from the medullary cavity of the affected bone, this study suggests that when *S. aureus* is the isolate from sinus track then it can be assumed to be the cause of COSM. The low yield of isolates from either method had also been documented in other studies.^{8,10} Reasons suggested were poor sampling methods and prolonged use of preoperative antibiotics by the patients. Indiscriminate use of antibiotics is common in our setting.

Our study also demonstrated that there was only 45% concordance between sinus track and intra-operative medullary cavity culture in those with positive culture. This was similar to report by Mackowiak⁶ supporting the use of operative specimen for identification of the pathogen. The increased yield from sinus track culture was not surprising because of the likelihood of secondary infections.⁴

The finding that femur is commonest site for COSM is similar to the finding by Essien from Enugu in Nigeria⁸, but contrasts with study from United States⁶ where the tibia was the most affected. It is noted that where the haematogenous spread predominates as route of infection, femur is commonest site while in those with trauma, tibia is more commonly involved. The tibia is most commonly involved bone in open fractures while the femur is a well-vascularised bone making it site of predilection in haematogenous infections. Majority of the patients in this study were in the first and second decade of life, as osteomyelitis is usually a disease of growing children.⁹

References

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Table 1. Aerobic bacteria culture from the specimen

Specimen	Bacterial Isolate	No. of patients
Sinus culture	<i>Staphylococcus aureus</i>	9
	Coliform	1
	Mixed growth	1
Bone culture	<i>Staphylococcus aureus</i>	5
	<i>Coliform</i>	1
	<i>Pseudomonas</i>	1