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Case Report

Combo flap interposition in recurrent TMJ ankylosis

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ABSTRACT

Aims and objectives: Various interpositional materials have been used to prevent the recurrence after gap arthroplasty in temperomandibular joint ankylosis cases; most commonly used being the temporalis muscle and/or fascia and free fat dermis graft. In this study, a combination of temporalis muscle and free fat dermis interposition was used and its efficacy in preventing reankylosis was evaluated.

Materials and methods: Two cases of unilateral temperomandibular joint reankylosis were evaluated with a follow up of 3months.

Results: Regular clinical and radiological follow up was done for 3months during which the average mouth opening of 32 mm was maintained, with good occlusion and proper function. Post op orthopantomogram showed a well maintained gap between the newly created articular surfaces indicating no evidence of reankylosis in both cases.

Conclusion: In this short term prospective study, we found that this combo interposition of temporalis muscle flap and free fat dermis graft in recurrent ankylosis along with adjuvant indomethacin therapy produced satisfactory results in achieving adequate mouth opening and jaw function.

INTRODUCTION

Temperomandibular joint (TMJ) ankylosis is a pathologic condition where the mandible is fused to Glenoid fossa by bony or fibrous tissues. This interferes with mastication, speech, oral hygiene, and normal life activities. Trauma is the most common cause of TMJ ankylosis, followed by infection. Ankylosis of the TMJ usually develops before the age of 10 years, but can be found at any age; the incidence peaks in patients aged 20–30 years.(5) Ankylosis of the TMJ can be classified based on a combination of the site (ie, intra-articular or extra articular), the type of tissue involved (ie, bony, fibrous, or fibro-osseous), and the extent of fusion (ie, complete or incomplete)(6).

Surgery is the protocol for management. If insufficient mandibular bone is removed , a recurrence of the ankylosis can be expected. Interpositioning is recommended after gap arthroplasty as a means of preventing re-ankylosis. For establishment of a 'functional pseudoarthrosis', it is essential to consider an autogenous interpositional graft.(2). Different interposition grafts have been used, such as the temporomandibular meniscus, temporalis muscle/fascia, fascia lata, skin, auricular cartilage, fat, alloplastic materials and xenografts (4). Dimitroulis interposed dermis fat graft, taken from the groin in the TMJ. The presence of dermis in the graft keeps the fat intact by preventing its disintegration. The free fat graft has more chances of its resorption (3). The temporalis muscle is the most widely used among interpositional material due to its ease of usage, dependable blood supply, proximity to temporal joint, good functional

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results, minimal risk of facial paralysis, successful clinical results and minimal complications. While the versatility of temporalis as interpositional material is undoubtful, reports of persistence of postoperative pain, re-ankylosis and necessity for aggressive postoperative physiotherapy (7).

A dual interposition was tried in our study by placing both fat and muscle in the joint followed by aggressive physiotherapy.

Materials and methods

Two cases of unilateral temperomandibular joint reankylosis were evaluated. First case being a 14 year old female and the second being a 7 year old male. Both patients had undergone a surgery for ankylosis at our centre before 2years. At presentation the maximum incisal opening was almost 0 mm. Patients were assessed both clinically and radiologically (fig 1,2).

The protocol consisted of the following steps: 1) the creation of a minimal gap of 15 to 20 mm by gap arthroplasty; 2)free fat dermis graft on the medial aspect; 3) temporalis muscle interposition on lateral aspect;4) postoperative indomethacin for 1 week 5) immediate aggressive physiotherapy.

Details of the previous surgery regarding the cause, extent, duration, maximal incisal opening were recorded. Gap arthroplasty with interposition of free fat dermis harvested from abdomen was done in the first procedure. Following this, reankylosis had developed in a span of two years likely due to inadequate physiotherapy and infrequent check up.

Fig.1: Pre OP Mouth Opening

Fig. 2: Pre OP OPG

Surgical procedure

A second surgery to correct reankylosis was planned under nasoendotracheal blind intubation. An Alkayat Bramley incision was placed and adequate exposure of zygomatic arch, sigmoid notch and callus was made and a gap arthroplasty of 1.5 to 2cm was done by resection of callus.

Immediate intraoperative mouth opening was measured as 28mm and 32mm respectively. Free fat dermis was harvested from lower abdomen (fig3). The graft was placed in saline immediately after its removal from donor site. Now, anterior two thirds of temporalis muscle attached to the coronoid process was raised, rotated and tunelled beneath zygomatic arch(fig4). First, the free fat dermis graft was tucked anteromedially into the arthoplasty site and followed by interpositioning the temporalis muscle flap posterolaterally. Anchoring of interpositional material was done periarticularly using 3-0 vicryl sutures. A mastoid bandage to reduce postoperative edema was placed in both cases and removed at discharge. Indomethacin therapy as an adjuvant was started in the immediate postoperative

period in divided doses of 25mg twice daily with regular monitoring of renal function tests (RFT). Indomethacin was withdrawn on 2nd post op day in the first case due to rise in the RFT values. It was however continued upto one week in the second case. Physiotherapy was started from first post operative day in both the cases.

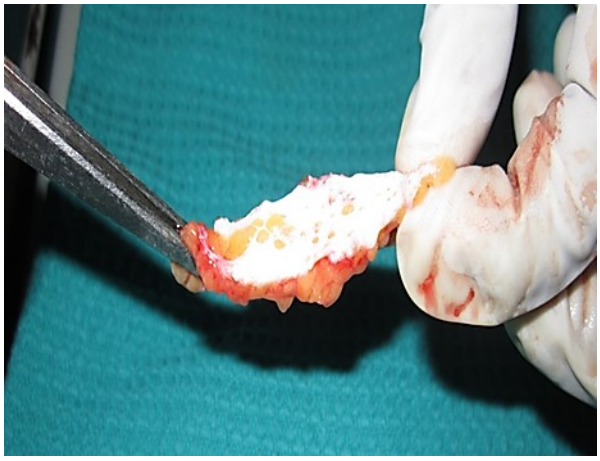

Fig. 3: Free fat Dermis Graft from Abdomen

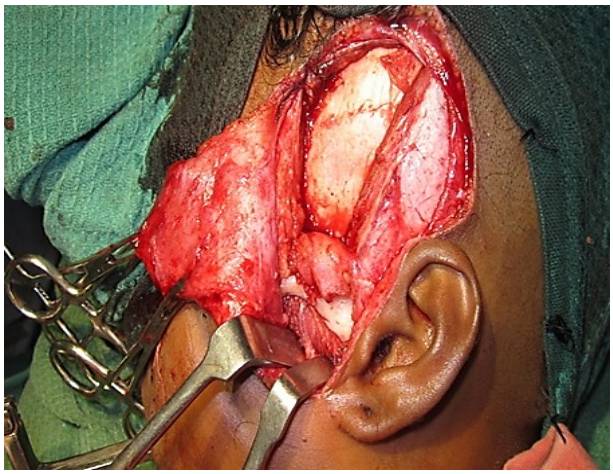

Fig. 4: Temporalis muscle flap Inter Positioning

Results

Patients were assessed for maximal interincisal opening, protrusive and lateral movements, involvement of facial nerve, pain, swelling and infection. Both of them had aetiology of trauma in their early childhood. Inability to open mouth led to poor oral hygiene, problems in speech and feeding due to which the subjects were underdeveloped for their age. Severe crowding and a midline shift towards the ankylosed side was seen in both cases. Previous attempts of gap arthroplasty and free fat interposition was a failure in both cases.

Recurrent ankylosis was mainly attributed to the inadequate interpositional material in the medial aspect of joint. Temporalis muscle flap was sandwiched more the lateral aspect leaving the medial portion, which is more prone to reankylosis, devoid of any interposition material. To overcome this, we have tried combo flap interposition where in the free fat was tucked into arthroplasty site on the medial aspect and temporalis musle flap was interpositioned on the lateral aspect. Indomethacin therapy was given as an adjuvant A post operative mouth opening was measured to be average of 32mm in both cases. Follow up of after 3 months showed no evidence of recurrence till date (fig 5, 6)

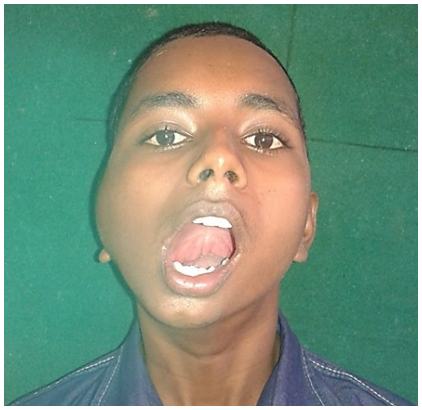

Fig. 5: Post OP mouth opening

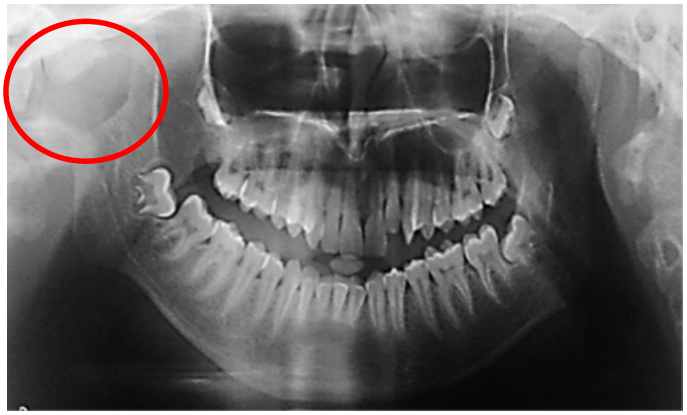

Fig. 6: Post OP OPG

Discussion

Temperomandibular joint (TMJ) ankylosis is a devastating problem that results in limitation of mandibular movements leading from mild to complete inability in opening mouth and associated difficulties in speech, feeding, poor oral hygiene and underdeveloped growth(7) which impairs the normal social life of the individual.

Trauma is the leading cause for TMJ ankylosis and the treatment of this condition poses a considerable challenge because of the high incidence of recurrence. A combination of surgery and aggressive physiotherapy is required to maintain mandibular function and prevent recurrence (12). Various methods can be used. Arthroplasty without interposition requires a gap of 10 to 20 mm and often results in mouth deviation and has a high recurrence rate of about 53%. For this reason it seems better to create a minimal gap and then place interposition to prevent recurrence caused by osteoblastic growth between the abraded bone surfaces(4).

At present, there is no ideal interpositional graft. The problems encountered with the present autogenous grafts are: muscle shrinks and fibroses, fascia lacks bulk, cartilage tends to fibrose. Dimitroulis interposed dermis-fat grafts in 11 patients for the management of temperomandibular ankylosis, and identified only one case of reankylosis.(1). On the other hand, the temporalis muscle flap was seen to be an ideal interpositional material due to its close proximity to the site, good vascular supply, ease of access to the condyle area , minimal risk of nerve damage and good functional results(11)

However, due to higher incidence of recurrences we, in this study, have evaluated the surgical outcome of a combined interposition of temporalis muscle and free fat dermis graft from abdomen in two cases of recurrent ankylosis of temperomandibular joint. To overcome the problem of recurrence in these cases indomethacin was given in the immediate postoperative period as an adjuvant . It should be started within 24 hours after surgery, because heterotropic ossification starts around 16 hours and reaches peak at 48 hours. Although indomethacin is a known prophylaxis for prevention of heterotropic bone formation after hip arthroplasty (12) , its use in treating recurrent temperomandibular joint ankylosis is relatively new.

Conclusion

Management of recurrent temperomandibular joint ankylosis is a challenging procedure. This study recommended that the combo temporalis muscle flap along with free fat dermis, a biologically accepted

autogenous material,seems to be better than temporalis muscle flap used alone especially in cases of reankylosis along with indomethacin therapy as an adjuvant . Patients are under regular follow up for period of three months and will be monitored for long term stable results.

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