

Temporoparietal fascia flap for facial reconstruction

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Temporoparietal fascia has been widely used for ear reconstruction. Besides, it may be used for ear reconstruction. Besides, it may be used for different purposes in facial reconstruction. This paper presents the use of temporoparietalis fascia for orbital reconstruction in three cases, for soft tissue defects on exposed bone in one case and for improvement of facial contours in bilateral Romberg's disease (Progressive hemifacial atrophy) in one case. We achieved satisfactory results without complications. [Turk J Med Res 1994; 12(1): 18-24]

Key Words: Temporoparietal fascia, orbital reconstruction, progressive hemifacial atrophy.

Although the use of temporoparietal fascia for one-stage ear reconstruction has gained popularity in the last two decades (1,2,3,4,5,6) there are relatively less reports in the literature concerning its use for other facial deformities.

Temporoparietal fascia is part of the superficial musculoaponeurotic system and its blood supply is via superficial temporal vessels (7). Superficial temporal artery is one of the terminal branches of the external carotid artery. After emerging from beneath the superficial lobe of the parotid gland, it courses superficial to the zygomatic arch and anterior to tragus. About 5 cm above the arch it gives an anterior branch toward the frontal area and a posterior branch to the temporoparietal area. External diameter of the artery is about 1.5-3.0 mm. Venous drainage is via the superficial temporal vein accompanying the artery. Vein empties into the internal jugular vein and has a diameter of 1.3-3.0 mm (8,9).

We used temporoparietal fascia flaps for many primary and secondary ear reconstructions on more than thirty patients. Its use for this purpose is well documented. Temporoparietal flaps may also be used for forehead, eyebrow, eyelid, nasal and other soft tissue defects of the face (5,10,11,12,13,14). Microsurgical transfers of the flap add new dimensions to its use (8,9,15).

In this article we present various applications of temporoparietal fascia flap for cases of facial reconstruction and for Romberg's disease.

MATERIALS AND METHODS

We used temporoparietal fascia for orbital reconstruction after extensive tumor resections in three cases; for improvement of facial appearance in a patient with Romberg's disease and for closure of exposed mandible in a case with electrical burn injury.

Surgical technique

All the patients were operated on supine position under general anaesthesia and with oro-tracheal in-



Figure 1. a) A neglected case of basal cell carcinoma of the peri-orbital region.

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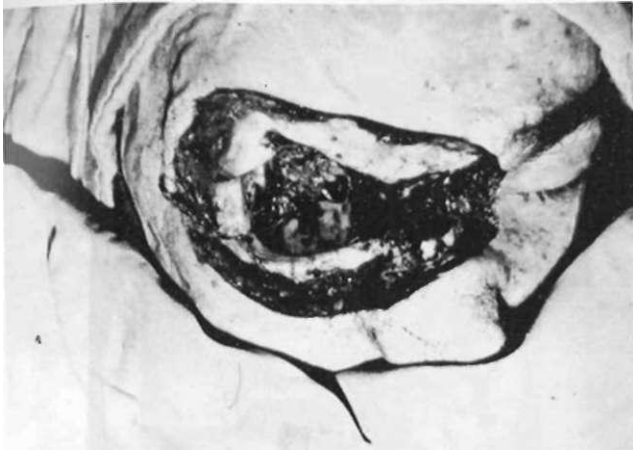


Figure 1. b) Exenteration of the tumor and orbital contents.



Figure 1. c) Preparation and transfer of temporoparietal fascia flap.

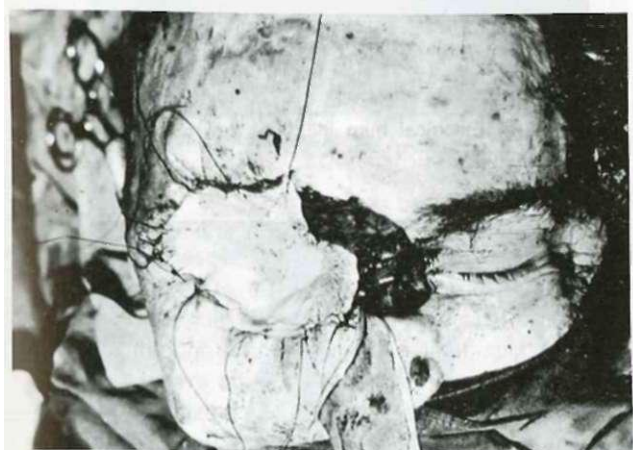


Figure 1. d) After covering a vascular zones with temporoparietalis fascia, onlay grafts are fixed.

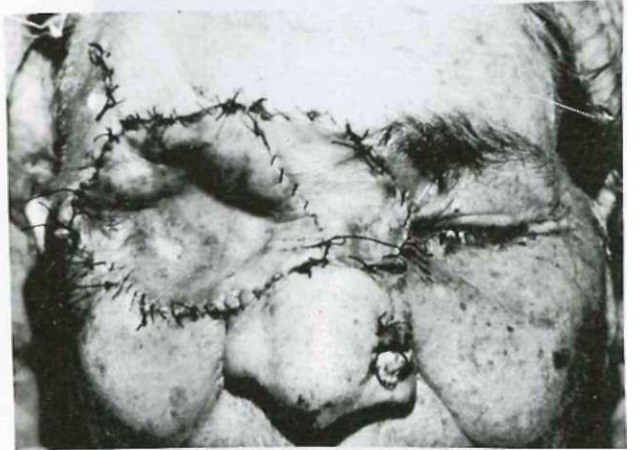


Figure 1. e) Postoperative view

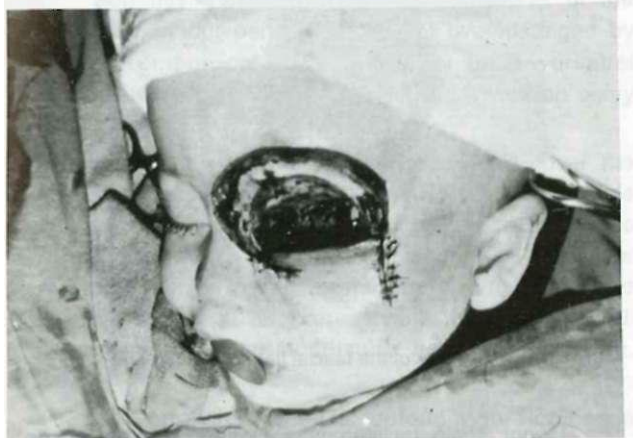


Figure 2. a) Embryonal rhabdomyosarcoma with orbital bone invasion.



Figure 2. b) Preparation of temporoparietal fascia flap,

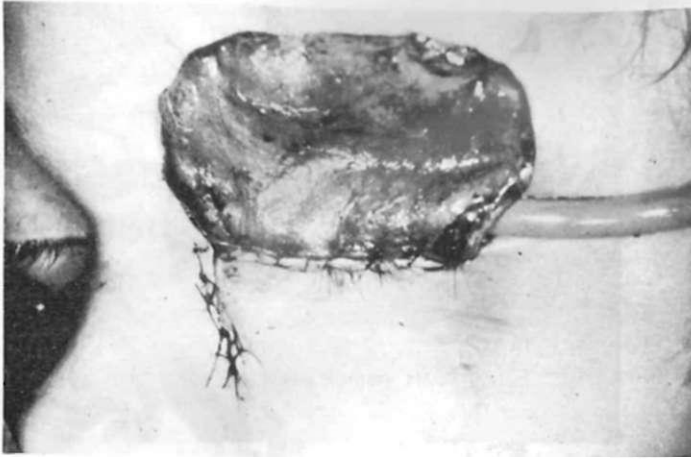


Figure 2. c) A foley catheter balloon was used to construct orbital cavity with an overlying fascial flap.



Figure 3. a) Electrical burn injury of the mandible exposing mandibular bone.



Figure 2. d) After division, inset and grafting trials for an eye prosthesis.

tubation. All of hair, scalp and the whole face were prepared with %10 povidone iodine scrub solutions for surgical antisepsis. The flap was raised bu making an /Y or T shaped scalp incision along the course of the artery. The plane of dissection was between the superficial and deep temporal fascial nerve while great auricular nerve might be sacrificed. A 10x12 cm flap could usually be prepared. When a greater flap was required, flap might be extended by using the posterior branches of the temporal arthey communicating with the occipital artery.



Figure 3. b) Transfer of the fascial flap to the defect.

Donor scalp incision was closed with nonabsorbable sutures following the placement of a suction catheter in the dissection plane.

— Orbital reconstruction



Figure 3. c) Postoperative view.

In planning an orbital reconstruction with a temporoparietal fascia, the measurement was made from medial canthus to the pivot point of the flap planned on the same side with the orbital defect. After transferring flap through a subcutaneous tunnel, split thickness skin grafts were taken from hairless areas of the body. Grafts were fixed and mild pressure was applied for enabling adequate contact with the recipient bed without disturbing the flap vasculature (Fig. 1abcde, 2abcd).

— Mandible defect

Soft tissue defects exposing some part of the mandible without periosteum cannot be managed by grafts. Temporoparietal fascia may be a versatile reconstructive procedure by combining it with an onlay graft.

A flap of adequate size to reach and cover the entire exposed bone was prepared on the same side of the defect and transferred to the region through a subcutaneous tunnel. A graft to match facial skin color was prepared and fixed on the flap and mild pressure was applied to provide contact with the vascular bed. Care was taken not to disturb flap perfusion (Fig. 3abc).

— Correlation of facial deformity in Romberg's disease

For correction of facial deformity in Romberg's disease bilateral temporoparietal fascia flaps were prepared and were used to cover the entire cheek via

a large subcutaneous tunnel. The flaps were positioned and fixed by means of a few nonabsorbable pull-out sutures which were removed early in the postoperative period (Fig. 4abcde).

RESULTS

We used temporoparietal fascia flap in 5 cases for facial reconstruction. In each case, temporal fascia accomplished what it set out to do. None of our patients complained of donor site scars and we had no donor site problems except for a minimal loss of hair on the incisional lines.

We observed edema in the early postoperative period which subsided slowly and which never created circulatory problems.

DISCUSSION

After exenteration of the orbital contents, if the eyelids can be preserved, they may be used to resurface the socket. If the eyelids cannot be preserved, a split thickness skin of non-hair bearing areas may provide coverage for the bony surfaces with an overlying periosteum. The problem arises when segmental bone resections and deperiostealized bony surfaces have to be covered with soft tissues which may supply an adequate socket reconstruction for fitting an eye prosthesis (16). The temporoparietal fascia is a versatile flap donor source. Because of its highly vascular nature, it can be transferred to the defects in instances where a skin graft is preferable to a bulky flap but a suitable



Figure 4. a) Bilateral Romberg's disease, preoperative view.



Figure 4. b) Transfer of the fascia flaps.

bed is lacking (1,15). By using temporoparietalis fascia for orbital reconstructions comprising inadequate graft beds, we avoid the use of local or distant flaps and related donor site scars as well as secondary procedures to reshape these bulky tissues. Temporoparietal flap is large enough to cover entire orbit and its pliability allows it to fit the orbital contour properly.

Facial defects of considerable size may be resurfaced by using local flaps, however donor site scars are visible and a virgin area is sacrificed in order to close the defect. Exposed bones with a surrounding scarrical halo, as in our case with electrical burn injury, may endanger the viability of local flaps as well. Distant flaps are not preferable due to inadequate skin match donor site scars, immobilisation problems and they require at least two stage procedures. We used temporoparietalis fascial flap to cover exposed mandibular bone with a non-hair bearing onlay skin graft. Flap was easily transferred to the defect via a subcutaneous tunnel leaving only a hidden scar.

Reconstruction of the facial contours, as in Romberg's disease is another field of use. The disease has an uncertain etiology. Vasoconstriction and lipolysis due to sympathetic nervous system involvement has been favoured as the etiological factor (17). Most patients may be managed by only soft tissue reconstruction without the need for skeletal augmentation. Subcutaneous fat injections, deepithel-



Figure 4. c) Early postoperative view with marked edema of the flaps.

ized abdominal tube flaps, free vascularized dermal-fat transplantations and free vascularized omentum transfers are among the methods used (17-18-19). In using temporoparietal fascia for soft tissue reconstruction of Romberg's disease, we not only tried to add tissue to the region but we also wished to increase the vascularity of the region and hoped to prevent progression of the disease. As with many other methods, late postoperative results are not totally satisfying even if some progression can be accomplished.

Complications of the temporoparietal fascia flap are quite rare and we faced no complications except for minimal loss of hair on incisional lines (1,4).

Temporoparietal fascia flap may be prepared with great success rates in relatively short time after some experience is gained in the dissection of the flap. We must keep in mind that larger flaps may endanger the viability of the distal portions of the flaps (20).

Conclusions

a) Temporoparietal fascia flaps are useful in reconstructing facial defects with a vascular bed by enabling the use of grafts.

b) It leaves a hidden scar and avoids the visible scars of local facial flaps.

c) It may be used in Romberg's disease.

d) It is a reliable flap with few complications.



Figure 4. d) Postoperative view after a month.



Figure 4. e) Postoperative anteroposterior view after 3 months.

Yüz rekonstrüksiyonunda temporoparietal fasiyal flebi

Temporoparietal fasya kulak rekonstrüksiyonu için yaygın olarak kullanılmaktadır. Kulak dışında, yüz rekonstrüksiyonunda değişik amaçlarla kullanımı söz konusu olabilir. Bu makalede temporoparietal fasyanın üç vakada orbita rekonstrüksiyonunda ve bir vakada bilateral Romberg hastalığında (Progressif hemifasial atrofi) fasiyal konturlerin düzeltilmesinde uygulandığı sunulmaktadır. Komplikasyonsuz başarılı sonuçlara/inmiştir. [TurkJMedRes 1994; 12(1):18-24]

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