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ORIGINAL ARTICLE

GAP ARTHROPLASTY IN TEMPOROMANDIBULAR JOINT ANKYLOSIS: A RETROSPECTIVE STUDY

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ABSTRACT: Temporomandibular joint (TMJ) ankylosis is a disorder that leads to a restriction of the mouth opening from partial reduction to complete immobility of the jaw. The author retrospectively analyzed 20 patients with TMJ ankylosis which were treated by gap arthroplasty in department of surgery, Government Medical College, Haldwani from March 2008 to Jan 2015. Mean follow up was at least twenty-four months (Minimum 24 and maximum 48 months). The purpose of this paper was to show that gap arthroplasty improve mouth opening when treating TMJ ankylosis. This was the first study in Kumaon region of Uttarakhand.

KEYWORDS: Temporomandibular joint disorders, ankylosis, arthroplasty.

INTRODUCTION: BACKGROUND: Temporomandibular joint (TMJ) ankylosis is most commonly associated with trauma (13% to 100%), local or systemic infection (0% to 53%), or systemic disease, such as ankylosing spondylitis, rheumatoid arthrits, or psoriasis.[1,2]

TMJ ankylosis may be classified by a combination of location (intra- or extra-articular), type of tissue involved (bony, fibrous, or fibro-osseus) and extent of fusion (complete, incomplete).[3] Literature classifies ankylosis as true and false. Any condition that gives rise to osseous or fibrous adhesion between the surfaces of the temporo-mandibular joint is a true ankylosis. False ankylosis results from pathologic conditions not directly related to the joint.[1,4]

The TMJ ankylosis is a extremely disabling affliction that causes problems in mastication, digestion, speech, appearance, and hygiene.[5] In growing patients, deformities of the mandible and maxilla may occur together with malocclusion.[6,7]

There are no consensus in the existing literature of the best treatment for TMJ ankylosis. Several authors studied and developed different techniques, but reccurence still remains the major problem when treating TMJ ankylosis.[1,2,5,8-11]

Inadequate exposure of the TMJ region for not to know on the adjacent structures (Facial nerve, carotid, jugular and maxillary vessels) often leads to insufficient removal of the ankylotic bone, thus leading to a recurrence of the problem.[3,7]

The purpose of this paper was to show that gap arthroplasty improve mouth opening when treating TMJ ankylosis.

MATERIALS AND METHODS: 20 patients (eleven TMJs) with TMJ ankylosis were treated at the department of surgery, sushila tiwari hospital, Haldwani. All patients were treated by gap arthroplasty.

Preoperative assessment included the clinical history of the patient, radiographic and physical examination. The collected data were: the cause of the ankylosis, facial asymmetry, presence of micrognathia, the onset time of the ankylosis, the side affected (uni or bilateral) and occlusion.

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Measurements of maximal interincisal opening (MIO), lateral movements and protrusion were made one day before the surgical procedure. The radiographic examination included panoramic radiographs and computerized axial tomograms to determine the anatomic boundaries of ankylosis and the type of the ankylosis.

All surgical procedures were performed in the operating room under general anesthesia. For all patients, the TMJ approach consisted of a preauricular incision.[8]

After exposing the joint and identification of the site of the ankylosis, aggressive excision of the fibrous and/or bony mass was realized initially with drills and completed with a chisel, followed by excision of the coronoid process and burring of the glenoid fossa, creating a gap of at least 15 mm between the roof of the fossa and the mandible A passive interincisal mouth opening of at least 30 mm was achieved. Contralateral coronoidectomy was performed when necessary, in accordance with Kaban´s protocol.[9]

After vigorous irrigation with saline, suction drains were placed after the resection to avoid edema and infection. The incisions were closed, and a pressure dressing was applied. The physiotherapy began one day postoperatively with jaw exercises under orientation. During the surgical procedure the following data were collected: time of the operation, maximal mouth opening and occlusion. During the next 3 to 4 weeks the diet was evolved to solid consistency.

All the patients were followed-up at minimum period of evaluation of twenty-four months. Postoperative data consisted of: maximal mouth opening, complications and recurrence.
The results were expressed by mean ± SD.

RESULTS: 20 patients were submitted to TMJ surgery. 13 patients (65%) had unilateral involvement and 7 patients (35%) bilateral involvement. The mean age was 20 years ± 9 (range 3 to 30 years). Etiology included trauma (n = 15), and others (n = 5). Preoperative CT scans revealed fibrous ankylosis (n = 4), fibro-osseus ankylosis (n = 2) and bony ankylosis (n = 14), and that diagnosis was confirmed when the joint was exposed in the intraoperative period.

The mean maximal incisal opening (MIO) in the preoperative period was 9. 25 ± 6. 41 mm (range 0 to 17 mm) and in the postoperative period it was 29. 88 ± 4. 16 mm (range 26 to 37 mm).

The most frequent complication was temporary facial nerve paralysis and it was encountered in 5 patients (25%). No recurrence was observed in our series.

DISCUSSION: Trauma was the major cause of TMJ ankylosis in our series (65%). The kind of trauma that usually results in ankylosis of the TMJ is predominantly experienced in childhood, and if no treatment is undertaken for a fracture of the condyle, the myositic mass grows in the juxta-articular tissue, resulting in a bone mass. Of particular significance is the decision as to the indication and timing of surgical treatment during childhood. The facial remodeling is greater when the release is done in childhood. Remodeling of the mandible after surgery, especially in unilateral ankylosis, is a phenomenon that has no parallel elsewhere in the body.[5] Our results are similar to the works of Roychoudhury et al and Raveh et al.

To prevent surgical recurrence in cases afflicted with ankylosis, radical removal of the bony or fibrous ankylotic segment is essential.[7,9] However the unfavorable anatomic configuration and the proximity of vital structures make the surgical procedure particularly difficult.[8]

Roychoudhury et al.[5] recommended a gap of at least 15 mm between the recountoured glenoid fossa and the mandible and subjected this gap to extensive active jaw opening exercises to prevent re-ankylosis when using gap arthroplasty. In all cases the gap was made accordance with this recommendation.

According to Kaban et al.[9] the advantages of gap arthroplasty are its simplicity and short operating time and the disadvantages include:

1. Creation of a pseudoarticulation and a short ramus;
2. Failure to remove all the bony pathology, and
3. Increased risk of reankylosis. In our series, using this technique, we were able to reduce operating time, but patients with bilateral involvement showed more frequent anterior open bite.

This complication was treated with physiotherapy and the use of elastics.

A careful surgical technique, and subsequent meticulous attention to long-term physiotherapy are both considered essential to achieve a satisfactory result.[10] Many studies have shown that the choice of interposition material is important in preventing recurrence.[6,11] Interposition of autogenous or alloplastic material at the ostectomy site is a mechanism to prevent recurrence; however, there are possible disadvantages, such as morbidity at the donor site and unpredictable resorption when autogenous material is used, and the risk of a foreign body reaction when alloplastic material is used.[10]

Bilateral arthroplasty is frequently associated to anterior open bite, because there is a shortening of the ramus and only hinge movement is possible. This complication could be minimized, when interpositional arthroplasty or total reconstruction of the TMJ is used. Unstable occlusion after the arthroplasty is corrected once the patient is taught to close in occlusion.[5]

The complication of facial nerve weakness occurs when there is excessive retraction intraoperatively of the soft tissues, and it usually responds to steroid therapy.[4] In our series, patients who experienced this complication (25%) were followed up and within 3 months it has disappeared completely without additional treatment.

CONCLUSIONS: Trauma was the major cause of tempomandibular joint ankylosis in our sample. Gap arthroplasty showed good results when treating TMJ ankylosis.

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