

Case Report

Unilateral Masseteric Hypertrophy- Report of a Case with Ultrasonographic Justification

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ABSTRACT

Masseteric hypertrophy is a comparatively rare condition of unknown cause characterized by an asymptomatic, benign enlargement of unilateral or bilateral masseter muscles. It causes a prominent mandibular angle, alters facial lines and gives a characteristic square configuration of the face, which cause discomfort and negative cosmetic impacts for patients. This paper reports a case of masseter muscle hypertrophy diagnosed using conventional radiography and Ultrasonography. The awareness with this condition is important and clinicians should consider masseteric hypertrophy in the differential diagnosis of parotid gland tumors or other dental and jaw pathologies.

Key words: Masseter muscle, hypertrophy, ultrasonography, radiology.

INTRODUCTION

Masseteric hypertrophy (MH) is documented as an asymptomatic enlargement of one or both masseter muscles. Two types of masseter muscle hypertrophy are reported i.e. congenital or familial and acquired due to hyper-function. Acquired type is the most frequent type although congenital variety also exists. Most of the cases of MH are bilateral and symmetric whereas unilateral occurrence can be seen in patients who are habitual of chewing on one side. [1,2]

In majority of cases etiology for MH is uncertain, although many causative factors like malocclusion, clenching, bruxism, and temporo-mandibular joint disorders have been postulated. [1,3] People of Asian descent are more susceptible to develop MH. [4,5] The highest incidence has been reported in the second and third decades of life with no specific gender predilection. Baek *et al* in their study of 108

cases, reported the mean age of occurrence of MH was 30 years, 43% were females and bilateral involvement reported in 60% of the patients. [5]

This paper reports a case of unilateral masseteric hypertrophy diagnosed using imaging modalities like conventional radiography and ultrasonography (USG). Clinical and diagnostic significance of ultrasonography in MH has also been reported.

CASE REPORT

A 13-year-old female patient reported to the Department of Oral medicine and Radiology with a complaint of swelling in the left lower side of face of two years. The patient reported slow and gradual increase in the size of the swelling in a period of 2 years which has been painless so far. There was no history of facial trauma; bruxism, clenching or other parafunctional

habits and her medical and family history were noncontributory.

On clinical examination, a soft unilateral swelling was noted over the left body; near the angle of the mandible which becomes more prominent while clenching (Figure 4). There was no pain during palpation or function. The left mandibular angle showed considerable enlargement resulting in square-jaw appearance. (Figure 1) The opening and closing of the jaw was within normal limits. Slight midline deviation was observed during occlusion (Figure 2). There was no temporomandibular joint clicking and no evidence of para-functional habits was present. From the clinical finding a provisional diagnosis of masseteric hypertrophy was considered.

Panoramic and postero-anterior radiographs were taken to rule out the possible pathologies in the bilateral angle region which revealed the prominence of

everted left mandibular angle and bone spur development. Figure (3,4) Ultrasonographic examination of right and left masseteric region showed an increased uniform muscle mass of the left masseter (1.16cm) when compared to right side (0.88cm) with characteristics of normal musculature without any nodular, cystic or irregular foci. There was no underlying pathology detected sonographically.

On the basis of the history revealed by the patient and correlating with the clinical, radiographic and ultrasonographic features, a final diagnosis of unilateral left masseteric hypertrophy was made. Patient reassurance was provided accordingly and referred to orthodontic sub-team for treatment of malocclusion. The patient was not consented to medical or surgical treatment and was kept under regular periodic follow up.



Figure 1: Frontal profile showing swelling in the left mandibular angle region.



Figure 2: Intraoral view showing slight midline deviation during occlusion.



Figure 3: Panoramic radiograph showing left mandibular angle prominence.



Figure 4: Postero- anterior view (cropped) showing development of bony spur in left mandibular angle.

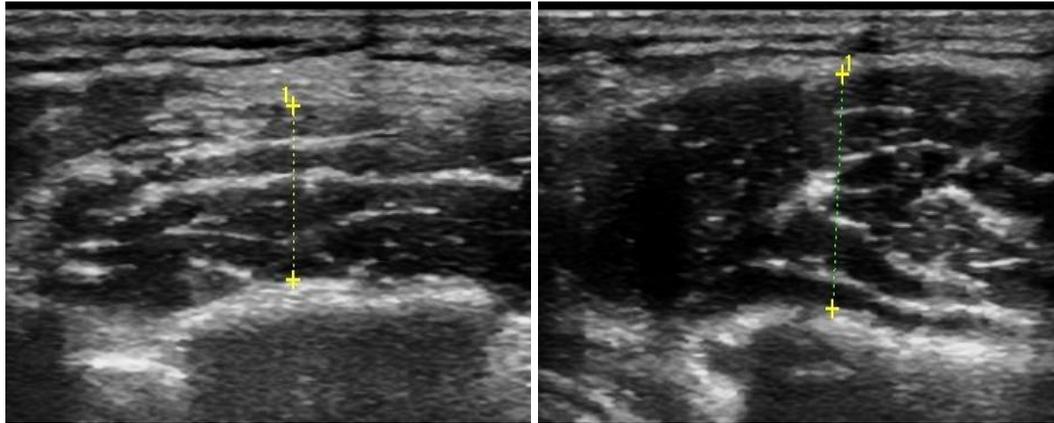


Figure 5(Right, Left): Ultrasonographic examination showing increased thickness of the left masseter muscle (1.16cm) when compared to right side (0.88cm)

DISCUSSION

Hypertrophy of the masseter muscle was first reported in a 10 year-old-girl by Legg in 1880. [6] Clinically MH is characterized by unilateral or bilateral enlargement of the masseter muscles and in some cases is accompanied by pain of intermittent type. [7,8] Anatomically, the masseter muscle is a thick quadrate muscle composed by two layers, originates from the inferior and deep surface of the zygomatic arch which inserts into the inferior-lateral aspect of the mandibular ramus. [9]

Though the etiology of MH is unclear, there are several theoretical considerations such as psychological factors, particularly emotional stress, anxiety, and personality disorders, has also been related to MH. Several authors claim that emotional stress results in chronic forceful clenching of the jaws and bruxism, which cause a compensatory hypertrophy of the muscle. [10] In the case reported, we could not identify any parafunctional habit or psychological disturbance and for that reason, the muscle hypertrophy may be regarded as idiopathic.

Diagnosis of masseter hypertrophy is mainly by history, clinical examination, muscle palpation and findings of imaging modalities. Clinical examination and palpation would reveal a uniform muscle mass and its contraction could be felt in the mandibular angle region while clenching conversely, nodular, irregular growth are the features of other benign and malignant

neoplasms. The bone spurs at the angle of the mandible are commonly associated findings of MH which could be appreciated from the panoramic as well as antero-posterior radiograph in the case reported (Figure 3, 4). Bone spurs are mainly caused by periosteal irritation and subsequent new bone deposition in response to increased forces exerted by the muscles bundles of the region. [11] However, approximately 20% of normal people have this finding and hence it cannot be considered as a diagnostic aid. [12]

Various imaging modalities can be used to assess the thickness and functions of masseter muscle. Recently, upsurge of ultrasonography and its application has spread throughout different fields of medicine. It is based on the transformation of sound waves into visible light waves. The main advantages of USG are, it is instant, convenient, easy, non invasive and inexpensive method to apply when compared to other advanced imaging modalities like CT and MRI. Besides there is no conclusive evidence of adverse biological effects for USG at diagnostic power level so far. Hence USG can be used as a reliable imaging modality for measuring the thickness of masseteric muscle. [13]

MH usually presents as a relatively firm, nontender preauricular swelling that may be diagnostic challenge to the clinicians. [13] The differential diagnosis of MH comprises of various pathologies such as parotiditis, lipoma, parotid tumor,

vascular tumors, benign or malignant muscle tumors, benign and malignant mandible tumors. The exact diagnosis is comparatively difficult for unilateral cases which justify the need of performing a sialography in order to discard the possibility of parotid gland alterations. [14,15] Ultrasonography has also been playing a significant role to rule out the possible causes of soft tissue lesions from MH.

Several treatment options have been reported for masseteric hypertrophy, ranging from conservative treatment to invasive surgical procedure. Conservative options includes reassurance, tranquilizers or muscle relaxants, psychiatric counseling, use of mouth guards, analgesics, physical therapy, dental restorations, and occlusal adjustments to correct premature contacts. Local injection of very small doses of botulinum toxin type A into a muscle causes local paralysis consequently individual muscles become selectively weakened and atrophy of the muscle occurs .But the main disadvantage of this therapy is that the effect of treatment reverts to the original condition in a period of 6-8 months owing to resynthesized neuromuscular synapses and developed antibodies because of the repeated injections. Botulinum toxin type A only reduces muscle volume temporarily on the contrary surgical excision of muscle tissue reduces the actual number of muscle cells. Moreover, it is an expensive therapy and should be considered only for patients with complicated or disabling bruxism and is unresponsive to other medical and dental therapy. [1,2,16,17] Surgical approach for masseter hypertrophy consists of partial muscle resection, usually in the lower portion with or without concomitant reduction osteoplasty of the angle of the mandible when it is prominent. [1,3,15,16]

CONCLUSION

Masseter muscle hypertrophy is a benign condition that generally does not require surgical intervention. Due to lack of familiarity, there is great chance for misdiagnosing the entity that may lead to

unnecessary biopsies, explorative surgeries and even radiotherapy for suspected parotid tumors. Hence MH should be included in the differential diagnosis of diffuse swellings at the mandibular angle and ramus region in order to avoid unnecessary diagnostic procedures.

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