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Clinical study of temporomandibular joint ankylosis & its management

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Abstract
Introduction: TMJ ankylosis is one of the problem at OGH and a challenge both to the Anesthesiologist and the surgeon.
Aim: To study the etiology, occurrence in relation to age, sex, side and severity & choice of management of Temporomandibular joint Ankylosis and their outcome.
Methodology: This is a study of the cases, which numbered about 15 cases, has been operated in the Department of Plastic Surgery at Osmania General Hospital between 2011 to 2015 and 2017 to 2018 in association with department of Radiology and department of Oral Medicine . The Epidemiology, Causes and Management of Temporomandibular Joint Ankylosis and Outcome are studied in all patients. All these patients had clinical and radiological evidence of bony ankylosis with minimal inter incisor distance pre-operatively.
Results: In the present study, the age of presentation in this study was between 10 and 35 years with commonest age being second decade. In this study TMJ Ankylosis was common in females. (female: male=2:1). Childhood trauma was the major cause. Unilateral involvement was more common (5:1) and frequently on left side. Most of the patients presented to the hospital when the mouth opening dropped below 0.5 cm. All the patients were intubated successfully with awake blind nasal intubation. All the patients were routinely extubated when patient was stable. In this study Acrylic ball interpositional arthroplasty in adults was the procedure of choice with no major complications. Average mouth opening achieved in this study was 36mm. Early postoperative physiotherapy with molar bite blocks & active chewing exercises and follow-up is mandatory to prevent recurrence. No recurrence was noticed in this study group.
Conclusion: The primary objective of adequate mouth opening which is long lasting is achieved in this series.

Keywords: ankylosis, interpositional arthroplasty, blind nasal intubation, unilateral involvement

Introduction
A more complete definition of the TMJ ankylosis is “Restricted mobility and consolidation of at Temporomandibular joint”
Temporomandibular joint Ankylosis is a disorder that leads to restriction of mouth opening from partial restriction to complete immobility of jaw. TMJ ankylosis is an extremely disabling affliction that causes problems in mastication, speech, digestion, appearance and oral hygiene. TMJ ankylosis deformities of mandible in growing children may accompany with malocclusion.
It is most commonly associated with trauma and other causes such as local infection or systemic disease such as Ankylosing Spondylosis, Rheumatoid Arthritis or Psoriasis [1-4].
TMJ Ankylosis is essentially a condition afflicting the population of the “Developing countries” where the medical facilities are still not adequate. Despite the developments in Oral & Maxillofacial surgery, treatment of patients with ankylosis of the Temporomandibular joint still remains challenging [4-6].
Several authors studied and developed different techniques but recurrence still remains the major problem. Currently three basic techniques commonly employed are Gap Arthroplasty, Interpositional Arthroplasty & Joint Reconstruction.

Aim of the Study
To study the etiology, occurrence in relation to age, sex, side and severity & choice of management of Temporomandibular joint Ankylosis and their outcome.

Objectives of the Study

- To evaluate the etiology, occurance and management of Temporomandibular joint Ankylosis in 15 patients
- To achieve adequate opening of mouth.
- To prevent recurrence of the ankylosis.
- To correct and restore the secondary facial deformity.
- To avoid anterior open bite & restore occlusion.

Patients & Methods

This is a study of the cases, which numbered about 15 cases, has been operated in the Department of Plastic Surgery at Osmania General Hospital between 2011 to 2015 and 2017 to 2018 in association with department of Radiology and department of Oral Medicine.

The Epidemiology, Causes and Management of Temporomandibular Joint Ankylosis and Outcome are studied in all patients.

All these patients had clinical and radiological evidence of bony ankylosis with minimal inter incisor distance pre-operatively.

The presence of bony ankylosis had been confirmed at surgery in all cases.

The preoperative & postoperative maximal inter incisor opening & complications were carefully examined in all patients.

Inclusion criteria

All the cases which have been diagnosed as true TMJ ankylosis.

Exclusion criteria

Cases who have hemi facial microsomia and all other causes of false ankylosis.

Methodology

In Prospective study 5 cases of true ankylosis requiring interpositional arthroplasty with acrylic ball was selected.

All cases were evaluated with thorough local and clinical examination. Patients were subjected to investigations such as blood investigations, Orthopantomogram, CT Scan and MRI scan.

In Retrospective Study 10cases were selected operated with interpositional arthroplasty with acrylic ball performed in the Department of Plastic Surgery at Osmania General Hospital between 2011 to 2014

Procedure

Following sterilization protocol awake blind nasal intubation was performed. Patient was placed in a supine position with pillow under shoulder neck turned towards opposite side. Under strict aseptic conditions, through the preauricular an inverted hockey stick incision was given and approached a temporomandibular joint. Posterior border of vertical ramus, Arch of zygoma, Coronoid notch was identified. Posterior wedge ostectomy and anterior osteotomy performed. Mouth opening was assessed. Coronoidectomy done as mouth opening achieved with interpositional arthroplasty with Acrylic Ball. Bilateral molar bite blocks kept after achieving adequate mouth opening (3.5cms). Hemostasis secured and Drain was placed. Wound closed in layers.

Post-operative period

Patient shifted to ICU with extubation. Patient was then shifted to ward after 48 hours of procedure. Drain removed on 3rd day. No collection from wound was noticed. Suture removal done on 8th day.

Patient discharged after advising to retain molar bite blocks continuously and active chewing exercises. Advised for review after 2weeks.

Follow up:

2 weeks: inter incisor distance: 3.5cms 6 weeks: inter incisor distance: 3.8cms 12weeks: inter incisor distance: 4cms

Observations and Results

A clinical study of 15 cases, with 10 cases of Retrospective and 05 cases of Prospective study, of temporomandibular joint ankylosis operated in the department of Plastic surgery, Osmania General Hospital during the period of 2011 to 2015 and 2017 to 2018.

Age Distribution

The patients who presented to us, were found to range from 10-35 years of age, with most of them falling in the age group between 11 & 20 years.

Table 1: Age distribution

Age distribution	Number	percentage
1-10	1	6.66
11-20	10	66.6
>20	4	26.6

Table 2: Sex distribution

Sex	Number	Percentage
Male	10	66.66
Female	5	33.33

The patients in our series were mostly females 10 and the rest 05 are males, F: M ratio being 2:1.

Etiology

In our series, 09 patients presented with history of trauma, 02 presented with H/O infection, and the remaining 04 had no definitive history of injury or infection.

Table 3: Etiology

Etiology	Number	Percentage
Trauma	9	60
Infection	2	13.3
Unknown	04	26.6

Table 4: Unilateral Versus Bilateral Involvement:

Laterality	Number	Percentage
unilateral	14	93.3
bilateral	1	6.6

In our series, 14 patients had unilateral involvement, out of which 11 are left side and 03 are right side whereas bilateral involvement was seen in 1 patient.

Side Involvement

In our series, 14 patients had unilateral involvement, out of which 11 are left side and 03 are right side whereas bilateral involvement was seen in 1 patient.

Table 5: Side involvement

Side involvement	Number	Number
Left side	11	73.3
Right side	03	20
Bilateral	1	6.66

Pre-Operative Inter-Incisor Distance

In our presented cases, most of the patients had Preoperative inter- incisor distance (IID) of less than 5mm.

Table 6: Inter-Incisor Distance

Inter-Incisor Distance	Numer	Percentage
<5mm	09	60
5-8mm	6	40

Post-Operative Interincisor distance

The post-operative inter incisor distance (IID) immediately following the surgery observed was between 3.5cms – 4cms, in most of patients. The mouth opening improved further in most of the patients over a period of time with molar bite blocks & mouth opening exercises.

Case 1: 17yr old female patient with left TMJ bony ankylosis.

Fig 1: Pre Operative

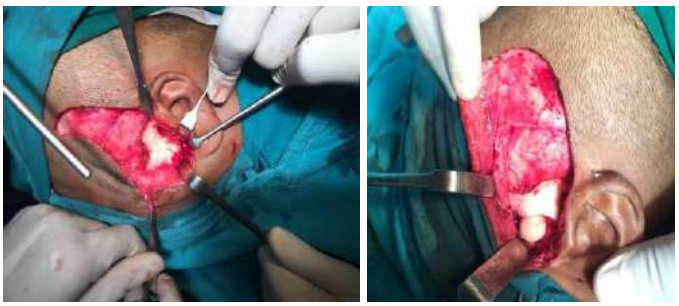

Fig 2: Intraoperative

Postoperative

Case 2: 20 yrs old female patient with left TMJ bony ankylosis.

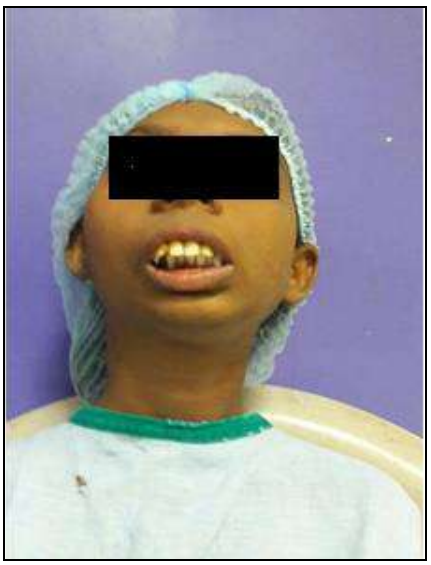

Fig 3: Pre-Operative

Fig 4: Intraoperative

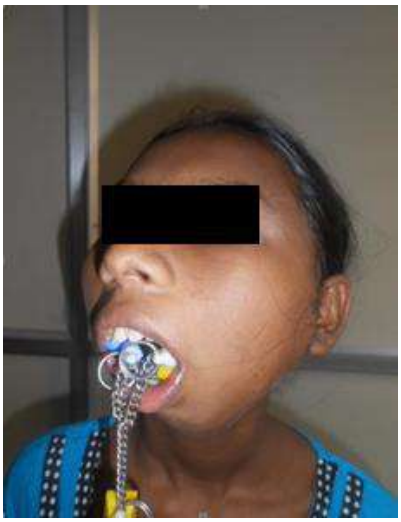

Fig 5: Postoperative

Discussion

This clinical study of 15 cases, with 10 cases of Retrospective and 05 cases of Prospective study, temporomandibular joint

ankylosis operated in the department of Plastic surgery, Osmania General Hospital during the period of 2011 to 2014 and 2017 to 2018 In the Department of Plastic Surgery at Osmania General Hospital, Hyderabad. Temporomandibular ankylosis is a common condition, seen mostly in younger age groups.

Factors, which were studied in the patients, were

1. Age group
2. Sex involved
3. History involved
4. Side involved.
5. Facial asymmetry.
6. Pre-operative mouth opening.
7. Postoperative mouth opening.

All these patients had clinical and radiological evidence of bony ankylosis with an average inter incisor distance less than 5mm pre-operatively. The presence of bony ankylosis had been confirmed at surgery in all cases.

The medical history, follow up period, pre-operative & post-operative maximal inter incisor opening & complications were carefully examined in all patients. OPG (orthopantamogram) and mastoid view radiographs were taken in all patients. CT scans are done to assess type, severity of ankylosis and to plan ostectomy at highest level as possible.

Majority of our patients were between 11 and 20 years old and the overall age distribution was similar to patients treated by Sawhney [7].

Trauma either noticed or incipient is the major cause. The absence of proper facilities for treating sub-condyle fractures, common in young age groups, the fear of pain and consequent prolonged immobilization in the immediate post traumatic period lead eventually to ankylosis in such cases is in accordance with the study done by Benaglia MB *et al*, [8] Bilateral temporomandibular joint ankylosis as sequel of bilateral fracture of the mandibular condyle and symphysis.

Restriction in opening of mouth following trauma in children should always be suspected to be sub condylar fracture/intra capsular crushing of condyle which may eventually lead to temporomandibular joint ankylosis.

The number of our cases resulting from infection was less than those of Borc¸bakan ¨s in the same population. The widespread use of antibiotics at the earliest sign of infection, a common practice, may explain the less incidence infection.

In our series, the cases operated were:

In Prospective study 5 cases of true ankylosis requiring interpositional arthroplasty with acrylic ball was selected.

In Retrospective Study 10 cases were selected, operated with interpositional arthroplasty with acrylic ball.

In our series, 14 patients had unilateral involvement, out of which 11 were left side and 03 were right side whereas bilateral involvement was seen in 1 patient.

The most frequently reported operation in our study includes interpositional arthroplasty with Acrylic ball.

The results are summarized.

Our results of unilateral interpositional arthroplasty using acrylic ball in bony ankylosis of the temporo mandibular joint.

Table 7: Case details

Pre-op IID	No. of patients	post op-IID	No of patients
0mm to 5mm	9	3.5cms-4cms	12
6mm to 1cm	6	4cms -4.5cms	3

The acrylic marble as interpositional material is a very simple, safe and cheap, can be fabricated locally. The operation is quick and does not require an additional surgical site, besides it maintains the gap along with the vertical length of ramus and allows the movements in all directions simulating a normal joint. There is no report of acrylic causing a foreign body reaction in our series when used as the interpositional material in the management of TMJ ankylosis.

The type of the acrylic spacers we used were spherical. The spherical spacers enabled the patients for all jaw movements including lateral movements as well compared with the spacer applied by Sawhney who reported limited movement. Acrylic does not produce any long-term complications and is well tolerated.

Details of results of Interpositional Arthroplasty with acrylic ball in Unilateral Bony Ankylosis of the Temporo mandibular joint (Dr. C.P. Sawhney) [7].

Table 8: Interpositional Arthroplasty Case details

Pre-op IID	No. of patients	post op-IID	No of patients
0 cms -0.5cms	58	2.5-3cms	19
		3-3.5cms	27
		3.5-4cms	12
1cms -1.5cms	7	4-4.5cms	7

In our experience, with limited but adequate excision of bony block and acrylic ball we achieved adequate mouth opening. We achieved similar results as Dr. C.P. Schwaney study by performing interpositional arthroplasty with acrylic ball [7].

Though sternoclavicular interposition arthroplasty we have not done and even it is not a comparison with our procedures, our results are as good as sternoclavicular interpositional arthroplasty by Dr. Philip Korula [2]. Details of 15 cases of sternoclavicular joint interposition arthroplasty by Dr. Philip korula [2]. Post op inter-incisor distance ranged from 1.75cms to 4.8cms on a average follow up period of 23months.

Table 9: Post op inter-incisor distance

Post op IID	No. of patients
1.75cms-2.5cms	4
2.6cms -3.5cms	9
3.6cms-4.8cms	2

In our series in unilateral cases gap arthroplasty was done in cases with results as:

Table 10: Unilateral cases gap arthroplasty

Pre-op IID	No.of patients	Post op IID	No.of patients
0 to 5mm	8	3.5cms-4cms	10
5mm to 1cm	6	4cms-4.5cms	4

Reza Movahed *et al*. [9] Managed Temporomandibular joint ankylosis with TJR approach and suggested to consider TJR as initial treatment modality for management of TMJ ankylosis.

Katarzyna Sporniak- Tutak *et al*. [10] provided with an evidence-based review of the literature in order to determine the most efficient way to manage TMJ ankylosis and re-ankylosis. And concluded that in order to achieve a satisfactory and durable effective treatment, an individualized approach is necessary in each case.

Conclusion

Considering a individualized approach to render satisfactory treatment outcome we have used most common technique of Interpositional arthroplasty with Acrylic Ball and found

satisfactory results. However further additional techniques need to be considered in order to have further insight to the effectiveness of these techniques.

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References

1. Ko EW, Huang CS, Chen YR. Temporomandibular joint reconstruction in children using costochondral grafts. J Oral Maxillofac Surg 1999;57(7):789-98; discussion 799-800.
2. Korula P, Ramachandra NE, Dhanraj P. Tempormandibular arthroplasty by pedicled transfer of sternoclvicular joint-a simplified technique. British journal of plastic surgery 1991;44:410-414.
3. Moriconi ES, Popowich LD, Guernsey LH. Alloplastic reconstruction of the temporomandibular joint. Dent Clin North Am. 1986;30(2):307-25.
4. Wagner JD, Mosby EL. Assessment of Proplast-Teflon disc replacements. J Oral Maxillofac Surg. 1990;48:1140–4.
5. Valentini, Vetrono S *et al*. Surgical treatment of TMJ ankylosis: our experience (60 cases)-J Cranio fac. Surg – 2002;13(1):59-677.
6. Pogrel MA, Kaban LA. The role temporalis fascia and muscle flap in temporomandibular surgery. J Oral Maxillofac Surg. 1990;48:14-21.
7. Sawhney Chander Prakash. Bony Ankylosis of the temporomandibular joint: Follow-up of 70 Patients Treated with Arthroplasty and Acrylic Spacer interposition. J Plastic and Reconstructive surgery. 1986, 29-40.
8. Benaglia MB, Gaetti-Jardim EC, Oliveira JG, Mendonça JC. Bilateral temporomandibular joint ankylosis as sequel of bilateral fracture of the mandibular condyle and symphysis. Oral Maxillofac Surg. 2014;18(1):39-42. Doi: 10.1007/s10006- 012-0384-z. Epub 2013 Jan 10.
9. Reza Movahed, Louis Mercuri. Management of Temporomandibular joint ankylosis. Oral and Maxillo Facial Clinics. 2015;27(1):27-35.
10. Katarzyna Sporniak-Tutak, Joanna Janiszewska-Olszowska, Robert Kowalczyk. Management of temporomandibular ankylosis compromise or individualization – A literature review. Med Sci Monit. 2011;17(5):RA111-RA116.