



Comparison of the results of sinus track culture and sequestrum culture in chronic osteomyelitis

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A prospective observational study was conducted at J. N. Medical College, Aligarh Muslim University, to compare the bacterial flora obtained from sequestrum culture and sinus track culture and to evaluate their antibiotic sensitivity. A total of 62 patients with chronic osteomyelitis were enrolled (38 males and 24 females). Sinus track cultures were done taking all aseptic precautions and the results were compared. Thirty three patients out of 62 showed a discrepancy between the bacterial flora grown from sinus track and sequestrum cultures.

INTRODUCTION

Chronic osteomyelitis is a common cause of morbidity in the developing countries. The disease is more common in children. It is commonly a sequel of treated or untreated acute osteomyelitis. Undertreatment is a result of inadequate or unsuitable antibiotic therapy. The isolation of a proper causative organism and its antibiotic sensitivity is important as far as the treatment is concerned. In cases of chronic osteomyelitis, sinus tracks frequently develop from infected bone to the skin. The infected piece of bone is the sequestrum. Investigators have used the cultures of specimens from sinus tracks to identify the pathogen (1, 3, 5, 6, 10-14). In doing so, they have assumed that bacterial cultures from the sinus track originate from bone infection itself. Antibiotic resistance and secondary infection of the sinus tracks may contribute to erro-

neous results. Several authors have compared the results of sinus track specimen cultures with the results of bone biopsy/sequestrum cultures (2, 4, 7, 8). The aim of the present study was to evaluate the bacterial flora obtained through the sinus track specimen and sequestrum cultures in patients with chronic osteomyelitis. The study also aims to evaluate the bacterial sensitivity to various antibiotics and thus provide a cost-effective strategy in control of chronic osteomyelitis.

MATERIAL AND METHODS

This was a prospective observational study. A total of 62 cases of radiologically proven chronic osteomyelitis that visited J. N. Medical College Hospital, A.M.U., Aligarh, were included in the study. Forty-nine out of the 62 were less than 12 years of age. There were 38 males and 24 females. Cases of post-traumatic osteomyelitis and infected implants were excluded from the study. Sinus track cultures were taken under full

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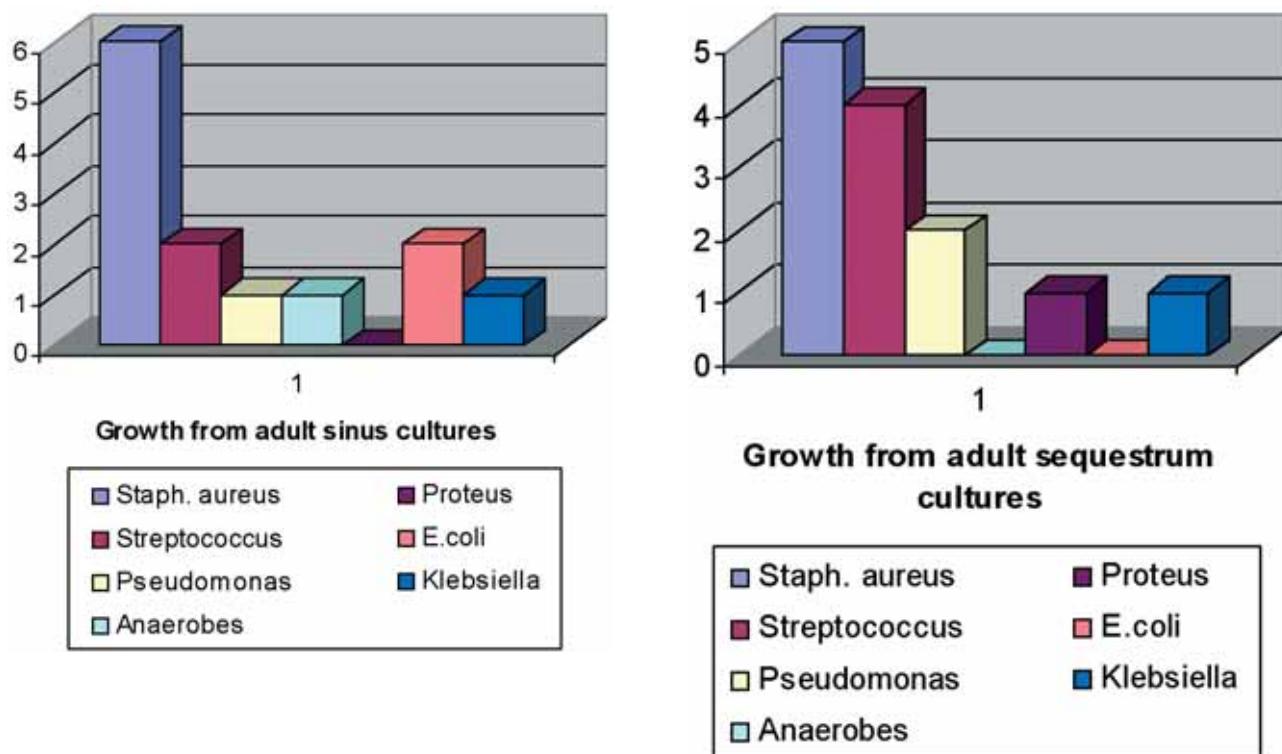


Fig. 1 a, b. — Growth from adult specimen cultures

aseptic precautions in three different culture tubes. Cultures were transported to the laboratory in appropriate media and inoculation was done for both aerobic and anaerobic organisms. For anaerobic cultures Mc Intosh Filde's jar was used. For culture plates, blood agar, Mc Conkey agar, chocolate agar and L. J. media were used. The sequestrum obtained during debridement was morsellised and sent for culture in Robertson's cooked broth. Sub-cultures were inoculated for isolation of different bacteria and sensitivity for various antibiotics was investigated. The results of bacterial flora grown from sinus track and sequestrum cultures were compared and evaluated.

RESULTS

In Adults

Staphylococcus aureus was the most common organism isolated in both sinus track cultures and sequestrum cultures (fig 1 a, b). In 7 cases out of 13 (55%), there was discrepancy between sinus track

cultures and sequestrum cultures. The commonest combination of the bacterial flora was *Staphylococcus aureus* in the sinus track culture and *Streptococcus pyogenes* in sequestrum cultures. No anaerobe was grown from the sequestrum culture. More than one organism grew in one patient.

In Children

The commonest organism to grow in both sinus track cultures and sequestrum cultures was again *Staphylococcus aureus* (fig 2 a, b). *Haemophilus influenzae* was isolated in 3 cases from the sequestrum in patients less than 5 years of age (fig 2 b). In one case, *Mycobacterium tuberculosis* was isolated and formed the basis of anti-tubercular treatment. No anaerobe was again isolated from either the sinus track or the sequestrum cultures. Out of the 49 cases more than one organism was grown in 5 cases on sinus track cultures. More than one organism grew in three sequestrum cultures.

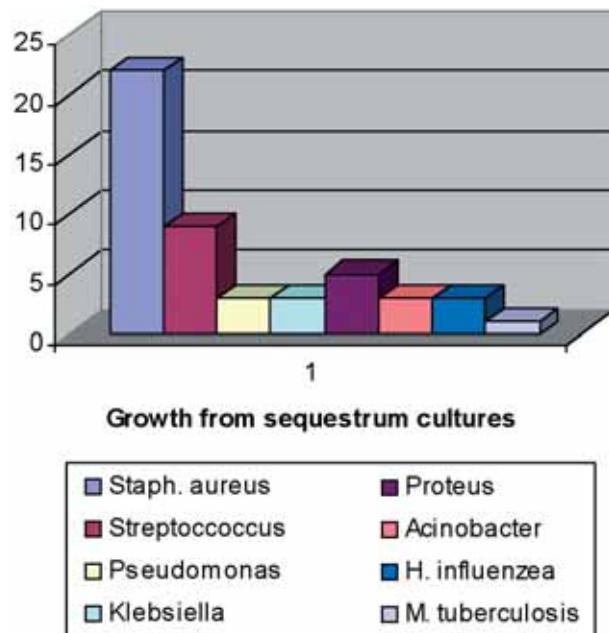
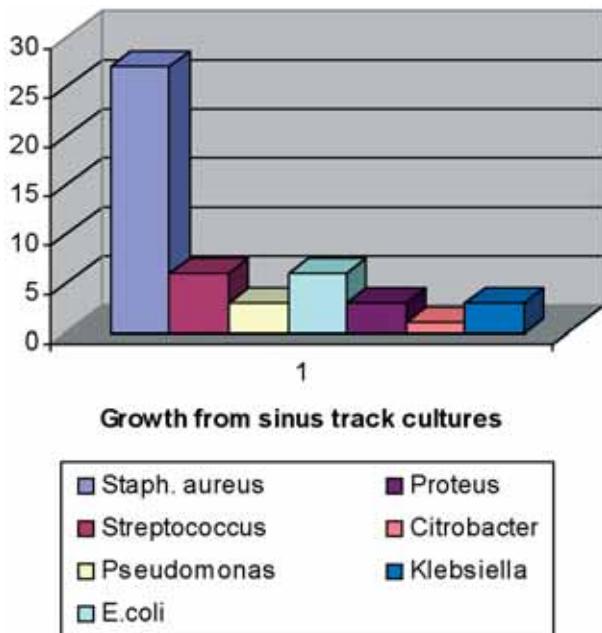


Fig. 2 a, b. — Growth from specimens from children

Out of these the most preponderant organism was considered. On comparison between the results of sinus track cultures and the sequestrum cultures, 26 patients out of 49 (53%) showed a discrepancy between the organisms grown.

An overall comparison of the results between the organisms grown from the sinus track and sequestrum cultures in 62 patients (including both adults and children in the study) showed a difference of organisms grown in 53% of patients.

The treatment response was better when antibiotics were given in accordance to the sequestrum flora in both adults and children.

DISCUSSION

It is apparent from our study that sinus track cultures and sequestrum cultures showed discrepancy in nearly every second patient. So, the sinus track cultures cannot be exactly be relied upon. Mackowiak *et al* (7) reported that to obtain a definitive bacteriological diagnosis an operative culture must be obtained. In their study in 40 patients, only 44% of sinus track cultures contained the organism isolated from the operative specimen, which is con-

sistent with our results. Patzakis *et al* (9) reported the growth of the same organism on cultures of specimens from the sinus track, specimens of purulent fluid, soft tissue and debrided bone in only 14 patients (47%) of the patients.

Staphylococcus aureus was the commonest organism isolated from both sinus track cultures and sequestrum cultures in our patients. The possibility of isolating the same organism was more when the causative organism was *Staphylococcus aureus*. Mackowiak *et al* (7) suggested that a presumptive diagnosis of *Staphylococcus aureus* infection can be made when the sinus track shows growth of *Staphylococcus aureus* but recommended a culture of an intraoperative specimen to confirm the diagnosis.

CONCLUSION

In view of our findings we conclude that the sequestrum biofilm provides accurate identification of bacteria. All sequestra should be sent to the laboratory for culture and antibiotic sensitivity. It is a cost-effective technique for the isolation of the

pathogens and proper treatment of osteomyelitis patients.

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