

Temporalis Myofacial Flap in TMJ Ankylosis with Gap Arthroplasty: A Case Report.

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ABSTRACT

A 10-year-old female with a history of a malocclusion and an inability to open her mouth was reported to the Out-patient Department of Career Post Graduate Institute of Dental Sciences And Hospital Lucknow. The maximum mouth opening was limited to 2 mm and further attempts to open the jaws caused considerable pain. Radiographs indicated new bone formation and loss of joint space in the right temporomandibular joint (TMJ). 3-dimensional CT showed bony fusion and bone thickness in the right TMJ. The physical, 3-dimensional CT and radiographic examinations revealed right TMJ ankylosis. Under general anesthesia, surgical treatment was performed to remove the ankylosis block with subsequent interpositional arthroplasty using a temporalis myofascial flap. The patient showed distinct improvement in both the articular functionality and clinical signs.

Keywords: Arthroplasty, Temporalis Myofacial Flap, TMJ Ankylosis.

INTRODUCTION

Temporomandibular joint (TMJ) ankylosis is characterized by the formation of a bony or fibrous mass that replaces the normal articulation. An ankylotic block causes a decrease in mandibular mobility. Particularly hindering mouth opening, as well as anterior and lateral movement (Kazanjian, 1995).^[1]

The mass is the pathology responsible for the ankylosis, but it is not a neoplastic process capable of continued growth.^[2]

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TMJ ankylosis is classified as either true or false. True ankylosis is a condition that results in osseous on fibrous adhesion between the surfaces of TMJ, within the limits of the articular capsule. False ankylosis results from diseases not directly related to the joint (Miller et al., 1975).^[3]

A variety of factor can cause TMJ ankylosis including trauma (13-100%), local or systemic infection (0-53%). Systemic diseases such as Ankylosing Spondylitis, Rheumatoid Arthritis and Psoriasis (28%) it also occurs after TMJ surgery.^[4-8]

TMJ ankylosis associated with difficulties in speech, mastication, swallowing, yawning, poor oral hygiene, and interferes with nutrition and dental treatment there are also restricted airway problems and impeded eruption of mandibular molars. In growing patients, deformities of the mandible and maxilla with malocclusion.^[8,9]

Recurrence is a major problem after release of tempromandibular joint (TMJ) ankylosis. Relapse of ankylosis postoperative rates are as high as 50%. Many investigations believe that the choice of interpositional material is important in preventing recurrence.^[10,11]

The treatment for TMJ ankylosis aims an complete removal of ankylotic block and a more normal range of jaw motion. Several techniques have been defined in human medicine for surgical correction of tmj ankylosis. These include subsequent arthroplasty, autologous tissue between articular surface or hetrologous material to restore the anatomic structure and normal function. (erol et al., 2006).^[12]

Appropriate interpositional material include: 1- autogenous tissue: meniscus, muscle, fascia, skin, cartilage, fat or combination of these tissues; 2 : allogeneic tissues; cartilage and dura; 3; alloplastic: sialastic materials like acrylic, proplast, and silicon; 4: xenograft tissues: usually of bovine origin (collagen and cartilage).^[13-18]

A temporalis myofascial flap is used in maxillofacial reconstructive surgery. It has the

advantages of a vascularized tissue flap, easy pedicled transfer and simulates physiological action (cheung, 1996 shimizu et al., 2006).^[19]

CASE REPORT

A 10-year-old female patient sought treatment due to TMA. The patient had a history of mandibular trauma one year back at her right TMJ, addressed by a surgical procedure at the site. Pre-operatively, the maximum mouth opening was limited to 2 mm. Facial asymmetry characterized the right side of the face. Coronal CT slices showed that the bony mass extended to the medial cranial base [Figure 1]. Thus, we were able to classify the lesion as true osseous/condyle ankyloses.^[20]



Figure 1: Coronal CT slice of the right temporomandibular joint ankyloses.

In some cases naso fibroscopy or tracheotomy requires general anesthesia.^[21] However for this particular case those procedure were not needed. A vaseline gauge was placed gently in the external auditory meatus and a preauricular incision was made as described by al-kayat & bramley.^[22]



Figure 2: Outline of preauricular incision was made as as described by Al-Kayat & Bramley.



Figure 3: Preauricular incision was made as described by Al-Kayat & Bramley.

An avascular tissue plane along the cartilagenous meatus was established using surgical scissors followed by blunt subcutaneous tissue dissection until reaching the superficial temporal fascia. Then superficial temporal fascia was incised and retracted anteriorly to protect the facial nerve branches. The periosteum over the zygomatic was then incised and retracted with the superficial temporal fascia, revealing the tmj which was found fused to the temporal bone.

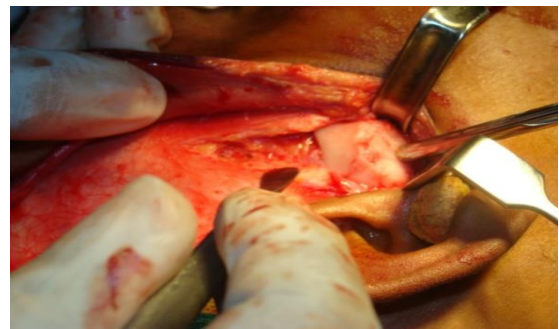


Figure 4: Intraoperative view of temporomandibular joint ankyloses.

The excess of bone was removed with a large round bur and chisel, beginning from the condylar neck at the level of the mandibular notch; the glenoid fossa was sculpted at the same level as the original fossa. The gap between glenoid fossa and condyle created taking care to maintain at least 4- 5 millimeters of distance between the skull base and all faces of condyle. The mandible was then mobilized and the new and condyle was checked sverify complete release.^[23]

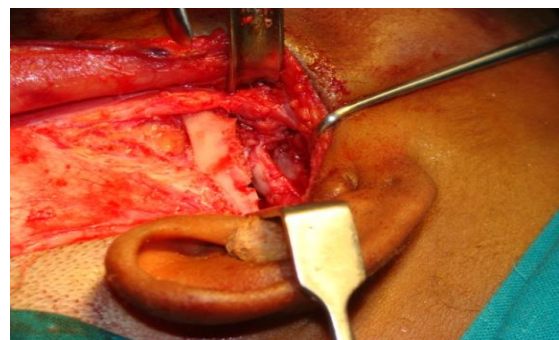


Figure 5: Resection of ankylotic block and creation of gap arthroplasty.

A thin layer of temporal deep fascia and muscle was harvested from the area posterior and superior to the ear in order to avoid any branches of the fascial nerve, taking care not to harm the deep temporal muscle blood vessels. The graft was inserted over the glenoid fossa and sutured with the zygomatic periosteum.

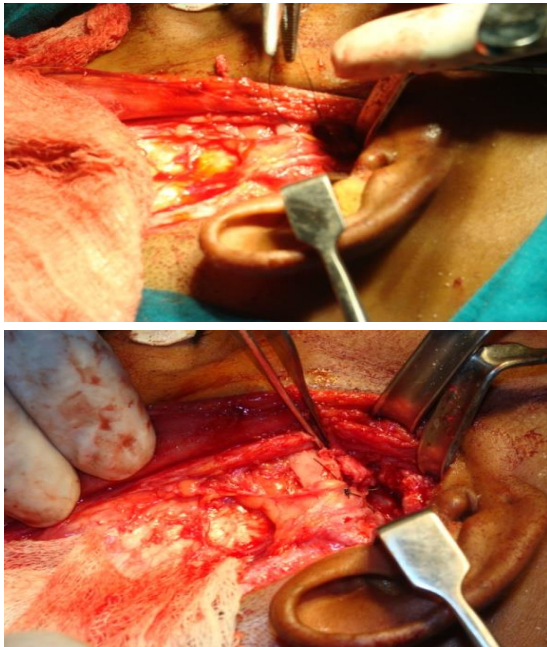


Figure 6 & 7: the temporalis myofacial flap raised & placed into gap arthroplasty & suture.

The wound was then closed in layers.



Fig 8: Suturing.

Physiotherapy was started after 4 days of surgery and maintained for 6 months. During the three-year follow-up, no sign of ankylosis recurrence was observed; maximum mouth opening is currently 35 millimeters.

DISCUSSION

TMJ ankylosis is characterized by abnormal immobility and consolidation of the tmj. The primary etiology of tmj ankylosis includes trauma and systemic infection. It was demonstrated that tmj trauma is the most common cause of tmj ankylosis.

Management of ankylosis occurs through surgical intervention; several authors agree that it is necessary to use an interpositional material to prevent re-ankylosis after arthroplasty. This particular aspect of the treatment has been discussed in numerous discussions. The temporalis muscle flap has been used for about 100 years for restoration of the facial and the craniofacial area; it is also the interpositional material most commonly used for correcting tmj ankylosis due to its ease of handling, proximity to the temporal joint, good functional results, successful clinical results, and minimal complications. However, the versatility of the temporalis myofascial flap technique in interpositional material is not certain and failure may occur. Inadequate removal of bone can result in reankylosis. Success in preventing reankylosis after tmj reconstruction is dependent upon appropriate surgical technique and long-term patient compliance in undertaking frequent mandibular exercise.

The primary function of the interpositional material is to prevent the reankylosis by eliminating contact between bone surfaces. This research suggests that the temporal muscle/ fascia graft can be an option for interposition material since it is easy and faster to perform compared with the advantage of being harvested from the same surgical site.

CONCLUSION

The authors agree with the statement that the success in preventing reankylosis after tmj gap arthroplasty is related primarily to the early postoperative physiotherapy, maintained long term. The technique described above is associated with adequate bone removal and excellent intraoperative joint mobilization. Nevertheless, the findings presented here are based on a single case; controlled trials must be performed to confirm this hypothesis.

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