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Case Report

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Iatrogenic chronic osteomyelitis of the clavicle: a rare case presentation

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ABSTRACT

Chronic osteomyelitis of the clavicle is a rare clinical entity, as it is an uncommon infection at uncommon location. This is a case report of a young male with chronic osteomyelitis of the clavicle following surgical intervention after a traumatic fracture of left clavicle, highlighting diagnostic challenges, radiological features, surgical management, and favorable outcomes. A 24-year-old Indian male farmer presented with a 4-month history of a discharging sinus over the midshaft of the left clavicle. He had sustained a clavicular fracture five months earlier, managed elsewhere with K-wire fixation, followed by implant removal after one month. Subsequently, he developed a persistent discharging sinus without systemic symptoms. Clinical examination revealed local tenderness, induration, and purulent discharge. Laboratory investigations showed elevated ESR (65 mm/hr) and CRP (42 mg/l). Culture from the sinus discharge yielded methicillin-sensitive Staphylococcus aureus (MSSA). Radiographs demonstrated sclerotic changes with patchy rarefaction suggestive of chronic osteomyelitis. The patient underwent surgical debridement and sequestrectomy. Intraoperatively, necrotic bone and sinus tracts were excised completely. Postoperatively, he received culture-sensitive antibiotics for six weeks. The wound healed primarily, inflammatory markers normalized, and shoulder function recovered fully without recurrence. This case underscores the importance of considering osteomyelitis as a differential diagnosis in patients presenting with chronic sinus formation after clavicular surgery. Prompt surgical management combined with targeted antibiotic therapy ensures optimal recovery and prevents recurrence. As iatrogenic chronic clavicular osteomyelitis is rarely reported, this case enhances clinical awareness among orthopaedic surgeons and broadens current understanding of post-operative bone infections in uncommon anatomical sites. It highlights that timely diagnosis and radical debridement can yield excellent functional and infection control outcomes.

Keywords: Chronic osteomyelitis clavicle, Sequestrectomy

INTRODUCTION

Chronic osteomyelitis represents a progressive inflammatory process caused by pathogens, resulting in bone destruction and sequestrum formation.[1] Osteomyelitis patients may display clinical symptoms, such as pain, swelling, purulent drainage, fistula and/or sinus presence, wound breakdown, erythema, and increased local temperature.[2]

Chronic osteomyelitis is a long-standing, serious, and potentially disabling infection involving the bone and bone marrow.[3] Osteomyelitis of the clavicle is rare, comprising a very low percentage of all osteomyelitis cases. Clavicular osteomyelitis, like other forms of bone infection, continues to present significant therapeutic challenges despite advances in surgical methodology and antimicrobial treatment protocols. It frequently recurs due to the challenges in achieving complete eradication. The condition can develop following improperly managed acute osteomyelitis, hematogenous dissemination,

traumatic injuries, or surgical interventions like joint replacements and internal fracture fixation. Additional causes include open (compound) fractures, infections by organisms such as *Mycobacterium tuberculosis* or *Treponema* species (syphilis), and the spread of infection from adjacent soft tissues.[4] Biofilm formation in osteomyelitis is prevalent and associated with implants in situ such as K-wires, plates and arthroplasty implants. Aggressive debridement, sonication and appropriate antibiotics has proven to decrease infective load.[5]

CASE REPORT

A 24-year-old male, farmer by occupation, presented to the Orthopaedic outpatient department with a 4-month history of discharging sinus over the middle aspect of the left clavicle. According to his past surgical history, the patient had sustained a fracture of the clavicle due to a fall five months previously. At that time, he underwent internal fixation with K-wire for the fracture elsewhere which was removed a month later. Post implant removal patient developed discharging sinus from operated site. There were no constitutional symptoms such as fever, weight loss, or malaise. He denied any history of tuberculosis or immunosuppression.

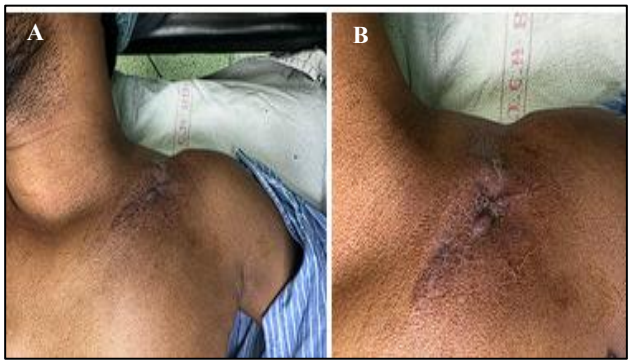

Figure 1 (A and B): Discharging sinus over left clavicle with skin changes around sinus.

Localized swelling and tenderness over the middle third of the right clavicle. Sinus tract with purulent discharge with indurated and adherent skin.

No neurovascular deficits in the affected limb. Range of motion in shoulder joint was painful in abduction after 90 degrees.

Investigations revealed elevated inflammatory markers, with an ESR of 65 mm/hr and a CRP level of 42 mg/L, along with mild leukocytosis (WBC count of 6,300/mm³), suggestive of ongoing infection. Culture of the discharge from the sinus tract grew methicillin-sensitive Staphylococcus aureus (MSSA), confirming the bacterial etiology. Further evaluation to rule out tuberculosis, including a Mantoux test and chest X-ray, returned negative results. Sample sent for CBNAAT was negative for *Mycobacterium tuberculosis*.

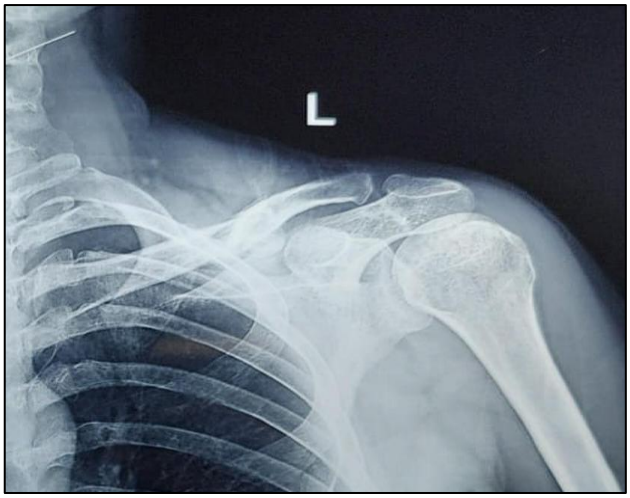

Figure 2: Radiograph showing sclerotic margins of fracture line with patchy rarefaction in the middle third of clavicle.

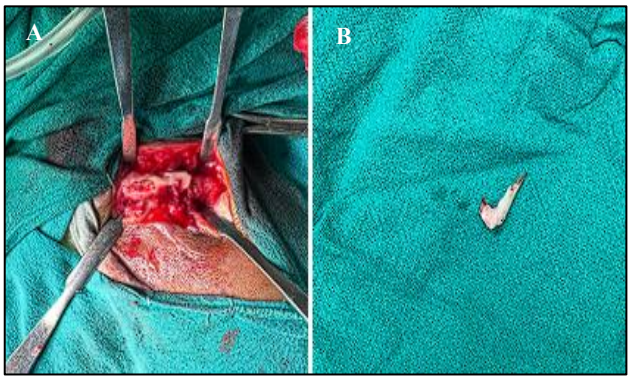

Figure 3 (A and B): Intraoperative findings of infected nonunion of clavicle with seuqestrum and cloaca.

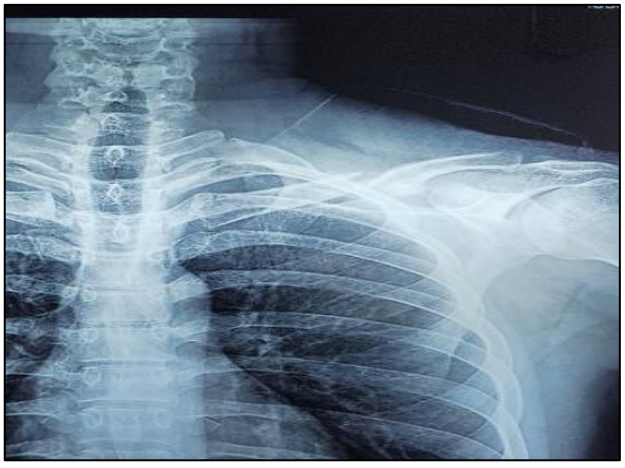

Figure 4: Post operative radiograph.

The patient underwent surgical debridement and sequestrectomy under general anesthesia. Intraoperatively, necrotic bone and purulent material were found and excised. The sinus tract was excised in toto. Bone curettage

was done until fresh bleeding was observed and sample was sent for histopathological examination.

Post-operatively, the patient was initiated on intravenous Clindamycin for two weeks, guided by culture sensitivity results, followed by a four-week course of oral antibiotics. The surgical wound healed by primary intention, with no recurrence of the sinus tract. Inflammatory markers, including ESR and CRP, gradually normalized within four weeks. With the aid of structured physiotherapy, the patient regained full shoulder function without any residual pain or limitation.

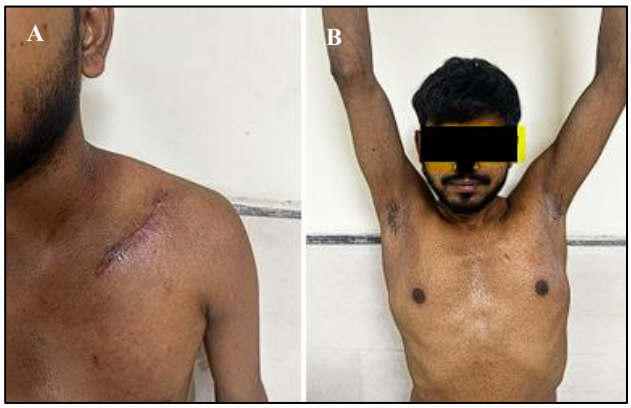

Figure 5 (A and B): Post operative status.

DISCUSSION

Chronic osteomyelitis of the clavicle is uncommon and usually post-traumatic or post-surgical. The differential diagnoses include tuberculosis, malignancy, and Ewing's sarcoma. Complications of subclavian vein catheterization are common and osteomyelitis is its one of a rare complication.[6] Radiographs, CT scans supplemented by MRI, are crucial for early diagnosis. CT imaging can detect soft-tissue edema and bone destruction not visible on plain radiographs, particularly in acute osteomyelitis. In chronic cases, it clearly shows bone sclerosis, demineralization, and periosteal reaction, helping assess disease extent and surgical planning, as well as guiding biopsies.

MRI typically reveals marrow fat replacement by edema and exudate, showing low T1 and high T2/STIR signals in affected bone. Granulation tissue enhances with gadolinium, while sinus tracts and soft-tissue inflammation appear similarly on T1 and T2 but lack enhancement.[7]

In a study of 294 reported case of chronic osteomyelitis of clavicle by Hu, Wei-ran et al the overall culture positivity rate for bacterial osteomyelitis was 81.82%, with Staphylococcus aureus identified as the most common pathogen, accounting for 44.70% of cases.[8] Long-term intravenous antibiotic therapy (six to eight weeks) has been used to successfully treat cases of hematogenously spread osteomyelitis.[9] Treatment involves adequate surgical debridement and prolonged, culture-sensitive antibiotics. Conservative treatment alone often fails due to sequestrum and chronic sinus formation.[10]

CONCLUSION

Though rare, clavicular chronic osteomyelitis should be considered in cases with chronic sinus or pain in patients with a history of trauma or surgery. Timely surgical intervention and tailored antibiotic therapy can lead to excellent outcomes. In persistent cases of clavicular osteomyelitis unresponsive to debridement and antibiotic therapy, surgical excision of the infected or sequestrated segment of the clavicle has proven effective, leading to resolution of infection and improved quality of life without compromising shoulder function.

Clinical message

Iatrogenic chronic osteomyelitis of the clavicle is a rare but preventable complication following surgical fixation. Early recognition of persistent sinus formation after clavicular surgery should raise suspicion of underlying infection. Prompt surgical debridement, removal of necrotic bone, and targeted antibiotic therapy can achieve complete eradication of infection and excellent functional outcomes. Awareness of this uncommon presentation helps clinicians avoid delays in diagnosis and prevents chronic morbidity.

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