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MASSETER MUSCLE HYPERTROPHY ASSOCIATED WITH TEMPOROMANDIBULAR JOINT DISORDER- A CASE REPORT

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ABSTRACT

Masseter muscle hypertrophy is a relatively uncommon condition that can occur unilaterally or bilaterally. Pain may be a symptom, but most frequently a clinician is consulted for cosmetic reasons. In this report we present a patient with unilateral masseter muscle hypertrophy who had asymptomatic temporomandibular joint (TMJ) disorder and was chewing unilaterally from the past 3 years. Ultrasonography (US) confirmed the diagnosis of masseter hypertrophy and the patient was treated with soft flexible splint.

INTRODUCTION

Masseter muscle hypertrophy (MMH) was first described by Legg in 1880, reporting on the case of a 10-year-old girl with concurrent idiopathic temporalis muscle hypertrophy [1]. It is a relatively uncommon condition that can occur unilaterally or bilaterally. The aetiology of this condition remains obscure, but some authors have correlated it to gum chewing, bruxism, malocclusion, psychological disorders, and temporomandibular joint (TMJ) disorders [2,3]. It may affect anyone regardless of the age, gender and ethnicity, however most studies state that adolescents and young adults are more prone to this condition [4]. Pain may be a symptom, but most frequently a clinician is consulted for cosmetic reasons as hypertrophy of muscle presents as swelling over angle of mandible leading to facial asymmetry.

Case Report

A 15 year old male patient came with a chief complaint of swelling over the right lower one third of face since three years. It was initially small in size and gradually increased over 3 years leading to facial asymmetry.

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It was associated with dull pain on biting food from same side and during opening and closing movements of the mandible. There was no past history of trauma or surgery. Medical history was non- contributory.

Extraorally, a diffuse swelling was present over right masseter region 3x2 cm in size. It was moderately tender and firm in consistency. On clenching teeth tightly, right masseter was tender and functional assessment of other muscles of mastication bilaterally was normal. Mouth opening was 3.8 cm with opening click on the right side. Intra-oral findings reveal crossbite of 43 (Fig. 1). Provisional diagnosis of Masseter muscle hypertrophy and anterior disc displacement with reduction on right side was given.

Differential diagnosis of salivary gland tumours, bone tumours and lymphangioma was considered. Diagnosis was confirmed by performing ultrasonography (US) examination of bilateral masseter muscle. It revealed 3mm increase in length and 0.3 mm in width of right masseter as compared to left masseter muscle at relaxed state, 5mm increase in length and 1.5 mm in width at contracted state (Fig. 2). A custom made soft flexible splint was fabricated and patient was asked to wear it 8 hours/day for first one and a half months followed by 4 hours/day for next fifteen days (Fig.3).

Patient was instructed to chew food gently bilaterally. Two months follow up showed remarkable reduction in extraoral swelling (Fig. 4).

Following this patient discontinued using soft splint and showed no recurrence of hypertrophy till date.

Table 1. Etiopathogenesis of MMH in present case

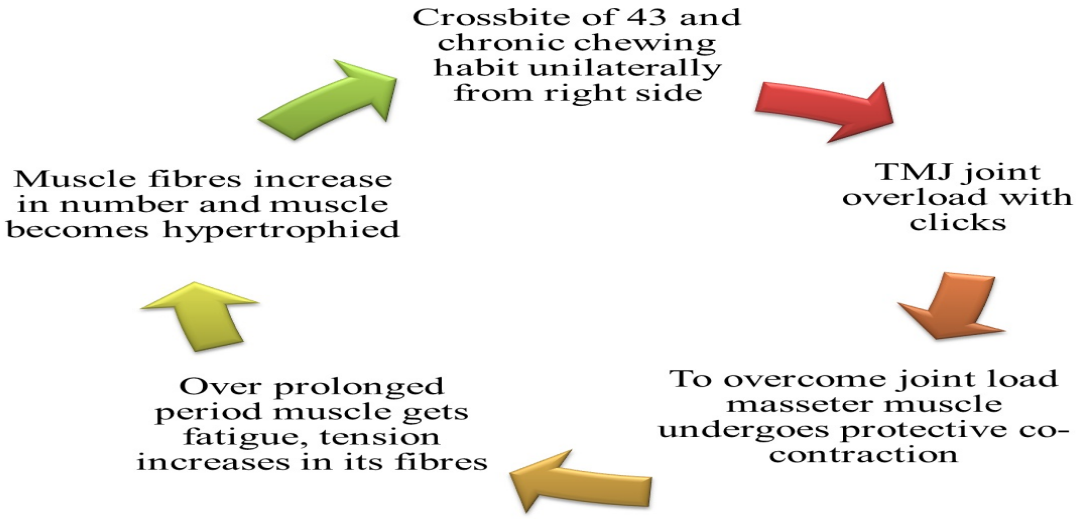


Table 2. Treatment modalities for MMH based on aetiology

Etiology	Method (Non- Surgical/ Surgical)
Emotional stress, anxiety and masseteric hyperfunction	•Pharmacotherapy— anxiolytics, muscle relaxants and antidepressants
Occlusal interferences, chronic bruxism functional habits and TMJ disorders	•Dental and orthodontic management— dental restorations, correction of premature occlusal contacts, splints, prevention and correction of parafunctional habits and malocclusions
Esthetic impairment due to unilateral or bilateral moderate hypertrophy	•Botulinum toxin A injection into the muscle (It is a powerful neurotoxin which is produced by the anaerobic organism Clostridium botulinum and when injected into the muscle causes interference with the neurotransmitter mechanism producing selective paralysis and subsequent atrophy of the muscle.) •Intraoral and extraoral surgical bilateral moderate hypertrophy resection of muscle size, removal of angle of mandible, neurectomy of masseter nerve, resection of buccal pad of fat.
Severe masseteric hypertrophy with esthetic and functional problems	•Radiofrequency electrocoagulation for volumetric reduction

Figure 1. Extraoral masseter hypertrophy on right side and intraoral crossbite of 43

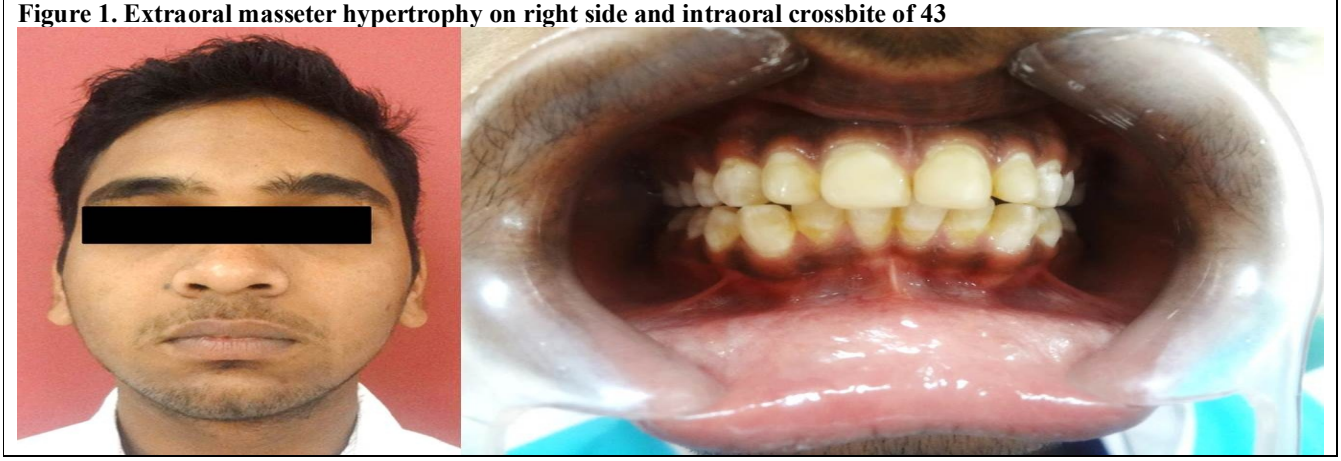


Figure 2. US scan showing right and left masseter in contracted (up) and relaxed (down) state.

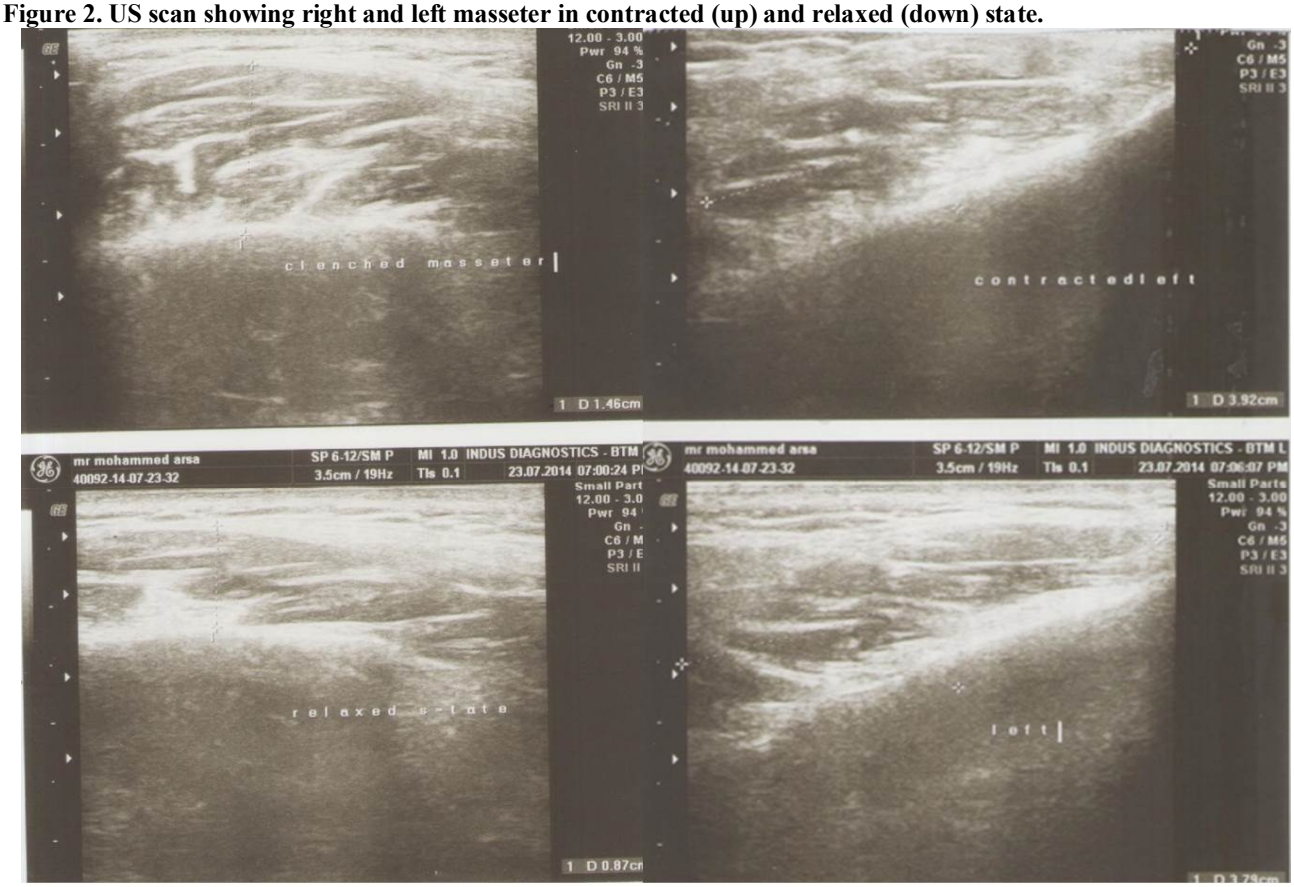
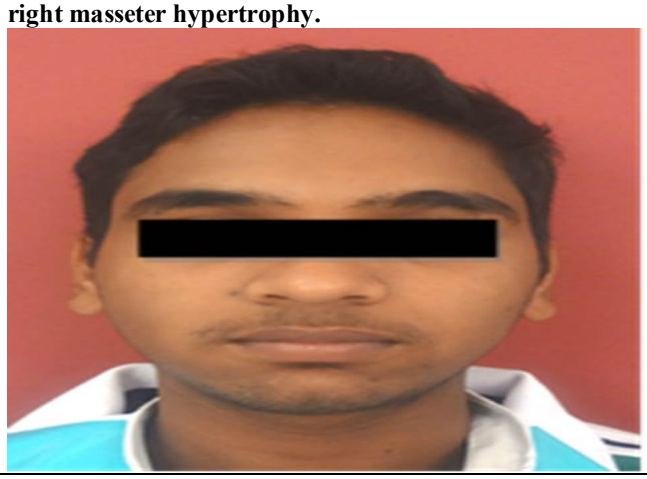


Figure 3. Soft flexible splint in-situ at the beginning of treatment.

Figure 4. Follow-up after 2 months showing regression of right masseter hypertrophy.



DISCUSSION

MMH is an asymptomatic, benign enlargement of one or both masseter muscles. With MMH, the patient's face takes on a characteristic rectangular configuration [5]. It alters facial lines, generating muscle tension or pain and negative cosmetic impacts for many patients [6]. According to Riefkohl et al study out of 90 patients 4% were less than 10 years old and 3% were over 40. The remaining patients had a mean age of 30 years. Fifty-seven percent of the patients were male and 43% were female [7]. In most cases, MHH is bilateral and symmetric. Unilateral occurrence can also be seen when patients chew or clench primarily on one side [8].

Masseter is a thick quadrate masticatory muscle, arises from the zygomatic arch and inserts into the inferior lateral aspect and angle of the mandibular ramus. Some authors suggest that the use of the term hypertrophy may be misleading, because the enlargement of the muscle is caused by an increase in the number of fibres and not increase in the cell size [9,10]. The masseter muscle is essential for adequate mastication and is located laterally to the mandibular ramus, and thus plays an important role in facial aesthetics. Anatomically, most of the masseteric thickness is along the inferior portion of the mandibular ramus, where the facial contour normally tapers.

The aetiology in the majority of cases is unclear. According to the literature review, clenching, bruxism during sleep, malocclusion, TMJ disorders, unilateral chewing, clenching due to stress and anxiety are considered as the most possible causes of MMH. In our case, aetiology was chronic occurrence of cyclic events involving unilateral chewing, crossbite in relation to 43 and TMJ disorder (Table 1).

Diagnosis cannot solely be based on clinical findings. US, computed tomography (CT) and magnetic resonance imaging (MRI) scan can be used to confirm the diagnosis. US scan is a cost effective and reliable method to assess the thickness of the masseter muscle in relaxed as well as contracted state [11]. It also helps the clinician in excluding other pathologies such as salivary gland or bony tumours, odontogenic space infections and hemangioma or lymphangioma. CT is indispensable in case of MMH with bone flaring, due to its high quality imaging of bone structures. On the other hand, MRI facilitates the diagnosis at the affected side because muscular structure signals are more intense, making it easier to compare the affected and non-affected sides [1,4,10]. In our case, diagnosis was based on clinical, palpatory and US findings.

MMH is a benign condition and therapy is usually not required. There are various management modalities which can be opted based on aetiology including non-surgical and surgical methods [1,3,5,10] (Table 2). Dental restorations and occlusal adjustment to correct premature contacts and malocclusions are important. According to Okeson dental and non-dental hypothesis have been suggested to explain the efficacy of oral appliances, including hard and soft splints in the management of TMJ disorders. Dental hypothesis include alteration of the occlusal condition by disengagement, condylar repositioning, relaxing jaw musculature, unloading the joints and increase in vertical dimension following usage of splints. Non dental hypothesis related to splints include increasing cognitive awareness, acting as a placebo and increasing peripheral input to the central nervous system which in turn decreases motor activity of the muscle [12,13].

Surgical reduction is usually the last modality in case other options fail or when severe enlargement of masseter muscle is present. In our case, patient was advised orthodontic correction of crossbite and soft flexible spilt for TMJ disorder. As our patient was unwilling for orthodontic correction, it was managed by long term use of soft flexible splint. In our case, the soft splint aided in condylar repositioning and relaxation of jaw musculature. After 2 months of treatment complete regression of MMH was evident.

CONCLUSION

Masseter muscle hypertrophy is a benign enlargement of masseter muscle due to multifactorial aetiology. Its diagnosis is mainly based on clinical and radiographic examination. It is important for a clinician to consider it in differential diagnosis of extra-oral swellings of the lower third of face, especially when any TMJ or occlusal discrepancy is present. Though it has no effect if left untreated however, for symptomatic and cosmetic reasons treatment should be recommended.

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