Silastic as Interpositioning Graft in TMJ Ankylosis

A A SHAH
Oral and Maxillofacial Surgery, De'Montmorency Institute Of Dental Sciences, Lahore
Correspondence to Dr. Adnan Ali Shah, Associate Professor

TMJ ankylosis is a commonly seen pathology of temporomandibular joint. This paper presents the successful use of silastic as an interpositional graft in the treatment of TMJ ankylosis.
Key words: TMJ ankylosis, Silastic

Craniomandibular ankylosis is characterized by the formation of a bony mass, which replaces the normal articulation. It is a true joint pathology (intra-capsular) with fibrous or bony union of condyle to the glenoid fossa. Although the bony mass represents the pathology responsible for ankylosis ,it is not a neoplastic process capable of continued growth. The pseudoankylosis is more commonly due to extra articular lesions, fibrous capsulitis, depressed zygomatic arch fractures and myositis ossificans. Trismus is a reflex muscle spasm due to trauma, sepsis,intramuscular hematoma or adjacent fracture.

Childhood trauma is the main aetiological factor for TMJ ankylosis. The well recognized sequence of blunt trauma to the chin followed by intracapsular 'burst' pattern fracture and long term growth impedence may be associated with TMJ ankylosis. Condyler neck fracture if treated by immobilization carries an increased risk of ankylosis in certain races. Adult rheumatoid arthritis effects the TMJ in about 50% of patients, joint infection such as arthritis, tuberculous arthritis in the tropics are important causes of ankylosis[1,2]. Mastoiditis is of historical interest only but if occurs is associated with severe trismus .Limitation of jaw motion and intra articular bone fragment hastens the progress of TMJ ankylosis.

Material and methods

This study was carried out at the Department of Oral and Maxillofacial Surgery de'Montmorency institute of Dental sciences Lahore, from 1998-2001.Total no. of the cases with temporomandibular joint ankylosis were 21.Male were 16 and females 5.Age ranged from 7-41 yrs .Unilateral ankylosis was seen in 15 cases and bilateral in 6 cases. Interincisal preoperative opening ranged from 0-7mm.Seven patients had already been treated for TMJ ankylosis and has had reconstruction of the joint carried out by costochondral graft and temporalis muscle with fascia. Routine investigations included CBC,electrolytes, LFTs, urea & creatinine, ECG for above 35 yrs ,OPG x ray and lateral cephalogram. Cross matching was done for every patient .TMJ was approached with standard Bramley Alkayat incision and after gap arthroplasty, silastic was interposed between the two articulating surfaces. This silastic was contoured with knife and secured to the condyler stump with wires.

Results

Out of 21 patients treated with silastic as an interpositional graft, 2 had reankylosis.In another 3 patients the extended from the glenoid fossa .There was no foreign body giant cell reaction noted in any of the cases. The rest had very satisfactory results (76.20%). The average interincisal opening was 37.50mm. Maximum follow up period was 4 years.

Discussion

The ankylosis can be grouped into four well defined types depending pathological changes seen. In type I there is flattening or deformity of the condyle with little joint space seen on the radiograph. At operation, minimal bony fusion is found, but there are extensive fibrous adhesions around the joint. Type II cases exhibit more pathology with bony fusion of the outer edge of the articular surface but with no fusion within the deeper area of the joint. In type III, there is bridge of bone between the ramus of the mandible and the zygomatic arch. Type IV is ankylosis in which the entire joint is replaced by a mass of bone.

Surgery is mainstay of the treatment including the procedures such as Gap arthroplasty, interpositional grafts, costochondral grafts. Coronoidectomy may be required during surgery for TMJ ankylosis. Usually performed via an intra oral route, improvement in net mandibular movement can be gained in excess of that derived from the primary joint operation. Physiotherapy is important in post operative period.

Various interpositional grafts materials have been used such as silicone rubber (silastic), Proplast Teflon (PT), mini anchor, Christenson Joint Prosthesis, Techmedica custom made total joint prosthesis.

Dimethylsiloxane (silicone) rubber implants with or without polymer fabric have been used in the augmentation of frontal, zygomatic, nasal, chin, parasymphyseal, paranasal ,orbital, maxillary, malar, nasal dorsum, ear and mandibular deficiencies and interpositioning graft material in TMJ. Silicone rubber implants have been used for surgical applications since the 1950s .Silicone can be obtained preformed commercially or for custom shapes; room temperature vulcanizing silicone can be used. Silicone easily can be modified intra operatively with the scalpel or scissors. It also can be fixated with a screw or suture to the underlying tissues. This material has "memory", which demands adaptation to bone contour in the "relaxed" state, since bending may

lead to extrusion or bone resorption. These implants easily are sterilized using steam autoclave or irradiation without damaging the material. Surrounding tissues do not react adversely to silicone, and only a thin fibrous capsule forms without ingrowth of tissue. Porous silicone implants and silicone bonded to decron have been used to enhance stability. Use porous implants in the presence of minimal or no tissue stress so that they do not tear or fracture .

In 1962, Swanson introduced a silicone small joint prosthesis for the hand[3]. It was only a matter of time before it was used in the TMJ .Its use escalated in the late 70s, and it was recommended initially as a permanent and then as a temporary disc replacement because of its ability to form a fibrous capsule around the silicone[4,5]. Kalamchi[6] in 1987 presented a retrospective study of 68 patients in whom silicone disc replacement was used between 1970 and 1985. Sixty three patients had good results with the longest time interval of 14 years 7 months. He also emphasized the need for good physiotherapy and compliance by these patients. Wilkes in 1982 proposed the use of temporary silicone replacement to help avoid post operative adhesions and its subsequent removal in 2-4 months. This was recommended to circumvent some of the longer complications of the wearing and thinning of the silicone with eventual fractures. Tucker et al[7] in 1989 using Macaca fascicularis monkeys underwent placement of temporary silastic material as a disc replacement bilaterally. The one side was removed at 3-4 months and the contralateral side continued to have silicone in the place .The animals were sacrificed at 3,4,5 and 6 months post removal and the sides compared. Irregularities of the articular bony surfaces were noted on the control side but, as the animals approached 5-6 months ,the side with the silicone which was still in situ displayed a thick fibrous capsule, minimal FBGC reaction and minimal articular surface bony irregularities . The author concluded that using silastic implants only as a temporary replacement was recommended. Nalbandian et al in 1983[8] sought to prove its benign nature utilizing dog autopsies upon natural death (>10 years) as well as a 14 yrs follow up of a human with multiple silicone joint replacements. Their statistics sought to prove that FBGC synovitis occurred in <1% of operated cases and lymphadenopathy was observed in 0.01% of cases. Beside the mild, benign nature of the reaction the silastic as interpositioning graft material are still popular and are widely used in TMJ surgery.

Conclusion

Silastic sheet is a handy material available to be used as an interpositional graft, with little problems it becomes a good choice in already operated cases which have developed re-ankylosis.

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