

Frey Syndrome

Treatment With Temporoparietal Fascia Flap Interposition

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There is a 10% to 48% reported incidence of clinically significant gustatory sweating after parotid surgery or injury. Various medical and surgical treatments have been used in the attempt to treat this socially embarrassing condition. These treatments are not always effective and often have unwanted risks and adverse effects. They also do not address the postparotidectomy defect. Prevention of Frey syndrome and correction of the postoperative contour deformity after parotidectomy have recently been achieved by interposition of temporoparietal fascia flap between the parotid gland and the cheek skin flap at the time of parotidectomy. This article presents the first report (to our knowledge) of an established case of Frey syndrome being treated with temporoparietal fascia flap interposition.

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Patients who suffer from Frey syndrome are socially embarrassed by gustatory flushing and sweating. Frey syndrome can occur after parotid surgery or injury to the upper neck or cheek region. The reported incidence of clinically significant gustatory sweating after parotidectomy ranges from 10% to 48%.¹ Subclinical Frey syndrome may reach an incidence of 100%.² Sweating is the result of aberrant reinnervation of the sweat glands on the face by parasympathetic nerve fibers from the otic ganglion.³

Patients are also distressed by the postparotidectomy contour defect and facial asymmetry. Removal of the parotid tissue typically creates a concavity behind the ascending ramus of the mandible. This concavity accentuates the line of the mandible on the side that has been surgically treated.

Many procedures have been proposed for treating established Frey syndrome. Most use interposition of different autologous tissues, most commonly fascia lata, or artificially processed tissue barriers between the skin flap and the parotid

bed. The effectiveness of the available surgical treatments is variable, and such treatments often require remote donor sites. Furthermore, they do not address the postparotidectomy cheek contour defect.

These disappointing surgical outcomes have resulted in a recent shift toward preventing Frey syndrome with prophylactic procedures at the time of parotidectomy. Rotation of the superficial musculoaponeurotic system,^{1,4,5} superiorly based sternocleidomastoid muscle flaps,⁶ and, most recently, temporoparietal fascia flaps (TPFFs)² have been used. The advantage of these procedures is that they use tissue from regions adjacent to the parotidectomy site both to prevent Frey syndrome and to reconstruct the associated retromandibular contour deformity.

We report a case of successful treatment of established symptomatic Frey syndrome with interposition of the TPFF. To our knowledge, this method of treating established Frey syndrome has not been previously described.

REPORT OF A CASE

A 64-year-old male veteran with a lengthy smoking history, presented with complaints of severe gustatory sweating unrelieved by medical treatments. His

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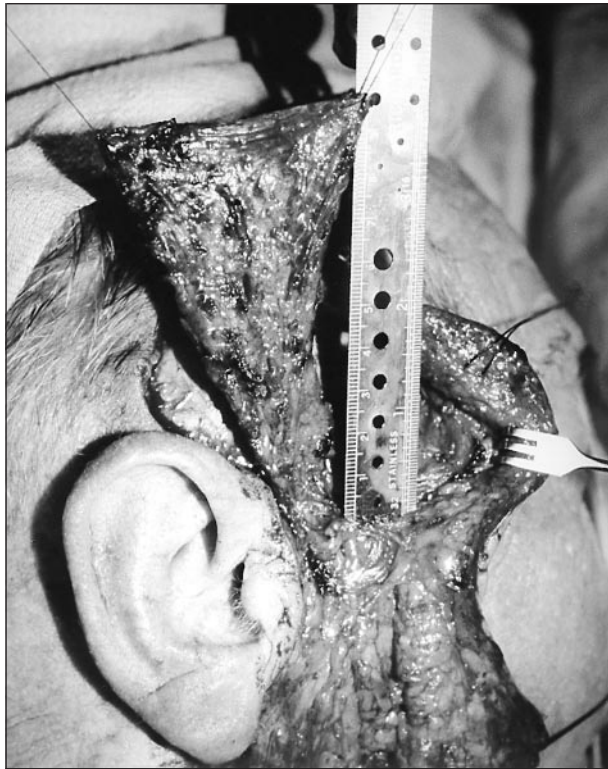


Figure 1. The length of the temporoparietal fascial flap measures approximately 10 to 12 cm. The numbers on the left of the ruler represent centimeters; those on the right, inches.

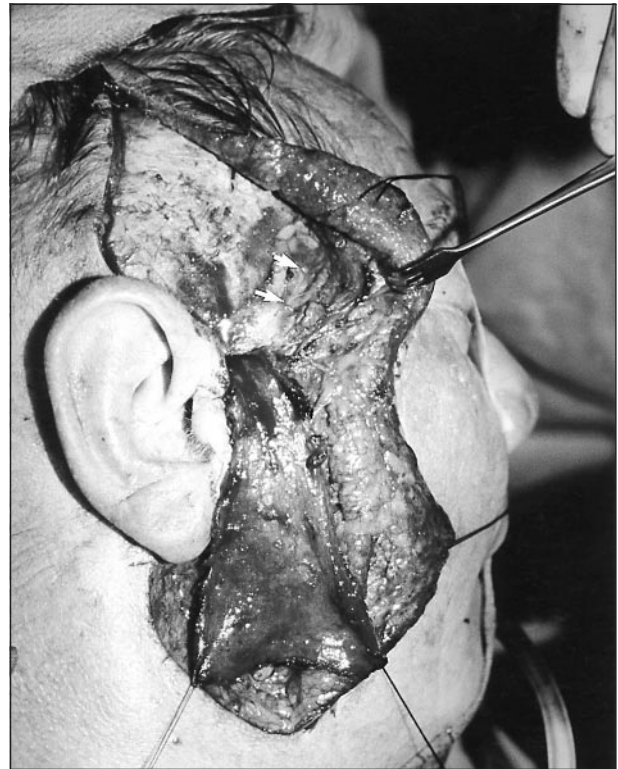


Figure 2. The temporoparietal fascial flap is rotated around the zygomatic arch. Note the location of the facial nerve (arrows).

symptoms began 45 years before evaluation, after he sustained a shrapnel injury to the right retro-mandibular region. At the time of injury, the parotid region was explored and the shrapnel was removed. This procedure left him with a depressed scar below the angle of the mandible. His symptoms of severe gustatory sweating were reproducible with oral sialagogues. Because of his long and heavy smoking history, we elected to use a vascularized TPF interposition to treat his severe gustatory sweating.

Before surgery, Doppler ultrasonography was used to evaluate the flow within the superficial temporal artery. The following surgical technique has been previously described by Sultan et al² and Cheney et al.⁷ Before surgery, a 10 × 12-cm area involved with gustatory sweating was outlined. The course of the frontal branch of the facial nerve was outlined on the skin. A standard pre-auricular parotidectomy incision incorporating the previous scar was performed; this incision was extended superiorly into the temporal hair-bearing region. The skin flap was elevated in a subdermal plane,

exposing the areas involved with gustatory sweating. Doppler ultrasonography was used to map the course of the posterior branch of the superficial temporal artery. The TPF was then carefully freed from the overlying and firmly adherent dermis. Great care was taken not to injure the vascular pedicle of the TPF during this superficial dissection. The frontal branch of the facial nerve was identified and marked. The anterior limit of the flap elevation was 2 cm posterior to the frontal branch of the facial nerve. The deep surface of the TPF was then easily separated from the loose underlying areolar tissue and temporalis fascia. The superior extent of dissection was at the temporal line. Once fully elevated, the TPF was 12 cm in length (**Figure 1**). It was rotated inferiorly (**Figure 2**) and sutured in place over the parotid gland (**Figure 3**), covering the entire region responsible for gustatory sweating. At the same time, it filled the tissue deficit that previously caused the cosmetic deformity. Drains were inserted in the TPF donor site.

The patient experienced complete relief from his gustatory sweat-

ing after surgery. The gustatory sweating has not recurred after 1 year of follow-up. Also, there is a marked improvement in facial contour. There were no complications.

COMMENT

Numerous treatments for established Frey syndrome have been attempted. Nonsurgical remedies include topical antiperspirants (2% glycopyrrolate),⁸ anticholinergic agents (3% scopolamine),⁹ antihistamine creams (20% aluminum chloride),¹⁰ alcohol injections of the otic ganglion,³ and low-dose irradiation.^{2,3} Their long-term effectiveness has been disappointing. The pharmacological treatments only provide symptomatic relief of gustatory sweating and often produce adverse effects. The relief is temporary, necessitating frequent dosing. With time, tolerance to these treatments develops.³

Various surgical procedures have been used to treat established Frey syndrome. The most commonly used method consists of relevation of the cheek skin flap and interposition of various tissue barriers



Figure 3. The temporoparietal fascial flap is positioned over the parotid gland and filling the depressed retromandibular defect at the angle of the mandible.



Figure 4. Postoperative frontal view, showing no fullness over the zygomatic arch.

between the cheek skin and the parotid gland.¹¹ Relevation of the cheek skin flap, excision of involved skin followed by skin grafting,¹² and tympanic neurectomy with or without chorda tympani transection³ have also been used. These procedures have variable effectiveness. Other major drawbacks to these remedies include the need for a remote donor site scar and the risk of facial nerve injury. Also, the post-parotidectomy contour defect is not addressed by these procedures.

The high incidence of Frey syndrome after parotidectomy and the variable success rate with treatments for established Frey syndrome have resulted in a shift toward prophylactic intervention at the time of parotidectomy.² Additional factors favoring this trend include the desire to re-establish facial contour. A variety of prophylactic techniques have been used, including interposition of various nonvascularized tissue, such as lyophilized dura,¹³ superficial musculoaponeurotic system,^{2,4,5} and dermis fat grafts,¹³ or interposition of vascularized flaps, such as the sternocleidomastoid muscle flap⁶ and, most recently, the TPF.²

The TPF is a reliable and versatile fan shaped flap that can reach defects as far as the orbit, ear, and

the upper neck area.⁷ It is pedicled on the superficial temporal artery and is well vascularized. There has been a resurgence in its use over the past 15 years for the repair of a variety of facial and auricular defects. Unlike other grafts and flaps used to treat Frey syndrome, the TPF donor site is in close proximity to the parotid bed, which is advantageous because it allows the creation of a single incision that is well hidden within the temporal hair line. Another advantage that the TPF has over other flaps is its ability to conform to the cheek contour, thereby filling tissue defects and repairing the cheek concavities that are often seen after parotidectomy.² The TPF is a thin flap with a thin pedicle. Unlike the temporalis muscle flap, it generally does not produce fullness at the zygomatic arch, even when it is rotated over the arch (**Figure 4**). These qualities make it a superior tissue barrier for the treatment of Frey syndrome as well as for filling the retromandibular postparotidectomy contour defect.

Our patient had established, debilitating Frey syndrome. Conventional medical treatment had failed. We elected to use the TPF primarily because of the increased risk of skin necrosis associated with the

patient's long smoking history. Interposition of the highly vascular TPF, as opposed to nonvascularized tissue, such as dermal grafts or fascia lata, can minimize this risk. Equally compelling was the TPF's pliability, which permitted effective correction of the patient's post-traumatic retromandibular defect.

There are several potential drawbacks associated with the use of the TPF. There is a risk of injury to the frontal branch of the facial nerve, because the nerve travels within the plane adjacent to the TPF. Injury can be avoided by recognizing the nerve's course and by limiting the anterior extent of the TPF elevation posterior to the path of the frontal branch. Also, ligation of the superficial temporal artery during parotidectomy limits the use of this flap. Flow within the superficial temporal artery should therefore be tested by Doppler ultrasonography before surgery. Transient or permanent alopecia to the donor site has also occasionally been reported.⁷

CONCLUSIONS

The TPF may represent an improved method for treating established Frey syndrome, particularly in smokers. Its unique advantage is

that it simultaneously provides a durable, well-vascularized barrier to aberrant reinnervation and allows superior recontouring of traumatic or postparotidectomy defects. Further use and study of this flap for this purpose are therefore warranted.

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