

Breaking The Bond: Restoring Motion in Bilateral Temporomandibular Joint Ankylosis

Abstract:

Background: TMJ ankylosis is a condition which results in partial to complete inability to open the mouth due to fusion of head of condyle and glenoid fossa. Temporomandibular joint is a finely balanced structure with high degree of anatomic precision joint due to unique anatomy and its relation to various important structures especially facial nerve and auriculo-temporal nerve.

Case presentation: An adult male patient of age 35 years has visited in the department of oral and maxillofacial surgery in MPCD& RC College, Gwalior with severe limited mouth opening (< 5mm) accompanied by open bite, resulting in impaired chewing function and decline in Psychological confidence after his road traffic accident two years back where he does not underwent any definitive treatment for his condylar fracture and which resulted in TMJ Ankylosis. The surgical procedure of gap Arthroplasty bilaterally in the patient with the resection of the ankylotic mass was done until mouth opening reached 35mm. Patient had mouth opening of 30mm and he is still under aggressive Physiotherapy for the same and has been able to perform various functions like speech clarity, maintenance of oral hygiene & chewing food which is the main concern for the patient which resulted in decline in confidence. Early post-operative exercises, close follow-up of the patient has been done for the prevention of postoperative adhesions and re-ankylosis.

Conclusions: Patient had mouth opening of 35mm and also had a satisfactory esthetic appearance and better oral hygiene maintenance.

Ky-wordse: TMJ Ankylosis, Ankylosis, bony fusion, gap arthroplasty

Introduction:

Temporomandibular joint is a finely balanced structure with high degree of anatomic precision. The term “ankylosis” is of Greek origin (from the Greek word *αγκυλος* meaning: bent or crooked) and corresponds to a “stiff joint”, since it leads to a partial or total loss of mobility of the TMJ. Temporomandibular joint ankylosis can be defined as Temporomandibular joint (TMJ) ankylosis is defined as bony or fibrous adhesion of the anatomic joint components accompanied by limitation of mouth opening, causing difficulty in mastication, speech, and oral hygiene. This may also influence symmetry of the facial skeleton, especially cases which occur when patient is still in the growth phase [1].

According to Kaban [2], trauma is the most common cause (31-98%), followed by local or systemic infection (10-49%), and lastly any systemic disease (10%). Infection occurring in the joint commonly occurs due to spread from otitis media or mastoiditis or from the hematogenous route-tuberculosis,

gonorrhoea, scarlet fever, etc. Systemic etiology may include ankylosing spondylitis, rheumatoid arthritis, or psoriasis.

Classically, hemarthrosis following trauma is the pathogenic factor for bone formation in TMJ ankylosis [3]. Condylar trauma may lead to hemarthrosis due to injury to the periosteum and capsular ligament. When this intracapsular

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hematoma organizes, hypertrophic bone is formed from the disrupted periosteum or metaplasia of non-osteogenic connective tissue. This may lead to hypomobility, and bony ankylosis may eventually develop and maxillofacial surgeon, otolaryngologists, and other clinicians through the years have been challenged by the temporomandibular joint due to unique anatomy and its relation to various important structures especially facial nerve and auriculo-temporal nerve.

Case Presentation:

A 35year old male patient has visited in our Department of Oral and Maxillofacial Surgery in Maharana Pratap College of Dentistry and Research centre, Gwalior with the chief complaint of inability in opening of mouth (<2mm) since two years.



FIGURE 1a: Pre-Treatment extra-oral Frontal view photograph **1b:** Pre-Treatment extra-oral Lateral view photograph

The patient was apparently alright two years back when he met with Road Traffic Accident. The patient then visited the hospital to the general practitioner where he was given bandage and not underwent any definitive treatment. After that he noticed gradual inability to open his mouth and over the period of time it became less which leads to resulting in impaired chewing function and decline in Psychological confidence. There was no history of difficulty in speech or any ear, nose, & throat infections



FIGURE2 Pre-Treatment Intraoral photograph shows reduced mouth opening

During the extraoral examination, revealed no condylar movement or any palpable swelling in the left side and slightly palpable with no condylar movement in the right side

of the temporomandibular joint. The interincisal opening was < 2mm and his oral hygiene was poor. A Computed tomograph (CT) imaging showed the Bilateral fusion of the left and right condylar head to the base of the skull, indicating Bilateral TMJ ankylosis .

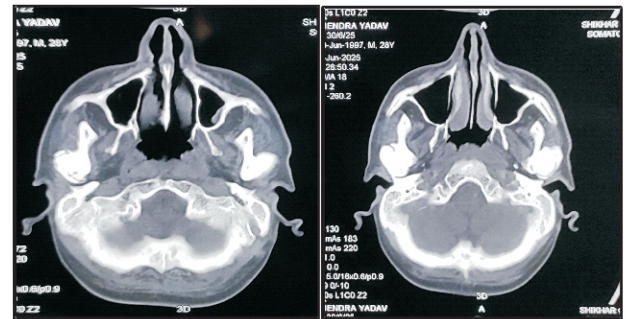


FIGURE 3: CT Scan(Axial cuts) showing bilateral condylar bony fusion to zygomatic arches well within the joint space

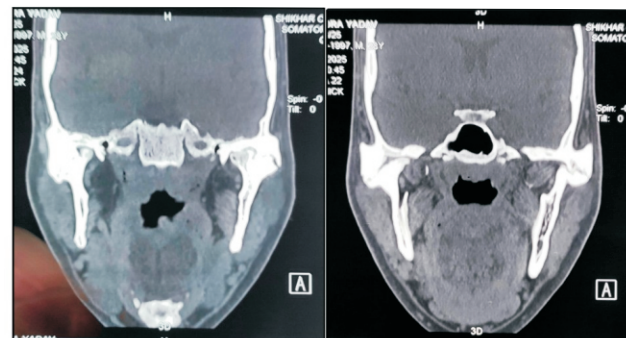


FIGURE 4:CT Scan(Coronalcuts)showing bilateral condylar bony fusion to zygomatic arches

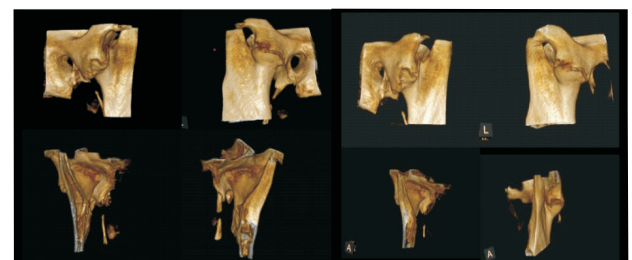


FIGURE5:CT Scan (3D) CT showing the condylar bony fusion with glenoid fossa



FIGURE 6 : Intraoperative photograph of surgical marking and incision made

The operation was done under nasotracheal anesthesia using nasofibroscope. An Alkayat -Bramhley incision was used to access the temporomandibular joint. During the operation the joint space was found to be completely occupied by the bony mass. Total resection of the bony ankylosed mass bilaterally ankylotic removed

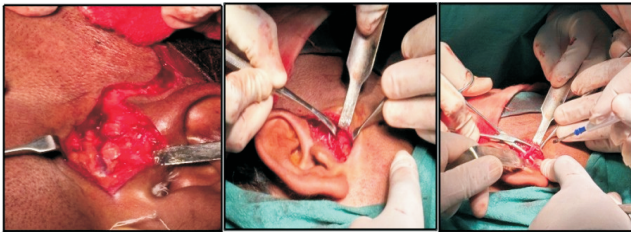


FIGURE 7 a: shows incision made
7 b: flap raised
7 c: Blunt dissection has performed

Blunt dissection was done in a manner so that Facial nerve is within the layer of the flap

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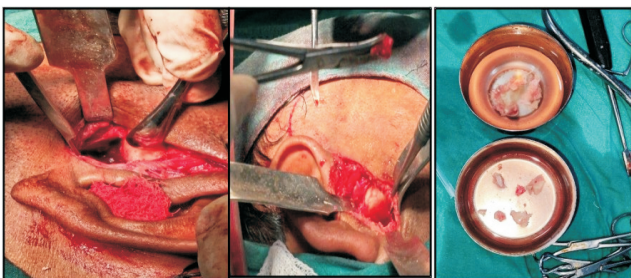


FIGURE 8a & 8b: removal of ankylotic mass
8c: Ankylotic mass

The same procedure of the Temporomandibular Joint Ankylosis was repeated on the another side. The maximum interincisal opening attained was 20 mm. So bilateral coronoidectomy was performed through the same approach and the maximal incisal opening increased to 35 mm.

Double Layered suturing with 3-0 vicryl and 3-0 silk suture has been done on either sides



FIGURE 9 a: Closure done with 3-0 vicryl suture
9 b & c: Closure done with 3-0 silk suture

Double Layered suturing with 3-0 vicryl and 3-0 silk suture has been done on either sides.



FIGURE 10 : Sequential extraoral Post-operative photograph in 2days, 1month & 2month follow ups

Five days post-operatively jaw opening exercises and aggressive physiotherapy was started. Physiotherapy included heat, massage and manual stretching exercises. Jaw opening exercises were performed with Heister Jaw opener and Ice cream spatulas by increasing its quantity. The patient was initially administered a soft diet, which progressed to solid diet over the next 5 weeks.

Discussion:

Trauma, particularly in childhood is the predominant factor in TMJ ankylosis [3], it has been seen that up to the second year of life, there are many vascular channels within the condylar head, but they vanish shortly thereafter [4]. Whenever injury occurs to TMJ region then these vascular channels cause extensive hemarthrosis and subsequently due to reduced functioning of the mandible it can result in fibrosis and eventually leading to complete fibrosis cause fibrosis and eventually leading to complete ankylosis. Active movement of the mandible is particularly important in preventing ankylosis in this highly vascularized and osteogenic environment. TMJ ankylosis can be prevented by early diagnosis and proper early treatment of condylar fractures.

The loss of mandibular function and major dento-facial sequelae cause various psycho-social problems. For that reason, the study and correction of TMJ ankylosis are important. Early and effective treatment to repair function and

facial development is therefore desirable [5]. There are many reported surgical procedures and accepted protocols [6] with the use of various grafts like chondroosseous grafts and alloplastic prosthesis for the purpose of reconstruction of TMJ, but still there is no standard concept for treatment of TMJ ankylosis. General agreement is that patient cooperation, early surgical intervention and postoperative physiotherapy are the most important for long term good results.

Frequently applied surgical methods for TMJ ankylosis are: gap arthroplasty, interpositional arthroplasty, and reconstruction of the joint using autogenous or alloplastic materials [5]. In contrast to such disadvantages as shortening of the ramus and increased recurrence rates following gap arthroplasty, complications such as donor site morbidity and foreign body reaction in cases of alloplastic material have been reported following interpositional arthroplasty. Intraoral distraction osteogenesis and autogenous bone grafts can be used for adjustment of secondary post-operative deformities.

Interposition arthroplasty for TMJ ankylosis has been in use for over 100 years; Risdon (1934) used gold foil. Later, Eggers (1946) used tantalum foil, whilst Boracbakan (1968) and Sawhney (1986) reported acrylic spacers for treating ankylosis. The purpose of using mobile spacers was to enable free movement of the mandible. The use of some auto-grafts has also been reported for the treatment of ankylosis [7]. However, the difficulty in fixing the metatarsal bone to the mandibular fragment, and excessive growth of costochondral grafts in younger patients was the disadvantages of these techniques. Blair and Murphy (1914) popularized and standardized the temporal muscle interposition arthroplasty. Its advantages are autogenous nature, resilience, adequate blood supply and proximity to the joint allows for a pedicled transfer of vascularized tissue into the joint area.

Conclusions:

Various surgical techniques have been advocated for the treatment of TMJ ankylosis but radical and sufficient resection of the ankylosed bone; early post-operative exercises, appropriate physiotherapy and close follow-up of the patient play important roles in the prevention of postoperative adhesions and re-ankylosis.

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