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Uses of Fascia Lata in Oral and Maxillofacial Surgery

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Abstract

Introduction: Oral and maxillofacial surgeons need grafting techniques to satisfy patient's needs in trauma, pathology, reconstructive surgery, facial aesthetics and dental implantology.1One of them is fascia lata which is a versatile source of graft material in various Oral and Maxillofacial surgeries such as soft tissue reconstruction and facial reanimation procedures.

In this article, we discuss the uses of fascia lata in Oral and Maxillofacial surgery.

Aim: This review presents the uses of fascia lata in Oral and Maxillofacial surgeries.

Method: This information is combined using various articles and a conclusion is drawn

Uses of fascia lata/Result: There are various uses of fascia lata in oral and maxillofacial surgery such as in temporomandibular joint ankylosis as interpositional

graft material, reanimation surgeries, allograft for covering intraoral defects, treatment of lagophthalmos, head and neck plastic surgery and peri-implant mucosal thickness enhancement

Conclusion: The fascia lata is a versatile graft used in many facial surgeries. The size of the fascia that is obtained is suitable for reconstruction of small and large defects of the head and neck.

Keywords: Fascia lata, head and neck reconstruction, facial reanimation

Aim

Introduction

Oral and maxillofacial surgeons need grafting techniques to satisfy patient's needsin trauma, pathology, reconstructive surgery, facial aesthetics and dental implantology.[1]One of them is fascia lata which is a versatile source of graft material in various oral and maxillofacial surgeries such as soft tissue reconstruction and facial reanimation procedures.[2]It has been described as an allograft and an autograft. Using grafts in the oral cavity provides pain relief, acceleration of wound healing and prevention of oedema, hematoma formation, infection, and relapse.

Fascia lata is a Musculo-fibrous covering on lateral aspect of thigh. It is a biodegradable natural tissue with great elasticity, is flexible and simple to fit, and is biologically compatible, making it safe for usage[1,7]. It also has a good tensile strength. Also has a low risk of infection and immunological reaction, complete remodelling, and quick wound healing due to the simulative influence on connective tissue synthesis. Histological studies in both animals and humans reveals that once the graft is secured in place, it become encased, sandwich-style, in granulation tissue before being replaced by connective tissue with no immunological or foreign-body reaction.

The lateral thigh fascia lata is adural substitute that is very effective in neurosurgical treatments and it can be sutured to natural tissues. It is homologous tissue with no risk of foreign body reaction and very low infection risk[3,4]. Lateral thigh fascia lata is an autologous graft tissue which is commonly employed in a wide range of surgical specialties, including cardiac surgery, orthopedic surgery, ophthalmology, urology and plastic and reconstructive surgery [5,6].

This article discusses the usage of fascia lata in oral and maxillofacial surgery.

Anatomy of fascia lata (fig 1)

Reinforcing longitudinal fibers thicken and strengthen the fascia lata laterally, resulting in the creation of the iliotibial tract, a thick fascial band. The iliotibial tract is a 2cm-wide, thick fibrous band on the lateral side of the thigh. Superiorly, this tract is separated into two layers, each with two muscles: the tensor fascia lata and gluteus maximus. Inferiorly, the two layers merge into a single thicker sheet called the gluteal aponeurosis, which is shared by both muscles. The iliotibial tract connects the iliac tubercle to the tibia's anterolateral tubercle and contributes to knee joint stability. The fascia lata has an oval hole or hiatus known as the saphenous opening or fossa ovalis, through which the great saphenous vein and efferent lymphatic arteries of the superficial inguinal lymph nodes pass.

The saphenous orifice is situated around 4 cm inferolateral to the pubic tubercle, beneath the medial part of the inguinal ligament. The falciform margin, a thick crescentic border, covers the opening on the inferolateral side. The fascia that surrounds the pectineus muscle forms the opening's medial border,

which is situated at a deeper level. The cribriform fascia links the median margin of the saphenous orifice. This sieve-like layer of fascia covers the saphenous opening, closing it. Structures traveling via the saphenous aperture pierce the cribriform fascia as they go towards their destination.

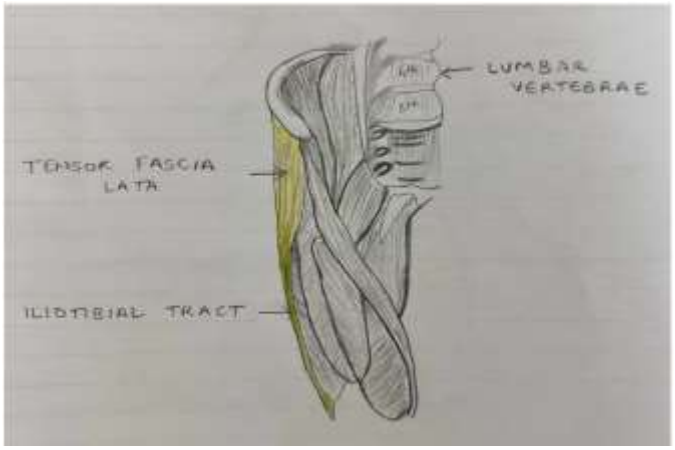

Figure 1:

Arteries: Superficial circumflex iliac artery, superficial epigastric artery, superficial external pudendal artery.

Veins: Perforating veins of great saphenous vein. (fig 2)

Lymphatics: Vertical group of lymph nodes

Nerves: Femoral branch of genitofemoral nerve, middle and lateral femoral cutaneous nerves, Ilioinguinal nerve and cutaneous branch of the obturator nerve.

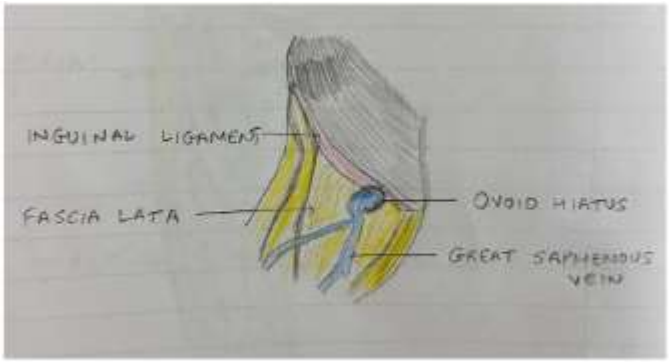

Figure 2:

Procedure to harvest fascia lata graft[8]

A soft roll is placed beneath the patient's buttocks, and the lower extremities are gently internally rotated. An incision is made on the lateral aspect of thigh, using the iliotibial groove as a guide. The length of the incision is dictated by the size of the transplant needed. Following the incision, dissection is conducted into the subcutaneous fat to reveal the fascia lata. This thick fascia lata emerges superiorly from the tensor fascia lata, gluteus medius, and Maximus muscles and terminates distally on the lateral condyle of the tibia. A fasciotomy incision is performed parallel to the skin incision and as far posteriorly as feasible on the graft. To prevent causing inadvertent muscle damage with additional devices, the fascia is separated from the underlying muscle using an index finger and a careful blunt dissection. The fasciotomy incision can be expanded as needed to accommodate the amount of the graft desired. After harvesting, the graft is covered in a moist dressing and stored until required. Fascial defect can be left unreconstructed or can be sutured with a 2/0 Vicryl suture. The skin was closed in layers using subcutaneous interrupted 3/0 Vicryl sutures internally and 3/0 nylon sutures externally. Finally, a pressure dressing is applied to the thigh to prevent dead space during recovery.[8]

Versatility and uses of fascia lata in Oral and maxillofacial surgery

1. Fascia Lata in Temporomandibular Joint Ankylosis as Interpositional Graft material

Temporomandibular joint ankylosis is quiet commonly seen and mostly occurs after trauma. The mainstay for temporomandibular joint ankylosis management is condylectomy along with interpositional graft placement. Functional activity of the ankylosed TMJ is mostly dependent on the ostectomy generated and the choice of interpositional material [8,9]. The LTFL graft has several advantages when used as interpositional graft material, that are - It is strong, pliable, and easily sutured

to native tissues; it is easily harvested as there are no important nerves or vessels are encountered during the surgical approach; no additional scar is created over the temporalis muscle and preventing trismus caused by degeneration, atrophy, or fibrosis of the temporalis muscle, thus prevents the chances of re-ankylosis. Some of the reported problems of an LTFL transplant include hematoma, dehiscence, nerve damage (distal branches of the lateral-cutaneous nerve), and muscle herniation.[4,8]

2. Applications in Reanimation of the Totally or Partially Paralyzed Face [5,10] -

In totally and partly paralyzed faces, autogenous fascia lata work as an "internal suspender" to support the modiolus and lip components and prevent the over pull of the opposing perioral muscles. (fig 3)

Early positioning of autogenous fascia lata provides static equilibrium to the deeper face architecture in repose. Invagination and static nostril elevation are seen along with the static suspension of the lateral paralytic ectropion is adjusted, scleral show and keratitis are improved, and epiphora is decreased. Chewing, fluid retention, speech articulation, smile symmetry, and ectropion all show immediate functional improvements. The psychological benefit is also immediate, with increased self-esteem and acceptance from family and peers.

A partial temporalis tendon transfer using cryopreserved fascia lata allograft results in improved face symmetry. Increased face symmetry at repose is observed soon following surgery, particularly after edema clearance.

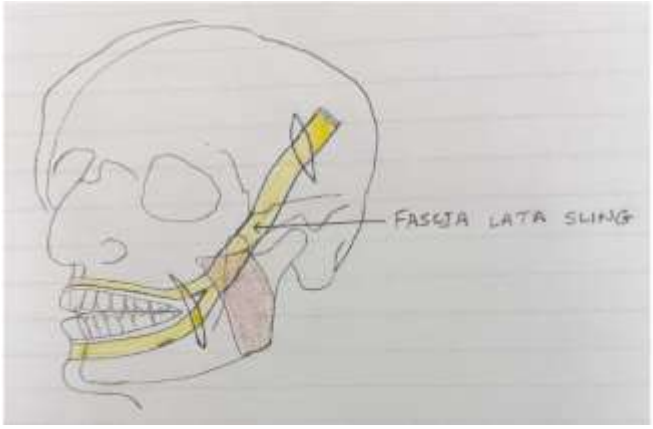

Figure 3:

3. Solvent-dehydrated fascia lata allograft for covering intraoral defects [11,12] -

Tumors, pre-prosthetic surgical procedures, and trauma all cause mucosal abnormalities in the oral cavity, which surgeons are constantly concerned about. Fascia lata allograft, whether freeze-dried or solvent-dehydrated, has been used in a variety of surgical procedures. [1-9]

The fascia lata graft is used in intraoral defects such as epulis fissuratum, verrucous carcinomas, pyogenic granuloma, cavernous hemangioma, and mucoepidermoid carcinoma (all of which originate in the buccal region). Tutoplast fascia lata is also done in patients with gunshot damage to improve the vestibular depth and repair the oral synchilia. The fascia lata is also utilized to cover the exposed lower anterior alveolar ridge of trauma victims.

Fascia lata in the oral cavity relieves pain, accelerates wound healing, and minimizes edema, hematoma development, infection, and recurrence.

4. Fascia Lata Graft for the Treatment of Lagophthalmos [13,14]

The most significant technique to protect the ocular surface is certainly reducing the ocular area that is exposed to the outside world, or at least decreasing it. The lower eyelid sling technique with fascia lata is a

successful and alternative therapeutic option for both ocular surface protection and aesthetic appeal. The technique not only improves cosmesis but also improves the function. With this technique it is found that preoperative corneal ulcer is recovered with corneal opacity and punctate epitheliopathy and postoperative corneal transparency is obtained. It treats the lagophthalmos by decreasing the size of the vertical eyelid aperture.

5. Autologous Fascia Grafts in Head and Neck Plastic Surgery[1,2,15,16-]

Grafts and implants are commonly used in head and neck plastic surgery to restore desired facial shapes and profiles. The material utilized for augmentation might be allogenous, homologous, autologous, or a combination of these [1,2]. Frequently graft material is necessary to enhance the nose, cheek prominence, chin, and other facial features. Autologous tissues have a decreased incidence of related complications, such as infection, rejection, shrinking, and deformation[16]. Fascia lata autograft is used for rhinoplasty for correction of supra tip and tip deformities. (figure 4)

It is also used in ear deformities and can be used to augment facial areas and depressions caused by trauma (Lefort II, Lefort III, or Smash injuries) or other infections and diseases.

The results demonstrate that the size of the autograft stays consistent, although there is a significant weight loss. Microscopic analysis of histopathologic sections reveals no inflammatory response to the fascia lata. It also appeared to preserve its histological structure.

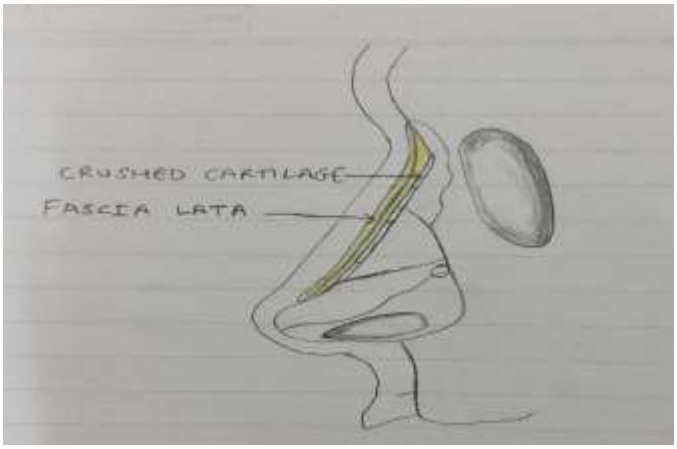

Figure 4:

6. Fascia lata graft in the peri-implant mucosal thickness enhancement[17,18]

Peri implant mucosal thickness (PMT)have an important role in maintainingperi implant health and enhancing aesthetic results, despite the fact that it is only one element impacting success[19].

Fascia lata graft is clinically safe and well-integrated into surrounding soft tissues, forming new connective tissue.

Fascia lata graft is a biodegradable structure with great elasticity and flexibility, which results in tensile strength and ease of fit; it is also biologically compatible, has a low risk of infection and immunological response, and is safe to use. The other advantages of using fascia lata graft are its greater availability, low cost, and ability to beharvested in large quantities.

It shows significant increase in the percentage of fibrovascular tissue also a significant increase in the vimentin expression (expressed in normal mesenchymal cells and is known to maintain cellular integrity and provide resistance against stress). It demonstrates almost complete integration with the surrounding soft tissues, with fibroblasts and collagen fibrils growing and extending into the interior of the tissue graft with no visible cellular morphological changes. Furthermore,

there is a visible thick layer of freshly created connective tissue that has expanded with more homogeneous cell invasion and more consistent collagen deposition. Thus it is responsible in increasing peri-implant mucosal thickness.

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