Original Article

FREQUENCY OF COMPLICATIONS WITH AUTOGENIC TISSUE INTERPOSITIONING ARTHROPLASTY AND ALLOPLASTIC IMPLANT ARTHTOPLASTY IN CASES OF TEMPEROMANDIBULR JOINT ANKYLOSIS

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ABSTRACT

Objective: *The objective of the study was to compare the postoperative complications of two different procedures of temporomandibular joint arthroplasty by autgenous tissue or alloplastic material.*

Material and Methods: *A randomized controlled trial was conducted on thirty cases of ankylosis of Temporomandibular Joint. Fifteen cases in-group I underwent temporomandibular joint arthroplasty by autogenous tissue and in fifteen cases of group II temporomandibular joint arthroplasty by alloplastic implant was done. Follow up was done over a period of one year, after one month, 3 month, 6 month ,9 month 12 month. the data analysed to compare the postoerative complication of temporomandibular joint arthroplasty by autogenous tissue or alloplastic implant.*

Results: *Group I mean age was 14.2 ± 4.858 years while in Group II mean age was 14.867 ± 4.47 years. In both groups preoperative interincisor opening distance was 0-5 mm. Late post-operative complication of the two procedure are, in group 1 TMJ Arthroplasty by autogenous tissue is 100% successful, while in group 2 the TMJ arthroplasty by alloplastic implant there is recurrence of ankylosis in three cases.Interincisor opening distance in Group I was 30.93 + 1.03 and in Group II it was 27.40 ± 5.38 (P<.05).*

Conclusions: *Interincisor opening distance in Arthroplasty of temporomandibular joint with autogenous tissue was greater at the end of one year as compared to Interincisor opening distance after Arthroplasty of temporomandibular joint with alloplastic implant.*

Key words: *Ankylosis, interpositional arthroplasty, temporomandibular joint*

INTRODUCTION

Temporomandibular joint (TMJ) ankylosis is an intra-articular condition, where there is 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. This ailment of the TMJ causes much misery for the unfortunate victim, interfering with mastication, digestion, denying the body from the benefits of a balanced diet, speech, appearance and 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 disturbance[1].

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The management of the TMJ ankylosis poses a significant challenge because of the technical difficulties and high incidence of recurrence[2]. The treatment of ankylosis is not only surgery but it has to be supplemented by post-surgical rehabilitation. The surgical modalities include gap arthroplasty[3], interpositional arthroplasty[2], and arthroplasty with costochondral graft[4]. Gap arthroplasty is a surgical procedure in which no material is interposed to the site after the arthroplasty[5]. It consists of liberal resection of the ankylotic joint and burring of the glenoid fossa, thus creating a gap of about 1-1.5 cm[6].

Interpositional arthroplasty is the procedure in which arthroplasty with immediate interpositioning of some autogenous or alloplastic material is carried out. The purpose of interposed material is to decrease the possibility of recurrence, to establish a false joint[7].

Proponents of the interpositional arthroplasty

have used different autogenous and alloplastic materials for the interpositioning and have found variable success rate. The different autogenous tissues used for interpositioning in various studies are: Temporalis muscle, Full thickness skin graft[8], uricular cartilage[9], Fascia lata[10].

Among the above mentioned autogenous interpositional tissues temporalis muscle flap is very effective method of preventing recurrence of ankylosis. It is one of the earliest interpositional method and has become increasingly popular, as alloplastic materials have not all stood the test of time[3].

Different alloplastic interpositional materials used in various studies includes:Silastics[11], glenoid Fossa implant[12], ACRYLIC spacer[13], Praplast/Teflon[14], Metal[15], Total Joint prosthesis[16]. The use of alloplastic or autogenous tissue, in the temporomandibular joint (TM J) arthroplasty remains controversial in the history of oral and maxillofacial surgery.

Arthroplasty, the creation of an artificial joint for restoration of TMJ movements in the patients with ankylosis, was first described by Barton of Philadelphia in 1826[17]. He cut through the neck of the condyle to mobilize the jaw having TMJ ankylosis. Humphrey in England, Bottini in Turin, and Little in New York[18], used the same technique for the release of TMJ ankylosis. This was followed by Esmarch who suggested the removal of a wedge shaped piece of bone from the ascending ramus of the mandible and formation of a false joint[19], since then many types of surgical techniques/modalities have been used for the release of TMJ ankylosis with variable success.

The purpose of this study was to compare the complications of arthroplasty with autogenic tissue of ankylsed TMJ with those of Arthroplasty with alloplastic implant. So the technique with fewer complications can be used for the management of ankylosis of TMJ.

The objective of this study to compare the frequency of complications of arthroplasty with autogenic tissue and arthroplasty with alloplastic implant in cases of ankyosis of Temperomandibulr joint.

METHODS AND MATERIALS

This was a comparative study. Thirty patients with TMJ ankylosis were selected, using non probability consecutive sampling amongst those who presented in outdoor department with temporomandibular joint ankylosis (unilateral). The patients with recurrent ankylosis were excluded from the sample to control confounders and thus bias in the study results. The patients were included in the sample after having their written informed consent. All the cases in the study were treated surgically and followed up for a period of twelve months at the department of oral and maxillofacial surgery, King Edward Medical College/Mayo Hospital, Lahore.

Thirty patients were randomly divided in two groups, 15 in each group. In group I, inter positional arthroplasty with autogenous material (temporalis fascia) while in group II, interpositional arthroplasty with alloplastic material (sialastic implant) was done under GA by the same surgeon.

The patients were sent to the ward after surgery and then discharged till the removal of stitches. The patients after surgery were kept under observation for one year to assess the complication in terms of recurrence of the problem. The patients with less opening of interincisor and those developing the ankylosis were considered as complication of the procedure. All these findings were recorded in a performa.

The data were entered and analyzed with the help of SPSS version 16. Mean age with SD of patients in both the groups was calculated. Frequency of males and females in both the groups was calculated. Mean with SD of of interincisor distance was measured in patients in both the groups and compared by applying t test with P value .05

Frequency of recurrence of ankylosis of TMJ was calculated in both the groups and compared by applying chi square test.

RESULTS

Over a period of one year from 1st January 2003 to 31 January 2004, Total numbers of thirty patients (30) were dealt, in which two groups were formed.

In group I, interpositional aarthroplsty by autogenous tissue (temporalus facia) done while in group II, arthroplaty by alloplastic material (silicon sheet) was done. In group I, the mean age was 14.2 + 4.858 years while in group II, the mean age was 14.866 + 4.447 (Table-I)

In group I, there was predominance of male gender over female with a %age of 66.67% for male and 33.37% for female in group I While in group II, it was 40% for male and 60% for female, having fifteen cases in each group. (Table-2)

In group I, average post operative interincisor opening distance after one year was 30.93 ±1.03. In group II, average post operative interincisor opening distance after one year was 27.4 ± 5.38. The recurrence rate was zero%(n=0) in group I, while in group II the recurrence rate was 20%. (Table 3 and 4)

DISCUSSION

In our study 15 patients treated with autogenous tissue in group I, obtained 100% success rate, 'while in group II, 15 patients treated with alloplastic material showed 80% relief of symptoms. 20% recurrence when re operated it is found a foreign body giant cell reaction around fragments of failed sialastic implants dispersed through out the tissue of all patients (20%) aiong with.!ymph adenopathy whose biopsy specimen showed foreign body giant cell reaction.

Bronstein (1987) did the clinical and radiographic evaluation of 20 silicon implants. Patients were generally pleased with the function although in many cases his criteria of success were not satisfied. Radiographic examination showed less disturbing bone erosion response. He also pointed out that bony apposition and osteophyte formation may be seen in joints in which silicon implants have been placed[20].

In our study there were no such radiographic findings in both groups. Ortak T; et al. 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 the silicon while no patient was operated on again for limited mouth opening in group I.

In our study three patients out of 15 patients were re-operated for the removal of implant due to foreign body reaction in group II while there was no recurrence in group I. Valentini V et al, in 2002 documented the result of the surgical treatment of the TMJ ankylosis over a period of 5 years. They used sialastic 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 temporal muscle. the use of sialastic 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[21].

In our study Sialastic removal was necessary in 3 cases in group II due to its inducement of foreign body granuloma but our duration was 12 month as compare to above study in which duration was 5 years. Criteria for Temporomandibularjoint meniscus surgery were published by American Association of Oral and Maxillofacial surgeons (AAOMS) in 1984. In that publication the use of alloplast as interpositional implant was recognized as an accepted treatmen. 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 change[21].

It was the consensus of the work shop on Temporomandibular joint implant surgery conducted by Amercian Association of Oral and Maxillofacial Surgeons (AAOMS) in november 1992, that perrmanent placement of silicon as an interpositional material of

TABLE-1: AGE OF THE PATIENTS

I Procedure	N	Mean ± SD
Interpositional Arthroplasty with Autogenous tissue	15	14.20 ± 4.85
Interpositional Arthroplasty with AIIoplastic material	15	14.86 ± 4.47

TABLE-2: Distribution of patients gender in Group I-2

	MALE	FEMALE
group 1	66.67%	33.37%
group 2	40%	60%

TABLE-3: Distribution of patients by Interincisor opening distance in Group I and Group II

Follow up interval	Group I	Group II	P Value
One year	30.93 ±1.03	27.4 ± 5.38	<0.05

TABLE-4: Distribution of patients by Recurrence of ankylosis in Group I and Group II

Group	Frequency of recurrence	Percentage
I	0	0%
II	3	20%

P<0.05

the temporomandibular joint should no longer be done.

Experimental and clinical studies have established a foundation for the use of autogenous materials to reconstruct the TMJ. Use of autogenous tissue decreases the likelihood of foreign body reaction[23].

There was some limitations in this study. The sample size was small as the disease is not very common so 30 cases could be collected. Moreover recently not much studies have been carried out on comparison of the complications in terms of interincisor opening distance and the recuurence of ankylosis of TMJ between the two techniques so for this study old references had to be quoted.

CONCLUSION

Postoperative complication rate is less in-patients undergoing interpositional arthroplasty with autogenous tissue as compared to patients undergoing interpositional arthroplasty with alloplastic material. Recurrence rate is higher in patients undergoing interpositional arthroplasty 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 statistically significant difference.

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