

Cervicofacial flap in lower eyelid reconstruction: A case report

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Case Report

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Background: Basal cell carcinoma (BCC) is the most common malignant neoplasm of the periocular region, most frequently involving the lower eyelid secondary to cumulative exposure to ultraviolet (UV) radiation. Surgical excision remains the mainstay of treatment but the resultant defects pose a serious reconstructive challenge. The layered eyelid anatomy is complex and functional, and a reconstructive procedure is required to restore facial aesthetics and to protect the eyes. The mustardé flap is a reliable and versatile technique in the reconstructive surgeon's armamentarium with excellent functional and cosmetic results if performed with a meticulous surgical approach.

Keywords: Basal cell carcinoma, lower eyelid reconstruction, Mustardé flap, cervicofacial flap, ectropion, periocular

The eyelid is a very complex anatomical structure with important functional consequences. The eyelid's primary function is to spread the tear film to keep the cornea moist and to maintain the facial aesthetic balance that is important for social interaction and human identity. It is the lower eyelid that is most susceptible to skin cancer, as it is constantly exposed to high levels of UV radiation from the sun. Basal cell carcinoma (BCC) is the most common malignant tumour of the eyelid and accounts for more than 90% of all malignant eyelid neoplasms¹. It rarely metastasizes but has a peculiar slow and relentless habit of local growth with extensive destruction of the surrounding structures including the tarsal plate, the orbicularis oculi muscle and the complicated lacrimal drainage apparatus. Basal cell carcinoma of the eyelids is treated by surgical excision with oncological margins, which often leads to important defects that are difficult to suture. There are several methods of reconstruction including primary closure, full thickness skin grafts and various local and regional flaps. Mustardé's cervicofacial rotation-advancement flap has become a mainstay of lower lid reconstruction².

Case report

Our clinic received a patient who was 46 years old and had a lesion on his lower left eyelid that had been there for at least two years at his visit. The cervicofacial flap reconstruction yielded good results in terms of both aesthetics and functionality, while the

treatment itself went off without a hitch and did not suffer from any difficulties. The cervicofacial flap reconstruction yielded good results in terms of both aesthetics and functionality, while the treatment itself went off without a hitch and did not suffer from any difficulties after 8 weeks of evolution.

Discussion

Reconstruction of lower eyelid defects following the excision of basal cell carcinoma remains one of the most difficult challenges of reconstructive surgery, whereby the surgeon is called upon to juggle oncological radicality with eyelid function and aesthetic harmony, three often competing goals³. In this context, the Mustardé cervicofacial rotation-advancement flap has emerged as a reliable and versatile workhorse, offering a one-stage solution that adheres to the fundamental principles of sound reconstruction: replacing like with like tissue, minimising donor site morbidity, and sparing adjacent critical structures⁴. The flap's principal advantage lies not merely in the abundant tissue it provides, but in its sophisticated biomechanical design, for unlike simple advancement flaps or skin grafts, which recruit tissue along a single vector and concentrate tension at the wound edges, the rotation-advancement mechanism distributes closing forces over a broad arc spanning the cheek, preauricular, and temporal regions, thereby shifting the epicentre of tension from the highly sensitive eyelid margin—where even minimal vertical pull can cause ectropion—to the more forgiving



Figure 1. Basal cell carcinoma located on the left inferior eyelid.

tissues of the lower face; this property is clinically paramount, as ectropion remains the most feared complication, potentially leading to corneal exposure,



Figure 2. Presurgical marking for Mustarde Flap.



Figure 3. Surgical dissection of the cervicofacial flap

keratopathy, epiphora, and even visual compromise, and when the Mustardé flap is meticulously anchored to the periosteum of the lateral orbital rim, it effectively suspends the reconstructed eyelid against



Figure 3. Post-operative evaluation and outcomes at 8 weeks of evolution.

gravity and postoperative cicatricial contracture, ensuring long-term stability⁴. Aesthetically, the advantages of the cervicofacial flap are hard to beat with other techniques, as the cheek skin shares the same embryologic origin, thickness, colour, and density of appendages as the lower eyelid, providing a better textural and chromatic match that ages well with the patient. Full-thickness skin grafts, although useful for smaller defects, are notorious for unpredictable pigmentation, surface irregularities, and the obvious “patch” phenomenon that interrupts natural facial transitions⁵. The robust vascular supply through the subdermal plexus in the Mustardé flap promotes rapid healing, decreases the risk of necrosis, and minimises secondary contracture, which is advantageous in irradiated or heavily actinically damaged fields where compromised recipient beds threaten graft survival⁶. Nevertheless, the Mustardé flap is not a cure-all, and complications may include transient edema of the lower lid, marginal epidermolysis at the distal tip of the flap due to its random-pattern vascular supply, hypertrophic scars or dog-ear deformities at the pivot point, and most importantly injury to the temporal and zygomatic branches of the facial nerve which, although rare in the hands of experienced surgeons, emphasizes the importance of thorough knowledge of anatomy and meticulous dissection superficial to the SMAS, and excessive cephalad tension placed on the anchoring sutures may lead to an elevation of the lateral canthus that results in a “peek-a-boo” deformity or an over-rounding of the palpebral fissure, problems that are generally correctable with secondary procedures but that underscore the importance of precise planning and intraoperative adjustment⁷. A major shortcoming is that the flap cannot serve as the only reconstructive modality for full-thickness defects involving all three lamellae, as in such complex cases, anterior lamellar coverage with the Mustardé flap must be supplemented by a robust posterior lamellar reconstruction to provide structural support, and the classic combination of a Hughes tarsoconjunctival flap from the upper eyelid, followed by a second-stage Mustardé flap for anterior coverage, remains the gold standard for extensive full-thickness defects, capitalizing on the robust vascularization of both flaps to minimize ischemic complications, although the surgeon must counsel the patients about the potential upper eyelid donor site morbidity, including ptosis or entropion⁸. In the larger reconstructive armamentarium, the Mustardé flap has to be considered in the context of other techniques, for example the rhomboid (Limberg) flap provides an elegant geometric solution for moderate defects but is not suitable for large or laterally extensive lesions; the Tenzel semicircular flap is ideal for lateral canthal defects but may not provide enough tissue for medial or extensive lower lid involvement; the V-Y

advancement flap can blunt the nasojugal fold; and the Mustardé flap stands out for its versatility, reliability and reproducible results and is therefore the preferred choice for most medium-to-large anterior lamellar defects. Ultimately success depends on judicious patient selection and individualised planning⁹. Young patients with minimal skin laxity, smokers with compromised microcirculation and those with previous irradiation are poor candidates, while the elderly patient with copious cheek laxity and actinic skin is the ideal candidate. The surgeon should also consider the role of ocular dominance, baseline tear function and pre-existing ectropion or lagophthalmos as these factors have profound effects on the surgical plan and postoperative recovery¹⁰. Advances in tissue engineering, refinement of microsurgical techniques, and integration of preoperative imaging and virtual planning will likely drive the evolution of periocular reconstruction in the future, and acellular dermal matrices and synthetic scaffolds may one day provide alternatives to autologous tissue for posterior lamellar reconstruction, reducing donor site morbidity¹¹. The increasing use of Mohs micrographic surgery, with its precise margin control, will continue to reduce defect size, expanding indications for simpler reconstructive options¹². The Mustardé flap will remain an indispensable pillar of the reconstructive surgeon's practice for the foreseeable future, however, a testament to the enduring principles of plastic surgery: restoring form and function through thoughtful application of sound anatomical knowledge and surgical skill¹³.

Conclusion

The management of basal cell carcinoma of the lower eyelid emphasizes the necessity of a combined approach that stresses tumor removal while preserving function. The Mustardé cervicofacial rotation-advancement flap is a proven, reliable, and effective method of reconstruction of large anterior lamellar defects after oncologic resection. It is an important tool in the reconstructive surgeon's armamentarium, providing firm, color-matched, tension-free coverage with a favorable complication profile.

References

1. Anastasopoulos, I., Ntamagkas, A., Chrysikos, D., Patelis, A., & Troupis, T. (2025). Basal cell carcinoma of the right lower eyelid treated with tarsoconjunctival and Mustardé flaps. *Cureus*, 17(2), e79129. <https://doi.org/10.7759/cureus.79129>
2. Gigov, K., Ginev, I., & Kavaradzhieva, P. (2025). Mustardé cheek rotation-advancement flap: A case-based experience in reconstruction of a large defect of the lower eyelid due to squamous cell carcinoma. *Clinics*

- and *Practice*, 15(9), 165.
<https://doi.org/10.3390/clinpract15090165>
3. Gündüz, K., Demirel, S., Günalp, I., & Polat, B. (2006). Surgical approaches used in the reconstruction of the eyelids after excision of malignant tumors. *Annals of Ophthalmology (Skokie, Ill.)*, 38(3), 207–212.
<https://doi.org/10.1007/s12009-006-0006-1>
 4. Ibáñez-Flores, N., Bruzual-Lezama, C., Castellar-Cerpa, J. J., & Fernández-Montalvo, L. (2019). Reconstrucción de párpado inferior mediante injerto de pericráneo y colgajo de Mustardé. *Archivos de La Sociedad Española de Oftalmología (English Edition)*, 94(10), 514–517.
<https://doi.org/10.1016/j.oftal.2019.04.011>
 5. Johnson, A. R., Egeler, S. A., Wu, W. W., Bucknor, A., Ibrahim, A. M. S., & Lin, S. J. (2019). Facial reconstruction after Mohs surgery: A critical review of defects involving the cheek, forehead, and perioral region: A critical review of defects involving the cheek, forehead, and perioral region. *The Journal of Craniofacial Surgery*, 30(2), 400–407.
<https://doi.org/10.1097/SCS.00000000000005074>
 6. Mitra, S., Panda, S., Singh, C. A., & Thakar, A. (2023). Modified Mustardé flap for lower eyelid reconstruction in basal cell carcinoma: Revisited. *Indian Journal of Otolaryngology and Head and Neck Surgery: Official Publication of the Association of Otolaryngologists of India*, 73(3), 2492–2495. <https://doi.org/10.1007/s12070-023-03768-4>
 7. Mustardé, J. C., & Whitaker, L. A. (1981). Repair and reconstruction in the orbital region. A practical guide. *Plastic and Reconstructive Surgery*, 67(5), 692.
<https://doi.org/10.1097/00006534-198105000-00024>
 8. Rapstine, E. D., Knaus, W. J., & Thornton, J. F. (2012). Simplifying cheek reconstruction: a review of over 400 cases. *Plast Reconstr Surg*, 129(6), 1291–1299.
 9. Roth, D. A., Longaker, M. T., & Zide, B. M. (1998). Cheek surface reconstruction: Best choices according to zones. *Operative Techniques in Plastic and Reconstructive Surgery*, 5(1), 26–36.
[https://doi.org/10.1016/s1071-0949\(98\)80028-0](https://doi.org/10.1016/s1071-0949(98)80028-0)
 10. Salomon, J., Bieniek, A., Baran, E., & Szepletowski, J. C. (2004). Basal cell carcinoma on the eyelids: own experience. *Dermatologic Surgery*, 30(2 Pt 2), 257–263.
<https://doi.org/10.1111/j.1524-4725.2004.30085.x>
 11. Sand, J. P., Zhu, B. Z., & Desai, S. C. (2016). Surgical anatomy of the eyelids. *Facial Plastic Surgery Clinics of North America*, 24(2), 89–95.
<https://doi.org/10.1016/j.fsc.2015.12.001>
 12. Taub, P. J. (s/f). Cervicofacial flap. En A. Tran, T. Panthaki, Z. Hoballah, & J. Thaller (Eds.), *Operative Dictations in Plastic and Reconstructive Surgery* (Vol. 2017, pp. 353–355). Springer.
 13. Tenzel, R. R. (1975). Reconstruction of the central one half of an eyelid. *Archives of Ophthalmology*, 93(2), 125–126.
<https://doi.org/10.1001/archopht.1975.01010020131007>

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