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Case Report

Myositis ossificans of the masseter muscle after injury- report of a rare entity & review of literature

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Abstract

Myositis ossificans is a reactive lesion that occurs in skeletal muscle. Individuals presenting with myositis ossificans usually with a history of trauma to the involved muscle. We are presenting a case of 18 years old female had a history of trauma 2 years back.

Introduction:

Myositis ossificans is a heterotropic bone formation within a muscle. The incidence in head and neck is rare; it is mainly found (80%) in the extremities.[1] Concerning the head and neck, involvement of the temporal muscle,[2] the masseter muscle,[3] the buccinators muscle,[1] the platysma muscle[4] and the sternocleidomastoid muscle[5] is described. The fibrodysplasia ossificans progressiva, a rare autosomal-dominant disorder, has a prevalence of 1 in 2 million people and an onset in early childhood.[6]

Case:

A 16 years old female patient came to Oral & Maxillofacial Surgery Department, Dental faculty of BSMMU with the chief complaint of inability to open the mouth adequately for last 2 years. She had a history of trauma on her left cheek. Then she recognizes a gradual reduction in mouth opening.

Clinical examination revealed tenderness on left masseter muscle, anterior to the superior border of the ramus and reaching from the zygomatic arch to the body of the mandible without pain on palpation. Additionally, no pain was elicited on palpation of the temporomandibular joint on both sides. The maximum inter incisal opening was 1 cm with limited lateral excursions. Limited intraoral examination revealed poor oral hygiene, several teeth with severe dental caries, and a bony hard mass in left buccal sulci. The panoramic radiograph revealed an amorphous calcification within the soft tissue on left cheek region. Axial computed tomography scans were obtained of the facial skeleton, and diffuse calcification of the masseter muscle was seen. Laboratory data were all within normal limits. The history, clinical examination and radiographic findings on the masseter muscle, was strongly suggestive of the diagnosis of myositis ossificans.

Fig.1. Preoperative images of 16 year-old female, reduced (6 mm) inter incisal opening.

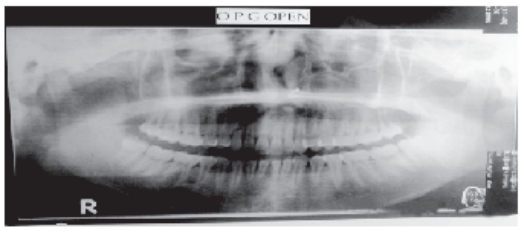

Fig. 2. Radiological study- Orthopentomography shows dense opaque area located on the left side of the angle & adjacent area of the ramus of the mandible. A well circumscribed calcified mass with density similar to bone was clearly separated from the adjacent mandibular ramus.

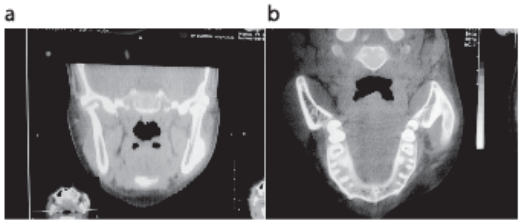

Fig.3. Radiological study-CT scan: Both a) coronal & b) axial view shows well-defined calcification located within masseter muscle.

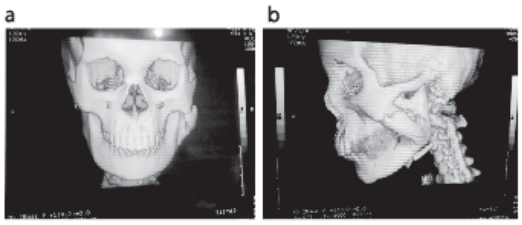

Fig.4. Radiological study- 3D CT scan: well-defined calcification located in masseter muscle area in both a) frontal & b) left lateral view.

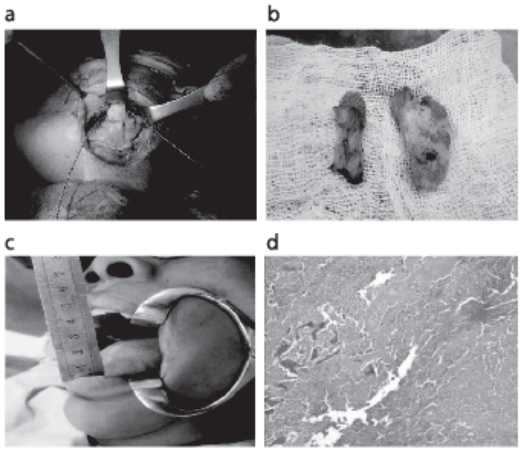

Fig. 5. Intraoperative images. a) post-ramal approach b) Macroscopic image of the surgical specimen

Operative procedure:

With all aseptic precausion under general anesthesia post-ramal incision was given then blant dissection was proceed to expose the ossified masseter muscle. The ossified muscle was excised. After achievement of full haemostasis the wound was closed in layers. The excised mass was sent for histopathologic examination.

c) Mouth opening raised 42 mm interoperatively d) Histopathological examination showing a central zone of bone tissue surrounded by mature bone.

It shows central cellular zone containing fibroblast with mitosis, numerous capillaries surrounded by osteoid matrix. Following Surgical excision, aggressive physical therapy was instructed to the patient to restore jaw movement.

Discussion:

The pathophysiology of myositis ossificans is still unclear. Bone morphogenic protein expression is discussed because of muscle trauma resulting in stem cells differentiating into osteoblasts and finally leading to ossification. Therefore, one treatment strategy can be bone morphogenic protein type I receptor inhibition in order to reduce this heterotropic ossification.[7] Aho et al.[8] were able to show in a rabbit model that microinjury and subsequent muscle necrosis can cause invasion of macrophages and release osteogenic growth factors. Concerning the aetiology of myositis ossificans traumatica of the masticatory muscles, several causes have been described: tooth extraction associated with involvement of the buccinator muscle,[1] local anaesthesia with involvement of the pterygoid muscle, and direct force with myositis ossificans traumatica of the masseter. On the one hand, the neurogenic component plays an important role because of long time intubation and immobilization with incomplete pareses C3 and critical myopathy/neuropathy (CIPNM) in an intensive care unit. On the other hand, the traumatic/inflammatory component plays an important role with sepsis. CIPNM occurs in 25–63% of patients who have been on an artificial respirator for at least 1 week.[9] In patients with sepsis, the incidence increases, and male patients develop this condition about twice as often as females.[9] Microcirculatory damage can reduce delivery of oxygen and glucose and therefore affect the nervous system, leading to CIPNM with selective myosin loss in muscles fibres and myonecrosis by inflammatory factors.[10] Factors that are associated with the development of CIPNM can be physical, surgical trauma, or chemicals in combination with sepsis and the application of neuromuscular blocking agents and steroids. These neuromuscular blocking agents are metabolized by the liver and kidney.[11] The effect of these blocking agents will be prolonged. Flaccid weakness of neck flexors and But no case in combination with myositis ossificans has been described in the literature. Another important factor could be the tube change with forced mouth opening without regular oral physiotherapy while being intubated without leading to a bleeding in an already fibrotic muscle after previous radiotherapy.

Different treatment strategies have been discussed in the literature for myositis ossificans traumatica: surgical treatment (excision) followed by physiotherapy (including TheraBite), medical therapy (non-steroidal anti-inflammatory drugs, bisphosphonates and magnesium), and low-dose radiation therapy.[12] Low-dose radiation therapy and nonsteroidal anti-inflammatory drugs are used in order to inhibit mesenchymal differentiation into osteoblasts. The use of bisphosphonates in order to prevent myositis ossificans is described in orthopaedics.[13] surgical

treatment (excision) was the option of choice in the present case because of complete ossification of the left masseter muscle was found both clinically and radiologically. Medical therapy was not offered because the patient was presented with a 2-years history of complaints, so the early phase of calcification was already over. The use of etidronate can also lead to osteomalzia with bisphosphonate associated necrosis of the jaws, so the patient did not receive this agent.

Conclusion:

In our case report, we have found that surgical excision followed by aggressive physical therapy gave us exciting result. In view of the successful result of our case, we can advocate that the surgical excision & intensive physiotherapy can be one of the best options for treatment of traumatic Myositis ossificans , post operative function and esthetics also. The treatment ensure are liable, available and easily affordable option for both the surgeons and patients.

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