

# The Usage of Temporoparietal Fascial Flap for Severe Traumatic Auricle Laceration Repair

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## Abstract

In this report, we outline the case of a patient who presented to our Emergency Room following a motorcycle accident. Among other injuries, the patient exhibited a severely lacerated auricle (almost complete detachment). In order to maximize both the success of the ear reconstruction, and the revascularization of the ear, we employed a temporoparietal fascia flap as in the re-attaching of the ear. For reconstruction of the head and neck region, particularly the auricular region, the TPFf presents a reliable and straightforward option with a high potential for success. We therefore suggest that Otolaryngologists and Head and Neck Surgeons keep this technique in mind when planning a surgical course of action.

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## Introduction

Temporoparietal flaps are extremely useful and versatile in cases of trauma, particularly with regards to tissue bed that have been devascularized, as the flap is highly vascular.<sup>1</sup> Being the only single-layered fascia flap that can be used as a pedicled vascular flap in the head and neck, the temporoparietal flap is thin and pliable, allowing it to nicely cover the contour of the external ear. Its resistance to infection allows for a ready acceptance of a skin graft.<sup>1</sup>

The use of a temporoparietal fascia flap (TPFF) for ear reconstruction was first described in 1898<sup>2</sup>. Until the

past few decades, the TPFf was not a widely used technique and has gained popularity after successful use of the flap was reported by Brent et al<sup>3</sup>, and again in 1993 when Cheney et al<sup>4</sup> described 21 cases utilizing TPFf for head and neck reconstruction. We used TPFf to gain vascular support for a very severely injured auricle as described in the literature. We performed a reconstruction with temporoparietal fascial flap for a severely lacerated auricle in order to enhance vascular supply to our patient who was a victim of a motorcycle accident.

## Anatomy

A TPFf is a thin, highly vascularized connective tissue

layer just deep to the hair follicles and subdermal layer of fibrofatty tissue in which they lie. Above the temporal line, the temporoparietal fascia becomes galea aponeurotica. Temporoparietal fascia glides over its deep surface, where it is separated from the deep temporalis fascia by the loose areolar tissue layer. TPF is continuous with subcutaneous musculoaponeurotic layer of the face, the galea above, the frontalis muscle in the front, the occipitalis behind. The flap ranges from 2 to 4 mm in thickness and can be harvested with dimensions up to 17x14 cm. The superficial temporal artery (STA) and superficial temporal vein (STV) nourish the TPF layer. TPF is most often based on the posterior branch of the superficial temporal vessels.<sup>5</sup>

Due to the lack of a significant innervation in the area where the flap is harvested (superior to the auricle) there is no risk of nerve damage, adding to the benefits of using a TPF.<sup>6</sup>

The TPF can be used in one of two ways: as a random local fascial flap, or as an axial fan flap (based on the superior temporal vessels.) Due to its rich vascularity and proximity, the TPF is an excellent method of reconstruction in cases of the head and neck region. TPF has been used in Frey Syndrome, osteoradionecrosis, nasal septal perforation repair, temporal bone pathology, alloplastic implant covering in microtia reconstruction, and superior auricular cutaneous tumor reconstruction.<sup>7</sup>

## Case

A 42 year-old male presented to the Emergency Room following a motorcycle accident. The patient had sustained injured to the left side of his face, including almost complete laceration of the left ear. The inferior lobule of the left auricle was attached to the temporal region by 3-4 mm of skin. The superior, anterior, and posterior parts of the auricle were completely detached, and the auricular cartilage and perichondrium was also severely damaged (Photo 1). The superficial temporalis artery and vein (which provide vascularization to the auricle from the anterior and superior) were completely severed, and the attachment of the posterior auricular artery plexus

(which provides vascularization to the auricle from the posterior and inferior) was weak.

## Procedure

The patient was prepped under general anesthesia. All of the lacerated tissue was irrigated with saline to remove foreign particles, cleaned, and treated with povidone iodide. A "T" shaped incision was made in the scalp superior to the lacerated left auricle (Photo 1).

**Figure 1 :** Pre-operative photo of lacerated ear.



The dissection was done past the dermis into the subdermis, to the superior line of the superior TPF. The superficial temporal vessels were identified and protected during the dissection. An incision was made to the TPF 1 cm away from the temporal line and the TPF subsequently elevated. Following that, the loose areolar tissue beneath it was elevated (Photo 2). The flap was lifted from the deep temporal fascia and turned downward on its vascular pedicle. Crushed cartilage was shaped to reform the auricular framework and sutured using 6/0 PDS. The elevated areolar loose tissue and TPF was sutured onto the new auricular framework in which maximized the coverage and contact, using 6/0 Prolene (Photo 3). The cutaneous wound in the scalp was closed in layers, and the auricular skin was closed with 6/0 prolene and a light pressure dressing was applied.

**Figure 2 :** Turning inward of flap.**Figure 3 :** Suturing of TPF into new framework

After reconstructing an almost completely severed ear with non-intact perichondrium and severe loss of vascularization, the healing process was unremarkable with no sign of necrosis. Due to the severity of the damage done to the ligament and muscular attachments, the post operative conchomastoid opening was slightly less than ideal, however from a cosmetic standpoint, the results at 6 months post-operatively were quite acceptable (Photo 4).

**Figure 4 :** 6 months post-op photo of patient

## Conclusion

Auricle traumas can result with unwanted and catastrophic damages. TPF is an easy, reliable solution for severe traumas of aurice. Also TPF is usable in cases of any vascularity demanding surgeries for ear framework.

## References

1. Moore EJ. Temporoparietal Fascia Flap. 2009. <http://emedicine.medscape.com/article/881374> Accessed: October 15, 2011.
2. Brown WJ. Extraordinary case of horse bite: the external ear completely bitten off and successfully replaced. *Lancet*. 1898;1:1533.
3. Brent B, Byrd HS. Secondary ear reconstruction with cartilage grafts covered by axial, random, and free flaps of temporoparietal fascia. *Plast Reconstr Surg*. Aug 1983;72(2):141-52.
4. Cheney ML, Varvares MA, Nadol JB Jr. The temporoparietal fascial flap in head and neck reconstruction. *Arch Otolaryngol Head Neck Surg*. Jun 1993;119(6):618-23.
5. David SK, Cheney ML. An anatomic study of the temporoparietal fascial flap. *Arch Otolaryngol Head Neck Surg*. 1995;121:1153-1156
6. Rose EH, Norris MS. The versatile temporoparietal fascial flap adaptability to a variety of composite defects. *Plast Reconstr Surg*. 1990; 85:224-232
7. Panje WR, Morris MR. The temporoparietal fascia flap in head and neck reconstruction. *Ear Nose Throat J*. 1991;70:311-317.