

BENIGN HYPERTROPHY OF MASSETERIC AND TEMPORALIS MUSCLES: SURGICAL TREATMENT

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ABSTRACT

Hypertrophy of masseteric and temporalis muscles is a rare condition of unknown cause characterized by excessive increase in volume of regions surrounding these muscles. Most patients complain of aesthetic changes resulting from facial asymmetry, the so-called “square face”; however, symptoms such as trismus, protrusion, and bruxism may also occur. The aim of this paper is to report the case of a 21-year-old man with hypertrophy of masseteric and temporalis muscles who was treated surgically. On physical examination, there was a bilateral increase in volume of the region surrounding masseter and temporalis muscles. Computed tomography revealed bilateral increase in mandibular angle and coronoid process. Eighteen months after surgery, the patient is fully recovered from hypertrophy, having no functional and aesthetic complaints.

KEYWORDS: Hypertrophy, masseter muscle, temporalis muscle, surgical treatment.

1. INTRODUCTION

Benign hypertrophy of masseteric and temporalis muscles is characterized by the overdevelopment of these muscles, leading affected individuals to exhibit a brachycephalic facial pattern¹. Some authors correlate this disorder to congenital or acquired conditions resulting from masticatory hyperactivity². Bilateral hypertrophy of masseteric and temporalis muscles is a rare clinical entity with few cases reported in the literature³, the first of which (a 10-year old children) was described by Legg in 1880. This condition is limited to the masseteric and temporalis muscles and may occur in one or both muscles⁴. It is clinically manifested by a marked enlargement of mandibular angles, whether unilateral or bilateral. Additionally, patients may report pain and functional difficulties, but aesthetic compromise is usually their only complaint².

The diagnosis is mainly clinical, although imaging

tests, such as conventional radiograph, computerized tomography, ultrasound, and magnetic resonance imaging, are crucial to establish differential diagnosis, i.e., to rule out other conditions that may affect the same region, e.g., cysts and tumors⁵. There is a wide range of treatment modalities for benign hypertrophy of masseteric and temporalis muscles, including conservative procedures like botulinum toxin, muscle relaxation, antidepressant therapy, and surgical interventions. These interventions may approach only the affected muscle, only the bone where muscles are attached, or involve a combination of both approaches⁶. This paper reports a case of hypertrophy of masseteric and temporalis muscles that was treated surgically.

2. CASE REPORT

A 21-year-old man presented to the Department of Oral and Maxillofacial Surgery of the hospital complaining of a marked bilateral increase in facial volume. During history taking, the patient was not able to inform the time since symptom onset, but reported that it started some years ago. He had no complaints of pain. Physical examination revealed bilateral increased volume in masseteric and temporalis muscles (Figures 1A and 1C).

Computed tomography showed a bilateral increase in mandibular angle and coronoid process. Ultrasound scans did not reveal pathological processes in facial muscles. Based on clinical and immunological findings, the patient was diagnosed with hypertrophy of masseteric and temporalis muscles.

For the treatment of temporalis hypertrophy, a bilateral incision was made on the posterior buccal surface of the mandible, under general anesthesia, followed by coronoidectomy. For the treatment of the masseteric muscle, a bilateral submandibular approach was used to remove the bone portion of the mandibular angle and to perform

bilateral myotomy of the deep bundle of the masseteric muscle (Figure 2). Subsequently, the surgical site was extensively cleaned and tissue layers were sutured. The removed material (muscle and bone) was sent to histological analysis, which revealed no pathological changes.

Immediately after the procedure, a compressive dressing was applied and oral antibiotics, analgesics, and anti-inflammatory drugs were prescribed. Eighteen months after surgery, the patient has a good health status, showing good mouth opening, no aesthetic complaints, and no signs of recurrence (Figure 1).



Figure 1. A) Preoperative left-side view. B) Post-operative left-side view. C) Preoperative frontal view. D) Postoperative frontal view. E) Preoperative right-side view. F) Postoperative right-side view. G) Preoperative submandibular view. H) Postoperative submandibular view.

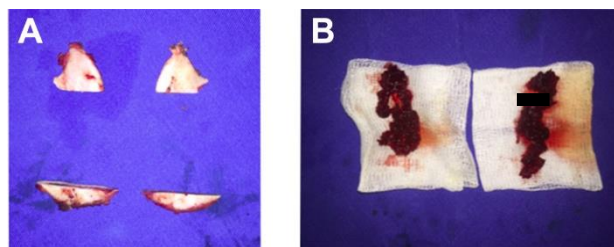


Figure 2. A) Coronoid processes and mandibular angles; B) deep bundle of the masseteric muscle.

3. DISCUSSION

On average, the masseteric muscle has 1,452 motor units and 640 muscle fibers per unit. Thus, a greater neuromuscular demand would exert a gradually stronger force on masseteric muscle fibers, leading to an increase in its cells or fibers⁷. Benign masseteric hypertrophy has been described as a condition of unknown etiology having either asymmetrical or symmetrical characteristics. Increased muscle volume may occur simultaneously with exostosis in the mandibular angle⁸.

The cause of benign masseteric hypertrophy has not been well established yet, but this disorder was found to be associated with some factors, such as psychological disorders, gum chewing, and temporomandibular joint

(TMJ) abnormalities. Some authors believe that most cases of benign masseteric hypertrophy are related to anxiety⁹. González Magaña *et al.* (2012)¹⁰ emphasizes that benign masseteric hypertrophy is a multifactorial disease, being associated with dietary habits, bruxism, TMJ disorders, and changes in dopamine and acetylcholine modulation in nociceptors and neuroreceptors of one or both masseteric muscles. The diagnosis of benign masseteric hypertrophy should not be based exclusively on clinical findings. Computed tomography and magnetic resonance imaging enable a more detailed visualization of soft tissues and of medial and lateral aspects of the masseteric muscle, allowing for the measurement of muscle volume at different portions of the muscle, which may be very useful in surgical planning⁷. According to da Silva (2006)², masseteric hypertrophy may be congenital or acquired due to some bone, dental or bite abnormality leading to a posterior force that, when acting laterally, promotes excessive activity of the temporalis muscle. Temporalis muscle hypertrophy has always been associated with masseteric hypertrophy⁴, causing both of them to share some similarities. Ali *et al.* (2010)¹¹ found that temporalis muscle hypertrophy should be treated with subcutaneous botulinum toxin type A (Dysport) administered bilaterally on temporalis muscles and subsequent follow-up.

In 1977, 17 cases were surgically treated by Beckers (1977)¹² using the intraoral technique, which consisted of removing an internal muscle bundle of the hypertrophied masseteric muscle (from the superior border of the zygomatic arch to the lower angle of the mandible), thus preventing a visible facial scar and reducing the possibility of injuries to the branches of the facial nerve. Currently, the most used method to correct idiopathic masseteric hypertrophy is the intraoral technique through a submandibular Risdon's incision, with the removal of internal vertical muscle bundle representing nearly 2/3 of masseteric muscle thickness⁹.

With regard to the removal of the bone portion, this may be performed using three different techniques: spine/spur resection, buccal cortical resection, or resection of the mandibular angle bicortically throughout its thickness, as shown by Rocha *et al.* (2007)⁵.

4. CONCLUSION

The surgical treatment proposed for this case (removal of the deep layer of the masseteric muscle, removal of the mandibular angle, and coronoidectomy) was effective in curing the disorder, restoring muscle function and facial aesthetics.

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