Bilateral Masseter Muscle Hypertrophy-a Case Report and Review of Literature

Sujatha S Reddy¹, Giridhar A G², Ravleen Nagi³

ABSTRACT:
Masseter muscle hypertrophy is a rare condition characterized by unilateral or bilateral enlargement of the masseter muscle affecting both males and females following puberty. It usually manifests in late adolescence or early adulthood. Its etiology remains unknown. Masseter muscle hypertrophy produces facial asymmetry and familiarity with this condition is important to rule out other pathologies such as parotid gland tumors and dental infection. Here in, reporting a case of bilateral masseteric hypertrophy in a 55 year old female patient diagnosed using imaging modalities such as conventional radiography, ultrasonography and computed tomography.

Key words: Masseter muscle hypertrophy, facial asymmetry, bone spur, ultrasonography, computed tomography

INTRODUCTION
Masseter muscle hypertrophy (MMH) is a benign increase in the size of masseter muscle that may affect one or both sides of the face. MMH was first described by Legg in 1880. Although a few cases have been documented since then, it has been stated that this disorder is more common than generally recognized. Pain may be a symptom, but most frequently the clinician is consulted for cosmetic reasons. In few cases prominent exostoses at the angle of the mandible is noted. MMH is associated with variable causative factors such as genetic predisposition, bruxism and clenching associated with psychological stress, anxiety, sleep disorder, malocclusion and temporomandibular disorders. Zachariades et al reported two cases where vascular lesion gradually subsided to a residual muscular hypertrophy. A congenital variant also exists, but acquired MMH is by far the most frequent. Most cases of MMH are bilateral and symmetric, but asymmetry is not unusual. Unilateral occurrence also can be observed when patients clenched or chewed primarily on one side.
Diagnosis is based on the awareness of the condition, clinical and radiographic findings and exclusion of other pathologies in the angle of the jaw such as parotid tumors, vascular tumors and lipoma. In MMH, a long standing uniform mass is noted unlike the irregular and nodular growth that characterizes other benign and malignant neoplasms. Panoramic radiographic examination complement the clinical diagnosis whereas Computed tomography, magnetic resonance imaging (MRI), and ultrasonography (US) scan can be used to confirm the diagnosis. US scan is found to be a reliable and accurate method to assess the thickness of the masseter muscle. Treatment of MMH ranges from conservative to invasive therapy. Mild cases do not require any treatment, or at times reassurance or tranquilizers will help; however in severe cases botulinum toxin type A injections or surgery can be considered. In few cases, where stress is observed, psychological follow up may be required in association with other treatments.

CASE REPORT

A 55 year old female patient, reported with a complaint of progressive swelling of right and left lower half of the face which became more pronounced on clenching. The swelling became increasingly prominent over the preceding years. Patient also complained of dull, aching, intermittent pain on clenching her teeth. The swelling was initially noticed 5 years back following menopause and has progressed to the present state (Fig 1). There was no history of trauma, paraesthesia, xerostomia, trismus, dysphagia, or difficulty with mastication and speech. Patient complained of stress following loss of a family member and was on antidepressants since 2 months. She complained of early morning stiffness of the jaw, since three months. On questioning the patient admitted to bruxism. She was a chronic tobacco chewer and used to chew tobacco 4-5 times/day regularly since ten years. Family history was non contributory.

Clinical examination revealed bilateral ill defined facial fullness in the region of the masseter muscle. On palpation the swelling was non tender and no thrills or bruises were elicited. Bimanual palpation and palpation during contraction showed the mass to correspond to the outline of the masseter muscle. On clenching, the swelling became more prominent and firm, and it was well appreciated on the left masseteric region. The opening and closing of jaws were normal. There was no evidence of midline shift or occlusal disharmony. Intraorally, a free and clear salivary flow exited from the right and left stenson duct. Attrition was noticed in relation to maxillary and mandibular posterior teeth, suggestive of bruxism.

Based on the history and clinical examination, a provisional diagnosis of bilateral masseter muscle hypertrophy was given. Benign parotid tumors, lipoma, vascular tumors, and temporomandibular disorders were considered under the differential diagnosis. Panoramic radiograph revealed slight prominence of the right and left angle of the mandible (Fig 2). Occlusal attrition in relation to maxillary and mandibular posterior was suggestive of bruxism. Anteroposterior radiograph revealed the presence of bone spur in the left angle of the mandible (Fig 3). US scan showed a compensatory hypertrophy in the area of muscle insertion due to the increase in masseter muscle size and tension. The right masseter muscle measured 20.5 mm in relaxed state and 22.2 mm in contracted state and the left masseter muscle measured 20.0 mm in relaxed state and 24.7 mm in contracted state (Fig 4a, b and Fig 5a, b). The site of measurement was in the thickest part of the masseter muscle, close to the level of the occlusal plane, approximately in the middle of mediolateral distance of the ramus. CT scan contiguous nonenhanced axial and coronal images obtained from the level of hyoid bone to the level of temporo-mandibular joints revealed bilateral masseter muscle hypertrophy and a small bony spur with mild expansion of the underlying bone on the outer cortex of the left ramus of the mandible. Mild irregularity and thickening of the cortex was also observed (Fig 6). The maximum thickness of masseter muscle was 21 mm on the right side and 24 mm on the left side (axial sections).

Based on the above findings, a final diagnosis of bilateral masseter muscle hypertrophy was given. The patient was advised to quit the tobacco chewing habit, was put on muscle relaxants and was referred for psychiatric consultation. Prosthetic crowns were advised to correct the occlusal attrition. She was referred to dermatology for cosmetic correction of the facial hypertrophy, but the patient refused because aesthetics was not her priority.

DISCUSSION

MMH is an asymptomatic, benign enlargement of one or both masseter muscles. 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. Most of the MMH cases reported in the literature have occurred usually in late adolescence or early adulthood, but our patient developed MMH following menopause at the age of 51 years. The precise etiology of MMH is not clear. Several authors claim that emotional stress results in chronic forceful clenching of the jaws and bruxism, which cause a work hypertrophy of the masseter muscle. Our patient also complained of stress due to some personal problem, with evidence of bruxism and severe attrition of all the upper and lower posterior teeth. Bruxism along with tobacco chewing habit in our patient might have induced bilateral hypertrophy of the masseter muscle. Furthermore, long standing cases usually exhibit hyperostosis at the bony attachment of the masseter muscle as seen in our case. Guggenheim and Cohen reported that bone spurs are caused by periosteal irritation and new bone deposition responding to increased forces exerted by the muscle bundles. MMH is known to occur in isolation or with temporalis muscle hypertrophy, but temporalis hypertrophy without hypertrophy of masseter muscle is very rare. Change in facial appearance is the most frequent complaint of patients with MMH. Though hypertrophy is probably the most common cause of isolated enlargement of the masseter muscle, consideration should be given to the possibility of inflammation, neoplasia, or, rarely, malignant infiltration. Occasionally, masseteric hypertrophy can be misdiagnosed as parotitis or malignant neoplasm.

Diagnosis of masseter hypertrophy cannot solely be based on clinical findings alone, CT, MRI and US scan can be used to confirm the diagnosis. CT and MRI are useful in determining the extent and location of bucco-masseteric masses. CT scanning is indispensable in case of MMH with bone flaring, due to its high quality imaging of bony structures and direct bone imaging, but is not possible with MRI because cortical bone produces no significant signal. The salient distinguishing feature is the associated bony changes i.e. hyperostosis at the site of muscle attachment, in benign masseteric hypertrophy. CT scan in our patient demonstrated a small bony spur arising from outer cortex of the left ramus of the mandible with mild expansion of the underlying bone. US scan evaluation revealed increased MM thickness on both sides in relaxed and contracted state, compared to that of unaffected individuals.

Microscopic examination of the excised muscle tissue usually shows normal muscle fibres without changes in length, thickness, or nuclear structure. Zachariades et al reported two cases in which phleboliths were associated with masseteric muscle hypertrophy.

MMH is a benign condition and therapy is usually not required. Non-surgical modalities of treatment include reassurance, tranquilizers, spasmodylitics or muscle relaxants, psychiatric care and injection of very small doses of botulinum toxin type A. Botulinum toxin A 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. The action of this therapy may be temporary, new neuromuscular synapses may be resynthesized over a period of few months and antibodies may develop because of the repeated injections. It is also an expensive therapy and should be considered as an option only for those who have complicated or disabling bruxism and are refractory to other medical and dental therapy. Dental restorations and occlusal adjustment to correct premature contacts and malocclusions are important. Parafunctional habits must be prevented. A more radical approach to treating MMH consists of partial muscle resection, usually in the lower portion using either the intraoral or extraoral approach. Some authors have recommended concomitant resection of the prominent mandibular angle. The disadvantage of surgical reduction includes the risks of general anaesthesia, postoperative haemorrhage, oedema, hematoma, infection, scarriing, and facial nerve damage. Following treatment, follow up is required because this condition can be recurrent.

CONCLUSION

MMH is a relatively rare condition of unknown cause and it should be considered under the differential diagnosis of head and neck masses, located in the cheek. Early diagnosis of MMH is important so that the patient and parents can be informed about the likely development of facial asymmetry and further progression prevented.

ACKNOWLEDGEMENT

We would like to thank our Principal and Professor Dr. H. N. Shama Rao and our Head of the Department Dr. Yashoda Devi B.K. for their support and guidance.
REFERENCES