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OPERATIVE TECHNIQUE

Rising challenges in dermatosurgery: Cutler-Beard flap for total upper eyelid defect after squamous cell carcinoma

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INTRODUCTION

Eyelid tumors, although less common than other facial malignancies,[1] pose a significant clinical challenge. They require early diagnosis and intervention to prevent potentially fatal complications such as orbital invasion and loss of eyelid function.[2,3] Effective management often requires advanced reconstructive techniques to gain functional and aesthetic results,[4] emphasizing the importance of periocular surgical expertise among dermatologic surgeons. In this report, we present a rare case of squamous cell carcinoma of the upper eyelid, which required complete excision followed by reconstruction using the Cutler-Beard flap.

CASE AND TECHNIQUE

A 68-year-old male patient with a five-month history of a tumor on the left upper eyelid was referred to our outpatient clinic by an ophthalmologist after topical therapy with 5-fluorouracil proved unsuccessful, resulting in exophytic tumor growth that almost completely covered the eyelid (Figure 1a,b, 2a). Previous punch biopsies had confirmed the diagnosis of a verrucous squamous cell carcinoma with early stromal invasion. Despite the low-risk nature of the tumor and after ruling out orbital involvement with MRI, we opted for surgical removal to achieve pR0 resection. This

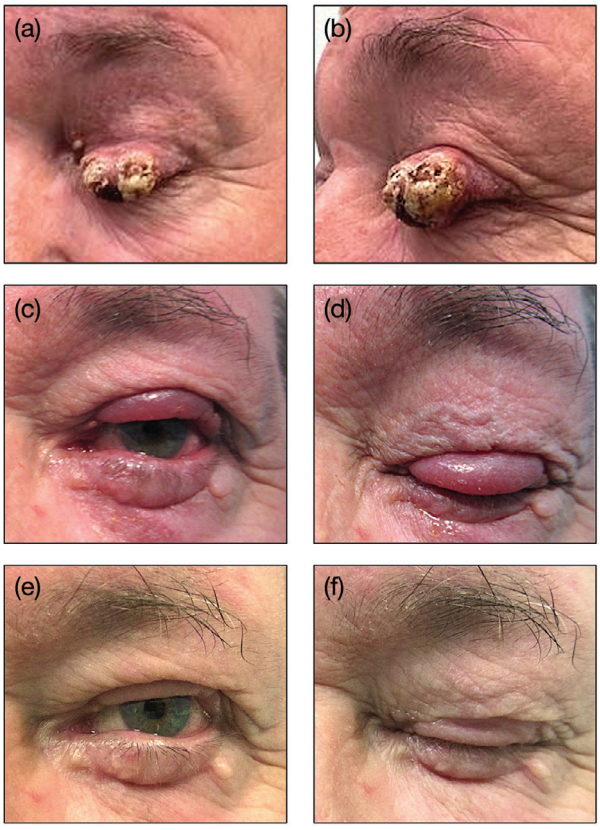

FIGURE 1 Pre- and post-operative images showing the successful reconstruction of the upper eyelid. (a, b) Squamous cell carcinoma of the upper eyelid. (c, d) Two-week follow-up after total upper eyelid reconstruction: Quick recovery with minimal lymphedema. (e, f) Eight-week follow-up, showing good cosmetic and functional outcomes.

RaphaelWilhelm and Klajdi Begaj contributed equally to this work.

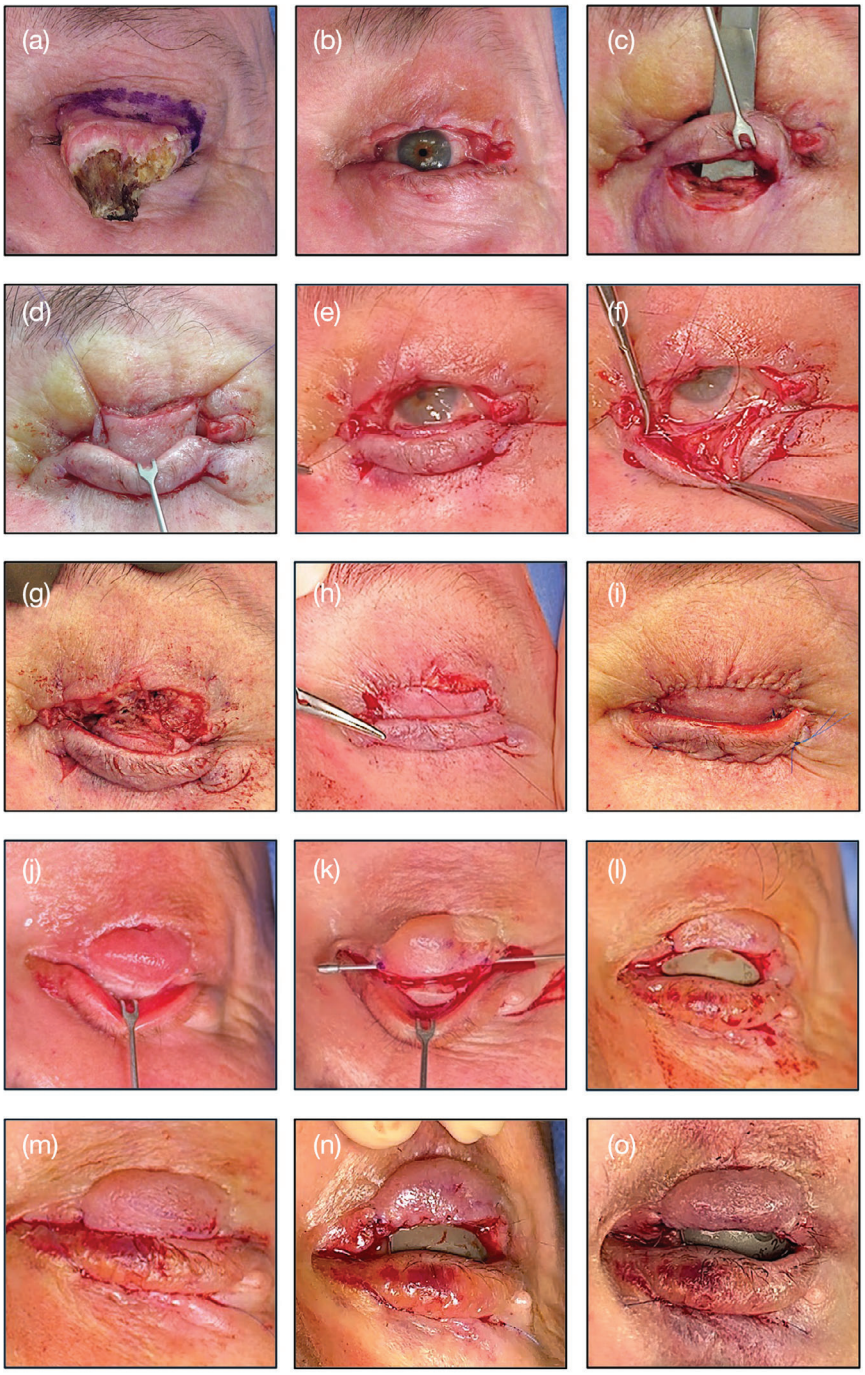

FIGURE 2 Intraoperative steps of the Cutler-Beard flap. (a, b) Preoperative marking of tumor margins and complete excision of the upper eyelid. (c, d) Incision below the lower eyelid margin and cranial flap mobilization under the tarsus. (e–g) Suturing of the posterior conjunctival lamella. (h) Suturing of the anterior myocutaneous lamella. (i) Completion of the first stage of the procedure. (j) Result five weeks postoperatively. (k) Division of the pedicle flap after probing. (l) Placement of the eye shield to protect the globe. (m) Return of flap to the initial lower eyelid site und suture. (n) Suturing of the reconstructed upper eyelid. (o) Result of the procedure.

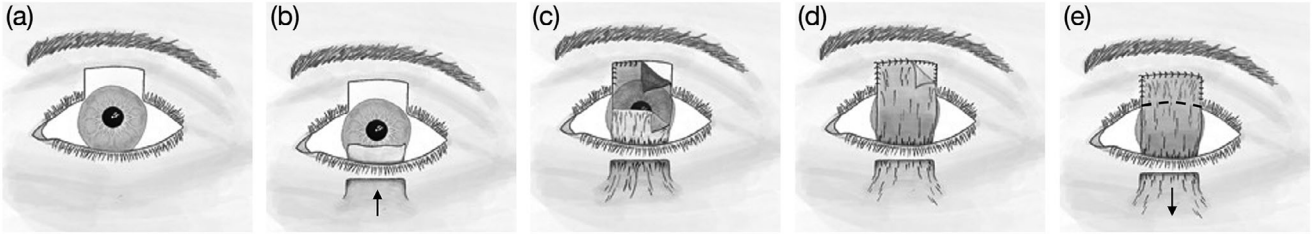

FIGURE 3 Schematic representation of the Cutler-Beard flap, illustrating the general surgical steps. (a) Incision below the lower eyelid margin. (b) Flap mobilized cranially and tunneled beneath the tarsus. (c) Conjunctival component sutured to upper eyelid structures. (d) Skin flap sutured to upper eyelid. (e) Pedicle divided.

resulted in the excision of nearly the entire left upper eyelid (Figure 2b).

For reconstruction, we used the Cutler-Beard flap, a two-stage surgical technique which is schematically illustrated in Figure 3. During the first stage, an incision was made approximately 5 mm below the lower eyelid margin. A full-thickness flap, containing skin, orbicularis oculi muscle and conjunctiva was elevated, tunneled beneath the remaining tarsus of the lower eyelid and transferred to the upper eyelid defect (Figure 2a–d). The anterior myocutaneous and posterior conjunctival components of the flap were sutured separately to their corresponding structures in the upper eyelid (Figure 2e–i). In this case, no tarsal substitute was used for reconstruction. Ofloxacin eye ointment was applied, followed by placement of an eye patch until flap separation.

Five weeks later, during the second stage of the procedure, the pedicle was divided, and the lower eyelid flap was returned to its original site and sutured with non-absorbable sutures. The newly reconstructed upper eyelid was sutured with the underlying conjunctiva anchored using 6-0 absorbable sutures (Figure 2j–o).

DISCUSSION

Reconstruction of large, full-thickness defects of the upper eyelid remains a significant surgical challenge, particularly when more than 50% of the eyelid is involved.[5] Systemic therapies, such as cemiplimab, present a viable alternative for patients at high risk of functional impairment or disfigurement from surgery and may also be used as neoadjuvant treatment to reduce the radicality of surgical resection and improve overall outcomes.[6]

The Cutler-Beard flap is a technique for reconstruction of the upper eyelid, offering the advantage of "like-for-like" tissue replacement. This method is particularly suitable for larger defects, as it uses adjacent tissues that maintain anatomical and functional consistency with the upper eyelid.[7]

One of the primary advantages of the Cutler-Beard flap is the ability to achieve effective coverage and restoration of the upper eyelid in a two-stage procedure. Studies have shown that this technique can result in good functional and aesthetic outcomes, with only minor postoperative adjustments required in select cases.[5,8] These results suggest that the Cutler-Beard flap is highly reliable, with a low complication rate over long-term follow-up.

However, this technique has its limitations. Disadvantages include the prolonged occlusion of the eye during the healing period, as well as insufficient posterior lamellar support due to the absence of tarsal tissue in the lower eyelid flap. This lack of tarsal support may contribute to complications such as upper eyelid entropion, and lower eyelid retraction or laxity.

Several authors point out that modifications, such as using tarsal substitutes from the contralateral eye or autologous cartilage, can enhance structural support. However, these techniques often introduce technical complexity and may not always improve clinical outcomes.[9]

In our case, despite the absence of a tarsal substitute, we achieved excellent functional and aesthetic results (Figures 1c–f). Our patient demonstrated good functional healing of the eyelid, without complications and a pleasing cosmetic result. It is essential to emphasize the importance of a multidisciplinary approach in such cases. Regular follow-ups by both dermatologists and ophthalmologists ensured close monitoring of the patient's progress. Long-term postoperative follow-up is critical for identifying potential complications and optimizing outcomes.

In conclusion, as facial skin malignancies rise globally,[10] and other surgical techniques suitable for larger defects are sparse,[5,9] the Cutler-Beard flap is a valuable technique for total upper eyelid reconstruction. Its ability to provide both functional and aesthetic repair makes it a valuable tool in the armamentarium of dermatologic and other reconstructive surgeons.

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CONFLICT OF INTEREST STATEMENT

None.

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