FREQUENCY AND MANAGEMENT OF TEMPOROMANDIBULAR JOINT ANKYLOSIS: A STUDY CONDUCTED OVER THE PERIOD OF 13 YEARS

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ABSTRACT

Objective of this study was to highlight the frequency and management of temporomandibular joint ankylosis. One hundred and forty patients visiting the Department of Oral and Maxillofacial Surgery, Ayub Medical College and Teaching Hospital, Abbottabad were included in this study. It was conducted from year 2000 to 2012.

Frequency of patients was noted and interpositional gap arthroplasty was conducted on each one. Males were 90 / 140 (64.3%) and females 50 / 140 (35.7%). Causes of ankylosis were birth trauma 7(5%), falls from roofs 39(27.9%), falls from trees 61(43.6%), infection 3(2.1%) and road traffic accident 30(21.4%). Post operative mouth opening at one year follow-up was normal in 112(80%) patients and restricted in 28(20%).

Falls from roofs and trees were common causes of temporomandibular joint ankylosis in this region and most of the patients were males with unilateral presentation. Interpositional Gap Arthroplasty was found highly effective and safe surgical management option for temporomandibular joint with acceptable immediate and long term outcome, particularly when temporalis fascia or muscle and iliac crest grafts were used for adults and costochondral grafts with fascia interposition used for children.

Key Words: *Temporomandibular joint ankylosis; interpositional material; post operative opening.*

INTRODUCTION

The temporomandibular joint (TMJ) is a diarthrodial atypical synovial joint that is capable of both rotational and translatory movements. The TMJ is formed by the mandibular condyle and the glenoid fossa of the squamous part of the temporal bone and is separated into upper and lower cavities by a fibrocartilagenous articular disc.[1, 2]

Ankylosis is a Greek terminology meaning 'stiff joint'. Hypomobility of the joint can lead to inability to open the mouth and perform normal functions. Due to ankylosis the normal eating and speaking process is disturbed which is extremely distressing to the patient.[3,4,5]

TMJ ankylosis is most commonly linked to trauma (13-100%), infection (10-49%), and systemic diseases like anklosing spondylitis, rheumatoid arthritis and psoriasis (10%).[6]

The airway management is single most important challenge because of deficient mandible. Varieties of surgical techniques have been proposed but none of them have proven to show 100% results.[7,8,9]

Interpositional materials like temporalis muscle, fascia, auricular cartilage, dermis, fascia lata, silastic, lyodura etc have been used but temporalis muscle and fascia are the most common options considered worldwide.[10,11,12]

Usually the complications arising from TMJ surgeries are facial nerve damage, re ankylosis, airway lose, shortening of ramal height, scar and donor site morbidity.

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Received for Publication: July 24, 2013
Revision Received: August 14, 2013
2nd Revision Received: September 06, 2013
Revision Acceptd: September 20, 2013

The present study was conducted to assess the frequency and management of TMJ ankylosis in this department.

METHODOLOGY

The results of patients with TMJ ankylosis treated in the Department of Oral and Maxillofacial Surgery of Ayub Medical College and Teaching Hospital, from year 2000 to 2012, were assessed.

140 patients formed the study group. The diagnosis was made on clinical basis selected from OPD of Oral & Maxillofacial Surgery, Ayub Teaching Hospital. An informed consent was obtained from the patients or their parents/guardians. The demographic information like name, age, sex and address was recorded. Routine investigations and radiographs like Orthopantomogram (OPG) and or Posteroanterior (PA) view of mandible were undertaken.

Interpositional gap arthroplasty was conducted in each patient. Interpositional materials used included fascia, muscle, silastic sheet and conchal cartilage. Costochondral and iliac crest grafts were also used in few patients for restoring the ramal height and growth. Distraction osteogenesis and orthognathic procedures were also undertaken according to the need. The operations were carried out under general anesthesia (GA) with nasotracheal intubations.

Before intervention, patient's record was entered on a specially designed Proforma. Post operatively follow up was maintained upto one year and mouth opening at that time was recorded. Mouth opening was checked by measuring interincisal distance in millimeters by using vernier caliper. 45-55mm mouth opening was considered as normal.

RESULTS

Age range was 4-25years with mean 12.92 $\pm$ 5.21. According to age of the patients they were divided into 3 age groups ranging from 4-12 years (60), 13-18 years (50) and 19-25 years (30). Causes of ankylosis were birth trauma 7(5%), falls from roofs 39(27.9%), falls from trees 61(43.6%), infection 3(2.1%) and road traffic accident 30(21.4%). Interpositional materials used were Conchal cartilage 3(2.1%), Temporalis Fascia 56(40%), Temporalis Muscle 44(31.4%) & Silastic Sheet 37(26.4%). Unilateral ankylosis was seen in 80(57.1%) and bilateral in 60(42.9%).

Costochondral graft was used in 40(28.6%) patients and iliac crest graft in 17(12.1%). For esthetic rehabilitation orthognathic surgery was performed in 11(7.9%) and distraction osteogenesis in 4(2.9%).

DISCUSSION

Normal mouth opening in adults is between 40-56 mm. Temporomandibular joint ankylosis not only affects mouth opening but also the normal growth pattern of the mandible.[13] Ankylosis can be fibrous or osseous, causing restriction in condylar movements, which is generally not associated with pain. Digital palpation of the ankylosed temporomandibular joint during maximal movements demonstrates none or very limited translation of the condyle.[14,15,16]

Limited mouth opening due to ankylosis does not improve by exercises or any conservative therapy. Topazian reviewed gap arthroplasty without interposition and reported a recurrence rate of 53%.[17]

The treatment of TMJ ankylosis continues to be a topic of current interest because of the surgical difficulties and rate of recurrence. The aim in the treatment of TMJ ankylosis is the complete surgical resectioning of ankylotic bone, aggressive exercises to prevent recurrence, ensuring functional occlusion and dental rehabilitation.[18] The techniques employed to that end are joint reconstructions performed with costochondral grafts or alloplastic joint prostheses, gap arthroplasty and interpositional arthroplasty. At present, there is no ideal interpositional graft.[19]

The problems encountered with the present grafts are; muscle shrinks and fibroses, fascia lacks bulk, cartilage tends to fibrose and calcify while alloplastic implants under functional loads disintegrate and cause

TABLE 1: DISTRIBUTION BY SEX

Sex of the patient	Patients	Percentage
Male	90	64.3%
Female	50	35.7%
Total	140	100%

n=140

TABLE 2: POST OPERATIVE MOUTH OPENING AT ONE YEAR FOLLOWUP

Mouth opening	Patients	Percentage
Normal	112	80%
Restricted	28	20%
Total	140	100%

n=140

foreign body giant cell reactions.[20,21] Although temporalis flaps are still the most popular choice of grafts, dissecting temporalis muscle leads to scar contracture of the donor site which may further exacerbate the trismus unless an ipsilateral coronoidectomy is performed.[22] The use of autogenous full thickness skin or dermis grafts as interpositional materials has also been published.[23]

The advantages of the alloplastic material are that they are easy to use, have a short operating time and low cost, however, the disadvantages are foreign body reaction, dislodgement, and infection. Usually, silicone is used as a rectangle or a disc, but these must be rigidly fixed. In spite of this, dislodgement or extrusion may occur. It is recommended that the TMJ ankylosis should be dealt with aggressive surgical approach with minimal resection of bone in vertical height and using silastic interpositional material followed by early mobilization of the joint. It not only results in satisfactory mouth opening and jaw function, but also ensures reduction of re-ankylosis.

Using silicone implants as inverted T-shaped implants to decrease the complication rate was proposed by Karaca *et al*. and the long-term results were perfect.[24]

CONCLUSION

Falls from roofs and trees were common causes of TMJ ankylosis in this region and most of the patients were males with unilateral presentation. Interpositional Gap Arthroplasty was found highly effective and safe surgical management option for TMJ with acceptable immediate and long term outcome, particularly when temporalis fascia or muscle and iliac crest grafts were used for adults and costochondral grafts with fascia interposition used for children. For esthetic rehabilitation orthognathic surgery or distraction of mandible was used with excellent results once adequate mouth opening was achieve.

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