

Management of Acquired Bilateral Masseteric Hypertrophy- A Case Report

Yadav S¹, Dhupar V², Dhupar A³, Akkara F⁴, Mittal HC⁵

ABSTRACT

Masseter muscle hypertrophy is a rare condition of unknown cause, which is important due to growing cosmetic concern. A hypertrophied masseter may cause prominent mandibular angle, alter facial lines and characteristic square configuration of face, which may be unacceptable to the patient. Several treatment options reported for masseter hypertrophy, which range from conservative treatment options to invasive surgical procedure. The botulinum therapy offers good results but it's expensive and requires repeated injections with the chances of antibodies development. However, surgical treatment though invasive provides quick and permanent treatment for masseter muscle hypertrophy. The present case reports surgical management of young male patient with masseter hypertrophy due to cosmetic reasons.

Keywords: Masseter muscle, Hypertrophy, Partial muscle resection, Reduction osteoplasty

¹ Professor & Head
Department of Dentistry
B.P.S. Govt. Medical College for Women, Khanpur
Kalan, Sonapat, Haryana

² Professor & Head
Department of Oral & Maxillofacial Surgery
Goa Dental College & Hospital, Bambolim, Goa.

³ Professor
Department of Oral Pathology
Goa Dental College & Hospital, Bambolim, Goa.

⁴ Associate Professor
Department of Oral & Maxillofacial Surgery
Goa Dental College & Hospital, Bambolim, Goa.

⁵ Senior Resident
Department of Dentistry
B.P.S. Govt. Medical College for Women, Khanpur
Kalan, Sonapat, Haryana.

INTRODUCTION

Masseteric hypertrophy (MH) is recognized as an asymptomatic enlargement of one or both masseter muscles (1). It is a rare condition of unknown cause, which is important for esthetic reasons, functional reasons and differential diagnosis of head and neck pathology. However, facial appearance is the most frequent reason for seeking treatment by patients with masseteric hypertrophy. A hypertrophied masseter may cause prominent mandibular angle, alter facial lines and characteristic square configuration of face (2), which may be unacceptable to the patient.

The etiology in the majority of cases is unclear, although many causative factors causing functional impairment have been postulated like malocclusion, bruxism, clenching and temporomandibular joint disorders (1,3). People of Asian descent are more frequently involved (4,5). The highest incidence has been reported in the second and

third decades of life, with no gender predilection. Baek et al in their review of 108 cases found that patient mean age was 30 years, 57% were males and 60% had bilateral involvement (5).

There are two types of masseter muscle hypertrophy: congenital or familial and acquired due to hyper-functionality (6). The most frequent type of MH is acquired type although congenital variety also exists (1). Most cases of Masseteric hypertrophy are bilateral and symmetric, but asymmetry is not unusual. Unilateral occurrence can be seen in patients who are habitual of chewing on one side (1). The differential diagnosis includes parotiditis, parotid tumor, lipoma, benign or malignant muscle tumors, and vascular tumors.

Several treatment options reported for masseter hypertrophy, which range from conservative treatment options to invasive surgical procedure. Occlusal adjustment, relaxation therapy, botuli-

Contact Author

Dr Sunil Yadav
drsky1@gmail.com

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num therapy, spasmolytics, tranquilizers, and antidepressant therapy are some examples of conservative treatment. Conservative approaches have both advantages and disadvantages to surgical approaches (6,7). Still surgical therapy is preferred for more reliable and permanent results though it's an invasive procedure. The present case reports surgical management of young male patient with masseter hypertrophy due to cosmetic reasons.

CASE REPORT

A 22 year-old healthy man was referred to the Department of Oral and Maxillofacial Surgery of Goa Dental College

and Hospital, Goa for unaesthetic appearance due to bilateral facial swelling. The patient explained the swelling grew slowly in 3-4 years approximately, which has been painless until now. Furthermore, he had no history of difficulty in opening his mouth and joint pain. He also gave the history of pan and gutkha chewing since 8 years. There was no history of facial trauma, dental abnormalities or temporomandibular joint clicking or no family history of any similar swelling.

Clinical examination revealed a firm bilateral tissue mass over the angle of the mandible, which became more prominent on clenching (Fig.1, 2). The opening and closing of the jaws were normal. No midline deviation was observed during occlusion. There was no temporomandibular joint (TMJ) clicking and occlusion derangement. No abnormality and potential etiological factor was seen in intra-oral and extra-oral examination. No evidence of para-functional habit was present.

Provisional diagnosis of bilateral hypertrophic of masseter muscles was made. Ultrasonographic (USG) imaging showed no underlying pathology except increased uniform muscle mass. Panoramic radiograph was taken to rule out any pathology in the bilateral angle region. The finding showed a

compensatory hypertrophy in the area of muscle insertion and prominence of the everted mandible angle bilaterally (Fig3). Based on these findings final diagnosis of bilateral masseter muscle hypertrophy was made.

Patient was advised to quit pan and gutkha chewing habit and treatment options available explained. Patient gave consent for surgical treatment i.e. partial muscle resection with reduction osteoplasty of the mandibular angle under general anesthesia. A sub-mandibular incision (Risdon) of approximately 5 cm was made isolating the mandibular marginal nerve and the facial vessels. The muscle was incised approximately 5 mm above the mandibular angle. The entire ascending branch of the masseter was detached, and a vertical internal muscle band equivalent to 1/3 of the thickness of the muscle was resected. After the muscle resection, reduction osteoplasty of the prominent mandibular angle was performed. The remaining external part of the muscle was sutured to its site of origin onto the muscle stump inserted in the mandibular angle region to allow for adequate functional recovery. At the end of the procedure a compressive dressing was placed. Similar procedure was performed on both sides. The drain was removed 24 hours after the surgery. Physical therapy was offered after two weeks



Figure 1: Front profile picture of the patient



Figure 2: Right lateral profile of the patient shows tissue mass over the angle of the mandible, which became more prominent on clenching

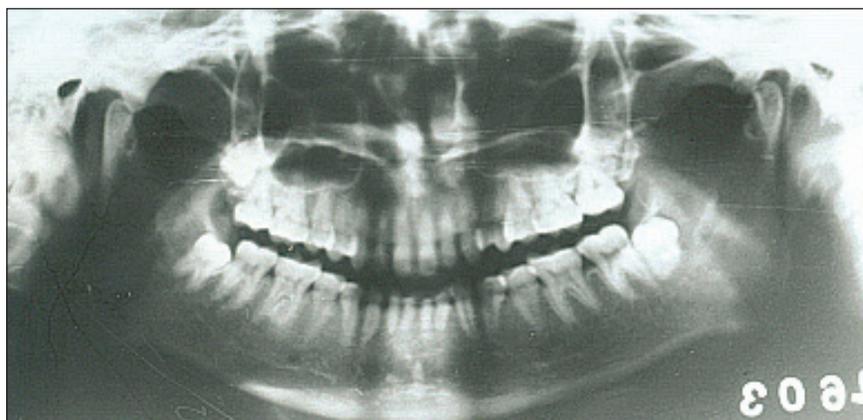


Figure 3: Panoramic radiograph shows hypertrophy in the area of muscle insertion and prominence of the everted mandible angle bilaterally



Figure 4: Front profile picture after partial muscle resection with reduction osteoplasty of the mandibular angle



Figure 5: Lateral profile picture shows invisible scar in the neck crease

post-operatively. Patient was followed for one year without any concomitant complication (Fig. 4, 5, 6).

DISCUSSION

The masseter muscle is essential for adequate mastication and plays an important role in facial esthetics also. Masseteric hypertrophy is asymptomatic persistent enlargement of one or both masseter muscles and usually the chief complaint is related to esthetics. Some authors suggest that the use of the term hypertrophy may be misleading, because it is caused by an increase in the number of fibers and not an increase in cell size (3), although the etiology

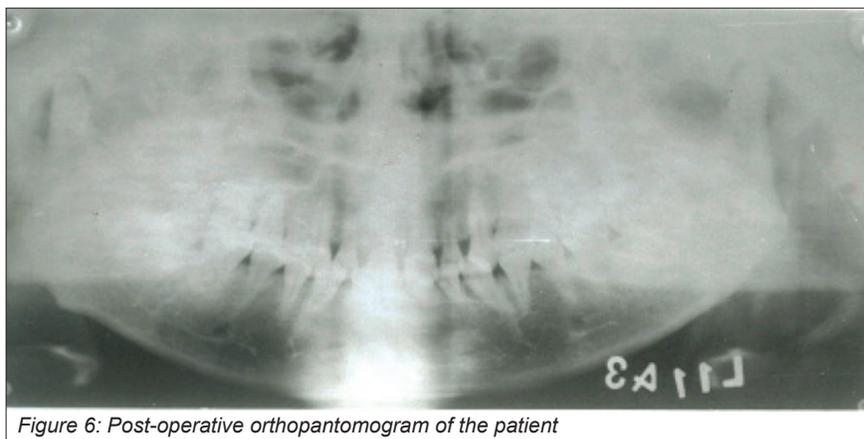


Figure 6: Post-operative orthopantomogram of the patient

remains unknown; bruxism, TMJ disorder, clenching, malocclusion have been found to be associated factor for the condition. Emotional stress may also trigger chronic forceful clenching of the jaws and bruxism, which may cause a work hypertrophy of the masseter muscle (8-10). In the present case patient tobacco chewing habit might have induced bilateral hypertrophy of the masseter muscle. Furthermore, these cases usually exhibit hyperostosis at insertion site of the masseter muscle, which is also evident in present case. Meaningful emphasis must be given to the differential diagnosis, because several malignancies can produce similar presentation. The differential diagnosis included parotiditis, parotid tumor, lipoma, benign or malignant muscle tumors, vascular tumors, benign and malignant mandible tumors (9, 11). The correct diagnosis is more difficult in unilateral cases and requires a differential diagnosis with parotid gland alterations, which justifies the need of performing a sialography in order to discard this possibility.

Diagnosis of masseter hypertrophy can be achieved from clinical examination, history, findings of imaging modalities, and muscle palpation. In masseteric hypertrophy, on visual examination and palpation, a uniform muscle mass and its contraction could be felt in the mandibular angle region when patient forcibly bites. On the other hand, irregular and nodular

growth characterizes other benign and malignant neoplasms. Sonography, computed tomography (CT) and MRI are useful in determining the extent and location of bucco-masseteric masses (12). CT scanning is indispensable to study hyperostosis at the site of muscle attachment, in benign masseteric hypertrophy (10). When the physical examination suggests masseteric hypertrophy, the panoramic radiograph is the most practical examination to complement the clinical diagnosis (2, 3). In the present case panoramic and antero-posterior radiograph revealed bone spurs at the mandibular angles which may be caused by periosteal irritation and new bone deposition responding to increased forces exerted by the muscle bundles (10, 11). USG of the region confirmed the uniform increased muscle mass with characteristics of normal musculature without any cystic, nodular or irregular foci. The treatment for masseter hypertrophy ranges from simple conservative to more invasive surgical reduction. Treatment varies from conservative to surgical, and the later depends on surgeon skill and experience. Occlusal adjustment, relation therapy, spasmolytics, tranquilizers, and antidepressant therapy are some examples of conservative treatment. However, conservative therapy is often not effective. Moore and Wood suggested intramuscular injection of botulinum toxin type A to decrease muscle activity and produce localized paralysis without producing

undesirable systemic effects, therefore, individual muscles can be selectively weakened and atrophy of the muscle occurs (6, 8, 13, 14). However, the effect in the masseter muscle may ultimately be completely reversible in 6-8 months (6, 13, 15) due to resynthesized neuromuscular synapses and developed antibodies because of the repeated injections (1, 7, 15). Moreover, It is also an expensive therapy and should be considered as an option only for those who have complicated or disabling bruxism and is refractory to other medical and dental therapy. Ham JW at all (2009) used radiofrequency coagulation by which an electric current is used as an alternative energy source which cause ionic agitation, leads to tissue coagulation through frictional (60-800c) to denature the proteins. This ultimately produces a focal necrosis of the hypertrophied masseter muscle without any side effects (15).

In the present case, patient refused for botulinum therapy because of expenses and required repetition in 6-8 months; and requested for some permanent solution for the condition. Thus, surgical reduction of masseter hypertrophy was offered and performed under general anesthesia with desired results. Surgical treatment was proposed for the first time by Gurney in 1947. Surgical approach to treating masseter hypertrophy consists of partial muscle resection, usually in the lower portion with or without concomitant reduction osteoplasty of the mandibular angle when it is prominent (3, 8). The surgical access can take either an intraoral or an extra-oral approach. Converse in the year 1951 resected both bone and muscle by excision of the internal layer

of the master muscle and reduction of the thickened bone in the region of the mandibular angle, via an intraoral approach.

However, extra-oral approach was used in the present case because of various reasons like better access, well identified muscle planes and reduction osteoplasty can be performed easily under direct vision. Incisional scar also camouflage in neck creases, thus does not pose significant cosmetic problem. The reported disadvantages of surgical reduction include the risks of general anesthesia, postoperative hemorrhage, edema, hematoma, infection, scarring, mouth-opening limitation and facial nerve damage (15). In the present case, no such complication encountered and patient was well satisfied with the results.

CONCLUSION

Nonsurgical approaches have both advantages and disadvantages to surgical approaches. The botulinum therapy offers good results but it's expensive and requires repeated injections with the chances of antibodies development. Surgical treatment though invasive provides quick and permanent treatment for masseter muscle hypertrophy.

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