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Case Report

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Implant fixation on myositis mass masquerading as distal humerus: an intraoperative error

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ABSTRACT

Myositis ossificans is a non-neoplastic ossifying mass seen in association with a bony and soft tissue trauma. We present a case of myositis ossificans mass developed after a distal humerus fracture mimicking the shape of lateral humeral condyle which led to inappropriate fixation of implant over the mass. Preoperative planning, extensile surgical approach, complete excision of the mass and use of image intensifier are highlighted which will avoid complications like failure of fixation and recurrence.

Keywords: Myositis ossificans, Implant failure, Pre-op Planning

INTRODUCTION

Myositis ossificans (MO) is a clinical condition characterised by non-neoplastic heterotopic ossification in extra skeletal soft tissues.[1] It usually presents 4–12 weeks following trauma. Elbow and hip are the commonest areas involved which ultimately leads to restriction of joint movements.[2,3] The clinical presentation of MO includes a rapidly enlarging tender mass with an irregular shape and border. The diagnosis is clear in the pretext of a recent bone or soft tissue trauma. Clinical and radiological features ensure appropriate diagnoses and guide treatment.[4] We report a case of post traumatic myositis ossificans around the fracture site in distal humerus which due to its regular shape mimicked lateral condyle of humerus leading to error in intraoperative assessment and fixation.

CASE REPORT

History

A middle-aged male with distal one-third humerus fracture was managed non-operatively with a Plaster of Paris cast. He presented to the primary surgeon with a myositis mass and a deformity at fracture site at 9 months. Partial excision of mass, deformity correction and plate fixation were performed. The deformity recurred along with implant failure at three months for which he visited our hospital. Patient was a chronic smoker. There were no known comorbidities.

Examination

General physical and systemic examination was unremarkable. Local examination revealed a surgical scar in the posterior aspect of arm healed by primary intention starting from deltoid tuberosity and extending distally for 8 cm (6cm proximal to tip of olecranon). There was no tenderness. Local temperature was normal.

There was a bony mass measuring approximately 6×4 cm^2 on the lateral aspect of distal arm. The implant was palpable over the mass. Abnormal mobility was present at the fracture site. There was a shortening of 1.7 cm. Distal pulses and nerve functions were intact. There were no clinical signs of infection. Shoulder and elbow movements were well preserved.

Evaluation

Radiological evaluation showed a fracture of distal one third of shaft humerus with implant fixation over the additional bony mass (Figure 1). There were no screws in the distal fracture fragment. His blood parameters were negative for infection.

Management

Implant removal, complete excision of the myositis mass, fracture reduction, plate osteosynthesis and bone autograft was performed. Intra-operative findings included a bony mass with smooth borders with adherent triceps muscle fibers mimicking the shape of lateral humeral condyle (Figure 2-5).

Locking compression plate with loose screws were found over the mass. Radial nerve was identified and secured. Distal humerus anatomical plate fixation along with bone grafting was done. Surgical wound was closed over a suction drain.

Post-operative protocol

Above elbow slab was applied. Wound inspection and drain removal were done at 48 hours. Oral Indomethacin 75mg daily was given for two weeks as prophylaxis to prevent recurrence of myositis.

Active shoulder and elbow movements were started at 7 days. Follow up was done at 2 weeks, 2,3 and 6 months. Gradual increase in activities including weightlifting were started.

Outcome

Fracture site showed progressive signs of union with no evidence of myositis recurrence. Active shoulder and elbow movements were complete.

Figure 1: Radiograph showing implant over the myositis mass. No screws in the distal fragment.

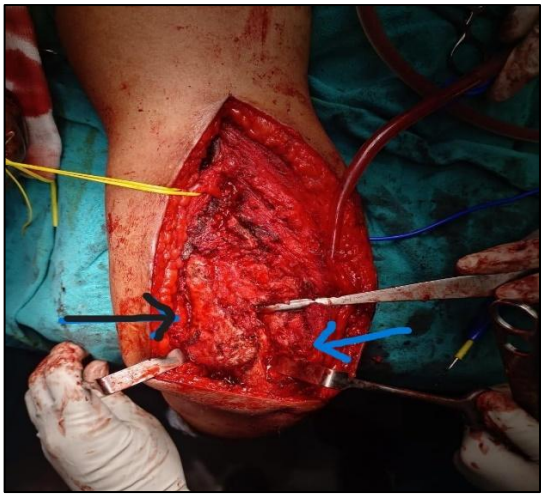

Figure 2: Complete surgical exposure. Black arrow is myositis mass mimicking lateral condyle. Blue arrow is parent distal humerus.

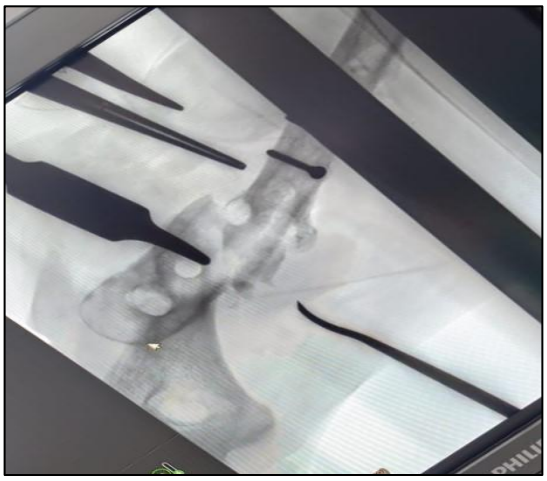

Figure 3: Intraoperative image intensifier showing myositis ossificans mass.

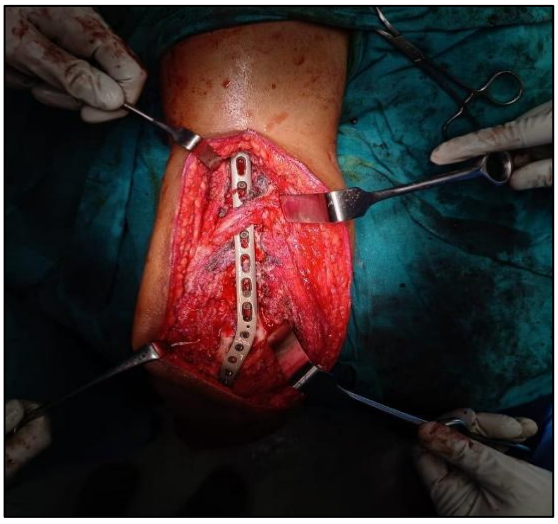

Figure 4: Radial nerve secured and plate was slid under the nerve.

Figure 5: Plate osteosynthesis.

DISCUSSION

Myositis ossificans is a self-limiting non-neoplastic ossifying lesion frequently seen in the skeletal muscles.[1] However, it can be found originating in other soft tissues like tendons, ligaments and subcutaneous fat. The exact etiology is not clearly understood. There are certain factors that may trigger its formation. Bony injuries, soft tissue trauma, burns, bony fractures, repetitive trauma are some of the traumatic triggers. Head injuries, spinal cord injuries and stroke are non-traumatic triggers.[5,6]

Management includes evaluation of radiographs to demarcate the extent and location of the mass. Elevated Serum alkaline phosphatase levels are supportive. In small lesions and/or lesions which do not cause any functional deficit, no active intervention is warranted. In lesions which cause loss of function, intervening surgically after the maturation of mass may improve the functionality by relieving the symptoms. Surgical excision of myositis mass requires an extensile incision and soft tissue dissection to expose the mass completely before excision.[7] Inadequate exposure leads to retention of residual mass resulting in persistence of symptoms and is a potential for recurrence.[8]

In our case, there were no identifiable triggering factors for formation of myositis ossificans except for fracture distal humerus. Fracture in itself is not a risk factor. We hypothesized that inadequate immobilization during the primary non-operative POP slab immobilization may have resulted in repetitive movements at the fracture site with resultant muscle trauma and development of an ossified mass. The index surgery in which excision of mass and plate osteosynthesis was performed was postulated as an intraoperative error in bony mass assessment. This assumption was made due to the presence of a small incision possibly not exposing the mass completely, the shape of the mass appearing as lateral condyle of humerus led to incomplete excision and implant fixation to the myositis ossificans mass. There is a possibility of image intensifier not used during the surgery.

At presentation to our hospital, the clinical feature was consistent with a bony hard mass and a deformity. There was a painless abnormal mobility at the fracture site and the implant was palpable over the deformed bony mass. A thorough preoperative planning of surgical steps was formulated and executed. An extensile skin incision and soft tissue dissection was performed. Implant removal was done. The bony mass was completely excised and confirmed under image intensifier. The parent distal humerus was identified and fixed to the proximal fragment with a locking compression plate.

Active exercises and indomethacin prophylaxis were given as per the standard postoperative management of excision of myositis ossificans.[9]

CONCLUSION

Intraoperative errors are likely a result of inadequate surgical exposure. An extensive surgical exposure is mandated to completely delineate the myositis mass before excision. Use of an image intensifier during surgery would eliminate the confusion and aid proper fracture fixation.

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