

Temporalis Muscle Transfer with Fascia Lata Sling: A Novel Technique for Facial Reanimation

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Abstract

Bell's palsy is an idiopathic facial paralysis which is a lower motor neuron disorder. The ultimate goal of treatment is normalization of paralyzed hemi-face with symmetrical smile and face along with corneal protection. The aim of this article is to revisit all the current options available for management of facial nerve paralysis with main concentration on best surgical management in long-standing cases i.e. regional muscle transfer using temporalis tendon with fascia lata. A Case Report of a 38 year old Indian male is reported with chronic facial palsy. Static Facial paralysis reanimation with fascia lata and tarsorrhaphy is explained step by step. Others Treatment modalities are explained. This present case report adds one more case to the scanty number of publications.

Keywords: Facial paralysis, facial reanimation, fascia lata, sling, temporalis muscle transfer

INTRODUCTION

Facial nerve palsy is damage to cranial nerve VII that innervates muscles of the face, periorbita, and inner ear.^[1] Bell's palsy is an idiopathic facial paralysis, which is a lower motor neuron disorder. It results in a lack of facial expression, which is not only an esthetic issue but also has functional consequences as the patient cannot communicate effectively and finally leads to psychosocial morbidity.^[2,3] Incidence is 10–40 cases/100,000, with more in 15–45 years of age and no gender predilection. Its etiology is mainly idiopathic but can be due to viral infection, vascular ischemia, hereditary, or an autoimmune disorder. Clinical features are the absence of forehead wrinkling, droopy eyelid, dry eyes, excessive lacrimation, facial weakness, facial asymmetry, dropping of the corner of mouth, dry mouth, and impaired taste. The severity and progression of Bell's palsy are assessed by House–Brackmann score [Table 1].^[1]

The ultimate goal of treatment is normalization of paralyzed hemiface with symmetrical smile and face along with corneal protection. Sir Charles Ballance was the first to operate on facial nerve and restore facial nerve function.^[4,5] Since then, several pioneers have given several surgical methods for the management of facial paralysis.^[4] The aim of this article is to revisit all the current options available for the management of

facial nerve paralysis with main concentration on best surgical management in long-standing cases, i.e., regional muscle transfer using temporalis tendon with fascia lata.^[2] This procedure offers early, dependable, and controllable reanimation of smile.^[6]

CASE REPORT

A 38-year-old Indian male reported to us with the complaint of an unaesthetic appearance of the face for 2 years. History revealed that duration of palsy is of 2 years. It was of sudden onset. He had no history of fever, trauma, or any dental extraction. The patient had a history of diabetes mellitus for 2 years. Facial appearance was abnormal, and on clinical examination, there was asymmetrical face with deviation to the left side on mouth opening, lack of movement of right forehead and eyebrows, i.e., wrinkles were not appreciated while activating the frontalis muscle, drooping of the right corner of the mouth, loss of nasolabial fold, and asymmetrical smile [Figure 1a and b]. The patient was unable

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How to cite this article: Dhirawani RB, Balaji SM, Singha S, Agrawal A. Temporalis muscle transfer with fascia lata sling: A novel technique for facial reanimation. *Ann Maxillofac Surg* 2018;8:307-10.

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Figure 1: (a) Frontal profile showing facial asymmetry. (b) Drooping of lip

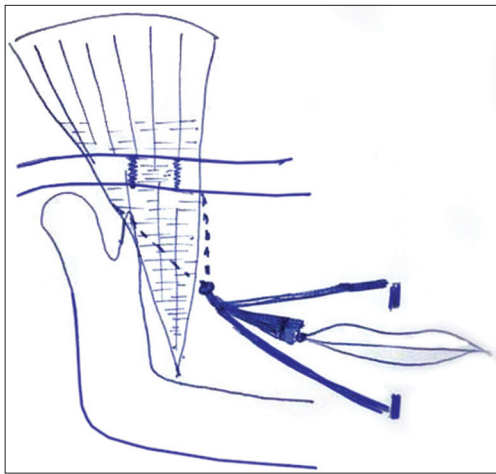


Figure 3: Schematic diagram

to blow his mouth and close his right eye completely. He had no alteration in taste sensation or paraesthesia. Laboratory investigations and imaging were within normal limits, so the patient was then planned for static facial paralysis reanimation with fascia lata and tarsorrhaphy under general anesthesia.

Surgery

Under nasoendotracheal intubation, Popowich and Crane's modification of Alkayat and Bramley's preauricular incision was made [Figure 2a], exposing the temporalis muscle and fascia [Figure 2b]. The middle one-third of the temporalis muscle was identified, elevated, and rotated on itself toward the corner of the mouth. Then, two osteotomy cuts were made on the mid-part of the exposed zygomatic arch and the bone between the osteotomy cuts was removed. Another incision was made just above the vermilion border at the oral commissure, along the nasolabial fold to expose the orbicularis muscle [Figure 2c]. The coronoid process was cut through an intraoral approach. An S-shaped incision made on the lateral thigh and exposed fascia lata was harvested using a

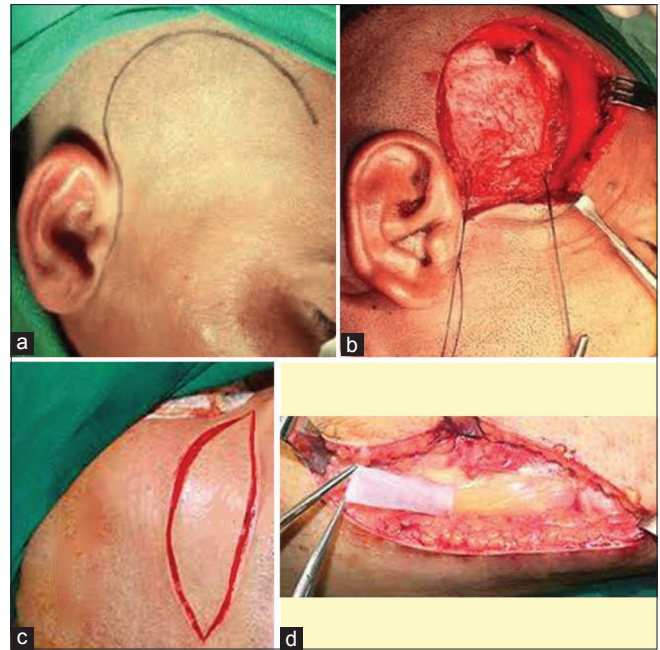


Figure 2: (a) Popowich and Crane's modification of Alkayat and Bramley's preauricular incision. (b) Exposed temporalis muscle. (c) Nasolabial incision. (d) Exposed fascia lata

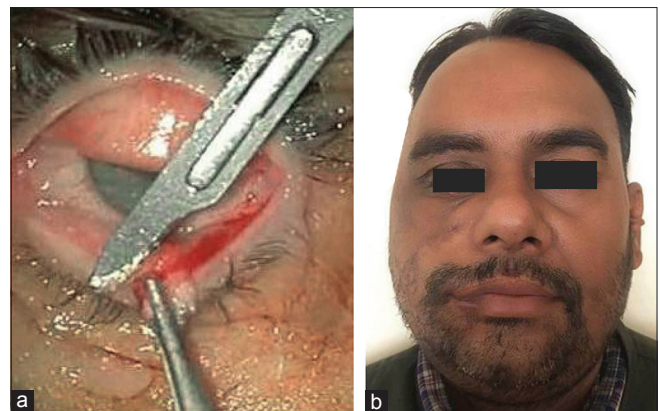


Figure 4: (a) Lateral tarsorrhaphy. (b) A 6-month follow-up

tendon harvester [Figure 2d]. The full length of the tendon was harvested. This was folded in a double-layered fashion and one end of the length was secured with the elevated temporalis muscle. The other end of the tendon was split into two, of which one was attached to the upper and the other to lower lip of the orbicularis oris muscle [Figure 3]. The two split ends of the tendon were suspended at the angle of the mouth with adequate tension to aid in restoration of function. Appropriately securing the tendon to the innervated circumoral musculature increases the balance of the mouth and reduces the risk of elongation of the affected (paralyzed) side. The skin was then closed conventionally in two layers. Lateral tarsorrhaphy was done on the right eye⁽⁷⁾ [Figure 4a]. The patient was kept under appropriate antibiotic and painkiller coverage. Proper follow-up of the patient was done [Figure 4b].

Table 1: House-Brackmann score

Grade	Description	Characteristics
I		Normal
II		Slight - mild weakness
III		Moderate - facial asymmetry and weakness but eye closes
IV		Moderately severe - total facial asymmetry and weakness with incomplete closure of the eye
V		Severe - barely detectable movement
VI		Total - no facial function

DISCUSSION

Bell's palsy management is a combination of pharmacologic therapy, physical therapy, and surgical intervention (dynamic and static techniques).^[8] The early administration of corticosteroid with the addition of an antiviral agent such as valacyclovir in the treatment of Bell's palsy is beneficial.^[1] Any surgical intervention for facial paralysis should consider the patient's age, medical history, and the segment of nerve injured, the patient's expectations and risk tolerance, and most important duration of facial paralysis.

Management of an acute facial paralysis (<3 weeks) includes facial nerve decompression surgery by the transmastoid approach, middle fossa approach, and translabyrinthine approach^[9] or tension-free primary facial nerve repair and cable grafting using great auricular nerve, sural nerve, and the medial and lateral antebrachial cutaneous nerves.^[10]

Surgical treatment of intermediate duration facial paralysis (3 weeks–2 years) is nerve transfers and cross-facial nerve grafting. Cross-facial nerve grafting can be performed if the contralateral facial nerve is intact and functional. Nerve transfer procedures are done using donor nerves such as hypoglossal, spinal accessory, the masseteric branch of the trigeminal nerve, and motor branches of the cervical plexus amongst which the hypoglossal-facial transfer is most common.^[11,12]

In most cases of chronic facial paralysis of >2-year duration, the native facial musculature has atrophied and requires the use of alternative muscles for facial reanimation. Muscle transfer techniques including regional and free muscle transfer are the mainstay of management for chronic facial paralysis. The temporalis muscle transfer is the most commonly utilized regional muscle transfer, but masseter or digastric can also be used. Free muscle transfer includes the gracilis, pectoralis minor, serratus anterior, and latissimus dorsi.^[8,13]

Here, a modified approach involves the attachment of the fascia lata graft to the reflected temporalis and suturing this to the orbicularis oris is used. For ease of rotation and comfortable function without mechanical impingement and obstruction, a part of the coronoid process was removed through which the dislodged fascia lata can be passed and then anchored to the facial musculature. This technique is suggested to have best results in challenging long-standing cases.^[4] It gives immediate results in facial symmetry, food

intake, and speech, with only a 7% complication rate.^[14] The tendon of the palmaris longus muscle can be used in place of fascia lata sling.^[15]

A subcutaneous tunnel is extended from the selected buccal branch on the intact side to the pretragal region on the contralateral paralyzed side, which can be connected by a small gingivolabial incision. The use of a tendon stripper or a plastic drain with a trocar (where the sural nerve is sutured to the end) is helpful for creating the subcutaneous tunnel.^[16]

Neuroorrhaphy can be done in which 2–3 epineural sutures with 9-0 nylon are used to perform a meticulous microneural anastomosis.^[16]

Adjunctive tools such as acupuncture, botulinum toxin injection, and biofeedback with mirror assistance or electromyogram device can be helpful.^[17]

The optimal approach of reanimation in incomplete palsy patients is to functionally upgrade tone and movement without sacrificing any existing function. Neurotization procedures should be used when additional innervation such as functional muscle transfer is planned to result in more muscle fiber recruitment.^[16]

Many times nerve repair is combined with static reanimation of the eye closure using an upper lid weight or palpebral spring.^[15]

CONCLUSION

Surgeons have a wide array of surgical treatment options available for the management of the patients with facial paralysis. An organized, thoughtful approach is necessary when evaluating patients with facial paralysis to ensure that no obvious treatment choices are overlooked.^[8] Still, long-standing facial paralysis remains a complex management challenge. The temporalis muscle-tendon transfer with fascia lata is a safe and effective procedure for reanimation of the paralyzed smile. The technique provides a high degree of control over both the distance and direction of pull on the reanimated commissure. However, the smile is not immediately spontaneous and must be "learned."^[6] This present case report adds one more case to the scanty number of publications.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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