

Case Report

LATERAL THIGH FASCIA LATA AS INTERPOSITIONAL GRAFT FOR TEMPOROMANDIBULAR JOINT ANKYLOSIS

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ABSTRACT

Successful management of temporomandibular joint (TMJ) ankylosis depends on adequate gap arthroplasty and interpositional graft; the objective is to produce a functioning pseudoarthrosis that prevents reankylosis and provides adequate mobility. Several interpositional grafts have been used for the treatment of temporomandibular joint ankylosis such as indigenous pterygomassteric sling, temporalis muscle/fascia, auricular cartilage, fat and dermis- fat. Lateral thigh fascia lata (LTFL) graft is commonly used in neurosurgical practice and in other surgical specialities. We present a case of lateral thigh fascia lata used as interpositional graft for the treatment of a unilateral bony temporomandibular joint ankylosis.

Keywords: *Temporomandibular Joint Ankylosis, Lateral Thigh Fascia Lata*

INTRODUCTION

Ankylosis release is the oldest form of TMJ surgery, and it has evolved from simple bone division to separate the ramus from the cranial base to complex arthroplasty (Amir *et al.*, 2000). The goals of surgery for TMJ ankylosis should be to establish movement, function in the jaw, prevent relapse, restore appearance, and achieve normal growth and occlusion in the child. The management of these patients is by gap arthroplasty with interpositional grafting (Bashshur *et al.*, 2002). Different interpositional grafts have been used Such as indigenous pterygomassteric sling, temporomandibular meniscus, temporalis, muscle / fascia, skin, auricular cartilage, fat and dermis-fat. Flaps of temporalis muscle and/or fascia were first described by Yalovsky (1898) and first used by Murphy (1914) for surgery of the temporomandibular joint (Bashshur *et al.*, 2002) & it has become the most popular interpositional grafting technique because of its simplicity and close proximity to the surgical site (Amir *et al.*, 2000). Lateral thigh fascia lata serves as an excellent dural substitute and is commonly used in neurosurgical practice. Fascia lata is strong, pliable, and easily sutured to native tissues. It is homologous tissue with no risk of foreign body reaction and a very low risk of infection (Bulgannawar *et al.*, 2011). Lateral thigh fascia lata is widely used in a large variety of surgical specialties when autologous graft tissue is desired, including cardiac surgery (De-Vries *et al.*, 2007), orthopedic surgery (Dimitroulis, 2004), ophthalmology (Kaban *et al.*, 2009), urology (Kargi *et al.*, 2003), general surgery (Kartus *et al.*, 2001) and plastic and reconstructive surgery (Karaaltin *et al.*, 2009; Kohanna *et al.*, 1977). We present a Case of a unilateral temporomandibular joint ankylosis managed with gap arthroplasty and lateral thigh fascia lata as interpositional graft.

CASES

This case reports to a 20-year-old man referred to department of Oral & Maxillofacial Surgery, Kothiwal Dental College & Research Centre, Moradabad with history of trauma after road traffic accident. Trauma had occurred 16 months before with no signs of mandibular fracture. The chief complaint was a progressive decrease in mouth opening. On examination, a maximum inter-incisal mouth opening was 10 mm. flattening and elongation of face was present at unaffected side. Immobility of head of condyle present at left side. Computed tomography showed bony fusion of right temporomandibular joint ankylosis (figure 1). With these clinical and radiographic findings a diagnosis of a left bony TMJ ankylosis was done. Under general anesthesia a right preauricular approach with Al-Kayat and Bramley incision was given (figure 2) and gap arthroplasty was performed by excision of the ankylosed mass beginning from the condylar neck and getting a final gap of 15mm between ramus & skull base (figure 3).

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Once the ankylosed tissue was excised we proceeded to harvest lateral thigh fascia lata to use it as interpositional graft.



Figure 1: Bony fusion of head of condyle and glenoid fossa of temporal bone



Figure 2: Al-Kayat and Bramley incision



Figure 3: Gap created (15 mm) between ramus & skull base

Harvesting Technique for Lateral Thigh Fascia Lata

The length of the incision depends on the size of the graft required in this case we used a 3 cms incision (Figure 4).



Figure 4

After the incision was done, dissection was carried down through the subcutaneous fat and the fascia lata was exposed. This thick fascia lata arises superiorly from the tensor fascia lata and gluteus medius and Maximus muscles and inserts distally on the lateral condyle of the tibia. With an index finger, careful blunt dissection was used to separate the fascia from the underlying muscle, this finger dissection was made in order to avoid inadvertent trauma to the muscle with other instruments. Since the ankylosed tissue had been already removed, a template of the amount of graft needed was done with latex of surgical gloves, then this was transposed to the fascia lata and the tissue was grafted. Even though this fascial defect can be left unreconstructed, we used a 2/0 Vicryl suture to correlate and approximate fascia lata as much as possible. Skin was closed in layers using subcutaneous interrupted 3/0 Vicryl sutures and 3/0 prolene sutures for skin (Figure 5).

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Figure 5

Lateral thigh fascia lata was secured laterally, medially, anteriorly, and posteriorly between mandibular ramus and skull base with 3/0 vicryl suture (Figure 6a, b). The preauricular incision was closed in layers. Physiotherapy was started from the first postoperative day. Patient has been followed up for 6 months without any sign of reankylosis and no complications after LTFL graft. Patient's actual maximum mouth opening is 32 mm.



Figure 6a Figure 6b

DISCUSSION

Functional activity of the ankylosed TMJ relies primarily on the osteotomy created and the choice of interpositional material (Link *et al.*, 2008). Arthroplasty without interpositional graft 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 greater than 5 mm and then perform interpositional graft to prevent recurrence caused by osteo-blastic growth between the abraded surfaces (Bashshur *et al.*, 2002). The rationale behind interpositional arthroplasty is that the presence of dead space after extensive resection of callus leads to hematoma formation with subsequent organization. Local pluripotent stem cells may then be induced to differentiate into fibroblast and osteoblast, with deposition of collagen and bone. A decrease in vascularity and oxygen tension occurs in the surrounding tissues, favoring the transformation of fibrous tissue into cartilage and bone. The objective is to create a functioning pseudoarthrosis that prevents recurrence and provides adequate mobility (Link *et al.*, 2008). No ideal interpositional graft is available because the problems encountered with the various available materials are that the temporalis muscle shows some degree of degeneration or atrophy and becomes fibrosed, which aggravates the trismus, fascia lacks of bulk, cartilage tends to fibrose and calcify, and alloplastic implants under functional loads disintegrate and cause foreign body giant cell reaction (Bashshur *et al.*, 2002). Lateral thigh fascia lata envelopes the muscles of the upper leg. Laterally, this fascia coalesces to a much thicker iliotibial band. This fascial band runs from ilial crest to the tibia. It is narrow distally and much broader proximally. Several muscles in the upper leg have fibrous attachments to this fascial band. The planes just superficial and deep to this band are essentially avascular. The iliotibial band lies under the subcutaneous tissue. LTFL is widely used in a large variety of surgical specialties. LTFL graft has some advantages for its usage in this surgery: it is strong, pliable, and easily sutured to native tissues, it is easily harvested and no important nerves or vessels are encountered during surgical approach, the

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harvesting time should take about 15 to 20 min, no additional scar is done over temporalis muscle avoiding trismus secondary to degeneration, atrophy or fibrosis of temporalis muscle. None of these complications were seen in our case. This case has 6 months of follow up to the date with no complications of the donor site and with no reankylosis. Actually the patient has a maximum mouth opening of 32 mm while opening. The 32 mm of maximum mouth opening of our patient is almost on the lower scale reported by Kaban *et al.*, (1990) reporting excellent results with his protocol for treating TMJ ankylosis, with a maximal incisal opening of 37.5 ± 3.90 mm (Thangavelu *et al.*, 2011). In a more recent retrospective analysis of 11 children younger than 16 years of age treated by Kaban's protocol he reports a mean maximal incisal opening of 38.2 mm with a range of 15 to 49 mm. Ten of the eleven patients had a maximal incisal opening greater than 30 mm. Even though we just report one case, for us the usage of LTFL graft was safe and easy.

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