Original Article

Arthroplasty of Temporomandibular Joint Ankylosi By Autogenious Tissue Versus Alloplastic Material

Fazal Dad and Asma Uppal

ABSTRACT

Objective: To compare the post operative late outcome of the temporomandibular joint arthroplasty of two different surgical procedures, arthroplasty by autogenous and alloplastic material.

Study design: Comparative study.

Place and Duration of Study: This study was conducted at the Maxillofacial Surgery Unit, Mayo hospital / King Edward Medical College, Lahore from 1st January 2003 to 31 Dec. 2003.

Materials and Methods: the study was conducted in the oral and maxillofacial surgery department Mayo hospital Lahore. Thirty TMJ ankylosis patient were divided into two equal groups, group A and group B. group A fifteen patient underwent TMJ arthroplasty with autogenous tissue. While group B fifteen patient TMJ arothroplasty was done with alloplastic material, post operative complications are recorded at each follow up visit.

Results: In group A there were five male and ten female patient. In group B there were six male and nine female patients. mean age group A was 14.2+_ 4.858. while in group B mean age was 14.867+- 4.47 years. There was no statistical difference in age of two groups (P=723). After one year of follow up. There is no post operative complication in group A while in group B three patients had recurrence due to foreign body reaction. Who had to be re-operated.

Conclusion: arthroplasty of temporomandibular joint with autogenous tissue should be preferred in the patient of temporomandibular joint ankylosis as compared to arthroplasty of temporomandibular joint with alloplastic material.

Key Words: temporo mandibular joint, ankylosis, interpositional arthroplasty

Citation of articles: Dad F, Uppal A. Arthroplasty of Temporomandibular Joint Ankylosi By Autogenious Tissue Versus Alloplastic Material. Med Forum 2017;28(12):85-88.

INTRODUCTION

The jaws have been frequently referred to as area of surgical romance because of the complexity of the disease entities they contain and challenges that they pose to the surgeon to correctly diagnose and to effectively treat the prevailing ailment.

Temporo mandibular joint (TMJ) is the only synovial joint in the maxillofacial religion, rest are all sutures and fissures[1.] temoromandibular joint is the part of the stomatognathic system. Any factor influencing this system will affect the function of the TMJ, resulting into hypo or hypermobility[2]. the factor influcing the TMJ are numerous but one condition, temporomandibular joint ankylosis is taken into consideration in this study.

Tempormandibular joint TMJ ankylosis is an intra articular condition, where there fusion of the articular surfaces of the joint i.e; condyle of the mandible with the glenoid fossa resulting in the chronic hypo mobility or immobility. TMJ ankylosis is one of the common disorders affecting TMJ. Those aliment of TMJ is an affliction which occasions much misery for unfortunate victims interfering with mastication, digestion, denying the body from the benefits of a balance diet, speech appearance and oral hygiene. If the condition develops in the childhood facial deformity brings psychological stress, which adds to physical handicap, thus disrupting family life and creating emotional disturbances. [3]

The management of TMJ ankylosis poses significant challenges because of the technical difficulties and high incidence of recurrence.[4] the treatment of ankylosis is not only surgery but it has to be supplemented by post surgical rehabilitation. The surgical modalities include gap arthrplasty, interpositional arthroplasty, and arthroplasty with costochondral[5.] Among the above mention autogenous interposition tissues temporalis muscle flap is very effective method of preventing recurrence of ankylosis, as alloplastic materials have not all stood the test of time.[6] different alloplastic interpositional materials used in various studies includes, silastic, glenoid fossa implant[7], acrylic spacer, Teflon, total joint prosthesis[8]

The use of alloplastic or autogenous tissue, in the temporomandibular joint arthroplasty remains controversial in the history of oral and maxillofacial

Department of Maxillofacial Surgery, Bolan Medical Complex Hospital, Quetta.

Correspondence: Dr Fazal Dad, Assistant Professor, Maxillofacial Surgery, Bolan Medical Complex Hospital, Quetta.
Contact No: 0331-8310749
Email: fazaldadkhankakar919@gmail.com

Received: August 01, 2017; Accepted: October 27, 2017

surgery. The initial search for artificial replacement of joint by alloplast once considered as paramount solution to the temporomandibular joint ankylosis. In this regard the attempt by Gluck with Ivory prosthesis a century ago and use of vatalium fifty years back are notable.[9] A century of experience does not look as kindly on the application of alloplastic material to TMJ maladies. Hence the controversy of autogenous and allopastic material is still unresolved and needs further work in the reconstruction of temporomandibular joint[10].

Arthroplasty the creation of an artificial joint for restoration of TMJ movement in the patients with ankylosis was first described by Barton of philadeiphia in 1826[11.] He cut through the neck of condyle to mobiles the jaw having TMJ ankylosis. Humhrey in England bottini in turin[12] and little in new york used the same technique for the release of TMJ ankylosis.henny 1969 recommended that silicon sheet could be used after condylectomy as an interpositional material. After 3 years ll patients demonstrated normal joint space with a slight decrease in motion of condyle but without pain. The potential disadvantages of alloplastic reconstruction relate mainly to wear or failure of the material. Wear particles can generate a giant cell foreign body reaction with potential loosening of the implant, resulting in displacement of occlusal change[13].

Verneuil was the first to use temporalis flaps as an interpositional material in the TMJ ankylosis but significant pain on fumction was documented. Experimental and clinical studies have established a foundation for the use of autogenous material to construct the TMJ. Use of autogenous tissue decreases the likelihood of foreign reaction. The need for temporomandibular joint reconstruction is indicated by the severity of the structural damage to its anatomical components. Such damage result in decrease in mandibular function and in most cases a concomitant loss of anatomic form.

The rehabilitation procedures include the post operative mouth opening. Exercises for stabilization of mouth opening, orthodontic treatment / orthognathic for the correction of dentofacial deformities. The best treatment is always judged with the end. The initiation of treatment of TMJ ankylosis is to release and functional rehabilitation of joint. The study is intended the comparison of post operative complication in TMJ arthroplasty by autogenous and alloplastic material.

MATERIALS AND METHODS

This was a comparative study. Thirty patients were selected amongst those who present in outpatient department with temporomandibular joint ankylosis (unilateral). All the cases in the study were diagnosed treated and followed up from 1st January 2003 to 31 Dec. 2003 at the interval of one month, three month, six month, ninth month and twelve months In the department of the oral and maxillofacial surgery, King Edward Medical college/Mayo Hospital Lahore.

Patients were divided at random in two groups irrespective of sex of patients under study. In group 1, inter positional arthroplasty with autogenous material (temporal fascia) while in group 2 , inter positional arthroplasty with alloplastic material (Sialistic implant) was done. Outcome of both groups along with post operative complication were evaluated and compared between two groups in follow up period. Informed consent from all patients was taken. The patients were ensured about the confidentiality of the information given by them. At each follows up visit complications in terms of infection, hemorrhage, recurrence were checked and recorded.

RESULTS

over a period of fourteen month from 1st January 2003 to 29 February 2004. Total numbers of thirty patients were dealt in which two groups were formed. In group 1 interpositional arthroplasty with autogenous tissue was done while in group 2, interpositional arthroplasty with alloplastic material was done. In group 1 the mean age was 14.2+- 4.47. in group 1 there is predilection of male gender over female with a percentage of 66.67% for male and 33.37% for female in group 1 while in group 2, it was 40% for male and 60% for female, having fifteen cases in each group. In group 1 and 2 , radiographically 100% of cases were proved as temporomandibular joint ankylosis.

In group 1, the preoperative interincisor opening distance ranged between0-5mm. the early postoperative interincisor opening distance ranged between 15-20. The postoperative interincisor opening distance in different patients are shown in table 4. In group 2, the preoperative interincisor opening distance ranged between 0-5mm. the early postoperative interincisor distance ranged between 15-20. The late postoperative interincisor opening distance in different patients are shown in table 2. Post operative interincisor opening distance after one month, there was no statistical difference and it is equal in both groups.

Table No.1: Interincisor opening distance(group 1)

Follow up visits	Mean (mm) +-SD
pre operative	2.33+-2.13
one month postoperative	20.93+-1.03
three month postoperative	23.53+-1.59
six month postoperative	25.60+-1.40
nine month post operative	28.60+-1.40
twelve month postoperative	30.93+-1.03

After thre months again there was no any statistical difference in both groups (p= 0.8) after six months group 2 showed decrease interincisor opening distance in three patients due to this there was statistically significant difference as compared to group 1 (p=.009).

after one year statistical difference was again significant in both groups (P=.0I)

The complication of immediate postoperative facial nerve (zygomatic brach) weakness was seen in one patient in both group i.e 1,2. Fortunately non of the patient had residual facial nerve weakness in subsequent follow up visits. The recurrence rate was 20% (n=3) and it was due to foreign body reaction.

Table No.2: Interincisor opening distance (group 2)

follow up visits	Mean (mm)+-SD
preoperative	2.13+-2.20
1 month postoperatively	20.90+-1.03
3 mont postoperatively	23.33+-1.95
6 month postoperatively	24.13+-2.33
9 month postoperatively	26.67+- 3.99
12 month postoperatively	27.4+-5.38

DISCUSSION

Total number of thirty cases were selected and divided at random in to two groups irrespective of age and sex of patients under study, comprising of 15 cases in each group. Group 1 underwent interpositional arthroplsty with autogenous tissue while interpositional arthroplsty with alloplastic material was done in group 2. The main purpose of this study was to compare the post operative complication in both surgical procedures.

Louis G Mercuri categorized the criteria for success specific to alloplastic implant are

- The material from which the devices are made must be biocompatible.
- The devices must be designed with stand the loads delivered over the full range of function of the joint.
- The devices must be stable in situ.
- The surgery to implant must be performed for the proper indication and must be performed aseptically.

Ryan (1984) at the American Association of oral and maxillofacial surgeons (AAOMS) clinical congress, reported an 89% success rate in 150 patients (185 joints) with silicon, which was wired or sutured to the glenoid fossa and articular eminence. The average follow was 1.5 years.[15] in our study 15 patients treated with autogenous tissue in group 1. 100% obtained relief of symptoms while in group 2 in which 15 patients treated with allopplastic material showed 80 % relief of symptos and infection In 3 patients (20%).

Ortak T, at el, They did the study on 38 patients with TMJ ankylosis in 2001. They documented that in two patients (5.2%) another operation to remove silicon material was needed because of infection and exposure of silicon while one patient was operated on again for limited

mouth opening[14]. In our study 15 patients treated with alloplastic material showed 80% relief of symptom and found a foreign body giant cell reaction around fragments of failed sialistic implant with lymph adenopathy whose biopsy specimen showed foreign body giant cell reaction.

Valentini V, at el in 2002 documented the result of surgical treatment of the TMJ ankylosis over a period of 5 years. They used sialistic material in 11 cases in which implant removal was necessary in 5 cases due to inducement of foreign body granuloma . they declared that the gold standard surgery of TMJ ankylosis today is represented by shaving of articular surfaces and subsequent arthroplasty with or without temporal muscle myofacial flap interposition as the use of sialistic as alloplastic material could be associated to an increased persistence of the local symptoms and a higher risk of foreign body granuloma and it may favour ankylosis, relapse and hinder rehabilitation. In our study sialistic removal was necessary in 3 cases in group2 due to its inducement of foreign body granuloma but our duration was 14 month as compared to above study in which duration was 5 year.

Criteria for temporomndibular joint meniscus surgery were published by American Association of oral maxillofacial surgeons(AAOMS) in 1984. In that publication, the use of alloplastic as interpositional implant was recognized as an acceptable treatment[15].but the potential disadvantages of alloplastic reconstruction relate mainly to wear or failure of the material. Wear particles can generate a giant cell foreign body reaction with potential loosening of the implant, resulting in displacement or occlusal changes.[16]

It was consensus of the workshop on temporo-mandibular joint implant surgery conducted by American Association of oral and maxillofacial surgeons (AAOMS) in November 1992, that permanent placement of silicon as an interpositional material of the temporomandibular joint should not longer be done except when used to prevent recurrence of ankylosis. experimental and clinical studies have established a foundation for the use of autogenous material to reconstruct the TMJ. Use of autogenous tissue decreases the likelihood of foreign body reaction.[17]there was some limitation of our study like small sample size and short duration of study. To further looking to the matter we need large sample size and longer follow up duration to find exactly the late complications and recurrence in these patients.

CONCLUSION

Arthroplasty of TMJ with autogenous tissue should be preferred in the patient of TMJ ankylosis as compared to arthroplasty of temporomandibular joint with alloplastic material due to following conclusion drawm on the basis of this study.

1. Functional rehabilitation result obtained through the use of interpositional arthroplasty with autogenous tissue followed by exercise was better irrespective of the sex of the patient.

2. Post operative complication rate is less in patients undergoing interpositional arthroplasty with autogenous tissue as compared to patients undergoing interpositional arthroplasty with alloplastic material.
3. Recurrence rate is higher in patients undergoing interpositional arthrolasty with alloplastic material as compared to gap arthroplasty with autogenous tissue , but due to small number of cases and short duration of the study it was not possible to ascertain stastically significant difference.

Author's Contribution:

Concept & Design of Study:	Fazal Dad and Asma Uppal
Drafting:	Fazal Dad and Asma Uppal
Data Analysis:	Fazal Dad and Asma Uppal
Revisiting Critically:	Fazal Dad and Asma Uppal
Final Approval of version:	Fazal Dad and Asma Uppal

Conflict of Interest: The study has no conflict of interest to declare by any author.

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