

Bulky Muscle Mimicking a Tumor?

(A Rare Case Report)

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Abstract:- A rather uncommon pathologic disease in adolescents is masseter muscle unilateral hypertrophy.. Its origin is unknown and because it needs to be distinguished from other masseter-related disorders, it calls for a high level of suspicion. We describe a rare instance of unilateral masseter muscle hypertrophy in a 13-year-old female patient with a painless swelling in the posterior left cheek that led to facial asymmetry and negatively impacted the girl's self-image because there are few pathology studies that explain this condition. Clinical assessment, ultrasonic scanning, sialography, histological testing, and surgical correction of the unilateral masseter muscle hypertrophy were all used to support the diagnosis.

I. INTRODUCTION

The lower face's contour is determined by the mandible's bone structure, which is covered in soft tissue like skin, subcutaneous cell tissue, and masticatory muscles.. These elements can develop abnormally, leading to mental disability, facial asymmetry, and aesthetic issues. A 10-year-old girl was the first person to ever have bilateral hypertrophy of the masseter muscles which is an uncommon pathological condition [3]. Even less common and occasionally problematic in terms of differential diagnosis is unilateral hypertrophy. There are extremely few reports of unilateral hypertrophy in the literature and there are even fewer pathologic investigations that have been published to explain this disease and the causes of muscle hypertrophy. There are extremely few reports of unilateral hypertrophy in the literature, and there are even fewer pathologic investigations that have been published to explain this disease and the causes of muscle hypertrophy⁽³⁾. Although acquired masseter hypertrophy is more common, a congenital variant also exists. Asymmetry is fairly uncommon, but bilateral and symmetric masseter hypertrophy are the norm. Patients with unilateral incidence may also chew or clench primarily on one side. [4,2] The masseter muscle, which is lateral to the mandibular ramus and plays a significant role in face aesthetics, is necessary

for effective mastication. Several patients will have discomfort and undesirable cosmetic effects as a result of a hypertrophied masseter. Inadequate muscle function can also lead to disorders like trismus, protrusion, and bruxism [2]. The pronounced mandibular angle caused by masseter hypertrophy is viewed as being unsightly.

The literature has not yet established an uniform protocol on masseter hypertrophy's management^[2]. For masseter hypertrophy, there are both nonsurgical and surgical therapy options. Idiopathic masseter hypertrophy is treated with psychological counselling, the use of mouth guards, muscle relaxants, anxiolytics, analgesics, physical therapy, dental restorations, and occlusal adjustments to correct premature contacts. Yet surgical treatment is frequently required to enhance dental occlusion because conservative therapy is frequently ineffective, particularly in unilateral cases like ours where surgery was required for cosmetic reasons. Surgery is used to cure the condition. In cases where the bony structure of the mandibular angle has developed, a mandibular osteotomy is carried out in addition to the removal of excessive vertical fibres from the inner third of the hypertrophied muscle. Gurney first talked about surgical treatment in 1947 [10,11]. Gurney first talked about surgical treatment in 1947 [10,11]. The surgical method may be intraoral, extraoral, or a mix of both, depending on whether only the internal portion of the hypertrophied muscle needs to be removed or if bone resection is also required. Martensson used a triangular incision to remove the masseter muscle insertion from a patient who had a history of bruxism and unilateral masseter muscle hypertrophy [12]. When an intraoral approach is used to remove an internal muscle band from the hypertrophied masseter from an upper insertion in the zygomatic arch to a lower insertion in the mandibular arch, there is less risk of damaging facial nerve branches and a visible scar on the patient's face [13].

II. CASE REPORT

A female patient visited the specialised outpatient clinic of "B Maxfac" on December 20th 2022, complaining of the gradual onset, over a period of about 3 years, of a painless swelling in the posterior left cheek, in the area of the masseter muscle, which resulted in facial asymmetry and had an impact on the patient's self-image. The patient was admitted to the hospital for more examinations. Clinical examination revealed that she had facial asymmetry that was considerably more cosmetically offensive when she clenched her teeth.

The patient revealed that she occasionally used chewing gum, chewed on both sides, and had no past history of mental illness, facial injuries, dental issues, or parafunctional activities like bruxism. The area's consistency was normal, homogeneous, painless, and devoid of any abnormalities brought on by dental occlusion, and there was no sign of any local inflammatory symptoms. Initial differential diagnoses included a salivary gland issue, a lymphatic or arteriovenous malformation, a muscle tumour, or a lipoma. Biochemical testing, medical imaging scans, and clinical interdisciplinary investigations (psychological, neurosurgical, dentoalveolar and maxillofacial surgery, and ophthalmological consultation) helped rule out all of these conditions (the results were within the reference range). An ultrasound study of the masseter region showed 13/42mm of hypertrophied muscle. Nuclear magnetic resonance (NMR) suggested the diagnosis of hypertrophy because the left masseter muscle was twice as large as the contralateral muscle; however, muscle morphology and signal strength were normal, and there was no significantly higher contrast agent uptake on the impaired side compared to the normal side. There are no further intracranial or bone problems.

Under general anaesthesia, an intraoral approach was used for the procedure, and the vestibular incision was placed in the third molar region and extended to the anterior border of the ramus for aesthetic purposes and to lessen the risk of damaging facial nerve branches. The antero-internal portion of the hypertrophied masseter muscle was highlighted, and extra muscle tissue was removed. The benign nature of the illness was explained to the patient. The patient acknowledged satisfaction with the clinical component at the 14-day follow-up. There are no known functional losses.

III. DISCUSSION

Unilateral masseter muscle hypertrophy in children is a fairly rare pathologic disease. Because it must be separated from other masseter-related illnesses, its origin is unknown, and it warrants a high degree of suspicion. Medical imaging may assist in making the diagnosis, whereas pathological testing provides important information and aids in identifying the etiological cause. When a treatment plan is being developed, the patient's expectations and physical findings should be carefully taken into account.

This article describes a rare instance of unilateral masseter muscle hypertrophy without any other accompanying conditions that required surgery for both cosmetic and psychological reasons. At the follow-up, her postoperative development was positive. Being more bilateral than unilateral, the syndrome is a rare pathological entity, and it is unusual for it to arise in adolescence. 4% of the 90 patients in the study by Riefkohl et al. were younger than 10 years old, 3% were older than 40, and the remaining patients had a mean age of 30 years [15]. In 2019, Antunes et al. presented a similar case on a female adolescent 15-year old, but the treatment, evolution, or pathological examination were not specified in the report [16]. Trujillo et al. reported a similar case in 2002 of a 16-year-old boy; the main concern of his grandmother was that the swelling could be a malignant tumour; the aesthetic factor was not as important to them, so the patient was referred for relaxation therapy and no surgical intervention was indicated; the authors do not mention how the patient recovered. Another case report is from 2016, but she did not receive any medical or surgical treatment [5].

When the patient clenches his or her teeth so the masseter muscle is more visible during contraction, the diagnosis may be made clinically by palpating the muscle with the fingers. 6. The masseter muscles are most frequently injured; they can be up to three times bigger than the muscles on the opposite side. Periosteal appositions may arise and be apparent on the lower branch of the jaw on the affected side, but these were not found in the case reported here. At imaging, they appear normal without increased contrast. It's crucial to identify masseteric hypertrophy as soon as possible so that the patient's parents and they are aware of the likelihood of facial asymmetry developing.

The histological analysis of the afflicted muscle establishes a favourable diagnosis of hypertrophy. According to Katsetos et al.'s 2014 statement that "Muscle biopsy is key in the diagnosis of reactive masticatory muscle hypertrophy and its distinction from masticatory muscle myopathy (hypertrophic branchial myopathy) and other non-reactive causes of painful asymmetric temporalis muscle enlargement" [17], the author's team underwent a thorough pathological examination of the affected temporalis muscle and found histochemical evidence of muscle hypertrophy with. Nevertheless, some patients receive symptomatic care rather than a muscle biopsy for a variety of reasons [18,19]. Histological analysis of tissue from patients with masseter muscle hypertrophy in earlier studies revealed significant hypertrophy with an increase in muscle fibre diameter of more than two to three times that of normal muscle fibres [20,21]. The Trujillo et al. comment that "microscopic examination of the removed muscle tissue usually shows normal muscle fibres without changes in length, thickness, or nuclear structure" is slightly contradicted by these data, however they are consistent with what we discovered in our case report. In our case, biological tests and medical imaging scanning helped rule out other illnesses, but anatomopathological techniques helped establish the precise diagnosis. Pathological investigations are required since the definitive diagnosis is much harder to make in unilateral cases.

Since there is no established procedure for the therapy of masseter muscle hypertrophy in the literature, our patient received three years of conservative care without any success. For a superior cosmetic result, the procedure was then carried out by an extraoral technique with intradermal sutures. Surgery can include some hazards, including damage to the facial or mandibular nerves, bleeding from the masseter artery, bone lesions, infections, postoperative trismus, restricted mouth opening, and effects of general anaesthesia [14,22]. Although careful monitoring is necessary since this illness can reappear, no case of relapse following surgical treatment has been documented in the literature (unlike with botulinum toxin therapy).5. Conclusions

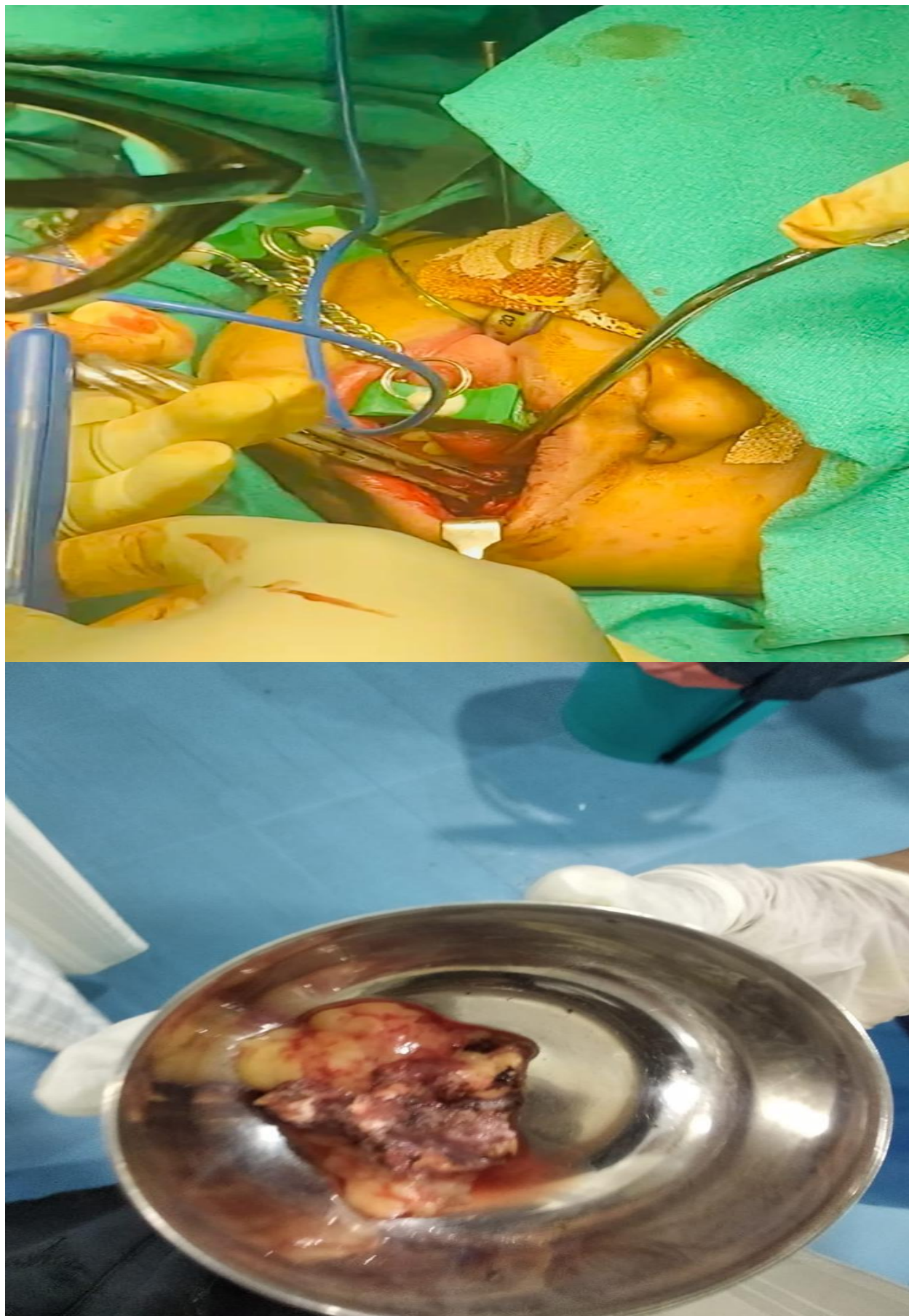
Debulking the muscle is one of the finest therapeutic options for unilateral masseter muscle hypertrophy, and bone recontouring is an option in cases where there are bony prominences. The defect should be properly corrected without going too far. Mild occurrences of muscle hypertrophy can also be treated with a botulinum toxin injection.

REFERENCES

- [1.] Elena Țarcă,¹ Elena Cojocaru,^{2*} Alina Costina Luca,³ Laura Mihaela Trandafir,³ Solange Tamara Roșu,⁴ Valentin Munteanu,⁵ Viorel Țarcă,⁶ Cristian Constantin Budacu,^{7*} and Claudia Florida Costea⁸ Unusual Case of Masseter Muscle Hypertrophy in Adolescence—Case Report and Literature Overview 2022 Feb; 12(2): 505.
- [2.] Lee H.J., Jung S.J., Kim S.T., Kim H.J. Ultrasonographic Considerations for Safe and Efficient Botulinum Neurotoxin Injection in Masseteric Hypertrophy. *Toxins*. 2021;13:28. doi: 10.3390/toxins13010028.
- [3.] Legg J.W. Enlargement of the temporal and masseter muscles, of both sides. *Trans Pathol. Soc.* 1880;3:361–366.
- [4.] Sannomiya M. Masseter muscle hypertrophy—Case report. *Braz. Dent. J.* 2006;17:347–350. doi: 10.1590/S0103-64402006000400015
- [5.] Kamble V., Mitra K. A Rare Association of Bilateral and Unilateral Masseter Hypertrophy with Hypertrophy of Pterygoids. *J. Clin. Diagn. Res.* 2016;10:TJ3–TJ4. doi: 10.7860/JCDR/2016/16102.7187.
- [6.] Shetty N., Malaviya R.K., Gupta M.K. Management of unilateral masseter hypertrophy and hypertrophic scar—A case report. *Case Rep. Dent.* 2012;2012:521427. doi: 10.1155/2012/521427.
- [7.] Guruprasad R., Rishi S., Nair P.P., Thomas S. Masseter and medial pterygoid muscle hypertrophy. *BMJ Case Rep.* 2011;2011:bcr0720114557.
- [8.] Harriman D.G. The histochemistry of reactive masticatory muscle hypertrophy. *Muscle Nerve.* 1996;19:447–456. doi: 10.1002/(SICI)1097-4598(199611)19:11<1447::AID-MUS9>3.0.CO;2-C.
- [9.] Trujillo R., Jr., Fontão F.N., de Sousa S.M. Unilateral masseter muscle hypertrophy: A case report. *Quintessence Int.* 2002;33:776–779.
- [10.] Gurney C.E. Chronic bilateral benign hypertrophy of the masseter. *Ann. J. Surg.* 1947;73:137–139. doi: 10.1016/0002-9610(47)90304-8.
- [11.] Trento G.D.S., Benato L.S., Rebellato N.L.B., Kluppel L.E. Surgical resolution of bilateral hypertrophy of masseter muscle through intraoral approach. *J. Craniofac. Surg.* 2017;28:400–402. doi: 10.1097/SCS.0000000000003779.
- [12.] Martensson G. Hypertrophy of the masseter muscle. *Acta Otolaryngol.* 1989;50:526–530. doi: 10.3109/00016485909129228.
- [13.] Beckers H.L. Masseteric muscle hypertrophy and its intraoral surgical correction. *J. Maxillofac. Surg.* 1977;5:28–35. doi: 10.1016/S0301-0503(77)80072-6.
- [14.] Obwegeser H.L. *Mandibular Growth Anomalies*. Springer; Berlin/Heidelberg, Germany: 2001. Masseter muscle hypertrophy and bony surplus; pp. 425–431. Terminology—Aetiology Diagnosis—Treatment.
- [15.] Riefkohl R., Georgiade G.S., Georgiade N.G. Masseter muscle hypertrophy. *Ann. Plast. Surg.* 1984;12:528–532. doi: 10.1097/0000637-198406000-00007.
- [16.] Antunes J.J., Almeida S.A., Monteiro R.M.P.C., Martins A.M. Idiopathic masseter muscle hypertrophy: A case report. *Einstein.* 2019;17:eAI4506. doi: 10.31744/einstein_journal/2019AI4506.
- [17.] Katsetos C.D., Bianchi M.A., Jaffery F., Koutzaki S., Zarella M., Slater R. Painful unilateral temporalis muscle enlargement: Reactive masticatory muscle hypertrophy. *Head Neck Pathol.* 2014;8:187–193. doi: 10.1007/s12105-013-0480-x.
- [18.] Vordenbäumen S., Groiss S.J., Dihné M. Isolated unilateral temporal muscle hypertrophy: A rare cause of hemicranial headache. *Headache.* 2009;49:779–782. doi: 10.1111/j.1526-4610.2009.01393.x
- [19.] Ranasinghe J.C., Wickramasinghe C., Rodrigo G. Isolated unilateral temporalis muscle hypertrophy in a child: A case report with literature review. *BMC Pediatr.* 2018;18:71. doi: 10.1186/s12887-018-1061-7.
- [20.] Guggenheim. P., Cohen L.B. The histopathology of masseteric hypertrophy. *AMA Arch. Otolaryngol.* 1960;71:906–912. doi: 10.1001/archotol.1960.03770060018002
- [21.] Tsuneki M., Maruyama S., Yamazaki M., Niimi K., Kobayashi T., Nishiyama H., Hayashi T., Tanuma J.I. Masseter muscle hypertrophy: A case report. *J. Oral Maxillofac. Surg. Med. Pathol.* 2019;31:428–431. doi: 10.1016/j.ajoms.2019.08.005
- [22.] Kim J.-H., Lim S.-U., Jin K.-S., Lee H., Han Y.-S. The postoperative trismus, nerve injury and secondary angle formation after partial masseter muscle resection combined with mandibular angle reduction: A case report. *J. Korean Assoc. Oral Maxillofac. Surg.* 2017;43:46–48. doi: 10.5125/jkaoms.2017.43.1.46.



Picture 1: Preoperative photograph of unilateral masseter hypertrophy



Picture 2 and 3: Intraoperative photograph of masseter debulking



Picture 4: Postoperative picture of 14th day followup