Treatment of Unilateral TMJ Ankylosis in a Pediatric Patient with Temporalis Fascia Flap A Case Report

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The definite cause of temporomandibular joint (TMJ) ankylosis is still an unknown fact. TMJ ankylosis may result from, infection, trauma or insufficient surgical treatment of the mandibular condyle region. Different techniques have been described so far for the treatment of TMJ ankylosis, but no technique has successfully given uniform results. Relapse causing limited mouth opening, infection, open bite, reankylosis are the complications. Many authors agree that aggressive physiotherapy immediately after the surgical procedure, interpositional graft as spacer and wide bone resection are the basic principles in treating TMJ ankylosis. In this article, we discussed a case of unilateral TMJ ankylosis, in a 9-year-old boy, treated with the intre-positional gap arthroplasty with superficial temporalis fascia flap.

Keywords: Gap arthroplasty, Interpositional graft, Superficial temporalis fascia, Temporomandibular joint ankylosis

INTRODUCTION

Temporomandibular joint (TMJ) ankylosis is the common cause of acquired mandibular deformity in children as well as in adult if it is not treated in early age.¹ Hypomobility of the joint also affects the surrounding structures as well as the joint itself. Ankylosis which arises in early childhood usually results into facial asymmetry. In children, ankylosis usually occurs from an intra-capsular compression fracture or rarely from a suppurative arthritis of middle ear infection. The main etiological findings are trauma, systemic diseases, or infections. Physiological limitations such as difficulties on swallowing, mastication, and speech are complications seen in this pathology. Clinically, the patient presents with severe limitation of mouth opening resulting in compromised oral hygiene procedures. Disc repositioning in the treatment of traumatogenic TMJ ankylosis proves to be a feasible and effective method of preventing recurrence of this condition.²

Ankylosis in children usually occurs from a Type VI fracture of the condyle. Ankylosis occurring in childhood may grossly alter the facial skeleton, affect the child psychologic development.³ In children, ankylosis usually occurs from an intra-capsular compression fracture or rarely from a suppurative arthritis of middle ear infection.⁴ Pathomorphology of ankylosis is not unique and displays different aspects. Progressive ankylosis gene (ankylosis) which regulates the osteoblast differentiation is discovered lately.⁵ Patients characterized with young, severe TMJ trauma, comminuted condylar fracture or the sagittal fracture or those with medially dislocated condylar fracture, prolonged immobilization of the mandible, and disc displacement are prone to developing ankylosis.⁶

The aim of the treatment thus is the release of ankylosis, restoration of proper function and facial growth, prevention of reankylosis and consideration distraction at an early stage or osteotomy at a later stage.⁷

CASE REPORT

A 9-year-old male patient, attended at the Department of Oral And Maxillofacial Surgery, M A Ragoonwala College of Dental Sciences and Research Centre, complaining of limited mouth opening, inability to eat and difficulties in oral hygiene procedures. Presented condition was evolved slow and progressively since last 6-8 months with no evidence of trauma or pathology in the TMJ region as according to the patient.
On examination, clinically, the patient presented a mouth opening of 9 mm (Figure 1) with deviated lower jaw on the left side and limited joint activity on the left side. After computerized tomography and panoramic radiography analyses, abnormal bone formation was seen at the left condylar head of the mandible.

Surgery was initiated by placing an Al Kayat-Brahmley (preauricular) incision (Figure 2) on the left side to expose the ankylotic mass. Dissection was done above the superficial temporoparietal fascial plane.

Joint cavity was exposed taking linear incision. Ankylosed mass exposed. Then, gap arthroplasty was performed by resection of ankylosed mass with 701 and 702 fissure burs. Condylectomy was done, and the articular disc (Figure 3) was sutured to the fascia. Temporo-parietal fascial flap was harvested (Figure 4) and was sutured circumferentially to the articular disc with 3-0 silk to avoid reankylosis. Flap was closed in two layers. The surgical access was closed with a 3.0 vicryl suture. The skin surface was closed with 5.0 nylon (Figure 5).

Immediate post-operative mouth opening was 25 mm.
Coming day after surgery patient underwent physiotherapy for mouth opening to avoid reankylosis.

Mouth opening and Facial expression were evaluated 7 days, 30 days, and 60 days postoperative. The patient has attended the post-operative sessions showing good mouth opening and wound healing aspects, as well as healthy rehabilitation (Figure 6).

**DISCUSSION**

The treatment of TMJ ankylosis because of its technical difficulties and a high incidence of recurrence poses a significant challenge to the surgeon. Difficulties in mastication, poor oral hygiene, rampant caries, facial growth disturbances, possible pharyngeal narrowing, and the development of obstructive sleep-related breathing disorders may be the possible complications after failure in the treatment of TMJ ankylosis. Surgical treatment always has a particular importance in children. The potential for the growth impairment adds some problems. In the treatment of TMJ ankylosis in children, to maintain a normal growth and the development of the face is equally important to provide a satisfactory mouth opening with free movement of the mandible. The modified preauricular approach or the Al Kayat and Bramley approach (1979) provides excellent visibility due to a larger flap, and unyielding temporal fascia remains intact as it is not reflected with the skin. Facial planes are easily identifiable with this approach with less chances of sensory damage.

The three principal surgical methods include the simple gap arthroplasty, interpositional arthroplasty, and total joint replacement with a prosthesis.

According to topazian release of ankylosis by removing bony mass and creating a sufficient gap is the mainstay behind treating an ankylosed joint positioning of interpositional material in the gap to reduce the chances of reankylosis. In the technique of the gap arthroplasty, the success of the operation correlated with the wideness (size) of the gap. A major problem that occurs after the release of TMJ ankylosis is recurrence. Raveh says that many surgeons are concerned about damage to the facial nerve, and thus they limited their exposure and resection, leaving most of the ankylotic tissue along the glenoid fossa and skull base medially. Hence, the gap relatively created is thin and is not sufficient to enable optimal opening and free movements. Aggressive resection, early mobilization, insistent postoperative physiotherapy will produce satisfactory movement.

Some of the disadvantages of this technique are anterior open bite deformity due to removing a massive amount of bone from the ramus and the possible damage to internal maxillary artery. The advantages of this technique are less operating time, less complications, and importantly, its cost very low. The treatment of excessive TMJ ankylosis can be done by this technique.

A seven steps protocol has been developed for the treatment of TMJ ankylosis.

1. Aggressive resection of the bony or fibrous ankylotic mass
2. Dissection and stripping of temporalis muscle, scar release from the ramus and ipsilateral coronoidectomy
3. Contralateral coronoidectomy and stripping of the masseter, medial pterigoid, and temporalis muscles
4. New joint lining is constructed
5. Reconstruction of condyle with costochondral graft
6. Rigid fixation of the graft
7. Early mobilization and aggressive physiotherapy.

In the case of unilateral TMJ ankylosis, other remarkable observation was that the opposite joints were found healthy for many years. It is well-known that in cases of intermaxillary fixation, the movement of healthy condyles is restricted for 4-6 weeks.

Recently the use of acrylic and total joint replacement for treatment of TMJ ankylosis are under discussion. Furthermore, costochondral grafts and great toe joint are the subjects under discussion for treatment of TMJ ankylosis. These techniques though have some disadvantages as difficulty in fixation of the toe into the mandibular fragment, excessive costochondral grafts growth and metallic TMJ prosthesis are indicated in patients above 15 years. Distraction osteogenesis as a treatment option for patients of obstructive sleep apnea secondary to TMJ ankylosis seem to have more favorable results due to greater advancement possible, lesser chances of relapse, and correction of the deformity at the same time.
Interpositional gap arthroplasty is a highly effective and safe surgical management option for TMJ ankylosis with acceptable immediate and long-term outcome, particularly when temporalis fascia and muscle are used for adults and costochondral grafts with fascial interposition used for children.  

**CONCLUSION**

The approach described in this case suggests the principles necessary to overcome the TMJ ankylosis such as:
1. Adequate bone resection,
2. If needed use of interpositional spacer,
3. Aggressive post-operative physiotherapy for a sufficient period of time.

Interpositional arthroplasty remains to be treatment of choice for treating TMJ ankylosis through the years and using temporalis fascia flap for this purpose gives remarkable result due to its excellent vascular supply, association with minimal complications and minimal morbidity is in the form of function and cosmetics.

**REFERENCES**


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