Austin Surgery Case Reports

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Case Report

An Unusual Case of Severe Permanent Jaw Constriction after Craniotomy: A Case Report

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Received: August 29, 2025

Accepted: September 12, 2025

Published: September 16, 2025

Abstract

Permanent jaw constriction is a rare and disabling condition usually associated with temporomandibular joint ankylosis. Extra-articular causes, particularly heterotopic ossification following hematoma, are exceptional and seldom reported. We present the case of a 45-year-old patient with severe chronic trismus that developed one month after temporal craniotomy for craniopharyngioma. Imaging revealed extensive calcified ossification extending from the mandibular ramus, consistent with post-hematoma ossification of the temporalis tendon. A combined endobuccal and pretragal surgical approach allowed an excision of the calcified mass, achieving 3.5 cm intraoperative mouth opening. Postoperative management included early physiotherapy, and a structured rehabilitation program. At 7 months follow-up, mouth opening remained stable at 3.5 cm, demonstrating the effectiveness of combined surgery and long-term rehabilitation.

keywords: Permanent jaw constriction; Heterotopic ossification; TRismus; Combined surgical approach; Mandibular rehabilitation

Introduction

Permanent jaw constrictions are often caused by articular or muscular issues. However, extra-articular causes, such as ossification following hematoma, may be encountered. This phenomenon, rarely reported, is described here in a patient who underwent surgery for a brain tumor two years earlier via the temporal approach and later developed mandibular constriction secondary to a calcified hematoma.

Case Presentation

A 45-year-old patient presented with a chronic limitation of mouth opening of less than 0.5 cm. The patient had undergone craniopharyngioma surgery via temporal craniotomy 2 years earlier. One month later, he began noticing progressive limitation in mouth opening.

Clinical examination revealed a preauricular painless and hard swelling on the right side.

Oral examination showed significant dental defects, with limited mouth opening to 0.3 cm and no associated dental articulation issues (Figure 1).

The patient underwent a CT scan, which revealed extensive bone formation from the medial side of the right mandibular ramus to the lateral part of the right sphenoid wing, following the path of the right temporal muscle tendon, likely related to postoperative heterotopic ossification: myositis ossificans of the right temporalis tendon (Figure 2).

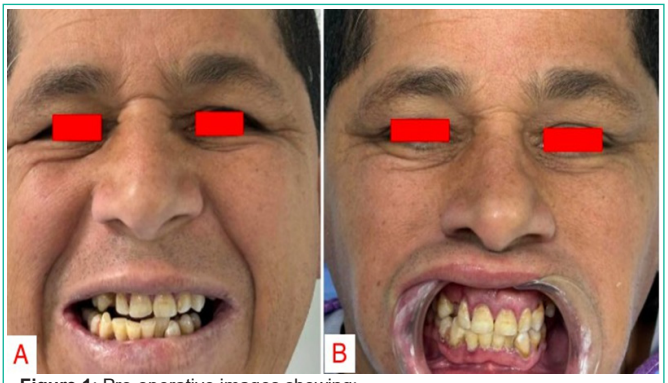

Figure 1: Pre-operative images showing:
A: Mouth opening limited to less than 0.5 cm; **B:** Patient's dental articulation.

Figure 2: Coronal (A) and Axial (B) sections of the Maxillofacial CT scan showing extensive bone formation from the medial side of the right mandibular ramus to the lateral part of the right sphenoid wing.

Citation: Boukhlouf O, El Azzouzi R, Elkadiri S, Benwadih S, Touarsa F. An Unusual Case of Severe Permanent Jaw Constriction after Craniotomy: A Case Report.Austin Surg Case Rep. 2025; 10(1): 1067.

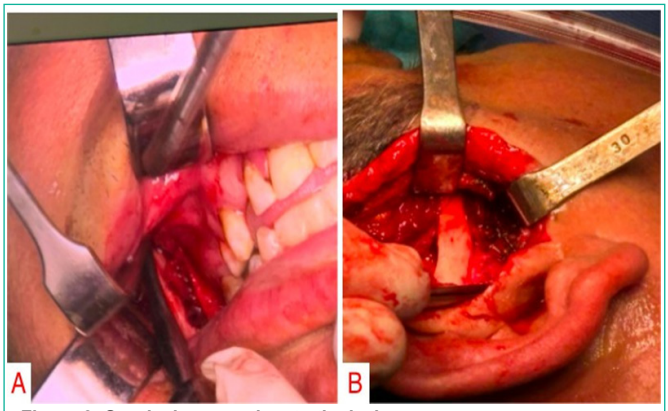

Figure 3: Surgical approaches to the lesion:
A: Internal: Endobuccal opposite the ascending ramus, following the anterior border of the ramus;
B: External: Pretragal with a skin incision in front of the tragus and detachment of the zygomatic arch.

The patient was operated on under general anesthesia using a combined approach (Figure 3). The endobuccal incision was made ascending the ramus, following its anterior border with subperiosteal detachment and preservation of the inferior alveolar nerve. An external pretragal approach involved an incision in front of the tragus, followed by subcutaneous detachment and identification of the facial nerve plane. The calcification was then removed, with careful release of adhesions, resulting in a 3.5 cm mouth opening obtained intraoperatively.

After ensuring rigorous hemostasis, a Redon drain was inserted to ensure drainage and prevent secondary hematoma.

Early mandibular mobilization was instituted to prevent scar trismus. Postoperative nutrition was based on a mixed or cold liquid diet, with a gradual return to normal nutrition depending on the recovery of mouth opening.

Figure 4: Results 7 months after surgery and rehabilitation, mouth opening more than 3.5 cm.

Mandibular rehabilitation was started 48 hours after surgery to avoid trismus and restore opening amplitude. This mainly involved progressive opening/closing, lateral movements, protrusion exercises, and the use of tongue depressors for a duration of 12 weeks, with a 6-month maintenance period. The evolution was progressively favorable, with mouth opening ranging from 2 cm at day 5 to 3 cm at 2 weeks, then 3.5 cm after 12 weeks.

Seven months after surgery, with continued rehabilitation sessions, the patient was able to maintain a mouth opening of over 3.5 cm (Figure 4).

Discussion

Permanent jaw constrictions most often result from intra-articular damage to the temporomandibular joint, notably fibro-osseous ankylosis, and muscular causes such as myositis ossificans, post-traumatic fibrosis, and cutaneous causes like sequelae of burns, noma, or post-radiation therapy. Extra-articular mechanical causes remain exceptional [1].

Our case reports post-calcified hematoma ossification, occurring remotely from a temporal craniotomy, responsible for severe chronic trismus [2].

Few reports have documented persistent trismus secondary to ossified extra-articular hemorrhage following cranial surgery [3]. The literature primarily describes myositis ossificans of the masticatory muscles, either traumatic or post-operative, and, less frequently, post-traumatic zygomatico-coronoid ankylosis [4,5].

Heterotopic ossification of maxillofacial soft tissues follows similar stages to those described in

traumatic myositis ossificans: intramuscular or interstitial hemorrhage, chronic inflammatory reaction, fibroblastic proliferation, and osteogenic differentiation leading to osteoid formation and, at maturity, lamellar bone [6]. The persistence of undrained blood deposits and the relative immobilization of the

segment promote this process. Repeated microtrauma can sustain inflammation and neo-ossification [7].

This model is widely accepted for traumatic myositis ossificans of the masticatory muscles and can be transposed to a periramal organized hematoma, as in our case.

Traumatic myositis ossificans frequently mimics TMJ ankylosis and may go undetected for several years

[4]. Post-fracture or post-inflammatory zygomatico-coronoid ankylosis is another diagnostic pitfall [7].

Imaging is central to differentiating intracapsular from extra-articular involvement and for planning the surgical approach. Panoramic radiography may suggest abnormal opacity or zygomatico-coronoid fusion but lacks spatial precision [5], CT scans provide diagnostic confirmation and therapeutic guidance.

Densities can help estimate the degree of maturation. MRI complements the assessment of soft tissue and TMJ involvement when intra-articular pathology is suspected.

In our case, CT identified a well-limited extracapsular mass

compressing the ascending ramus without condylar involvement, pointing to post-hematoma ossification rather than TMJ ankylosis [8].

A combined approach is appropriate when the lesion is extracapsular but adjacent to the condylo-zygomatic region, intimately related to the mandibular ramus and/or deep masticatory space, and bulky or encysted, making mobilization by a single route difficult [9].

The pretragal approach provides direct access to the condylar pole, zygomatic arch, and superficial temporal-zygomatic planes, allowing the temporal-zygomatic branches of the facial nerve to be located and protected in the superficial facial layer [8,9].

The endobuccal approach offers inferior and medial control, avoids additional skin scarring, and reduces the risk of damage to distal facial branches [7,9].

The combination of the two approaches allows a "pincer effect": superior control of the facial nerve and temporal pedicle, and inferior control of the inferior alveolar nerve, with progressive mobilization of the mass under crossed visual control [9].

In series describing combined approaches for condylar tumors or traumatic temporal myositis ossificans, permanent facial deficits are rare, and aesthetic results are deemed satisfactory [5,6,10].

Prevention of trismus recurrence relies on early mobilization and rehabilitation, ideally within 24-72 hours, with frequent, brief sessions repeated daily. These principles are common to post-radiation trismus, post-traumatic ankylosis treated conservatively, and MOT after excision [3].

The extrapolation of rehabilitation times remains tricky in the absence of controlled trials for maxillofacial calcified hematomas. Published series are heterogeneous and often retrospective, and the quality of follow-up and opening measurements varies. Multicenter registries or standardized mobilization protocols would be useful to compare functional trajectories according to etiology and type of intervention [3,4,6].

Conclusion

Extra-articular calcified hematoma is a rare cause of permanent jaw constriction. Diagnosis is based on cross-sectional imaging. The combined endobuccal and pretragal approach allows safe removal. This case demonstrates the importance of postoperative follow-up, rehabilitation, and early management.

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