

Interposition Arthroplasty using Temporal Fascia Flap For Temporomandibular Joint Ankylosis

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ABSTRACT

Introduction: Temporomandibular joint ankylosis is very common among young and young adults. TM joint can be intraarticular or extraarticular. The aim of treatment is not only to treat the movement of the joint but also to prevent relapse.

Material and methods: In our series of 20 cases of temporomandibular joint ankylosis treated at our institute Rajendra Institute of Medical Sciences, Ranchi, Jharkhand in Department of Surgery from January 2007 to January 2017 with interposition arthroplasty.

Results: Most of the patients were in the age group of 10 to 25 years, with equal male (10) to female (10) ratio of 1:1. 14 (70%) had unilateral ankylosis and 6 (30%) had bilateral ankylosis of temporomandibular joint ankylosis. Duration of ankylosis ranges from less than 2 years to more than 6 years. All the patients treated with interposition arthroplasty using temporalis fascia flap. Very good mouth opening was achieved in all the patients with mean follow up period of 6.5 years ranges from 2.5 years to 10 years.

Conclusion: Interposition arthroplasty using vascularized temporalis fascia flap is a very reliable method to prevent recurrence of ankylosis and it also avoids the disadvantages of alloplastic materials as well as non-vascularized autogenous tissues.

Keywords: Temporomandibular joint ankylosis, temporalis fascia flap, interposition arthroplasty.

INTRODUCTION

Temporomandibular joint ankylosis is very common among young and young adults TM joint can be intraarticular or extraarticular (Laskin 1978).¹ The Restoration of occlusion and minimising the secondary facial and occlusion abnormalities in the patients are equally important considerations which may be achieved by interceptive Surgery in an attempt to restore normal facial growth.

In adults, due to the failure of adaptation of occlusion to the abnormal situation, chin point may leave a large lateral open bite on the affected side. To correct this lateral open bite Genioplasty may produce an acceptable result. The most important aim must be to restore normal function which can be best achieved at the level of previous glenoid fossa from the mechanical point of view. This however is also the level at which ankylosis is most likely to recur. The aim of treatment is not only to treat the movement of the joint but also to prevent relapse.

MATERIAL AND METHODS

In our series of 20 patients (figure: 1-8) of temporomandibular joint ankylosis admitted from January 2007 to January 2017. After taking ethical clearance from the Departmental Ethical Committee, Department of Surgery, RIMS, Ranchi, this study was undertaken. All the patient had the complain of inability to open the mouth and diagnosis was based on clinical

assessment supplemented by orthopantomogram and CT scan. All the patients were operated under general anaesthesia with nasal intubation. Operative technique: The incision starts in a semicircular fashion in the hairline and extends in front of helix and following the curvature of helix goes behind the tragus. This incision is better than classical incision since the upper part is hidden in the hairline and the lower part behind the tragus. Dissection in the scalp directly goes down to temporal fascia i.e. the thickened white layer of fascia that lies directly on the temporal muscle. The dissection was continued downward exactly on top of the temporalis fascia. Now the temporalis fascia flap was raised with blunt and sharp direction. The mandible was moved and upper joint space identified the joint capsule was divided and the bony mass removed using osteotome and burr. Once mass has been removed opening of mouth was tried if any fibrous tissue causing restriction was also divided. Bone ends now smoothed out. If mouth opening was inadequate same procedure was performed on other side also or if preoperatively bilateral temporomandibular joint ankylosis diagnosed then also other side explored.

An inferiorly based temporal fascia flap approximately 2 cm x 7 cm in size was raised with the base of the flap lying above the zygomatic arch. The flap was transposed inferiorly to reach the glenoid fossa. The distal end of flap was folded to fill the glenoid cavity after removal of the bony mass. The flap margins were sutured to the residual surrounding tissue to prevent dislodgement of the flap. Wound was closed with the suction drain and drain removed after 48 hours. Both passive and active physiotherapy started using Heister mouth prop from 7th post operative day till 1 year.

STATISTICAL ANALYSIS

As this study was an observational study, so have used MS Excel format for compilation of data. Tables were made with the help of MS Excel. Mean and percentages were used to interpret the data.

RESULTS

Interpositional arthroplasty was done on 20 patient of temporomandibular joint ankylosis using temporalis fascia flap with male to female ratio of 1: 1 and majority of the patients where in the age group of 10 to 25 years (Table-1). The duration of ankylosis varied from less than 2 years to more than 6 years.

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Temporomandibular joint ankylosis was unilateral in 14 (70%) of patients and bilateral in 6 (30%) of the Patient (Table-2).

Pre operative mouth opening was 0-2 mm in 10 patients 2-5 mm in 8 patients and 5-10 mm in 2 patients. Following temporalis fascia flap the mouth opening achieved was between 20 to 40 mm in 8 patients and more than 40 mm in 12 patients the inter incisor distance measured at 2 years follow up in these Patients were between 20 to 40 mm in 9 patients and more than 40 mm in 11 patients (Table-3).

There were no complications in this series except for minor wound infection in 3 cases in post op period that healed with antibiotic therapy according to culture and sensitivity report and did not require any further operative procedures.

DISCUSSION

The normal mouth opening in adults varies from 40 to 56 mm but varies in children depending upon the age and structure of the child. The most important cause of TMJ ankylosis is trauma (Laskin 1978).¹ Another important cause of ankylosis is the condylar splits in a sagittal plane and the lateral fragment passes upwards over the outer rim of the glenoid fossa. The medial pole into which is inserted the lateral pterygoid muscle, is displaced anteromedially. The associated disruption and displacement of the interarticular cartilaginous disc together with the inevitable loss of mobility may lead to ankylosis (Moorthy and Finch 1983)² had broadly classified the usual treatment of ankylosis of the temporomandibular joint in 3 groups condylectomy, gap arthroplasty and interposition arthroplasty (Topazian 1964).³ review of gap arthroplasty without interposition reported recurrence rate as high as 53%, and now a days condylectomy is rarely performed. Rajgopal and Associates (1983)⁴ have suggested radical condylectomy as well as coronoidectomy, but the vertical ramus height becomes greatly reduced. Alloplastic materials like Proplast, Teflon, sialastic, methyl methacrylate or autogenous tissue like fascia lata or muscle, full thickness skin or cartilage into the defect has also been tried (Barry M. Zide 1990).⁵ Smith and Associates (1993)⁶ have reported implant erosion into the middle cranial fossa and the histology of these implants demonstrates that there is an exuberant Giant Cell inflammation that erodes bone. Demir et al (2001)⁷ have used preserved costal cartilage for the treatment of temporomandibular joint ankylosis with good functional result but antigen antibody reaction leading to late resorption of graft, that may lead to recurrence of ankylosis in the end. Burt Brent (1990)⁸ have quoted the result of studies that suggest that grafted cartilage does evoke transplantation antigens and that the rejection response is merely delayed by the physical barrier that the matrix interposes between the chondrocytes and the cells of immune surveillance system of the recipient host. However temporalis fascia flap is available at the operative site and is easy to raise and quick to execute. The vascularized flap shows less chance of subsequent absorption and Fibrosis. Abdul Hassan, et al (1986)⁹ have studied the surgical anatomy of temporal region. They found the superficial temporal fascia lies immediately deep to the hair follicles and is a part of the subcutaneous musculo-aponeurotic system and is continuous in all direction with other structures belonging to that layer. We have used this temporalis fascia in all our patients and found that superficial temporal fascia with rich blood supply and satisfactory arc of rotation to fill in the

Age group (years)	Male	Female	No. of patients	Percentage
< 5	-	-	-	-
5-10	2	1	3	15
10-15	3	2	5	25
15-20	2	3	5	25
20-25	2	3	5	25
>25	1	1	2	10
Total	10	10	20	100

Table-1: Particulars of patients (n=20)

Duration (years)	Unilateral	Bilateral	No. of patients	Percentage
< 2	7	3	10	50
2-4	4	1	5	25
4-6	2	1	3	15
>6	1	1	2	10
Total	14	6	20	100

Table-2: Duration and extent of ankylosis

Mouth opening (in mm)	Preoperative (No. of patients)	Postoperative (No. of patients)	At 2 years (No. of patients)
00-02	10	-	-
02-05	8	-	-
05-10	2	-	-
10-20	-	-	-
20-40	-	8	9
> 40	-	12	11
Total	20	20	20

Table-3: Pre and Post operative mouth opening

defect of osteotomy /ostectomy, the follow-up of patients has shown no relapse and recurrence of ankylosis in the long run. Krishna Rao, et al (2004)¹⁰ shown the role of simultaneous gap arthroplasty and distraction osteogenesis in the management of temporomandibular joint ankylosis in children, but requires patient selection in whom semi-classical microstomia is coexisting. Amarnath B.C, et al (2011)¹¹ reported a case treated with distraction but needs long time follow up for establishing it to be the treatment of choice and expertise in distraction osteogenesis.

CONCLUSION

The main aim of treatment of temporomandibular joint ankylosis is not only to achieve adequate mouth opening but also to prevent recurrence of ankylosis. Interposition arthroplasty using vascularized temporalis fascia flap is a very reliable method to prevent recurrence of ankylosis and it also avoids the disadvantages of alloplastic materials as well as non-vascularized autogenous tissues.

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