

Medial Canthus Reconstruction with the Paramedian Forehead Flap

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Background: The medial canthus represents the medial confluence of the upper and lower eyelid margins and plays an integral role in the lacrimal duct system. Various flaps have been utilized for the reconstruction of the lower eyelid in the medial canthal region. Our institution primarily utilizes the paramedian forehead flap for the reconstruction of medial canthus defects. Our study looked to evaluate the work of a single plastic surgeon and identify their postoperative outcomes. **Methods:** A retrospective chart review was conducted at Beaumont Health System, Royal Oak, for patients who underwent medial canthal repair by the lead surgeon between the years 2014 and 2018. Demographic data, operative details, complications, medical comorbidities, and patient outcomes were retrospectively gathered and analyzed. **Results:** A total of five patients were isolated. Patients underwent paramedian forehead flap medial canthal repair by the lead surgeon and were found to tolerate the procedure well. All patients had clinically viable flaps with aesthetically pleasing results. **Conclusions:** Utilization of the paramedian forehead flap leads to successful medial canthal repair with adequate coverage. Although the paramedian forehead flap requires three stages to complete, the procedure leaves patients with aesthetically pleasing results. In addition, the paramedian forehead flap has limited cases of ectropion. With the right expertise and patient population, the paramedian forehead flap can be highly successful in the repair of medial canthal defects. (*Plast Reconstr Surg Glob Open* 2022;10:e4419; doi: 10.1097/GOX.0000000000004419; Published online 13 July 2022.)

INTRODUCTION

The medial canthus represents the medial confluence of the upper and lower eyelid margins. The medial canthus functions to make an aesthetically pleasing eyelid and plays an integral role in the lacrimal duct system.¹ Various structures support the medial canthus in a narrow space composed primarily of the medial canthal tendon, which is attached to the frontal process of the maxilla.² The medial canthal support structure also includes Horner's muscle, medial rectus capsulopalpebral fascia, the preseptal part of the orbicularis oculi muscle, and the medial horn of the levator aponeurosis.³ Concerning the eyelid, there is the anterior portion composed of skin and muscles, the middle portion composed of the tarsal plate, which serves as the main structural component of the eyelid, and the posterior lamella.⁴

Defects of the medial canthus require prompt suspicion of lacrimal injury, and as such, the puncta should

be probed with a lacrimal probe.⁵ Reconstruction is performed in cases where one or both canaliculi have been damaged.⁵ Reconstruction of the medial canthus is often required for congenital, traumatic, or pathological causes such as basal cell carcinoma and involves attention to detail to minimize impairments in upper eyelid mobility and alterations in tear secretion.^{6,7} Additional complications from medial canthus reconstruction include flap necrosis, wound dehiscence, poor aesthetic outcome, patient satisfaction, and upper lid ectropion.⁸

A variety of skin grafts have successfully been used in reconstruction, providing rapid wound healing and recovery when compared with healing by secondary intention.⁹ Other grafts include porcine xenografts and Integra dermal regeneration templates, which have demonstrated excellent patient outcomes when used for eyelid reconstruction.^{10,11} Finally, full-thickness skin grafts (FTSGs) harvested from the contralateral superior eyelid are preferred due to an improved tissue match. However, other donor sites for FTSG include preauricular or postauricular area, the supraclavicular area, and the inner arm.¹²

Various flaps such as the rectangular glabellar flap have been utilized to reconstruct the lower eyelid in the medial canthal region.¹³ The midline forehead flap is another reconstructive method utilized for single-stage reconstruction of the medial canthal and lower eyelid region.¹⁴ However, drawbacks include an unfavorable cosmetic skin

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bulge at the nasal bridge and loss of medial canthal concavity, which requires corrective surgery.¹⁴ In addition, for defects in the lower medial canthal region, a VY advancement flap from the nasolabial region gives excellent results.¹⁵ Finally, for full-thickness medial canthal defects, Motomura et al¹⁶ have demonstrated the combined use of a palatal mucoperiosteal graft, advancement flaps, and cheek flaps to get adequate closure.

Our institution utilizes the paramedian forehead flap to reconstruct medial canthus defects. Our study looked to evaluate the work of an experienced plastic surgeon regarding outcomes for patients undergoing reconstruction of the lower eyelid in the medial canthal region.

METHODS

A retrospective analysis of all patients with medial canthal defects who underwent surgery for medial canthal reconstruction by the senior surgeon was conducted. Six patients were identified and each patient underwent prior Mohs surgical excision for cancers in the medial canthal region and then staged nasal reconstruction with paramedian forehead flap as described by Menick.¹⁷

Stage 1

A 7-MHz DD-701 hand-held vascular Doppler is utilized by the lead surgeon to identify and trace the superior course of the contralateral supratrochlear artery. The width of the paramedian forehead flap is measured and marked to be 10mm in diameter. The recipient site is debrided to healthy granulation tissue and template of the wound made and translated to the forehead. Next, the paramedian forehead flap is incised following the previously planned and marked design. The incision is carried down to the subgaleal plane in the forehead, being careful not to violate the pericranium. This dissection is continued to approximately 1 cm above the superorbital rim, where the periosteum is incised and elevated down to the level of the supratrochlear vessels. The flap is then translated to the medial canthal defect, and eyebrow skin is released to allow for coverage of the wound while minimizing tension within the forehead flap. Hemostasis is obtained with electrocautery, and the flap is inset to the wound with deep dermal and interrupted skin sutures. A FTSG is harvested from the inferior abdomen and used for coverage of the posterior aspect of the forehead flap. The skin graft is trimmed to the size of the flap and sutured with chromic sutures. The forehead donor site is widely undermined

Takeaways

Question: What are reconstructive options for the medial canthus?

Findings: Five patients with medial canthal defects underwent successful surgical treatment with a three-stage paramedian forehead flap reconstruction at our institution.

Meaning: The paramedian forehead flap is an effective and versatile reconstruction method for medial canthal defects that include the nasal sidewall, superior nasal labial fold, and upper cheek.

in the subgaleal plane to allow for primary closure of the donor site in a layered fashion. In the event that the donor site wound is unable to be closed primarily due to the size of the wound template, a FTSG is used for coverage of the remaining superior defect with bolster dressing.

Stage 2

Stage two of the paramedian forehead flap is completed 4 weeks after the initial surgery. This stage includes thinning of the flap overlying the wound. The flap is elevated from the bed, and extensive flap debulking is performed to remove fibrotic soft tissue to allow for improved contour of the flap and avoid pin-cushioning. The flap is sutured back on to the wound bed with interrupted proline sutures.

Stage 3

The third stage is completed 4 weeks after stage 2. The division of the flap is made at the midportion of the tubed paramedian forehead flap. Additional debulking of the forehead flap is completed as needed, the flap is inset with deep dermal 5-0 Monocryl suture, and the skin is closed with interrupted 5-0 Proline sutures. The eyebrow is reconstructed by making a vertical incision above the eyebrow at the base of the forehead flap. The skin is undermined laterally and medially. The tubed paramedian forehead flap is split and debulked, removing fibrotic and scar tissue. Finally, a triangular flap is created and inset to reconstruct the eyebrow.

RESULTS

Case 1

An 83-year-old White woman with a history of basal cell carcinoma and squamous cell carcinoma developed a new 2x2cm right nasal sidewall tumor, which was biopsied and

Table 1. Demographic Information for Patients Undergoing Medial Canthus Reconstruction

Case	Age (years)	Gender	Ethnicity	Medical History	Cause of Defect	Defect Side	Size of Defect (cm)	Flap	Harvest Site
Case 1	83	Female	Caucasian	Smoking, basal cell carcinoma, squamous cell carcinoma	Basal cell carcinoma	Right	3 x 2.5	Paramedian forehead flap	Contralateral
Case 2	54	Female	Caucasian	End stage renal disease, hypertension, diabetes	Basal cell carcinoma	Left	3 x 3.5	Paramedian forehead flap	Contralateral
Case 3	80	Male	Caucasian	Hypertension, basal cell carcinoma	Basal cell carcinoma	Right	2.5 x 3.5	Paramedian forehead flap	Ipsilateral
Case 4	65	Male	Caucasian	Seizure disorder, nodular squamous cell carcinoma	Squamous cell carcinoma	Right	4 x 2	Paramedian forehead flap	Contralateral
Case 5	68	Female	Caucasian	left sided breast cancer status-post lumpectomy	Basal cell carcinoma	Left	3 x 4	Paramedian forehead flap	Contralateral



Fig. 1. Case 1: preoperative view of a patient with a defect in her right medial canthal region.

showed squamous cell carcinoma with perineural invasion (Table 1). She underwent a Mohs resection of the right nasal sidewall. She presented to our clinic with a 3×2.5 cm full-thickness defect reaching the periosteum in the right medial canthus region (Fig. 1). The patient underwent first-stage paramedian forehead flap reconstruction and had no in-operation complications. The patient was discharged the following day without any complications. The patient returned for a follow-up visit 1-week postsurgery and was reported doing well overall (Fig. 2). However, she experienced clear drainage and stinging of the right eye. Sutures were removed during the second follow-up visit, 2 weeks after the first stage of reconstruction surgery. At this time, the forehead flap was well perfused with cap refill less than 3 seconds without drainage or signs of infection. The second stage of medial canthus reconstruction was then performed. Six days later, the patient was noted to have right eye conjunctivitis and decreased lacrimation, for which antibiotic drops were prescribed. During this follow-up visit, mild paresthesia was observed over the left forehead and right lower eyelid ectropion. The forehead incision was well-healed with a well-perfused flap. The third stage of the medial canthal reconstruction was performed, and no in-operation complications were noted. At the 1-week follow-up visit, the incisions were healing well, and sutures were removed.



Fig. 2. Case 1: 1-week follow-up after first-stage paramedian forehead flap reconstruction of the right medial canthal region.

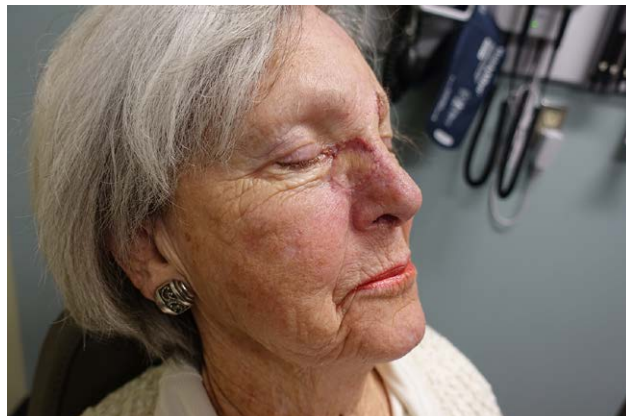


Fig. 3. Case 1: postoperative photograph at 12-month follow-up.

The patient next presented 8 months after the third stage of medial canthal reconstruction, and the forehead and left nasal dorsum scars were well healed with a pincushion area left of the eyebrow (Fig. 3). The patient did not wish to proceed with any surgical reconstruction requiring general anesthesia.

Case 2

A 54-year-old White woman presented to the clinic for evaluation for reconstruction secondary to Mohs excision defect in the left medial canthal region. Her medical history includes end-stage renal disease, hypertension, and diabetes (Table 1). Initial physical examination revealed a 3×3.5 cm Mohs defect on the left nasal bridge (Fig. 4). It was recommended that she undergo a two-stage forehead flap reconstruction with an FTSG. The FTSG was harvested from the suprapubic area during the first-stage procedure. The graft was inset on the posterior/underside side forehead flap to cover the raw surface. The patient was discharged the following day. She presented for follow-up 1 week after rotational forehead flap and reported mild frontal headache. Physical examination revealed a pink and well-perfused flap with capillary refill less than 2 seconds (Fig. 5). During the second stage, flap debulking was performed due to significant pincushion deformity. The thickened fibrotic tissue and frontalis muscle on the nasal



Fig. 4. Case 2: preoperative view of a patient with a defect in her left medial canthal region.



Fig. 5. Case 2: 1-week follow-up after rotation forehead flap reconstruction of the left medial canthal region.

side were excised. No intraoperative or postoperative complications were noted. She presented for a follow-up visit 1 week after the second procedure and did not complain of symptoms. During the third stage, an incision was made at the midportion of the tubed forehead flap. An incision was created to raise a skin paddle to 50% of the surface area on the left alar. The debulking was then performed to remove



Fig. 6. Case 2: postoperative photograph at 12-month follow-up.



Fig. 7. Case 3: preoperative view of a patient with a defect in his right medial canthal region.

fibrotic tissue on the flap side. The flap was undermined to 3×3 cm. The incision was made at the proximal portion of the forehead flap and extended to the vertical portion of the forehead. A 3×1 cm triangular flap was developed at the base of the forehead flap and inset to the forehead defect. The patient did not experience any complications. At 1-year follow-up, the patient was pleased with her cosmetic result with no new concerns (Fig. 6).

Case 3

An 80-year-old White man with a medical history of hypertension and basal cell carcinoma presented for reconstruction secondary to Mohs excision defect in the right nasal sidewall and dorsum (Table 1). Upon physical examination, a 2.5×3.5 cm full-thickness defect was appreciated (Fig. 7). A combined nasal and medial canthal reconstruction with forehead flap, FTSG, and tissue rearrangement of the forehead and cheek was recommended. The patient underwent stage one of right-sided medial canthal reconstruction with a left-sided paramedian forehead flap. The patient followed up 1-week postoperatively, and the flap and incisions were healing well (Fig. 8). Three weeks later, the patient underwent a second stage of reconstruction with flap debulking. Postoperatively, the flap was viable, and

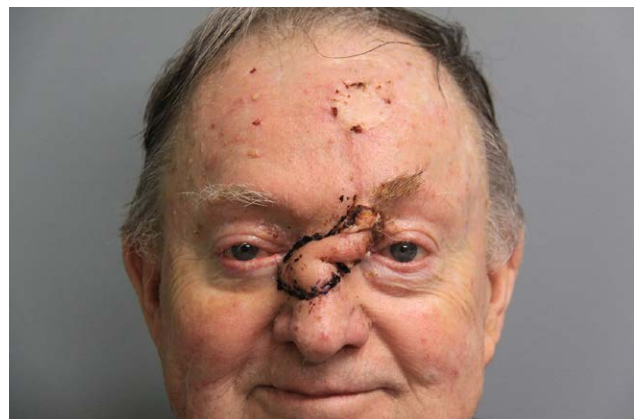


Fig. 8. Case 3: 1-week follow-up after left-sided forehead flap reconstruction of the right medial canthal region.



Fig. 9. Case 3: postoperative photograph at 12-month follow-up.

incisions were healing well. The patient then underwent the final stage of reconstruction 3 weeks later, which consisted of division and inset of the forehead flap, a 4×3 cm nasal tissue rearrangement with a rotational flap, and a 3×3 cm forehead tissue rearrangement. The patient followed up 1 month later, and he was pleased with his results and did not appreciate visual disturbances. There were no concerns of



Fig. 10. Case 4: preoperative view of a patient with a defect in his right medial canthal region.



Fig. 11. Case 4: 1-week follow-up after left-sided forehead flap reconstruction of the right medial canthal region.

eyelid complications, chronic pain, infections, ectropion, or dryness (Fig. 9).

Case 4

A 65-year-old White man with a medical history of seizure disorder and nodular squamous cell carcinoma presented for reconstruction after Mohs excision in the right medial infraorbital region (Table 1). Physical examination revealed a 4×2 cm defect involving the medial canthus (Fig. 10). The patient underwent lateral nasal sidewall reconstruction with a left-sided paramedian forehead flap along with 10×2 cm full-thickness skin grafts to cover the pedicle forehead flap to the nose. The patient tolerated the procedure well, and there were no complications. The patient followed up 7 days postoperatively where it was noted that he was doing well. Acticoat was removed from the skin bridge and the flap was shown to be well perfused (Fig. 11). The patient then underwent the second stage of medial canthal reconstruction and flap debulking. The patient tolerated the procedure well, and there were no complications. The patient underwent his third stage of medial canthal reconstruction, which consisted of division and inset of flap, forehead tissue rearrangement 2×3 cm, and medial canthal tissue rearrangement 2×2 cm. At 3-month follow-up, the patient had no visual disturbances and no new complaints, and was pleased with his results (Fig. 12).

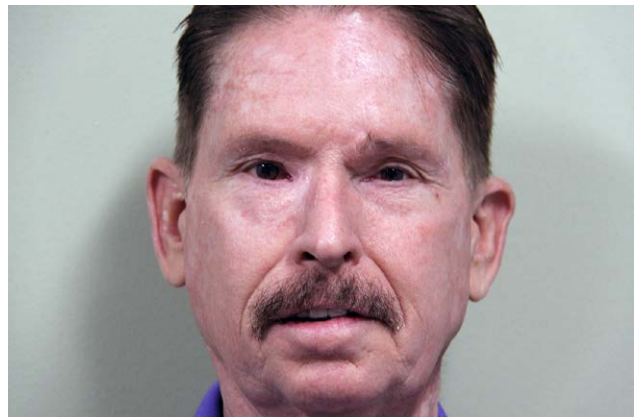


Fig. 12. Case 4: postoperative photograph at 12-month follow-up.



Fig. 13. Case 5: preoperative view of a patient with a defect in her left medial canthal region.

Case 5

A 68-year-old White woman with a medical history of left breast cancer status-post lumpectomy and basal cell carcinoma presented for reconstruction secondary to 3×4 cm Mohs excision with a defect in the left nasal and medial canthal region (Table 1; Figure 13). The patient underwent the first stage of reconstruction with a forehead flap with immediate canthoplasty and forehead issue rearrangement 6×6 cm. The patient presented four weeks postoperatively and although bulky, the forehead wound was healing nicely (Fig. 14). The patient was scheduled for her second stage in 2 weeks, but it was determined that the patient would require additional surgery to achieve maximal symmetry. The patient then underwent her second stage of nasal reconstruction, which consisted of flap debulking. The procedure consisted of reelevating the glabellar flap, removing the scar on the frontalis muscle on the nasal region down to the perichondrium, and debulking the flap extensively. She underwent the third-stage reconstruction of the flap, and the patient followed up in 1 week where scar massage and silicone scar treatment were recommended.



Fig. 14. Case 5: 4-week follow-up after forehead flap reconstruction with immediate canthoplasty for left-sided medial canthal defect.



Fig. 15. Case 5: postoperative photograph at 12-month follow-up.

At 6-month follow-up, there was good aesthetic contour of the flap (Fig. 15); the patient did not continue with long-term follow-up.

DISCUSSION

There are a variety of reconstructive techniques for the medial canthal region depending on the size, location, and depth of the defect. Superiorly based bilobed flaps should be given consideration when defects extend into the nasal sidewall, inferior medial canthal region, and nasojugal fold.¹⁸ In addition, this reconstructive technique has been shown to be effective in defects that may be larger and more elliptical.¹⁸ The flap achieves high patient satisfaction, and studies have reported limited cases of hemorrhage, infection, dehiscence, necrosis, or the formation of the trap door deformity.¹⁸ However, complications may include medial ectropion and canalicular stenosis.^{18,19} In our patient population, we found no ectropion or canalicular stenosis cases through the utilization of the paramedian forehead flap. Furthermore, unlike the paramedian forehead flap, the superiorly based bilobed flap is a single-stage reconstruction that may be effective in patients who elect to have minimal surgical procedures.

The rhombic flap has been reported in the literature as a “simple yet effective” method of medial canthal reconstruction.^{12,20} The flap is documented to be successful in defects that do not have sufficient tissue laxity or in circumstances in which tension vectors need to be modified.²¹ Also, the scar from a procedure using a rhombic flap can be placed in the natural skin creases of the nasal region, leading to an optimal aesthetic outcome.²² Finally, the rhombic flap has been shown to lead to alar retraction and pincushioning if there are miscalculations when trimming the defect.^{23,24}

The modified supratrochlear artery forehead flap (MSTAFI) has been shown to lead to acceptable aesthetic restoration along with a satisfying color match in patients with nasal defects.²⁵ The MSTAFI is a modification of a supratrochlear artery forehead island flap, which leads to distorted eyebrows and limited reach, which would potentially require a second stage.²⁶ The MSTAFI has improved mobility and a greater turning radius, which makes the

flap ideal in cases that require reconstruction of the lower eyelid, cheek, and nasal areas located further away.^{14,25,26} Finally, MSATFI has been documented to lead to protrusion at the nasal base, which may require excisional procedures, flap necrosis due to pedicle torsion, and venous congestion.^{25,26}

The glabellar skin flap is a quicker procedure that has been used for medial canthal reconstruction. It has the advantage of having an excellent blood supply and has been shown to lead to fewer secondary contractions when compared with that of full-thickness skin grafts.²⁷ In addition, the procedure is more straightforward to perform than other types of reconstruction and has shown to lead to high patient satisfaction.²⁸ However, several noteworthy disadvantages have been documented, including spacial narrowing between the eyebrows, formation of a bulky nasal bridge, and concavity loss in the medial canthal region.^{12,28} Furthermore, the glabellar flap can be used solely or in conjugation with other surgical procedures to reconstruct the medial canthal region due to minimal flap shrinkage along with its ability to match the thickness and texture of the surrounding tissue.²⁹

Finally, the paramedian forehead flap is another method that may be utilized for the reconstruction of medial canthal defects. Even though the contralateral supratrochlear artery is often used, studies have found that it can lead to nasal dorsum bulging, which would require further operations such as flap divisions.² In our study, the contralateral supratrochlear artery was utilized due to the improved arch of rotation for nasal defects, and we reported no complications. All patients in our patient population who underwent paramedian forehead flap reconstruction were pleased with their aesthetic outcome and did not report any complications. In addition, there were no documented cases of ectropion, visual disturbances, or flap necrosis. Furthermore, it is very important to encourage patients to engage in conservative therapies postoperatively, such as silicone gel, scar care, and scar massage. Furthermore, there have been documented cases of telecanthus formation when reconstructing the medial canthal region with the paramedian forehead flap.² Although telecanthus may occur with any form of medial canthal reconstruction, it is a complication that may be expected and minimized by anchoring of the flap down to the periosteum and reconstructing the medial canthal tendon, which would mitigate the potential for the flap to drift laterally. We did not experience any issues related to telecanthus in our patient population.

CONCLUSIONS

The paramedian forehead flap is an effective and versatile reconstruction method for medial canthal defects. We recommend using this flap because of its ability to cover more significant defects, including the nasal sidewall, superior nasal labial fold, and upper cheek. As a result, the paramedian flap decreases the need to utilize multiple flaps for coverage. Although utilization of this flap requires three stages, the procedure leaves patients with aesthetically pleasing results. Furthermore, with the right expertise and patient population, the paramedian

forehead flap is a surgical option that surgeons should heavily consider for the treatment of medial canthal defects.

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PATIENT CONSENT

Patients provided written consent for the use of their images and surgical treatment.

REFERENCES

1. Parent AD, Haines DE, Das SK. Neurosurgical considerations on the anatomy of the medial canthus in children. *Pediatr Neurosurg.* 1995;22:57–64.
2. Kim JH, Kim JM, Park JW, et al. Reconstruction of the medial canthus using an ipsilateral paramedian forehead flap. *Arch Plast Surg.* 2013;40:742–747.
3. Kang H, Takahashi Y, Nakano T, et al. Medial canthal support structures: the medial retinaculum: a review. *Ann Plast Surg.* 2015;74:508–514.
4. Cochran ML, Lopez MJ, Czyz CN. Anatomy, head and neck, eyelid. Updated August 11, 2021. *StatPearls* [Internet]. Treasure Island, Fla.: StatPearls Publishing; 2021. Available at <https://www.ncbi.nlm.nih.gov/books/NBK482304/>.
5. Alghoul MS, Kearney AM, Pacella SJ, et al. Eyelid reconstruction. *Plast Reconstr Surg Glob Open.* 2019;7:e2520.
6. de Jongh FW, Pouwels S, Weenen C, et al. Medial canthal reconstruction of skin defects with full-thickness skin grafts. *Dermatol Surg.* 2021;47:1135–1137.
7. Bostwick J III, Vasconez LO, Jurkiewicz MJ. Basal cell carcinoma of the medial canthal area. *Plast Reconstr Surg.* 1975;55:667–676.
8. Czyz CN, Cahill KV, Foster JA, et al. Reconstructive options for the medial canthus and eyelids following tumor excision. *Saudi J Ophthalmol.* 2011;25:67–74.
9. Ratner D. Skin grafting. From here to there. *Dermatol Clin.* 1998;16:75–90.
10. Raimor DW, Group AR, Pettit MS, et al. Porcine xenograft biosynthetic wound dressings for the management of postoperative Mohs wounds. *Dermatol Online J.* 2011;17:1.
11. Ozgonul C, Diniz Grisolia AB, Demirci H. The use of Integra dermal regeneration template for the orbital exenteration socket: a novel technique. *Ophthalmic Plast Reconstr Surg.* 2018;34:64–67.
12. Patel SY, Itani K. Review of eyelid reconstruction techniques after Mohs surgery. *Semin Plast Surg.* 2018;32:95–102.
13. Ogino A, Onishi K, Okada E, et al. Medial canthal reconstruction with multiple local flaps. *JPRAS Open.* 2018;15:4–9.
14. Mombaerts I, Gillis A. The tunneled forehead flap in medial canthal and eyelid reconstruction. *Dermatol Surg.* 2010;36:1118–1125.
15. Bhandari PS. Reconstruction of medial canthal defects by local/loco-regional flaps. *J Craniofac Surg.* 2021;33:e287–e290.
16. Motomura H, Taniguchi T, Harada T, et al. A combined flap reconstruction for full-thickness defects of the medial canthal region. *J Plast Reconstr Aesthet Surg.* 2006;59:747–751.
17. Menick FJ. Nasal reconstruction. *Plast Reconstr Surg.* 2010;125:138e–150e.
18. Pery JD, Taban M. Superiorly based bilobed flap for inferior medial canthal and nasojugal fold defect reconstruction. *Ophthalmic Plast Reconstr Surg.* 2009;25:276–279.
19. Yenidunya MO, Demirseren ME, Ceran C. Bilobed flap reconstruction in infraorbital skin defects. *Plast Reconstr Surg.* 2007;119:145–150.

20. Ng SG, Inkster CF, Leatherbarrow B. The rhomboid flap in medial canthal reconstruction. *Br J Ophthalmol*. 2001;85:556–559.
21. Cressey BD, Jellinek NJ. Rhombic flap: a useful flap for small-to-medium defects of the medial canthus. *Dermatol Surg*. 2020;46:1035–1038.
22. Shotton FT. Optimal closure of medial canthal surgical defects with rhomboid flaps: “rules of thumb” for flap and rhomboid defect orientations. *Ophthalmic Surg*. 1983;14:46–52.
23. Bednarek RS, Sequeira Campos M, Hohman MH, et al. Transposition flaps. Updated January 21, 2022. *StatPearls* [Internet]. Treasure Island, Fla.: StatPearls Publishing; 2022. Available at <https://www.ncbi.nlm.nih.gov/books/NBK500028/>.
24. Tasch C, Pattiss A, Lanthaler M, et al. A modified rhomboid flap for medial canthal reconstruction. *Plast Reconstr Surg Glob Open*. 2022;10:e4074.
25. Lian C, Zhang JZ, Li XL, et al. Reconstruction of a large oncologic defect involving lower eyelid and infraorbital cheek using MSTAFI flap [published online ahead of print, 2021 Mar 17]. *Ear Nose Throat J*. 2021.
26. Lian C, Li X-L, Liu X-J. Modified supratrochlear artery forehead island flap: a novel approach for 1-stage reconstruction of nasal defects. *Ear Nose Throat J*. 2021;100(5_suppl):788S–789S.
27. Emsen IM, Benlier E. The use of the superthinned inferior pedicled glabellar flap in reconstruction of small to large medial canthal defect. *J Craniofac Surg*. 2008;19:500–504.
28. Ahmad J, Mathes DW, Itani KM. Reconstruction of the eyelids after Mohs surgery. *Semin Plast Surg*. 2008;22:306–318.
29. Diaz Cespedes RA, Ortega Evangelio L, Oprisan A, et al. Utility of the glabellar flap in the reconstruction of medial canthal tumors after Mohs surgery. *Turk J Ophthalmol*. 2021;51:118–122.