

Mustardé Flap with Upper Eyelid Graft for Lower Eyelid Reconstruction Following Basal Cell Carcinoma Resection: Case Report

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ABSTRACT

Lower eyelid reconstruction is essential after the resection of malignant tumors such as basal cell carcinoma. The Mustardé flap, a rotational cheek flap, is a reliable and versatile technique for covering large defects, particularly when combined with a tarsal graft to restore the posterior lamella. We present the case of a 42-year-old woman with a 7-year history of a slowly growing basal cell carcinoma on the right lower eyelid. A full-thickness en bloc excision was performed, followed by reconstruction using a Mustardé flap and a tarsoconjunctival graft harvested from the ipsilateral upper eyelid. The patient had an uneventful recovery with good functional and cosmetic outcomes and no recurrence after three months. This case reinforces the utility of the Mustardé flap in complex eyelid reconstructions and highlights the importance of layered reconstruction for optimal results.

KEYWORDS: Lower eyelid reconstruction, Mustardé flap, basal cell carcinoma, tarsal graft, oculoplastic surgery, eyelid defect, full-thickness resection

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INTRODUCTION

Lower eyelid reconstruction is a critical procedure in plastic and oculoplastic surgery, necessary to restore both function and aesthetics following defects caused by malignant tumor resection, trauma, or congenital abnormalities. The Mustardé flap, described by John C. Mustardé in 1964, is a rotational cheek flap technique that has become a versatile option for extensive defects of the lower eyelid, the eyelid-cheek junction, and the cheek itself. This flap provides vascularized

tissue for the anterior lamella, often resulting in better functional and aesthetic outcomes than full-thickness skin grafts.

The lower eyelid is a lamellar structure composed of several layers essential for its function and appearance:

- **Anterior lamella:** Includes the skin—thin and elastic—and the orbicularis oculi muscle, which is responsible for eyelid closure.

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- **Posterior lamella:** Formed by the tarsal plate, which provides structural support, and the conjunctiva, a mucous membrane that facilitates ocular lubrication.
- **Support structures:** The orbital septum, orbital fat, and the medial and lateral canthal ligaments stabilize the eyelid.
- **Vascular supply:** The lower palpebral arteries (branches of the ophthalmic artery) and associated veins provide blood flow. Sensory innervation comes from branches of the infraorbital nerve.

In reconstruction, restoring both lamellae is crucial to ensure eyelid closure, tear film stability, and ocular globe protection. The Mustardé flap is primarily used to reconstruct the anterior

lamella, while the posterior lamella requires additional grafts or flaps, such as tarsoconjunctival grafts or nasal septal cartilage.

The Mustardé flap is indicated for extensive defects involving:

- **Lower eyelid:** Up to 100% of the eyelid, particularly following basal cell or squamous cell carcinoma resections.
- **Eyelid-cheek junction:** Large defects requiring vascularized tissue for adequate coverage.
- **Cheek:** Large areas where skin grafts would not achieve comparable aesthetic results.



Figure 1. Lesion on the right lower eyelid.

This technique is preferred when other options such as primary closure, smaller local flaps (e.g., Tenzel flap), or full-thickness skin grafts are insufficient due to the defect size or the need for well-vascularized tissue. It is also suitable for patients with a history of cutaneous malignancy, as long as risk factors such as smoking or previous surgeries are assessed.

Clinical Case:

A 42-year-old female patient with a 7-year history of a slowly growing basal cell carcinoma on the right lower eyelid, measuring approximately 3 × 4 cm. Her personal medical history includes:

- **Allergies:** Denied
- **Chronic degenerative diseases:** Denied
- **Surgical history:** Cesarean sections in 2002 (due to failure to progress in labor) and 2010 (due to preeclampsia)
- **Trauma history:** Denied
- **Blood transfusions:** Denied
- **COVID-19:** No previous infection; vaccinated with three doses against SARS-CoV-2
- **Smoking:** Denied
- **Alcohol use:** Positive—started at age 30, social consumption

- **Drug use:** Denied
- **Biomass exposure:** Denied

The patient had a chronic ulcer biopsy taken from the right lower eyelid lesion. The pathology report showed a basal cell carcinoma of nodular and micronodular types.

Physical Examination:

A lesion on the right lower eyelid measuring approximately 3 × 4 cm in diameter, with irregular borders, reddish coloration, and an oval shape (Fig. 1).

Surgical Technique:

Under balanced general anesthesia and following standard aseptic and antiseptic protocols, sterile drapes were placed. The patient was positioned in dorsal decubitus. After preoperative marking of the Mustardé flap, a full-thickness en bloc excision of the basal cell carcinoma on the right lower eyelid was performed (Fig. 2), resulting in a full-thickness eyelid defect measuring 4 × 8 cm.

Dissection of the Mustardé flap was then initiated (Fig. 3) in the subcutaneous tissue plane to protect the zygomatic branches of the facial nerve. The incision was extended to the postauricular surface, and flap dissection continued down to the mandibular margin and the nasogenian (nasolabial) fold.

A tarsoconjunctival graft measuring 4 mm × 2.6 cm was harvested from the ipsilateral upper eyelid (Fig. 3) and fixed

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in place with 5-0 Prolene sutures (Fig. 4). The Mustardé flap was then positioned and partially closed in the first layer (dermis and subcutaneous tissue) using 4-0 Vicryl support stitches, followed by skin closure using simple and

subcuticular stitches with 5-0 and 6-0 nylon (Fig. 5). A Penrose drain was placed to allow capillary drainage, and the wound was covered. The right eye was occluded for 24 hours. The surgical procedure was then concluded.



Fig.2 En bloc resection of the lesion on the lower eyelid



Fig.3 Marking for tarsal graft harvest from the upper eyelid.



Fig.4 Placement of the tarsal graft.



Fig.5 Immediate postoperative outcome.



Fig 6. Three months postoperative.

Aspect	Description
Indication	Large full-thickness defects of the lower eyelid, often post-tumor resection
Typical Cause of Defect	Basal cell carcinoma, squamous cell carcinoma, trauma, congenital anomalies
Flap Type	Mustardé flap – rotational cheek advancement flap
Reconstructs	Primarily the anterior lamella (skin + orbicularis oculi muscle)
Posterior Lamella Options	Tarsconjunctival graft, nasal septal cartilage, hard palate mucosa
Donor Site for Graft	Ipsilateral upper eyelid (for tarsal graft)
Advantages	Well-vascularized tissue, good contour, aesthetic match, relatively simple

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Complications	Ectropion, flap sagging, incomplete closure, scarring
Postoperative Care	Occlusion of eye, wound care, monitor for flap viability and healing
Outcomes	Generally excellent cosmetic and functional results when well executed

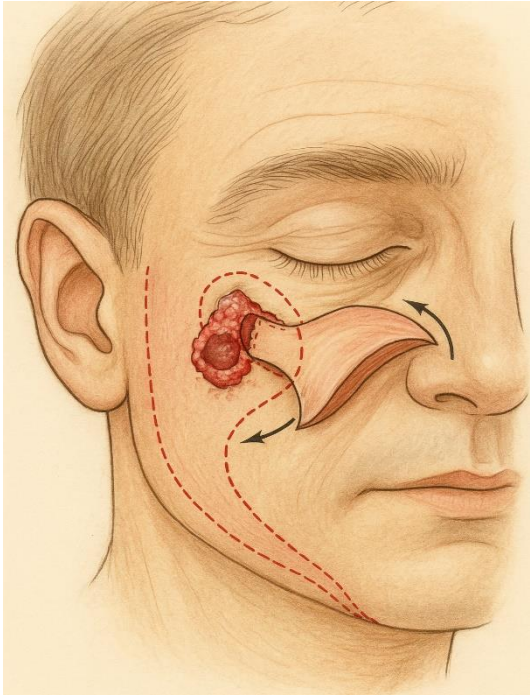


Fig. 7, illustration for technique

CONCLUSIONS

The Mustardé flap is a fundamental surgical technique for lower eyelid reconstruction, offering an effective solution for extensive defects with superior functional and aesthetic outcomes compared to skin grafts. Its versatility, ability to provide vascularized tissue, and relative simplicity make it a valuable tool in plastic surgery. However, its success relies on careful planning, precise execution, and appropriate postoperative management to minimize complications such as ectropion and flap sagging. Recent modifications—such as the use of tarsal grafts—have enhanced outcomes, and future research may explore combinations with other techniques to further optimize reconstruction in complex cases. Mustardé JC. Repair and Reconstruction in the Orbital Region: Churchill Livingstone; 1966.

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