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Case Report

Dentistry Section

# Surgical Correction of Unilateral Masseteric Hypertrophy with Mandibular Angle Overgrowth in an Adolescent by Mandibular Angle Ostectomy and Masseter Myectomy: A Case Report

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## ABSTRACT

Unilateral masseter hypertrophy and mandibular angle overgrowth is a very rare condition that causes marked facial asymmetry, especially when it occurs in adolescents. The deformity is caused by the prominence of muscle mass and the bony prominence of the gonial angle. It may sometimes cause aesthetic concerns and mild functional problems, such as discomfort in mastication. Although botulinum toxin injection can provide temporary relief for unilateral masseter hypertrophy, it does not correct the bony prominence and therefore requires surgical correction. This case report is about a 15-year-old male who presented with progressive left-sided facial asymmetry because of prominent mandibular angle and hypertrophic masseter muscle. Clinical evaluation showed unilateral prominence of the left mandibular angle, which was more prominent on clenching, with hypertrophy of the masseter muscle. Radiographic analysis, which included Orthopantomogram (OPG) and Posteroanterior (PA) skull view showed prominence and asymmetry of the left mandibular angle, which was suggestive of overgrowth. There was no history of trauma, systemic disease, parafunctional habits, or previous treatment. The surgical procedure was performed under general anaesthesia through an extraoral approach, with mandibular angle ostectomy and masseter myectomy. The postoperative course was uneventful, with resolution of oedema over time showing improvement in facial symmetry, streamlined gonial contours, and harmony without complications. The surgical approach resulted in satisfactory early aesthetic and functional improvement by addressing both the osseous and muscular components of the deformity. At 1-month follow-up, improved facial symmetry and mandibular contour were observed without postoperative complications.


**Keywords:** Facial asymmetry hypertrophy, Masseter muscle, Masticatory muscles osteotomy

## CASE REPORT

A 15-year-old male patient, reported to the in-patient department of Oral and Maxillofacial Surgery with a chief complaint of progressive facial asymmetry, primarily due to a prominent lower jaw on the left-side. The patient had been noticing gradual enlargement of the left-side of his lower face over the past few years, which had recently become more evident, resulting in aesthetic concerns and mild functional discomfort during chewing, which had recently become more apparent. The progression had been slow and insidious over the years, and the patient had not sought any treatment or consultation for this condition from other healthcare providers prior to their presentation to the department.

There was no relevant history of trauma, systemic disease, or previous surgical intervention. There was no significant medical or dental history, including chronic diseases, allergies, medications, previous dental treatments, or discrepancies in occlusion. The patient denied any significant personal history, including tobacco chewing and alcohol use, and any parafunctional habits like bruxism, teeth clenching, gum chewing, or other repetitive jaw movements. However, the patient did have a habit of preferential chewing mainly on the left-side, which may have contributed to the unilateral muscular and skeletal difference noticed.

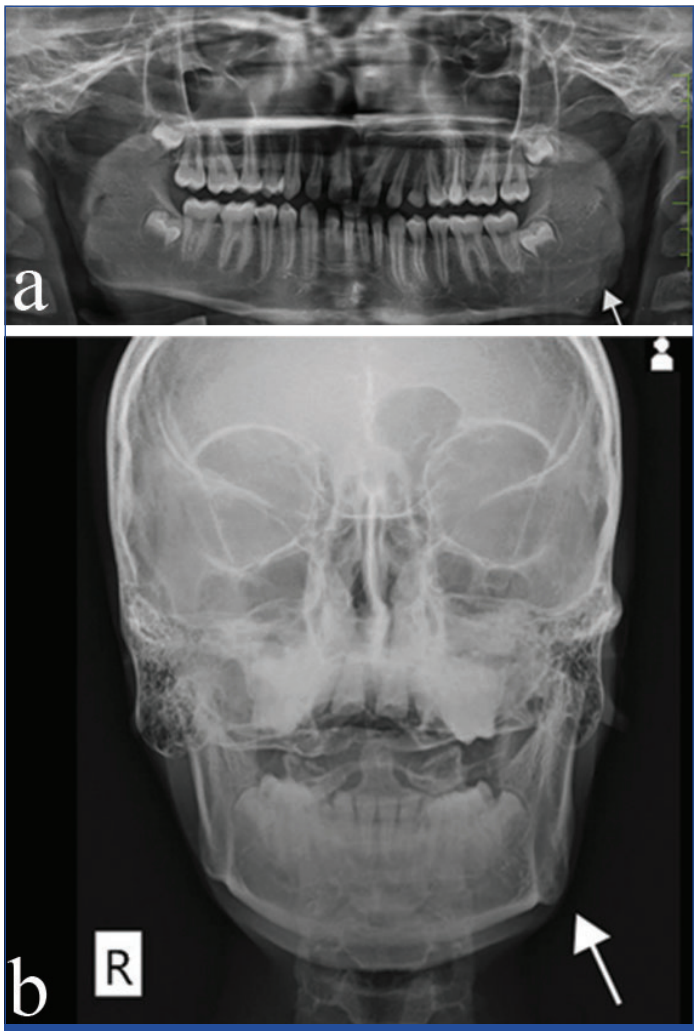
On clinical examination, facial asymmetry was clearly visible, with a disproportionate bulge over the left mandibular angle region. On palpation, the masseter was non-tender but hypertrophic, indicating underlying muscular and skeletal overdevelopment. A soft to firm swelling was noted unilaterally over the left mandibular body, near the angle region, which became more pronounced upon jaw clenching. Palpation of the left masseter muscle revealed an increase in bulk, particularly in its lower portion. The left masseter appeared significantly thicker compared to the right side. There was a noticeable bony outgrowth and accentuation of the mandibular angle contour [Table/Fig-1] (Pre-operative photographs). No deformity was evident intraorally.




**[Table/Fig-1]:** Pre-operative photographs: (a) Frontal view; (b) Three Quarter's view; (c) Worms view.

The differential diagnoses, which were considered after clinical examination, were parotid tumours/sialadenitis, lipoma, muscle tumours, vascular lesions, odontogenic infection, and hemifacial hyperplasia. These were excluded due to the gradual painless onset, non-tender firm swelling accentuating on clenching, absence of salivary/lymph node abnormalities, normal intraoral examination.

To evaluate the extent of bony and soft-tissue involvement, preoperative radiographic investigations were performed. An OPG revealed an enlarged and downwardly extended mandibular angle on the left-side with increased bone mass compared to the contralateral side. A skull PA view further confirmed unilateral mandibular enlargement consistent with mandibular angle overgrowth, showing marked asymmetry in the lower third of the facial skeleton. These imaging findings helped to rule out other differential diagnosis and further supported the diagnosis of unilateral mandibular angle overgrowth [Table/Fig-2] (Preoperative radiographs).




**[Table/Fig-2]:** Preoperative radiographs: (a) OPG; (b) Skull PA view.

Based on clinical and radiological correlation, a final diagnosis of masseteric hypertrophy with mandibular angle overgrowth of the left-side was established [Table/Fig-1] (Preop Radiographs). The patient was scheduled for surgical correction involving masseter muscle myectomy and mandibular angle ostectomy under general anaesthesia to achieve facial symmetry and address the functional and cosmetic concerns.

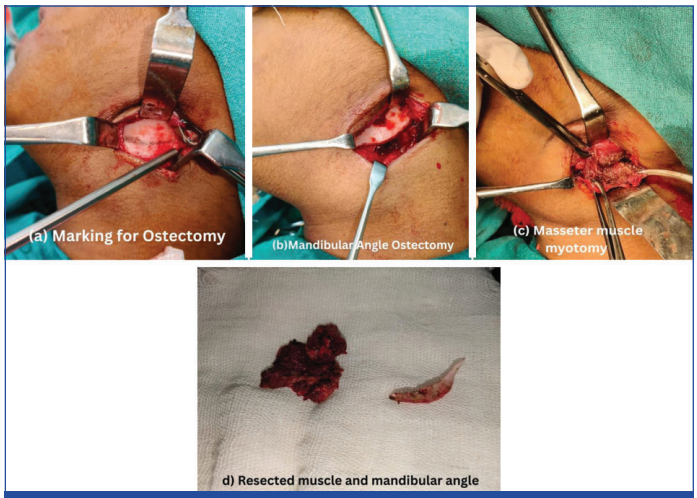
Based on the classification proposed by Kim SK et al., the patient fits into Class III deformity, which is characterised by a square-shaped mandibular angle with severe masseteric hypertrophy. This class typically requires mandibular angle ostectomy combined with masseter muscle myectomy for optimal aesthetic and functional results [1]. Accordingly, a masseter muscle myectomy and mandibular angle ostectomy were planned under general anaesthesia to correct the asymmetry and achieve facial balance.

Written informed consent for surgical treatment and publication, including clinical photographs, was obtained from the patient's legal guardian (mother), as the patient was a minor (15-year-old). Under general anaesthesia with nasotracheal intubation, the patient was prepared and draped using standard aseptic protocols. An extraoral periangular approach was employed: a 4-5 cm incision was made approximately 1-2 cm below the mandibular border in a natural skin crease to minimise visible scarring. The platysma muscle was divided, and blunt dissection was used to expose the masseter muscle and lateral surface of the mandibular angle while protecting the marginal mandibular branch of the facial nerve.

The hypertrophic masseter muscle was identified and partially released from its mandibular attachment. Through the same extraoral exposure, the excess mandibular angle was marked based on preoperative radiographic evaluation (OPG and PA skull views). Ostectomy was performed using a oscillating saw to resect the hypertrophic bony segment (approximately 1-1.5 cm of downwardly extended angle), followed by contouring and smoothing of the bone margins with rotary burs to achieve a harmonious, symmetric gonial contour without sharp edges.

Partial myectomy of the hypertrophic masseter muscle was then carried out by resecting the inferoposterior hypertrophic fibers (approximately 30-40% of the lower bulk) using electrocautery and sharp dissection, preserving the superior main muscle belly and neurovascular structures to maintain masticatory function.

Haemostasis was meticulously achieved with bipolar electrocautery and bone wax as required. The surgical site was irrigated copiously, and layered closure was completed (platysma with 3-0 vicryl sutures, skin with 4-0 ethilon subcuticular sutures). A Minivac drain was placed at angle region, and a pressure dressing was applied to reduce postoperative oedema and haematoma risk. The procedure was uneventful, with an approximate operative time of 90 minutes [Table/Fig-3] (Intraoperative photographs).




**[Table/Fig-3]:** Intraoperative photographs: (a) Marking for ostectomy; (b) Mandibular angle ostectomy; (c) Masseter muscle myectomy; (d) Resected muscle and mandibular angle.

On postoperative day 7th, the patient exhibited satisfactory healing with no evidence of haematoma, infection, or wound dehiscence. Mild postoperative oedema was present, as expected, which limited the immediate assessment of surgical outcomes [Table/Fig-4] (Postoperative photographs).




**[Table/Fig-4]:** Postoperative photographs: (a) Frontal; (b) Three quarter profile.

Post-op OPG demonstrates successful ostectomy, with visible reduction of the mandibular angle contour on the left-side. The bony outline was more streamlined and symmetric in comparison to the contralateral right-side. Ostectomy margins appeared to be smooth, and the overall bony contour is significantly improved [Table/Fig-5] (Post-op radiograpgh).



**[Table/Fig-5]:** Post-op radiograpgh (OPG).

On subsequent follow-up, after one month, the patient demonstrated a significant reduction in postoperative facial oedema, allowing for clearer assessment of surgical outcomes. The contour of the lower face appeared more balanced, with a marked and well-defined reduction in the left gonial angle. Symmetry between both sides of the mandible had noticeably improved, enhancing overall facial harmony. Healing was satisfactory, with no evidence of complications, and the aesthetic objectives of the procedure were evidently being met [Table/Fig-6] (Follow-up photographs).




**[Table/Fig-6]:** Follow-up photographs: (a) Frontal profile; (b) Three quarter profile.

## DISCUSSION

Masseter Muscle Hypertrophy (MMH) is an uncommon condition characterised by unilateral or bilateral enlargement of the masseter muscle, typically presenting with lower facial fullness and facial asymmetry. The condition is generally considered idiopathic; however, contributing factors such as bruxism, clenching, unilateral mastication, and temporomandibular disorders have been implicated in its development [2-4]. These factors may lead to increased functional load and adaptive hypertrophy of muscle fibres over time [3,4].

Patients most commonly present with aesthetic concerns, although mild functional symptoms such as discomfort during mastication or muscle fatigue may also be reported [2,5]. In adolescent patients, early recognition is important because continued craniofacial growth may exacerbate asymmetry and influence long-term treatment outcomes [5,6].

Diagnosis is primarily clinical and should be supported by imaging to exclude other conditions such as salivary gland pathology, neoplasms, or vascular malformations [2,5]. Conventional imaging such as OPG aids in identifying mandibular angle prominence, while advanced modalities including Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) provide detailed assessment of skeletal and soft-tissue components [5]. Ultrasonography has also been demonstrated as a reliable, non-invasive, and cost-effective modality for evaluating masseter muscle thickness and monitoring treatment outcomes [7].

Management of MMH includes both conservative and interventional approaches. Behavioural modification may help reduce contributing factors but is insufficient to reverse established hypertrophy [2,3]. Botulinum toxin type A (BoNT-A) has gained widespread acceptance as a minimally invasive treatment modality, acting by inhibiting acetylcholine release at the neuromuscular junction, thereby inducing temporary muscle atrophy [3,8]. Clinical studies have demonstrated a significant reduction in masseter muscle thickness and improvement in facial contour following BoNT-A injections [3,8]. However, these effects are temporary, typically lasting several months, necessitating repeated treatments [8].

With regard to skeletal effects, current evidence suggests that while BoNT-A reliably induces muscle atrophy, its influence on mandibular bone morphology remains variable and inconsistent, particularly with respect to long-term structural changes [9]. Therefore, its role is limited in cases where skeletal deformity significantly contributes to facial asymmetry.

In cases involving both muscular hypertrophy and mandibular angle prominence, surgical management remains the definitive treatment. Contemporary literature supports that combined correction of both soft-tissue and osseous components yields superior and long-lasting aesthetic outcomes [10]. Mandibular angle ostectomy effectively addresses the bony prominence, while partial masseter myectomy reduces muscle bulk and helps minimise recurrence [11].

Surgical approaches may be performed via intraoral or extraoral routes. The intraoral approach avoids visible scarring but may offer limited surgical access, whereas the extraoral approach provides improved visualisation of the mandibular angle at the expense of a visible scar and potential risk to the marginal mandibular branch of the facial nerve [12]. Careful surgical planning and technique are essential to minimise complications such as nerve injury, haematoma, infection, and postoperative trismus.

Non-surgical and surgical modalities differ significantly in their indications and long-term outcomes. BoNT-A offers a minimally invasive option with low morbidity but requires repeated administration, whereas surgical intervention provides a permanent solution, particularly in patients with significant skeletal involvement [12]. Thus, treatment planning should be individualised based on the severity of deformity, patient expectations, and the relative contribution of muscular and skeletal components.

The present case is notable due to unilateral involvement in an adolescent patient, which is relatively uncommon. Recent literature emphasises the importance of long-term follow-up in such cases, as ongoing craniofacial growth may influence postoperative stability and symmetry.

Postoperative outcomes following surgical correction are generally favourable, with significant improvement in facial symmetry and high patient satisfaction. However, long-term prospective data- particularly in adolescent populations- remain limited, highlighting the need for further research and follow-up studies.

## CONCLUSION(S)

The MMH associated with mandibular angle prominence presents a unique clinical entity requiring careful evaluation. While botulinum toxin type A offers an effective minimally invasive option for temporary muscle reduction, surgical management remains the definitive treatment in cases with significant skeletal involvement. A comprehensive, individualised treatment approach is essential to achieve optimal aesthetic and functional outcomes, especially in adolescent patients.

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