



A Rare Case of Unilateral Masseter Muscle Hypertrophy: A Case Report and Review of Literature

Dr. Sujeet Agrawal¹, Dr. Sushil Panbude², Dr. B. R. Singh³

1. Director and Consultant Radiologist, Shri Shyam Diagnostic, Ambikapur, Chhattisgarh, India
2. Junior Consultant, Department of Radiology, National Cancer Institute, Nagpur, India
3. Professor and HOD, Department of ENT, RSDKS Government Medical College, Ambikapur, Chhattisgarh, India

Corresponding Author: Dr. Sujeet Agrawal, Director and Consultant Radiologist, Shri Shyam Diagnostic, Ambikapur, Chhattisgarh, India.

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Abstract

Masseter muscle hypertrophy is an uncommon benign condition and can occur unilaterally or bilaterally. Most patients consult clinician for cosmetic reasons, but patients may have symptom of pain. In many cases, etiology remains unclear, however, it may be related to mandibular disorder (like exostoses), malocclusion, bruxism, clenching, unilateral masticator activity, pathology of temporomandibular joint or emotional alterations. Clinical and radiographic findings help in diagnosis and it is important to exclude other more serious pathologies tumors and inflammatory pathologies of muscles, bones and salivary glands. In this case report, we report a rare case of unilateral masseter muscle hypertrophy in a patient initially suspected of parotitis.

Keywords: Masseter muscle hypertrophy, cosmetic, eating habit, Botulinum toxin type A

Introduction

A 19-year-old male patient presented to ENT OPD with history of painless swelling on right side of cheek since 6 months. Since the patient belonged to remote area where diagnostic facilities are scarce, he was initially suspected for parotitis and received treatment for the same. However, it did not resolve. On clinical examination, there was soft non tender swelling in right mandibular region causing facial asymmetry. (Fig. 1) He had no history of trauma, constitutional symptoms or periodontal disease. Laboratory investigations reveals no significant alterations, negative inflammatory parameters and with negative viral serology. However, he had eating habit of preferential eating from right side. Hence, he was referred to our diagnostic center for imaging. On ultrasound examination, right masseter muscle was enlarged and showed no significantly increased internal vascularity. (Fig. 2) Right parotid gland was normal. CT scan was done to rule out any pathologies of mandible or dentures. CT scan also revealed asymmetrically enlarged right masseter muscle as compared to left, with maximum muscle thickness of 18 mm and length of 6.1 cms. Right parotid gland was normal. Underlying mandible showed normal morphology with normal anatomy of right temporo-mandibular joint. Dentures were also normal. (Fig. 3 & 4) Ultrasound and CT scan did not reveals any malignant or inflammatory pathologies on underlying muscles, bones or salivary glands. Hence when clinical history was carefully evaluated, patient revealed history of preferential eating from right side since childhood as well as history of bruxism and was the cause of right masseter muscle hypertrophy in our patient which resulted in facial asymmetry. Patient was counseled about the condition and referred back to ENT surgeon for further treatment.



Fig 1 – Image showing asymmetric swelling in right mandibular region

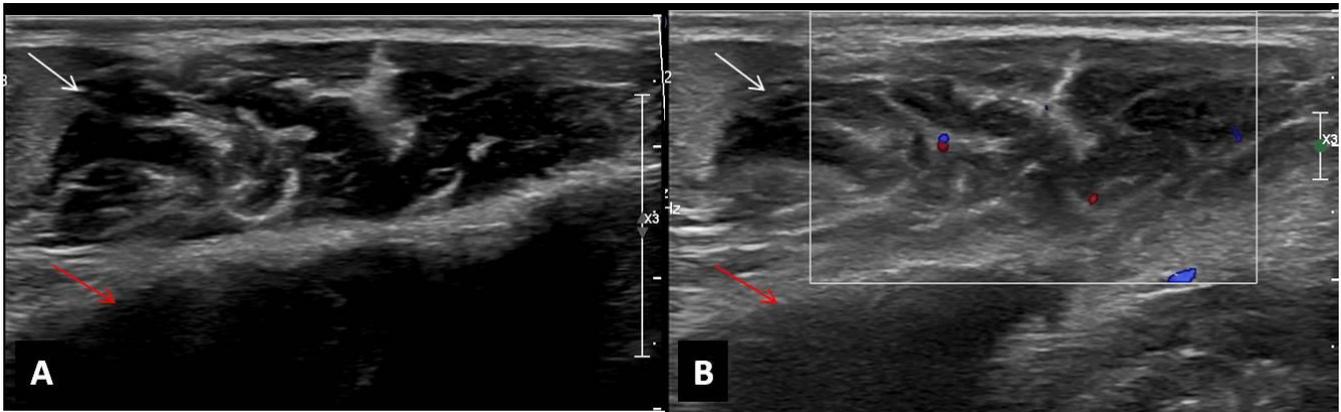


Fig. 2 – Ultrasound images show enlarged right masseter muscle with no significantly enlarged internal vascularity (white arrows in A and B). Red arrow shows mandible.

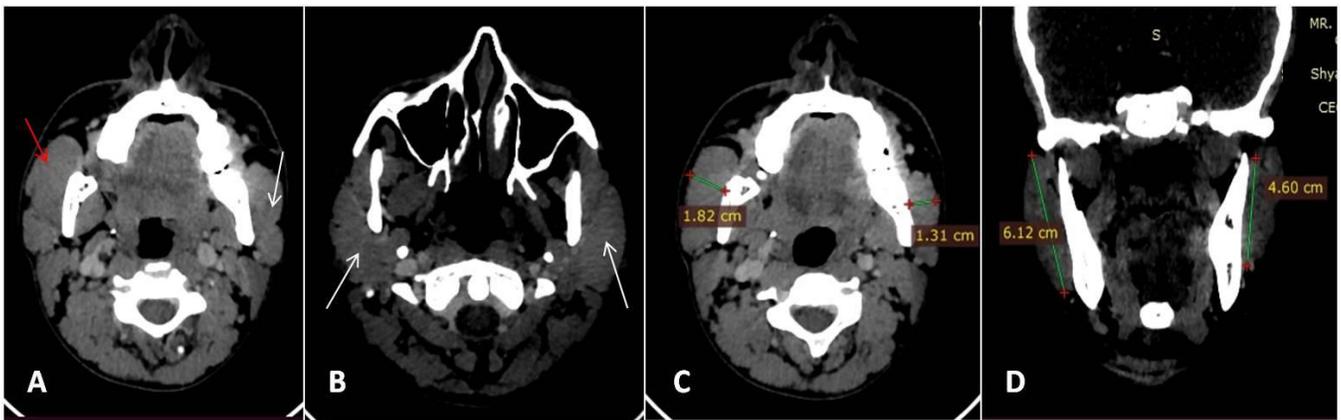


Fig. 3 –(A) Axial contrast enhanced CT (CECT) scan at the level of masseter muscles shows enlarged right masseter muscle (red arrow) as compared to left (white arrow), (B) CECT at the level of parotid gland shows normal both parotid glands (white arrows).

Figures C and D shows maximum thickness (C) and craniocaudal length (D) of bilateral masseter muscles.

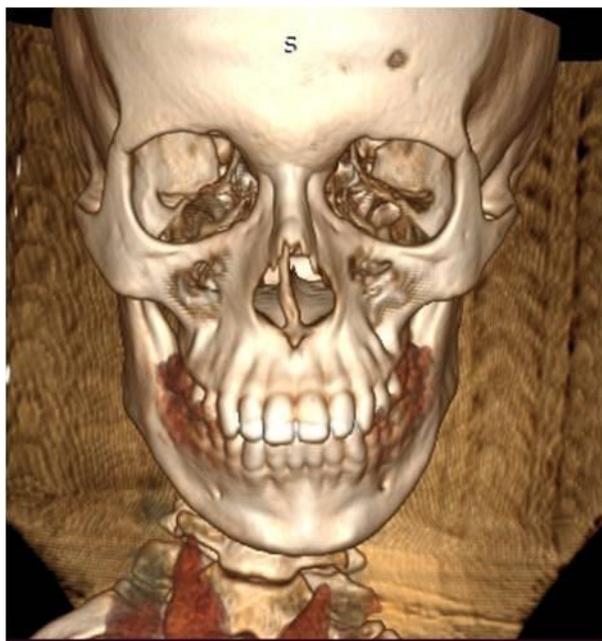


Fig. 4 – 3D reformatted images of CT scan shows normal mandible and dentures

Discussion

Masseter is a thick quadrate muscle of mastication arising from zygomatic arch and inserting into the inferior lateral aspect and angle area of mandibular ramus. Its helps in elevation and protrusion of the mandible and also plays an important role in facial esthetics.(1) Masseter muscle hypertrophy is a benign, unilateral or bilateral enlargement of masseter muscle which results from work hypertrophy as in clenching, bruxing or heavy gum chewing. It may also be related to mandibular disorder (like exostoses), malocclusion, pathology of temporomandibular joint or emotional alterations (stress, nervousness). However, in many cases, etiology remains unclear.(2)(3) It is most commonly seen in late adolescent and early adulthood and frequently seen in people of asian descent.

Masseter muscle thickness in male ranges from 9.6 to 13.1 mm, while in females it from 7.3 to 11.1 mm. (4) (5) Out patient had maximum right masseter muscle thickness of 18 mm. Since most thickness of masseter muscle is seen along the inferior mandibular ramus where facial contour tapers. Masseteric muscle hypertrophy results in characteristic rectangular configuration of face as seen in our case (Fig. 1). (6)

Emphasis should be given on the differential diagnosis of the unilateral right mandibular swelling since several malignancies also present with unilateral mandibular swelling. Masseter muscle hypertrophy usually has long duration and muscle contraction can be felt with forceful biting. It is felt as a smooth uniform swelling in contrast to irregular nodular neoplastic lesions. Imaging plays an important in

confirming the diagnosis of masseter muscle hypertrophy and ruling out malignant or inflammatory pathologies of underlying muscles, bones or salivary glands. Final diagnosis is based on clinical features, medical history and imaging features.

Once the diagnosis of unilateral masseter muscle hypertrophy is established, most common reason to seek treatment is aesthetic. There are several treatment options available ranging from conservative non-surgical approach to invasive surgeries. Management of the idiopathic masseter muscle hypertrophy is based on psychological counseling, use of mouth guards, muscle relaxant, analgesics or anxiolytic drugs, physical therapy, dental restorations, and occlusal adjustments to correct premature contacts. Isolated clinical therapy may achieve good results in patients with mild hypertrophy of masseter muscle, but there is no reliable report on the literature on the success rates of isolated clinical therapy. (7) In our case, cause of masseter muscle hypertrophy on right side was eating habit of preferential eating from right side and bruxism. So, he was counseled and advised to eat from other side and to stop unnecessary bruxism. After 1 month, there was some improvement with mild decrease in muscle hypertrophy.

Injection of botulinum toxin type A into the masseter muscle is a less invasive, safe and effective modality for treatment of masseter muscle hypertrophy and has been advocated for cosmetic sculpting of the lower face. Botulinum toxin type A is a powerful neurotoxin produced by anaerobic organism *Clostridium Botulinum* which when injected in muscle caused interference with the neurotransmitter mechanism resulting in selective paralysis and subsequent atrophy of the muscle. However, disadvantage of botulinum toxin type A is that the treatment effect wears away and reverts to original condition in 6 months. (7)(8)

Partial surgical excision of masseter muscle is a traditional method for treatment of masseter muscle hypertrophy. There are two approaches – intraoral and extraoral and in both approaches, excessive muscle fibers from inner third of the vertical fibers of masseter muscle are removed. In case of bony hyperplasia of the mandibular angle, reduction osteoplasty is performed. Remaining external fibers of the masseter muscle are then attached to mandibular periosteum to allow for the functional recovery. Complications of surgical excision include hematoma formation, facial nerve paralysis, infection, mouth opening limitation and risk from general anesthesia.(7)(9)

In conclusion, masseter muscle hypertrophy is an uncommon benign enlargement of masseter muscle. It is frequently confused with malignant and inflammatory pathologies of underlying muscles, bones and salivary glands. History, clinical features and imaging plays an important role in diagnosis of masseter muscle hypertrophy which can be treated with surgical and non surgical management.

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