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Restoration of Functioning of Ankylosed TMJ by Inter Positional Arthroplasty with Temporalis Muscle Flap – A Case Report

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Abstract:- Ankylosis of TMJ is a disorder in which a stiff joint makes the mouth opening restricted. The restriction of mouth opening is mostly due to union between the condylar head and the glenoid foss of temporal bone. The most common etiology for this ankylosis is trauma. The other causes include local and systemic infections, inflammations, neoplasms, previous TMJ surgeries and congenital syndromes. This ankylosis alters the entire life style of the affected person because of its additional clinical presentations like speech, chewing, facial appearance disfigurements. If affected in the growth phase during early childhood, it may lead to deformations in the mandibular growth leading to facial asymmetry. Hence, early diagnosis and surgical intervention are of critical importance in the management of TMJ ankylosis. The surgical therapy usually aims to achieve joint movement with optimal mouth opening and without any recurrences. Joint reconstruction, interpositional arthroplasty and gap arthroplasty are the three main surgical treatment options. Inspite of availability of various alloplastic and autogenous graft materials, interpositioning of the temporalis muscle flap to the joint space offers specific advantages like ease of harvesting, comparatively less morbidity of donor site, and adequate coverage of surgical site. The efficiency and efficacy of this temporalis muscle flap is highlighted in the present case report of surgical management of unilateral TMJ ankylosis.

Keywords:- *Ankylosis; TMJ; Interpositional Arthroplasty; Myofascial Flap; Temporalis, Limited Mouth Opening.*

I. INTRODUCTION

TMJ ankylosis is an untoward fusion between the glenoid fossa of the temporal bone and the condylar head of the mandible [1]. Clinically, it is a condition where the affected person is unable to open the mouth because of bony or fibrous union of condylar head with the glenoid fossa [2]. It alters the entire life style of the affected person because of its additional clinical presentations like speech, chewing, facial appearance disfigurements. If affected in the growth phase during early childhood, it may lead to deformations in the mandibular growth leading to facial asymmetry [3].

The most common etiological factors include trauma, local and systemic infections, inflammations, neoplasms, previous TMJ surgeries and congenital syndromes [4]. About 75% - 80% of recorded TMJ ankyloses cases were due to trauma [1]. Trauma might be indirect injury, intra or extra capsular fractures or birth trauma [4].

A thorough clinical examination along with radiological investigations help in making the diagnosis. TMJ ankylosis could be unilateral or bilateral based on which are the clinical features.

Bird face deformity is seen in bilateral joint ankylosis. Unilateral joint ankylosis presents with an elongated and flattened appearance on unaffected side and with a roundness and fullness of the face on the affected side. Chin and the mandible deviate to the ankylosed side. The lower border of the mandible shows a concavity in it that ends in a well-defined antegonial notch [5].

Major goals in the management of TMJ include reduction in pain, correction of facial deformity, restoration of mandibular functional efficiency and prevention of tendency of recurrence [6].

There are various surgical modalities of managing TMJ ankylosis including Interpositional Arthroplasty, Gap Arthroplasty, and Whole Joint Reconstruction all the three with either autogenous graft materials or alloplastic materials. No specific study in the current literature literature claims that any one particular surgical management is the best [7].

The present case report describes a case of unilateral bony TMJ ankylosis and its successful surgical intervention with interpositional arthroplasty using temporalis muscle flap.

II. CASE PRESENTATION

An eighteen year old female patient who is a student reported to the Dept. of Oral and maxillofacial surgery at GSL Dental College and Hospital with a chief complaint of limited mouth opening from 7 years. Patient had a history of trauma on left side of the face 10 years back for which she was advised conservative management with arch bars placement

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and mouth opening exercises in GSL Dental College and Hospital.

III. CLINICAL EXAMINATION

Clinical facial asymmetry was noticed with a slight concavity in the lower border of the mandible on left side (Figure 1). Limited mouth opening was noticed with an inter incisal distance of about 1 cm. Deviation towards left side was seen on mouth opening (Figure 2).

Fig 1: Patient's frontal Profile Showing Symmetry

Fig 2: Limited Mouth Opening with Deviation to Left Side

Occlusal cant sloping down towards right side was noticed (Figure 3).

Fig 3: Occlusal Cant Sloping Down Towards Right Side

IV. RADOLOGICAL EXAMINATION

Preoperative Orthopantogram (OPG) revealed obliterated joint space on left side with sclerotic bone (Figure 4 – shown in yellow arrow). A prominent antegonial notch was identified in the OPG (Figure 4 – shown in red arrow).

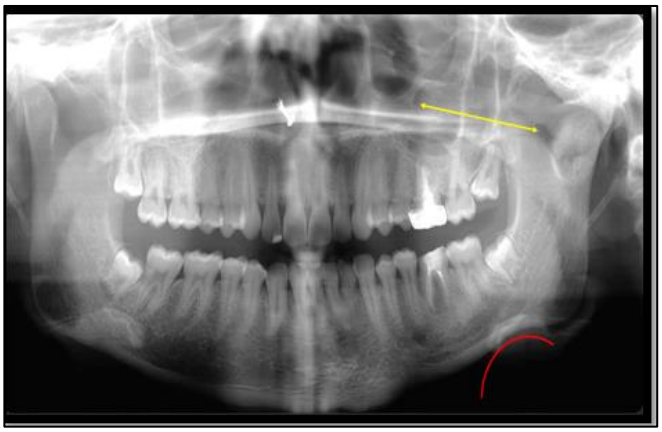

Fig 4: OPG Revealing Obliterated Joint Space and Antegonial Notch on Left Side

Cone Beam Computed Tomography (CBCT) scan revealed an enlarged condyle, thickened temporal bone, a zone of radiolucency in the bony ankylosed area located in the lateral aspect. No bony fusion area was noticed on medial aspect (Figure 5)

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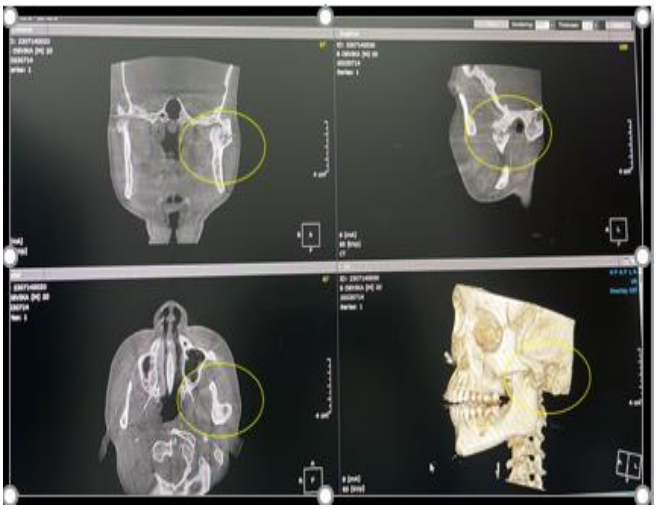

Fig 5: CBCT Scan Showing Bony Ankylosed Joint On Left Side

Based on clinical examination and radiological investigations, it was finally diagnosed as Unilateral bony TMJ ankylosis on left side.

V. MANAGEMENT

- *The Patient was Surgically Treated for the TMJ Ankylosis using Kaban's Protocol [8] where it Involved 4 Major Steps*

- Aggressive excision of ankylotic mass.
- Lining of joint with Temporalis myofascial flap.
- Early mobilisation of jaw
- Aggressive physiotherapy.

VI. SURGICAL PROCEDURE

Under all aseptic conditions, patient was shifted to operation theatre and the surgery was performed under general anesthesia. After surgical site preparation with povidine Iodine solution, marking was done for Al-Kayat-Bramley incision (Figure 6). The incision was made and a full thickness mucoperiosteal flap was reflected (Figure 7).

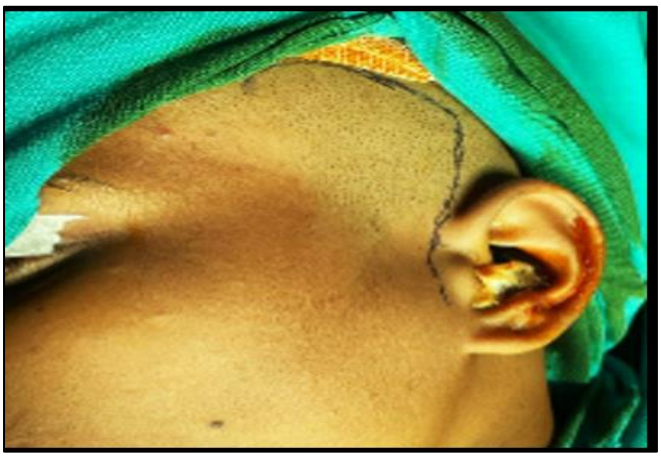

Fig 6: Marking if Al-Kayat-Bramley Incision

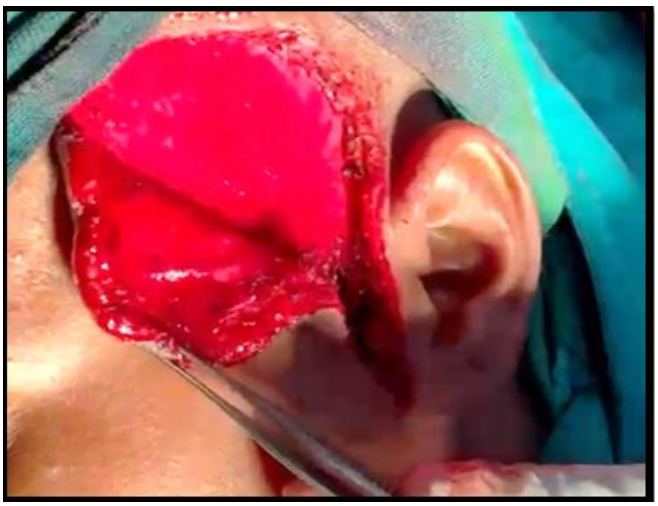

Fig 7: Reflection of Mucoperiosteal Flap

The ankylotic bony mass was exposed (Figure 8) and the surgical excision of the ankylotic mass was performed (Figure 9).

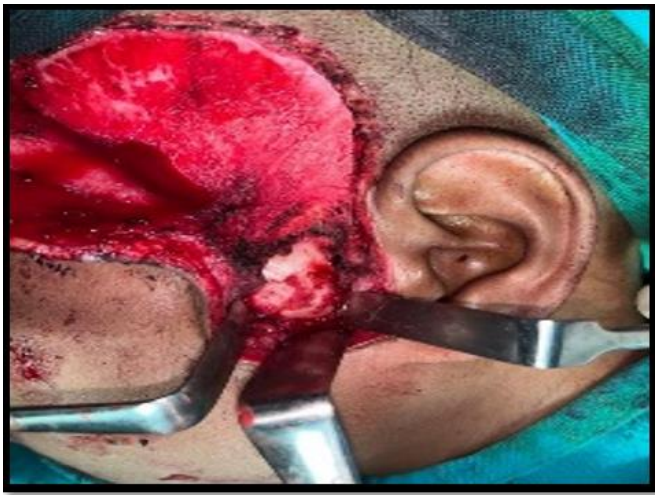

Fig 8: Exposure of Ankylotic Bony Mass

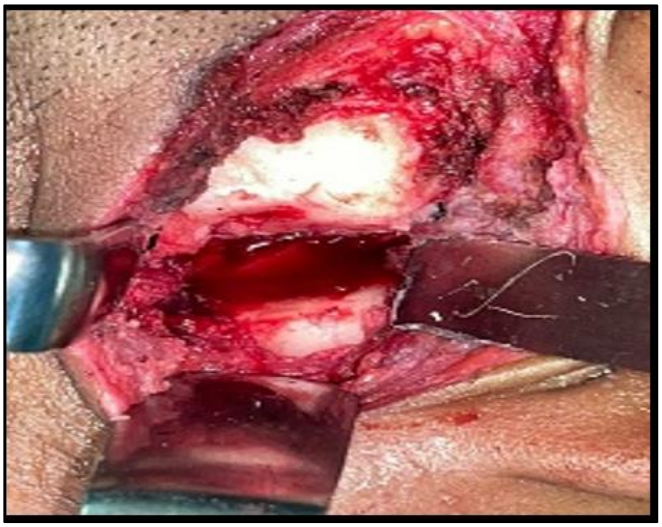

Fig 9: Site After Resection of Ankylotic Bony Mass

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2 horizontal cuts of osteotomy were made at the level of joint below the zygomatic arch. The bone was first thinned down using surgical burs and later carefully removed using chisels and ostetomes. The bony wedge was removed in sections rather than in toto and a gap of about 1.5cm was created between the glenoid fossa and condyle. Sharp bony margins were rounded off using bone file. The joint space now created was extensively irrigated with saline solution. Early mobilisation of the jaw was done by performing a forceful mouth opening of around 40 mm at the time of surgery. The temporalis myofascial flap was harvested and was rotated over the zygomatic arch to cover the joint space and the entire glenoid fossa (Figure 10). It was then sutured posteriorly, laterally and anteriorly. After placing a suction drain, the flaps were approximated and sutured with 3-0 vicryl for deeper layers and 3-o ethylon for skin sutures (Figure 11).

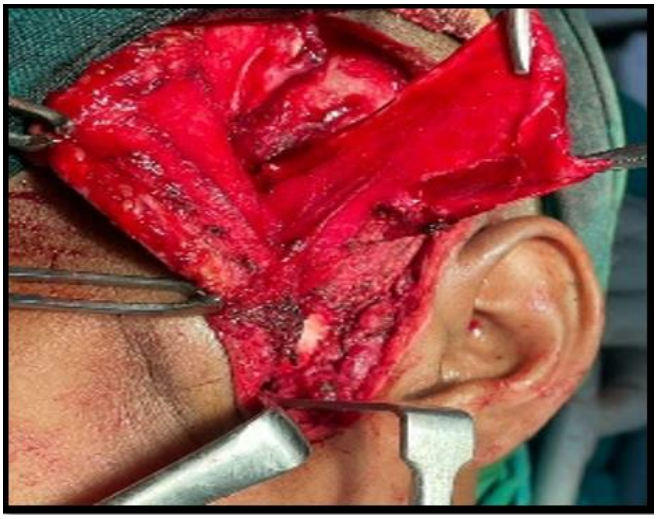

Fig 10: Harvesting of Temporalis Myofascial Flap

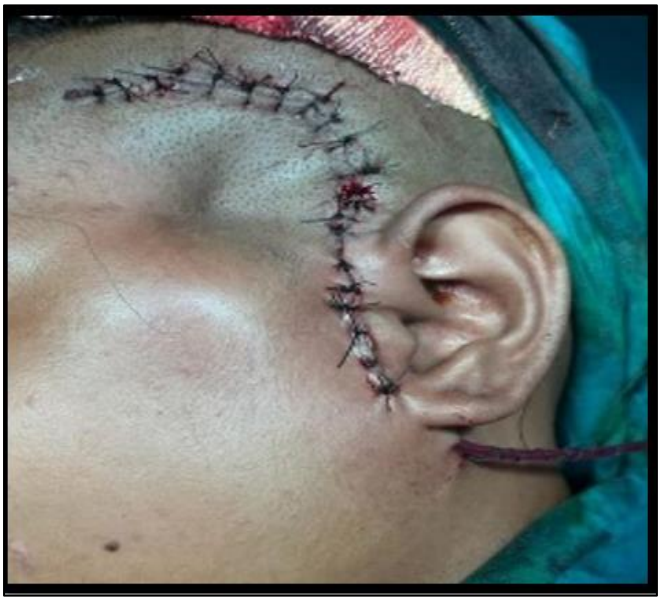

Fig 11: final Closure with 3-0 Ethylon Sutures

VII. POSTOPERATIVE FOLLOWUP

Post-operative follow up started the very next day of surgery and the events of postoperative follow up were gruelling. Heister mouth gag was used for performing intense mouth opening exercises. By 2nd day, an opening of 25 mm was achieved by following methodical mouth opening exercises. After tiresome 10 days of extensive mouth opening exercises with incremental stacking of ice cream sticks, a 30 mm mouth opening was achieved. The same exercises have been continued and by the 24th post-operative day, a 40 mm mouth opening has been achieved (Figure 12) and the incision area healed without any complications (Figure 13). Patient was advised to continue with physiotherapy for another 6 months to maintain optimal results.

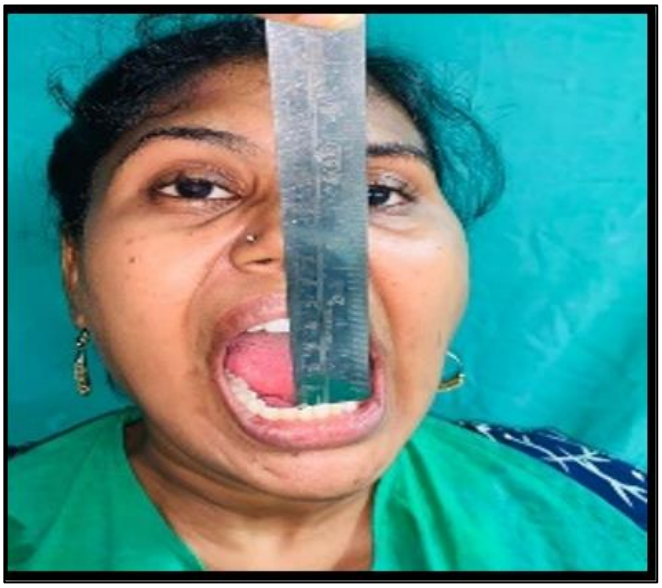

Fig 12: post-op day 24 with a mouth opening of 40 mm

Fig 13: External Suture Healing by Post-op Day 24

Post-operative OPG revealed patent joint space (Figure 14).

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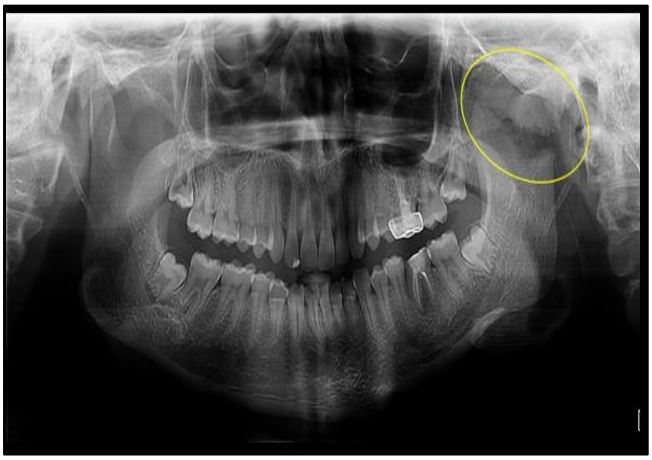

Fig 14: Post-Operative OPG Revealing Patent Joint Space Created

VIII. DISCUSSION

In this case report, the Al-kayat-Bramley approach has been followed which offered several advantages compared to many standard incisions. The plane of dissection was distinguished with ease and was in harmony with many adjacent anatomical structures preserving them [9]. The early mobilisation and physiotherapy attributes to the prevention of formation of unwanted adhesions and subsequently to avoid any soft tissue contractions. The ice cream sticks also called as the Popsicle sticks exercise was proved to be effective in many cases of limited mouth opening [10]. The patient was first given a stack of sticks, the number of sticks depending on the then existed amount of mouth opening. The patient was asked to bite on the sticks and hold for 10 minutes. This was repeated 10 times. The number of sticks is increased by 1 for every subsequent day. The patient was advised to keep on with the aggressive physiotherapy for the next 6 months to 1 year to maintain the achieved mouth opening of 40 mm.

IX. CONCLUSION

The present case report was a methodical management of TMJ ankylosis. A detailed history, a thorough clinical and radiologic examination, a methodical surgical intervention and a progressive physiotherapy resulted in a successful and efficient management of the unilateral bony ankylosis of TMJ. The patient's psychological confidence was observed to boost up in the post-operative follow ups indicating the successful outcome of the entire surgical procedure.

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