

Myositis Ossificans of Masseter Muscle: A Rare Case

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ABSTRACT

Myositis ossificans (MO) is a benign, localized, reactive lesion, commonly affecting the extremities of younger population. Its involvement of the masticatory muscles is rare. The present case elaborates the histopathology of myositis ossificans and its clinical correlation. A 32-year-old-male, presented with trismus and past history of trauma. On clinical examination, a well-defined, tender, hard swelling over the right cheek was noted. Contrast enhanced CT scan suggested ossified right masseter muscle. Gross examination showed multiple grey-white, firm to hard tissue bits and the microscopy revealed residual degenerated muscle fibres undergoing diffuse fibrosis surrounded by spicules of woven bone, along with focal areas of lamellated, uncalcified bone. Spicules of lamellar bone with well-formed medullary cavity containing haematopoietic elements were also noted. Myositis ossificans of masseter is a rare entity causes trismus, leading into reduced quality of life. A clinical suspicion and detailed histopathological examination can help guide the treatment.

Keywords: Myositis Ossificans, masseter, trismus, masticatory muscles.

INTRODUCTION

Myositis ossificans (MO) is a benign, localized, reactive lesion, commonly affecting the extremities of younger population.^[1,2] But, involvement of the masticatory muscles is an exceptional phenomena.^[3] It is a heterotopic bone formation within the muscle or fascia, presumably due to an acute trauma or repeated injury.^[4] MO is also referred as pseudo-inflammatory tumour whose aetiology and predisposing factors remain unclear.^[5] It can either manifest as a, genetically determined, progressive systemic disease involving multiple muscle groups or be a consequence of trauma.^[6] Only few cases have been reported with bilateral involvement.^[4] MO is described into four distinct clinical types such as myositis ossificans traumatica (MOT), myositis ossificans progressive (MOP), pseudomalignant MO and MO associated with paraplegia.^[2] MOT, also known as

Myositis ossificans circumscripta/fibro-dysplasia ossificans circumscripta, is the most common form, resulting in an ossification of muscle associated with trauma or inflammation.^[7] Myositis ossificans poses diagnostic as well as therapeutic challenge for its rarity and varied clinical presentation.^[8]

CASE REPORT

This study is about a 32-year-old-male, presenting with trismus and past history of trauma. The patient developed difficulty in mouth-opening since four to six months which was following trauma to the right zygomatic process causing a fracture almost a year back. Clinical examination revealed a well-defined, tender, hard swelling over the right cheek and significantly reduced mouth opening. (Figure 1) Contrast enhanced CT scan suggested ossified right masseter muscle. Operating the case showed an ossified

tissue. (Figure 2) On gross examination multiple grey-white, firm to hard tissue bits were noted.

Histopathological examination revealed a fragmented lesion, comprising residual degenerated muscle fibres undergoing diffuse fibrosis surrounded by spicules of woven bone, along with focal

areas of lamellated, uncalcified bone. (Photomicrograph 1 and 2) Spicules of lamellar bone with well-formed medullary cavity containing haematopoietic elements were also noted. (Photomicrograph 3 and 4) The diagnosis was given as myositis ossificans of the masseter muscle. In our case, it was most likely, traumatica (MOT).



Figure 1

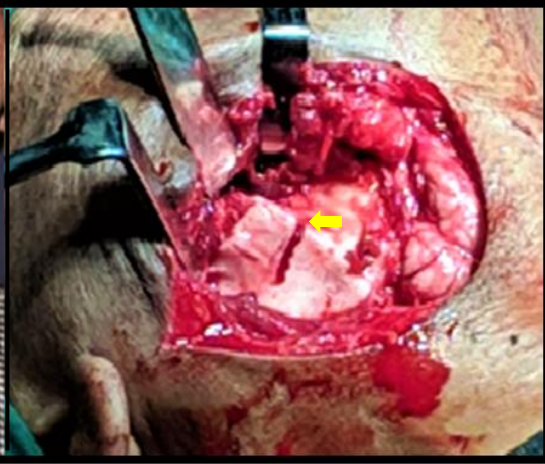
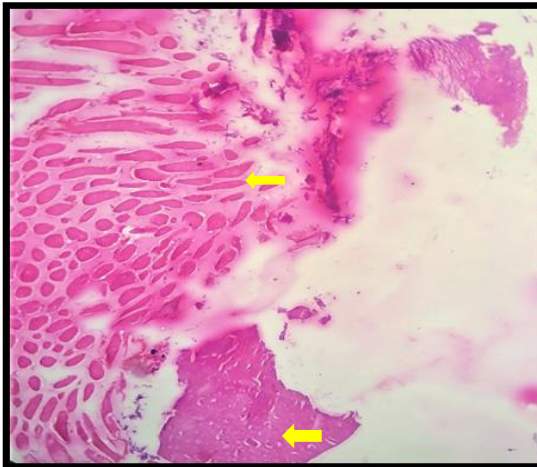
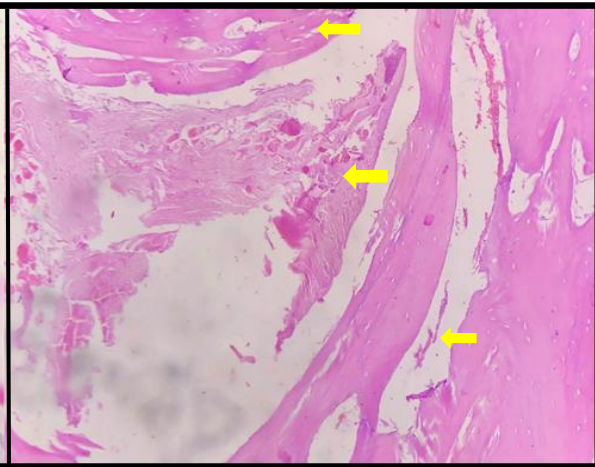


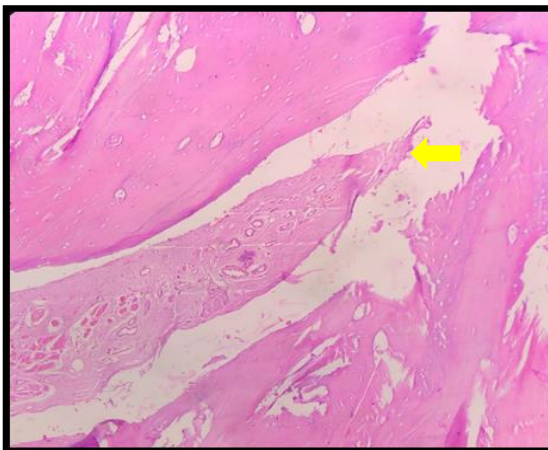
Figure 2



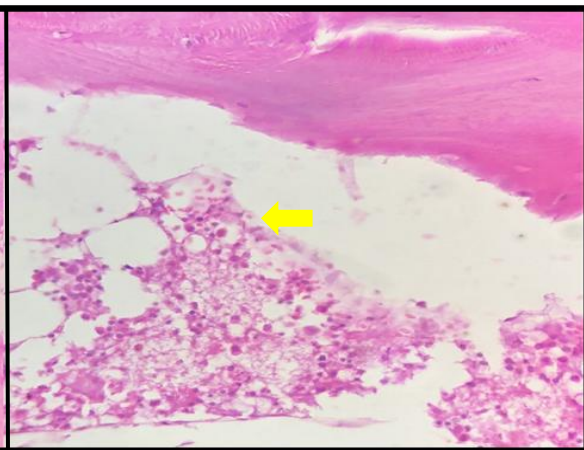
Photomicrograph 1 (H&E, 10X)



Photomicrograph 2 (H&E, 10X)



Photomicrograph 3 (H&E, 10X)



Photomicrograph 4 (H&E, 10X)

DISCUSSION

Myositis ossificans traumatica is commonly referred to as MO, because in more than half of the cases single or repetitive injury of the muscle is observed. [3] Other causes may involve chronic infection and surgery involving muscles. [9] It is characterized by ectopic bone formation within the muscles and other soft tissues. An extraskeletal bone formation was first described by Guy Patin in 1692 and was named MOT by Von Duschein in 1868. [6] However, in masticatory muscles, it was first reported by Ivy and Eby in 1924 affecting the masseter muscle. [10] It usually affects adolescents or young adult males, and is rarely found in the head or neck. [6] Trismus is the most common symptom. [11] The pathophysiology is described as trauma causing intramuscular haemorrhage followed by granulation tissue formation, fibroblastic proliferation, synthesis of chondroid and osteoid elements and calcification (ossification) 3-6 weeks later. [12,13] Bone morphogenetic protein (BMP) expression plays vital role in the pathophysiology. [7] All the other types are unrelated to trauma. [13] MOP is a rare autosomal-dominant disorder, with a prevalence of 1 in 2 million people and an onset described in early childhood. [7] It is characterised by multiple, heterotopic ossifications develop in the systemic muscle, fascia, tendons and ligaments. [6] The prognosis is generally poor. [10] Myositis ossificans pseudomalignant is often mistaken for a malignant lesion, while, Myositis ossificans associated with paraplegia possibly arises as a complication of spinal cord injury. High index of suspicion, CT imaging and microscopy are useful modalities in diagnosing the condition. [3] Although histopathology is considered the hallmark in identifying the characteristic zonal arrangement of the lesion, with inner, middle and outer zones. [14] MOT classically comprises a zonal architecture with peripheral ossification and central cellular area. [6] The central or inner zone contains undifferentiated cells,

haemorrhage, necrotic muscular tissue and loose fibrovascular tissue. [6] The middle zone contains immature osteoid, chondroid and woven bone tissue, while the peripheral or outer zone contains mature lamellar bone and collagenous fibrous stroma. [14] The differential diagnosis includes non-neoplastic disorders such as calcified fibromatosis, phleboliths and malignant tumours such as osteosarcoma, osteochondroma and rhabdomyosarcoma. [6] Osteosarcoma, poses an uncanny similarity to these lesions (when there is extensive ossification). [12] To differentiate, ossification is characteristically peripheral and centripetal in case of MO, whereas central and centrifugal in osteosarcoma. Also, MO comprises zone phenomenon and a lack of invasion to adjacent tissues, while in osteosarcoma, muscle fibre destruction is seen. [11] The treatment is based on the surgical removal of the lesion followed by rehabilitation at the earliest. [14] Although, recurrence can occur in some. [9]

CONCLUSION

Myositis ossificans of the masseter muscle is a rare benign, self-limiting condition, causing a characteristic limitation of the mouth-opening, which poses significant difficulty to the patient. It resembles a few benign and malignant conditions making the diagnosis challenging. However, microscopy shows the characteristic zone phenomena and an early clinical suspicion can aid into diagnosis, further reducing the morbidity.

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