The Role of Temporal Fascia Interposition in the Surgical Treatment of TMJ Ankylosis

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This retrospective study evaluates the clinical result of temporal fascia interpositioning in the treatment of temporomandibular joint ankylosis. A total 107 patients were assessed. The management protocol consisting of 1) aggressive resection, 2) coronoidectomy when necessary, 3) lining of the TMJ with temporalis fascia.4) early mobilization and aggressive physiotherapy. Patients were evaluated for clinical and radiological sings of Re-ankylosis for 3 years postoperatively. Our results revealed the function of the TMJ recovered well and there were no recurrence of ankylosis . We concluded that temporal fascia interposition is an ideal method for the prevention of relapse of TMJ ankylosis.

Key words: TMJ ankylosis, arthroplasty, temporalis fascia

Temporomandibular joint ankylosis is a serious condition in which there is obliteration of the joint space with scar tissue, with resultant limitation of jaw movement[1]. Limitation of mouth opening can be caused by bony or fibrous ankylosis of the temporomandibular joint as sequela to trauma[2], infection[3], autoimmune disease, tumors, failed surgery[4]and forceps delivery[5]

Surgical resection of the ankylotic mass alone through gap arthroplasty results in suboptimal results with reankylosis and deviation of mouth on opening. The chances of reankylosis with simple gap arthroplasty are noted as 14 %[6] 53 %[7] and 100 %[8] Several attempts have been made to reconstruct TMJ and prevent reankylosis by using costochondral graft[9] metatarsals, iliac bone[10] silastic[11] silicon rubber prothesis[12] and metal joint prothesis. They all have a risk of callus overgrowth around them, which led to attempts at preventing reankylosis with interposition arthroplasty[13, 14].

A varity of surgical procedure have been devised to overcome the potential complication of reankylosis. Autogenous materias such as full thickness skin, fascia, auricular cartilage dermis, fat, lyodura and temporalis have been used [15, 16, 17]. Non –biologic materials such as acrylic are also used but have a greater risk of complications like foreign body reactions and hypersensitivity[18].

In treating severely damaged TMJ structural components (ankylosis, arthrosis, tumour, perforation or degeneration of the disc), it is recommended to insert a biological interposition between bony articular surfaces[5]. Temporal fascia with varying thickness of temporalis muscle has been considered one of the best material for interpositioning[19].

It has the advantage of close proximity to the tempomandibular joint, it is thin and pliable and so can be easily draped into concavities and over convexities, and is highly vascular and resistant to infection[5].

This article aims to describe our experience of using temporal fascia as an interposioning material to prevent recurrence after arthroplasty in treatment of temporomandibular joint Ankylosis.

Material and Methods.

Our retrospective study includes 107 patients of TMJ ankylosis treated by interposional arthroplasty, at department of Oral and Maxillofacial Surgery Mayo hospital Lahore, between 1999 to 2002. Of the 107 patients, 63 were male and 44 were females. Thirty patients had previous failed surgery of ankylosis by means of gap arthroplasty alone that resulted in Re- alkalosis; age of these patients ranged from 18-37 years and mean was 27.2 years. Rest of the patients had no previous surgical intervention and all were below 12 years of age. Bilateral TMJ ankylosis was observed in 19 cases, right-sided in 38 cases, left-sided in 50 cases. In 36 cases coronoid processes were also involved.

A panoramic View radiograph was advised to see the extent and dimentions of ankylosis. Mean pre-operative mouth opening was 1.5 mm. The surgical protocol included, resection of the ankylosis, lining of the TMJ with temporalis fascia, cornoidectomy where needed, early mobilization and aggressive postoperative physiotherapy.

Surgical exposure was through Al kayat and bramley pre-auricular incision. Skin and superficial layers were elevated to expose temporal fascia. The dissection was carried down, taking care of the zygomatic branch of the facial nerve, to expose the joint. After exposure of the joint area a linear demarcation was identified between the glenoid fossa and the ankylosed head. Two curved periosteal elevators were introducing at the anterior and posterior limit of the ankylosis to protect internal maxillary arterty. Ankylosis was released with surgical drills and sharp osteotomes. Temporal fascia of adequate length was raised. It was rotated over the zygomatic arch and passed into the gap between the resected surfaces; it was suture to the tissue medial to the resected condyle.

Mouth opening was recorded immediately postoperatively. Strict and vigorous physiotherapy was started 2 days postoperatively and continued for 2 months. For each patient a number of variables were recorded including both subjective scores (pain and interference with eating) and objective data (interincisal distance). Patients also reported their use of pain medication, ability to function, diet, complications, and overall satisfaction. Patient were put on regular follow up every month for the first year, every six month the second year and yearly for the 3 rd year.

Results

All patients under treatment showed a distinctive improvement in mouth opening and symptoms. There were however few complications which included, wound infection in 6 patients, 12 patients had preauricular paresthesia. Facial weakness was seen in 9 patients, which was later recovered. There was no deviation on moth opening nor was there any open bite. Pain and swelling decreased postoperatively and did not require medication after 5th postoperative day.

In Patient who had been previously operated upon for ankylosis with gap arthroplasty, the need for physiotherapy was considerably reduced with interposining. They also reported less use of medication to relieve pain as compared to previous surgery with no fascial interpositioning.

Postoperative radiograph showed increase joint space with no sings of fibrosis or re- ankylosis. The average preoperative mouth Opening was 1.3mm in patients below 12 years of age and 1mm in adults. Mouth opening was increased immediately on release, average mouth opening was 34.5 mm in below 12 and 36.5 in adults, but there was a reduction in mouth opening 3 months after release with 13 % is below 12 and 10 % in adults, compared to 24 % and 17 % with previous surgical intervention without interposiontiong. Follow up was done for 3 years during which the average mouth opening of 38 mm was maintained, with good occlusion and proper function.

Later radiograph showed limited resoption in 3 patients with minor facial symmetry. There were no complaints of reankylosis, satisfactory mandibular function and mouth opening was achieved

Discussion:

After surgery for temporomandibular joint (TMJ) ankylosis, relapse is frequently due to fibrosis and ossification in the joint space[9] Interposionoing is advisable after gap arthroplasy as a mean of biological barrier[21]. Without lining the exposed bone surface chances of ankylosis are high[15]. Temporal fascia interpositioning tends to decrease chances of recurrence by partitioning the gap and prevention fibrous adhesions[21].

Gap arthroplasty as first described by ABBE in 1880 has been a commonly advocated method of releasing TMJ ankylosis[22]; it is simple and has short operating time[22]. Complication are however common since it does not restore TMJ functionally and histologically, and as such is not and effective reconstruction[23].

Topazian[8] reported a recurrence rate of 53 % in patient who were treated with gap arthroplasty alone compared to 0 % recurrence in patient who had interpositional arthroplasty.

The temporal fascia is versatile tissue and holds great promise for the reconstruction of various defects of the maxillofacial region and even as an interposing tissue. Its fan-out nature close proximity to the TMJ, rich blood supply and functional properties and minimal risk of complication favours its use as one of the most widely used interpostioning tissue[4, 21].

In our study we found that effective interposining of the fascia reduced the postoperative pain and the need for prolong physiotherapy usually encountered with simple gap arthroplasty. A mouth opening of 30 mm was our aim and have managed to maintain 30 to 40 mm of mouth opening after 3 years of follow up.

The postoperative result obtained and evaluation of mouth opening, joint pain on function, and range of motion proved that temporal fascia interposed in the joint space is successful in preventing reankylosis and substantially reduced duration and strain involved during physiotherapy. The findings of this study also support the use of temporal fascia in patients with previous failed surgery for ankylosis. In this study we concluded that temporal fascia is a valuable option for the treatment of TMJ ankylosis with minimal surgical morbidity, and successful clinical results.

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