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Gap Arthroplasty: Surgical Modality of TMJ Ankylosis

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Case Report

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ABSTRACT

This report describes surgical management of a 13-year-old female with unilateral TMJ (true) bony ankylosis with restricted IIO of 2mm, mandibular retrognathism, difficulty in speech, eating & breathing, along low self-confidence. Unilateral gap arthroplasty through a preauricular approach with ipsilateral coronoidectomy was done followed by aggressive jaw physiotherapy. Post surgically oral prophylaxis, restoration, extraction of carious teeth along speech therapy & psychological counselling were also done to enhance function & boost self-esteem & confidence ultimately resulting in good mouth opening, removing impaired functions & psychological stigma.

Keywords: Gap Arthroplasty, TMJ Ankylosis, Pre Auricular, Al Kayat Bramley, Coronoidectomy.

Introduction

Ankylosis of TMJ is described as an intracapsular fusion of the disc-condyle complex to articular surface of temporal bone including the fibrous/bony fusion between disc, condyle, glenoid fossa & articular eminence thus restricting the mandibular movements.[1] This fusion severely restricts the jaw movements & its growth, especially if it develops during the growth period of the patient. This disabling condition not only causes facial deformities, speech impairment, difficulty in mastication, reduction in airway space but is also psychologically distressing for the patient.[2]

Trauma to TMJ (13-100%), local / systemic infections(10-49%), or systemic diseases(100%), like rheumatoid arthritis, ankylosing spondylitis & psoriasis chiefly comprise etiology of TMJ ankylosis.[3] TMJ ankylosis is classified by a combination of location (intra or extra articulation), based on tissues involved (fibrous, bony, or

International Journal of Drug Research and Dental Science
Volume 2 Issue 4 (Page: 110-116), 2020 ISSN: 2582-0826

fibro-osseous), the extent of fusion (complete or incomplete), true or false.[4] Any condition causing osseous/fibrous adhesion between the surfaces of TMJ is true ankylosis. Pathological conditions not directly related to the joint causing fusion are termed false ankylosis.[5,6] In the treatment of TMJ disease, computerised navigation technology plays an ever-increasing role in procedures such as resection of tumors & gap arthroplasty.[7,8]

This paper focuses on the effective results of gap arthroplasty as a surgical option for increasing mouth opening & treating other associated problems.

Case Report

A 13-year-old female patient reported to our department of Dentistry/Oral & Maxillofacial Surgery, Government Medical College, Saharanpur, UP, with a chief complaint of limited mouth opening (2mm inter-inicial opening), malocclusion, restricted jaw movement & poor esthetics. Her eating pattern was characterised by an inability to chew, limited intake of liquids or semisolids. Her profile was convex, retrognathic jaw, snoring, few deciduous & carious teeth were also found. Her mother revealed her daughter had a history of fall from a wall 6years back for which only symptomatic treatment was given then, a few months ago she reported to a tertiary medical institute with the same problems but there she was denied treatment due to some unknown reasons.

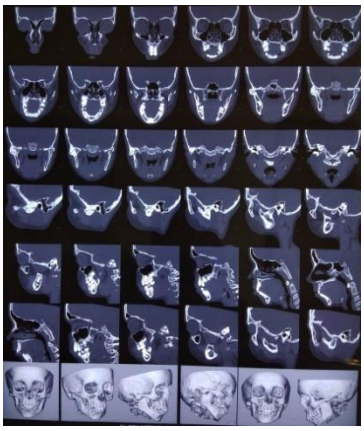
Clinical & radiographic examination revealed the case to be a right side bony TMJ ankylosis (medially dislocated condyle).

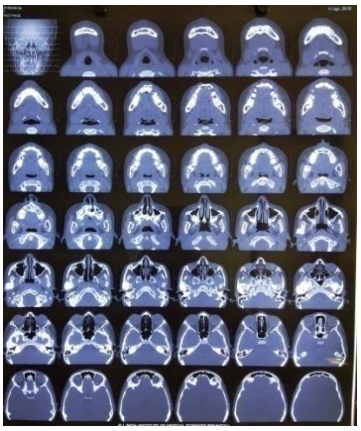
Fig.1 (A)

(B)

(C)

International Journal of Drug Research and Dental Science
Volume 2 Issue 4 (Page: 110-116), 2020 ISSN: 2582-0826





(D) **(E)** **(F)**

Figure. 1 (A-F) Showing Clinical Preoperative Front & Side Profiles (IIO 2mm), Scans & Radiograph Showing Bony Fusion at right TMJ.

Treatment plan included right side TMJ gap arthroplasty by AL-Kayat Bramley approach (preauricular) with ipsilateral coronoidectomy under general anesthesia. The aim was to achieve a maximal incisal opening (MIO) of about 35-40mm with the restoration of normal eating habits. All investigations & haemogram were done, necessary consents were taken. Fibre-optic assisted nasotracheal intubation was done, right ankylosed TMJ area was accessed through an extended pre-auricular approach (Al Kayat Bramley incision), dissection was done, facial nerve was identified & preserved, a bony chunk was removed at skull base by making superior & inferior osteotomy cuts at a distance of 1cm apart. This maneuver helped in achieving a considerable degree of mouth opening. Thereafter intraorally ipsilateral coronoidectomy was done to achieve a maximum mouth opening of 38mm.

Figure. 2 (A)

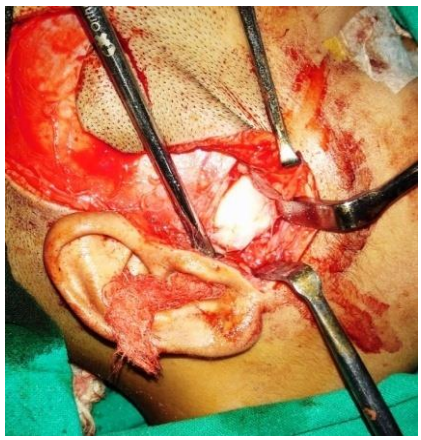


Figure. 2 (B)

Figure. 2 (C)

International Journal of Drug Research and Dental Science
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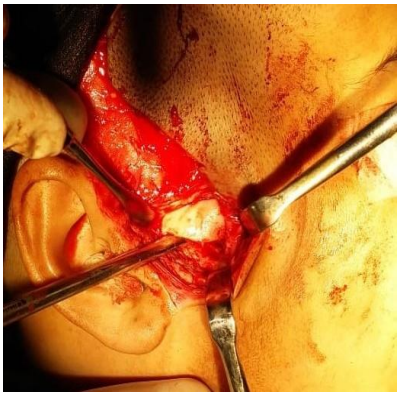

Figure. 2 (D)

Figure. 2(E)

Figure. 2 (F)

Figure.2 (A-F) showing right side raising of flap, gap arthroplasty being done after making Al Kayat Bramley Incision, maximum mouth opening (38mm) achieved after ipsilateral coronoidectomy, drain secured with closure.

The closure was done in layers with a drain secured for 3 days. The patient had an uneventful postoperative period, mouth opening exercise was started from 3rd post-operative day, a right temporal branch of facial nerve showed slight paresis. The patient was discharged after 12 days with instructions of intensive jaw opening exercise to further improve & maintain mouth opening.

In subsequent follow-ups, carious teeth were restored, oral prophylaxis was done, the patient was encouraged to take a more solid diet with proper mouth opening exercise. At 6 months post-operative review, the patient recovered well, developed good eating habits, paresis of the right facial nerve was resolved, mouth opening increased to 40mm. Both patient & her mother are very happy with the mouth opening and stable functional occlusion.

Figure. 3 (A)

Figure. 3 (B)

International Journal of Drug Research and Dental Science
Volume 2 Issue 4 (Page: 110-116), 2020 ISSN: 2582-0826

Figure. 3 (C)

Figure. 3 (D)

Fig. 3 (A-D) showing post operative results.

Discussion

TMJ ankylosis management depends upon many considerations, like patients' age in the growing stage, systemic conditions associated with previous infections or autoimmune diseases, & surgeon's expertise for selecting interpositional grafts.[12] Trauma in childhood usually results in ankylosis of TMJ & if untreated for fractured condyle, the myositic mass grows in the juxta-articular tissue, forming a bony mass. The facial remodelling is greater when gap arthroplasty is done in childhood. Especially in unilateral ankylosis, remodelling of the mandible after surgery is a phenomenon that has no parallel elsewhere in the body[9] & to prevent recurrence in patients afflicted with TMJ ankylosis, complete removal of bony/fibrous ankylotic segment is of utmost important.[3,10] Unfavorable anatomic configuration & close proximity to vital structures make the surgical procedure a great challenge to the operating surgeon.[11] Frequently used surgical techniques in TMJ ankylosis comprises resection, gap arthroplasty with or without interposition, total TMJ replacement with autogenous or alloplastic materials. It was found by a few authors that a wider resected bony gap is more effective in treating TMJ ankylosis by preventing reankylosis than any interpositional substitutes used.[3,13] Our study also signifies that radical resection is important to prevent a recurrence.

Danda & Chinnaswami[12] found no significant different outcomes in their 16 TMJ ankylosis cases between interpositional arthroplasty & only gap arthroplasty, Vasconcelos et al.[14] & Roychoudhary et al.[9] found better outcomes of resecting ankylotic mass. Earlier, in TMJ ankylosis management the importance of coronoidectomy was neglected by many surgeons, but coronoidectomy on affected & non-affected sides is one of the crucial surgical procedures due to its releasing effects of contracted temporalis muscles & restricted jaw movements.[13] If the jaw opening is not satisfactory during surgery, coronoidectomy done together with the release of any fibrosed/contracted contralateral temporalis muscle should be performed for better results.[9] Thus, according to the nature of opening limitation of mouth, contralateral gap arthroplasty &/or coronoidectomy with temporalis release is a better option, if maximal mouth opening of less than 25 mm is observed during surgery.

Gap arthroplasty with coronoidectomy is important for successful surgical results (at least 35mm passive MMO). For TMJ patients starting immediate physiotherapy is very important to prevent re-ankylosis.[3] The importance of postoperative physiotherapy for the prevention of re-ankylosis and for building muscular strength better was established by Roychoudhary et al.[9] Furthermore, to make the surgically established joint space more physiologically reorganized, early mouth opening exercise could really help.

Conclusion

Etiology of TMJ ankylosis must be completely evaluated & confirmed, thereafter doing ample bony resection so as to maintain a wider gap, combined with coronoidectomy, & other additional surgical techniques must be executed according to the individual case. Trauma was the major cause of TMJ ankylosis in our report & gap arthroplasty showed good results in treating ankylosis.

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