

Case Report

Brodie's abscess of proximal shaft radius in 17-year-old male: a case report

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ABSTRACT

Brodie's abscess is an uncommon form of osteomyelitis. It is typically found in metaphyseal region of long bones particularly of lower limb. We herein report rare case of Brodie's abscess of proximal shaft radius in 17-year-old male presented with pain over proximal aspect of left forearm for 2 months. A plain radiograph showed a translucent lesion of approximately 1.9×1.1 cm. Magnetic resonance imaging (MRI) showed Penumbra sign on T1 and T2 weighted images. Laboratory results showed no inflammatory response. Treatment was done by curettage. Culture report showed *Staphylococcus aureus* growth. Postoperatively administration of antibiotics was done. Follow up was uneventful. We diagnosed and surgically treated a rare case of Brodie's abscess of proximal shaft radius in 17-year-old male. As the upper extremities are areas of unloaded bone, we successfully treated this patient by curettage and antibiotics without bone grafting.

Keywords: Brodie's abscess, Osteomyelitis, Penumbra Sign, Corticotomy

INTRODUCTION

Brodie's abscess is an uncommon type subacute osteomyelitis demonstrated by bone cavity surrounded by bone sclerosis.^{1,2} The abscess is typically localized in the metaphysis of tubular bones, particularly in the lower extremities.³ Brodie's abscess in the upper extremities is rare. It is often difficult to diagnose the abscess because there are no characteristic findings on a plain radiograph and no obvious inflammatory response.⁴ Here, we diagnosed a rare case of Brodie's abscess appearing in the upper extremities and successfully treated it without bone grafting.

CASE REPORT

A 17-year-old male presented with pain over proximal aspect of left forearm for 2 months. The patient had not suffered trauma before the symptoms appeared and did not have any past medical or surgical history. Upon physical

examination, the circumference of the left forearm was same that of the right one, but there was no erythema or flare. Obvious restriction of range of motion and neurovascular deficit in the hand was not observed. A plain radiograph indicated cortical bone hypertrophy and a well-defined radiolucent lesion in the diaphysis of the left proximal radius (Figures 1 and 2). Magnetic resonance imaging (MRI) demonstrated that the lesion was hypointense on T1-weighted imaging (T1WI) and hyperintense on T2-weighted imaging (T2WI) inside the bone marrow of the radius (Figures 3 and 4). A hyperintense lesion on T2WI was also found outside the radius, indicating an extraosseous abscess (Figure 4). Regarding management of Brodie's abscess, several treatments have been reported.

Laboratory investigations showed a white blood cell (WBC) count of 6800/microL, a C-reactive protein (CRP) level of 4.23 mg/dl. The patient did not have a fever. Gram staining revealed pus cells and scattered gram-positive

cocci. Z N smear revealed no AFB. Sensitivity analysis revealed the bacteria was sensitive to all antibiotics. No obvious malignant cells were found. Histopathological study revealed chronic inflammatory cells and fibrosis in cortical bone. According to these findings, osteomyelitis, therefore, surgical treatment was undertaken. Henry's approach used for surgical exploration. Plane developed between brachioradialis and flexor carpi radialis longus (Figure 5).



Figure 1: Antero posterior view of forearm. Arrow showing lytic lesion in proximal shaft radius surrounded by rim of reactive sclerosis.



Figure 2: Lateral view of forearm. Arrow showing Brodie's abscess in proximal shaft radius.



Figure 3: MRI T2WI axial section of proximal radius and ulna showing Penumbra sign.

Neurovascular structures were identified and safeguarded. About 1 cm cortical bone defect identified and the corticotomy window was created around it. The medullary cavity was curetted through this window and debridement was done. The curetted sample sent for histopathological and bacteriological examination. However, since the upper extremities are areas of unloaded bone, autogenous bone grafting was not performed. *Staphylococcus aureus* was also found in the intraoperative culture.

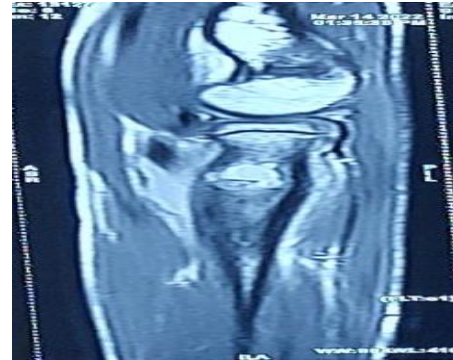


Figure 4: MRI sagittal section T2WI showing hyperintense signal in proximal shaft radius and surrounding soft tissue.



Figure 5: Intraoperative image showing corticotomy window created in proximal shaft radius using Henry's approach.

DISCUSSION

Brodie's abscess was first described and reported by Sir Benjamin Collins Brodie in the year 1832 as a localised abscess in tibia without acute symptoms.¹ Laboratory investigations are usually within normal limits in the case of Brodie's abscess. These abscesses are most reported in the lower extremities and the most common organism reported is *Staphylococcus aureus*.⁵ The differential diagnosis of Brodie's abscess include non-ossifying fibroma, osteoid osteoma, eosinophilic granuloma, chondroblastoma, unicameral bone cyst and fibrous dysplasia.⁵

Diagnosing Brodie's abscess is a difficult task on imaging, thorough evaluation through multiple modalities is essential. MRI imaging is far more superior over plain

radiograph for understanding the pathology of disease. Penumbra sign of brodie's abscess was characteristic finding on MRI reported by Grey et al.⁶ On T1 weighted image Penumbra sign is identified as a discrete peripheral zone of marginal higher signal intensity than the abscess and lower signal intensity than the fatty bone marrow.⁶ In our case Penumbra sign was detected (Figures 3 and 4). The other differential diagnosis in our study pre operatively was osteo articular tuberculosis as the incidence of tuberculosis of bone is more common in Asian population.⁷ Early diagnosis and treatment are possible through a combination of good history taking, clinical and radiological examination and a high degree of clinical suspicion.⁸ Roberts et al reported 61% growth of organism in the abscess.⁹ We also found the growth of *Staphylococcus aureus* in the abscess in our case.

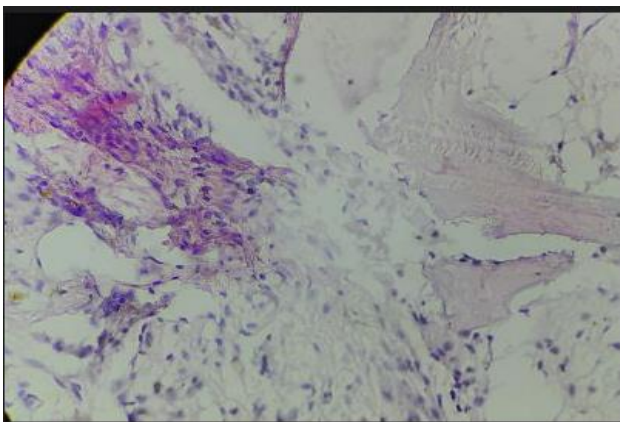


Figure 6: 40X Microscopic image showing lymphocytic infiltrates with few neutrophils.

Management of brodie's abscess is multi-fold. Brodie's abscess is best managed by surgical intervention consisting of Curettage, debridement and local infusion of antibiotics with or without cement followed by immobilisation⁽¹⁰⁾. Many authors have used antibiotic impregnated cement beads, Curettage with bone grafting is another option for management of such lesions with cavity diameters of more than 3 cm as indicated by Stephens and MacAuley, but in our case lytic lesion was around 1.9×1.1 cm so bone grafting was not done.^{3,11} The use of antibiotic bone cement into the cavity is recommended if the lesion is in the metaphyseal region of weight bearing bone.¹² We are of the same opinion as Ushijima and Arai about avoiding the use of autologous bone graft in unloaded bone.⁴

CONCLUSION

In a case of small proximal radius brodie's abscess the treatment modality of curettage and antibiotics without bone grafting gives satisfactory outcome.

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Ethical approval: Not required

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