

Partial Claw Hand in A Patient With History of Head Injury And Clavicle Fracture.

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Abstract

Introduction: Myositis ossificans is a known entity in brachialis muscle especially in patients with head injury but a myositis mass causing claw hand deformity was not reported till now.

Case presentation: We present the case report of a 32 year male patient, mechanic by occupation with 6 month old history of head injury with clavicle fracture presenting with partial claw hand. Initially thought to be brachial plexus injury but examination and radiological evaluation revealed a large mass of mature bone in brachialis muscle. Intraoperatively the mass of bone was found to be in close proximity with median nerve. The mass was excised in total and postoperatively patient's deformity improved over a period of one year.

Conclusion: Though it's uncommon for a myositis mass to cause claw hand deformity, it should be considered as a differential diagnosis especially in patients with head injury and thorough clinical and radiological examination should be done in such clinically important conditions.

Keywords: Myositis ossificans; brachialis; traumatic brain injury; median nerve; claw hand.

I. Introduction

Heterotrophic ossification of the upper limb is a rare post-traumatic complication¹. The incidence after traumatic brain injury has been reported to vary between 11% and 22%.^{2,3} The localized form of myositis ossificans of the upper limb often occurs in the brachialis muscle. Although the condition is said to be self limiting,⁴ excision is unavoidable in circumstances where the myositic mass limits daily activities. High suspicion is needed to diagnose this condition clinically. A painless enlarging mass occurring after single or repeated trauma should lead to a suspicion of myositis ossificans.⁵ Myositis ossificans may be an under recognized complication of trauma but should be considered in cases of delayed peripheral nerve injury after trauma.⁶ We present a case of partial claw hand due to myositis ossificans compressing median nerve in a patient who had head injury with clavicle fracture 6 months earlier. The mass was excised and postoperatively his deformity improved over a period of 12 months.

II. Case Presentation

A 32 year male patient presented with gradually progressing deformity in left hand since 6months. He had past history of head injury with left clavicle fracture, was admitted in intensive care unit. By this history we thought it would most probably be brachial plexus injury. Clinical examination revealed clawing of left index and middle fingers with diminished sensation over tip of index finger. As the distribution of neurological involvement was not dermatomal and myotomal a diagnosis peripheral nerve injury was made. On further examination there was limited movement in left elbow and a large, bony hard mass was felt in anterior aspect of lower part of arm. Radiological evaluation revealed a calcified lesion measuring 9.4×1.8×1.9 cms in the deep muscular plane of brachialis muscle in lower third of arm which was close to the adjacent neurovascular bundle. [Figure 1]. Electro diagnostic studies revealed compression of median nerve in lower part of arm.

After preoperative evaluation, patient was taken up for surgery. After giving general anesthesia, parts were painted and draped under aseptic precautions [Figure 2]. A medial 8 cms incision was used, then interval between medial border of brachialis and brachial vessels was identified and opened to locate and expose the myositis mass [Figure 3]. The mass was found to be in close proximity to both brachial vessels and median nerve [Figure 4]. It was carefully removed and was found to have 2 limbs [Figure 5]. Postoperative period was uneventful. Myositis mass was sent for histopathological evaluation which revealed organized cortex and marrow space resembling mature bone confirming the diagnosis. Early active and active assisted painfree mobilization and isometric exercises were initiated.

Patient was followed up at weekly intervals for first four weeks, then at monthly intervals till 6 months, then at 9 months and 12 months. At every visit patient was evaluated for recurrence by clinical and radiological examination.

Patient's deformity and elbow range of motion gradually improved over next 6 months and at the end of 12 months he was able to do all his activities of daily living. There was no recurrence at the end of 12 months.

III. Discussion

Heterotrophic ossification of the upper limb is a rare post-traumatic complication¹. The incidence after traumatic brain injury has been reported to vary between 11% and 22%.^{2,3} The localized form of myositis ossificans of the upper limb often occurs in the brachialis muscle. Proliferation of connective tissue occurs after a muscle injury that differentiates into mature bone. Such ossification preferably occurs in muscles that are repeatedly strained or injured.⁵ Lesions result in significant functional deficit in only 10% to 20% of patients.⁷ Although the condition is said to be self limiting,⁴ excision is unavoidable in circumstances where the myositic mass limits daily activities. High suspicion is needed to diagnose this condition clinically. A painless enlarging mass occurring after single or repeated trauma should lead to a suspicion of myositis ossificans.⁵ Myositis ossificans may be an under recognized complication of trauma but should be considered in cases of delayed peripheral nerve injury after trauma.⁶

The early clinical course of myositis ossificans traumatica closely resembles that of osteosarcoma with localized swelling and tenderness. Pain subsides after ossification, unlike osteosarcoma. Radiological and histopathological findings can satisfactorily distinguish between the two. Radiographs of osteosarcoma show periosteal elevation and cortical destruction, which are not present in myositis ossificans. During the early stage, computerized tomography demonstrates a zoning phenomenon in a myositis mass. Ultrasound also shows a center of less echogenicity with an outer sheet-like hyper echoic peripheral rim. The late stage radiographically resembles fully ossified bone.⁸

The characteristic histological features of myositis ossificans relate to the radiological picture. Ackerman⁹ described the zonation of the lesion which also follows a temporal course. In the early stages (0-10 days), the lesion is essentially an undifferentiated connective tissue response to injury that is similar to the cellular blastema found in early fracture repair. This stage is very difficult to diagnose radiographically or histologically. This connective tissue response comes to form the innermost zone (zone 1 by the classification of Ackerman⁹). Zone 1 is characterized by fibroblastic tissue with extreme variation in size and shape of cells and much mitotic activity. This stage or zone is impossible to distinguish from sarcoma.⁹ Zone 2 (or middle zone, which is often the next stage) is characterized by well oriented areas of cellular osteoid. The third zone or stage is well oriented bone at the periphery of the lesion. This zonation pattern, which relates to the radiographic appearance of the lesion, allows a definitive diagnosis of myositis ossificans.⁹ Also, the outer zones encapsulate the lesion and isolate it from muscle and normal bone which facilitates surgical removal. Furthermore, the encapsulation supports the premise that myositis ossificans is not an invasive process.¹⁰

Our patient had a mature myositis mass in the lower part of arm adjacent to the brachial vessels and median nerve. Surgical excision with early active and active assisted pain free mobilization resulted in improvement of elbow range of motion and gradual correction of claw hand deformity over the period of 6 months and he was able to do all his activities of daily living by 12 months.

IV. Conclusion

Though it is uncommon for a myositis mass to cause claw hand deformity, it should be considered as a differential diagnosis especially in patients with head injury and thorough clinical and radiological examination should be done in such clinically important conditions. Surgical excision followed by physiotherapy will give good functional outcome.

Abbreviations: None. **Consent:** Patient has given consent for publishing the details of the case including pictures in the journal. **Conflict of interest:** None.

Author's contribution:

Manjunatha V and Ranganatha BT analyzed and interpreted the patient's data, evaluated clinically and radiologically, and operated the patient.

Manjunatha V was responsible for follow-up and prepared the manuscript. Ranganatha BT read and approved the final manuscript.

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Figures: Title and legends.

Figure 1: CT with 3D reconstruction of arm with elbow.

CT showing the myositis mass in the lower part of arm which is located anteriorly and is seen to have 2 limbs.



Figure 2: Clinical picture of position of patient. Clinical picture of the patient showing sterile draping of the patient.

Figure 3: Intraoperative picture of interval between Brachialis and brachial vessels. Intraoperative Picture of biceps tendon retracted laterally showing the interval between brachialis and brachial vessels.



Figure 4: Intraoperative picture showing myositis mass. Intraoperative picture showing the myositis mass with its two limbs and its close proximity with brachial vessels and median nerve as indicated by pointing mosquitoes.



Figure 5: Intraoperative picture after excision of mass. Intraoperative picture showing the excised mass. Its structure can be clearly made out.

