

THE USE OF PARAMEDIAN FOREHEAD FLAP FOR RECONSTRUCTION OF UPPER EYELID DEFECTS

ÜST GÖZ KAPAĞI DEFEKTLERİNİN TAMİRİNDE PARAMEDİAN ALIN FLEBİ KULLANIMI

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SUMMARY: Direct primary closure of larger defects over the upper eyelid skin may lead to the mechanical restriction of eyelid movements, lagophthalmia and, subsequently, corneal damage in the long term. The pediculated paramedian forehead flap is a good alternative for the reconstruction of large defects of the upper eyelid because it is easy to close the defect of the donor area primarily, to extend the size of the flap as desired, and the blood supply from the supratrochlear artery is durable.

Key Words: Paramedian Forehead Flap, Eyelid Reconstruction, Basal Cell Carcinoma.

ÖZET: Üst göz kapağındaki büyük defektlerin tamirinde uygulanacak primer onarım, göz kapağı mekanik hareketlerinin kısıtlanması, lagofthalmi ve uzun dönemde kornea hasarına yol açabilir. Donör sahanın primer olarak rahatlıkla kapatılabilmesi, flebin istenilen genişlikte alınabilmesi, taşıdığı superior trochlear arter yoluyla kanlanmasının güçlü olması pediküllü paramedian alın flebini üst göz kapağının geniş defektlerinde iyi bir alternatif hale getirmektedir. Burada flebi uyguladığımız bir hastayı tartıştık.

Anahtar Kelimeler: Paramedian Alın Flebi, Göz Kapağı Rekonstrüksiyonu, Bazal Hücreli Karsinoma.

INTRODUCTION

The flexibility of the skin and subcutaneous tissues of the upper eyelid region frequently enables direct primary closure of small skin defects. Whenever the extent of cutaneous loss negates the possibility of direct primary closure, alternative sources of tissue coverage are required. Otherwise, one may face possible complications like mechanical restriction of eyelid movements, lagophthalmia and, subsequently, corneal damage in the long term. Should direct closure not be possible, the utilization of a random cutaneous flap is a good alternative. However, when the amount or quality of local tissue is inadequate to cover a cutaneous defect on the upper eyelid and the medial canthus, the best alternatives are median and paramedian forehead flaps and the Fricke flap

with its blood supply from the superficial temporal artery (1-4). The median (midline) forehead flap is one of the oldest reconstructive surgical procedures known. This flap was initially described in ancient Indian medical writings about the reconstruction of noses that had been mutilated as punishment for adultery (5). The paramedian forehead flap is a modification of the median forehead flap. It is considered an axial flap that derives its principal blood supply from the supratrochlear artery. It is a very robust flap with a durable and reliable blood supply. This rich blood supply allows the reconstructive surgeon considerable flexibility in providing blood supply.

In this report, a case of basal cell carcinoma of the upper eyelid, which resulted in a large cutaneous defect after excision, is presented and

the technique of reconstruction using the paramedian forehead flap is discussed.

CASE REPORT

An 80-year-old man was admitted to our department with a non-healing, gradually growing ulcer over his right eyelid for 2 years. He had smoked one pack of cigarettes per day for 20 years. On physical examination, an ulcerated lesion with overlying crusts on the superomedial side of his right upper eyelid was revealed. It extended to the pupil level on the lateral aspect, to the nasal dorsum on the medial and to the medial canthus 7 mm away in the inferior aspect (Fig.1). Eye movements were free in every direction. There was no restriction of eyelid movements, except from the mass effect of the lesion. An incisional biopsy from the lesion revealed it was basal cell carcinoma.

Preoperatively a paramedian forehead flap based on the contralateral superior trochlear artery was planned. After local infiltration anesthesia, an excision was performed leaving 5 mm of intact skin around the lesion. The excision involved subcutaneous tissues up to the tarsal cartilage level and up to the orbital fat tissue at the superior aspect. A left-sided paramedian forehead flap was prepared preserving the superior trochlear artery. The donor area was closed with direct primary repair. The excision defect was reconstructed using the flap. Three weeks later vascularization of the flap was assessed by occluding the arterial blood supply

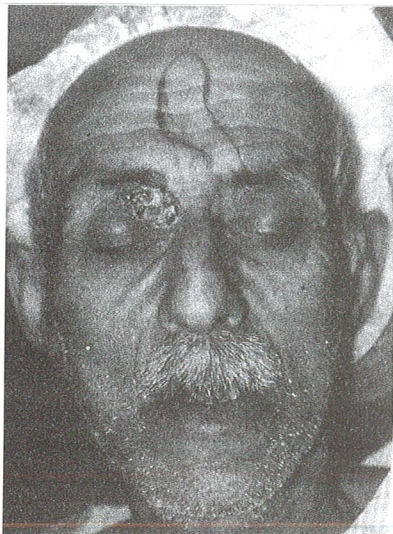


Fig. 1: Preoperative appearance. Note the sketch of the borders of the flap on the forehead.

from the pedicle of the flap for 24 hours, and the adequacy of the vascularization of the flap from the surrounding tissues was confirmed. The pedicle was excised, and its root was sutured back to the donor area (Fig. 2). After the early postoperative edema ceased, the minimal eye movement restriction due to the mass effect of the lesion recovered (Fig. 3).

DISCUSSION

When direct primary closure of the excision defect is not possible in the head and neck region, it may be reconstructed by:

- 1) A random regional cutaneous flap or a cutaneoconjunctival full-thickness advancement flap;

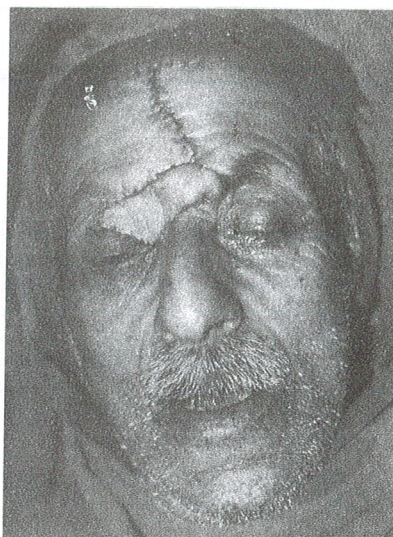


Fig. 2: Early postoperative appearance.

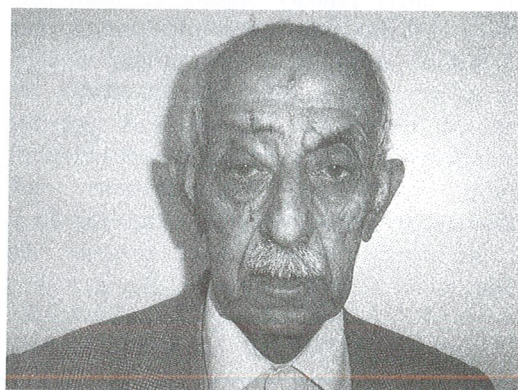


Fig. 3: Long-term result of the appearance

2) A myocutaneous flap that derives its blood supply from an axial vasculature; and

3) Free flaps with end-to-end vascular anastomosis of their vasculature to the dominant vascular structure of the recipient area (3,4).

In the reconstruction of the defects of the upper eyelid, the flexible nature of the skin and subcutaneous tissues of the surrounding region frequently enable direct primary closure of small skin defects. However, for larger defects, direct primary closure may lead to the mechanical restriction of eyelid movements.

Regional flaps are preferable in periorbital reconstruction because they are easy and ready to perform unless i) the recipient area is not well vascularized, ii) a bulky flap or graft is necessary to fill a large tissue defect or iii) the donor areas suitable for the regional flaps are utilized in previous operations. In such cases myocutaneous flaps would be a better alternative (2,4,6).

In this case: i) there was a large tissue defect; ii) during the excision of the lesion the excision had to extend up to the periosteum, thus ipsilateral supratrochlear vessels could not be preserved and the vascularization might have been insufficient for a regional flap from the supraorbital region; therefore a forehead flap deriving its blood supply from the contralateral supratrochlear vessels was used; and iii) the lesion was not located in a marginal location and was limited on the anterior lamella with no conjunctiva involvement. Because there was no defect of the conjunctiva we did not need to perform the full-thickness cutaneousconjunctival advancement flap from the lower eyelid to reconstruct the upper eyelid conjunctiva (Cutler-Beard technique).

The region of the forehead and glabella is almost ideal in texture, color and thickness for the reconstruction of the eyelid. The median forehead flap was classically described as a bipediced flap attached to both supratrochlear vessels. However experience has shown that this flap can safely be based on only one pedicle which allows for a greater rotation of the flap base and hence greater reach and length. The paramedian modification has a narrower base and is therefore even more flexible (4,7,8).

For the preparation of a narrowly based

paramedian flap, transcutaneous ultrasonic doppler detection of the supratrochlear vessels is of great value (4). When ultrasonic doppler detection is not available or is inefficient, supratrochlear vessels can be recognized with the help of morphometric findings. Vural et al. found that supratrochlear vessels were found just over the glabellar frown line in 50% of cases and were 1-6 mm (mean 3.2 mm) lateral to this point in the rest of the group in his study of 19 volunteers and 8 cadavers (9).

In our case the morphometric findings were helpful in the recognition of the supratrochlear vessels. During the resection of the lesion on the superior aspect near the orbital rim, it was necessary to resect up to the periosteum level, ipsilateral (right) supratrochlear vessels were recognized at a position 14 mm lateral to the midline and 2 mm lateral to the glabellar frown line and had to be resected. Using the same measurements on the contralateral side a narrow based paramedian forehead flap was prepared.

The pediculated paramedian forehead flap is a good alternative for the reconstruction of large defects of the upper eyelid because it is easy to close the defect of the donor area primarily and to extend the size of the flap as desired. The blood supply from the supratrochlear artery is durable and reliable, and reconstruction without any traction over the eyelid is possible.

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REFERENCES

1. Bajaj MS, Sethi A. Complicated eyelid reconstruction after unusual glabellar flap repair. *Acta Ophthalmol Scand* 2000; 78: 599-600.
2. Chiarelli A, Forcignano R, Boatto D, Zuliani F, Bisazza S. Reconstruction of the inner canthus region with a forehead muscle flap: a report on three cases. *Br J Plastic Surg* 2001; 54: 248-252.
3. Fischer T, Noever G, Langer M, Kammer E. Experience in upper eyelid reconstruction with the Cutler-Beard technique. *Ann Plast Surg* 2001; 47: 338-342.
4. Yeatts RP, Newsom RW, Matthews BL. Doppler-assisted vascular pedicle flaps in eyelid and periorbital reconstruction. *Arch Ophthalmol* 1996; 114: 1149-1152.
5. Menick FJ. Aesthetic refinements in use of forehead for nasal construction: the paramedian forehead flap. *Clin Plast Surg* 1985; 76: 866.
6. Park SS. Reconstruction of nasal defects larger than 1.5 centimeters in diameter. *Laryngoscope*, 2000; 110: 1241-1250.
7. Çakmak Ö, Özlüoğlu L. Burun rekonstrüksiyonunda paramedian alın flebi kullanımı. *KBB ve Baş Boyun Cerrahisi Dergisi*, 2000; 8: 139-142.
8. Kalcıoğlu MT, Kızılay A, Aktaş D, Çokkeser Y, Saydam L. Burundaki geniş doku kayıplarının alın flebi ile rekonstrüksiyonu. *Kulak Burun Boğaz Klinikleri Dergisi*, 2002; 4: 26-29.
9. Vural E, Batay F, Key M. Glabellar frown lines as a reliable landmark for the supratrochlear artery. *Otolaryngol Head Neck Surg*. 2000; 123: 543-546.