

# Addition of “Septal Window” to Lower Blepharoplasty for the Management of Fat of the Lower Eyelids

Bao Ngoc N. Tran, MD,<sup>a</sup> Margaret Luthringer, MD,<sup>a</sup> Laura Reed, MD,<sup>a</sup> and Mokhtar Asaadi, MD<sup>b</sup>

**Background:** The most common reason for dissatisfaction and reoperation in lower blepharoplasty patients is persistent bulging of the lateral fat pad. This compartment contributes the most to fat herniation and yet is the most commonly overlooked. The addition of a septal window, a small opening of the septum on the most prominent part of the lateral fat compartment, helps with precise removal of lateral fat and allows for additional fat excision after septal reset without disrupting the arcuate expansion.

**Methods:** Our lower blepharoplasty approach includes 1) a subciliary incision; 2) aggressive lateral fat excision through a septal window; 3) central and medial fat excision, transposition, and septal reset; 4) canthopexy; 5) orbicularis oculi muscle suspension; and 6) no dissection of orbicularis oculi medially and no skin resected medially to avoid lid retraction. We performed a retrospective review of all lower blepharoplasty cases by a single surgeon over 10 years. Demographics and operative outcomes were queried.

**Results:** There were 224 cases, 90% were women with a mean age of 58.2 years. The most common postoperative occurrences were eyelid edema, malar edema, and chemosis, all of which were self-limiting. Two patients needed additional removal of lateral fat of their lower eyelids.

Two patients had lid retraction, one of which had a previous facial nerve palsy and the other did not have a canthopexy and developed transient unilateral lid retraction that resolved with conservative treatment. Resumption of full activities and exercises at 6 weeks was typical.

**Conclusion:** The septal window facilitates aggressive resection of the lateral fat pad and additional fat excision after septal reset to create a smooth lid-cheek junction. In our practice, it is a critical component of a successful lower blepharoplasty.

**Key Words:** septal window, septal reset, lower blepharoplasty, fat transposition, lower eyelid fat compartments, lateral fat pad, arcuate expansion

(*Ann Plast Surg* 2022;88: S214–S218)

## BACKGROUND

As the eyes are often said to be the focal point of the face, margin for error in lower blepharoplasty is exceedingly small. Lower blepharoplasty is a complex, although common, aesthetic procedure. Complications can be encountered in the most experienced of hands. Various techniques have been designed to refine contour and shorten lid width; however, the cosmesis of the region remains largely a function of volume and position of the postseptal infraorbital fat pads. Thoughtful operative management of these fat pads is one of the key components of a successful lower blepharoplasty.

Management of fat in the lower eyelids has been rather controversial. Two opposing schools of thought dominate the literature: one favors direct excision with or without fat grafting to correct the nasojugal groove

and lid/cheek junction, whereas the other advocates for minimal excision, fat transposition, and septal reset.<sup>1–6</sup> Aggressive fat excision can result in hollowness of the lower eyelids, causing the so-called nursing home appearance; however, underresection of the lateral pad fat is a common issue in lower blepharoplasty patients and is the number one reason for patient reoperation. In addition, fat grafting to the lower eyelids has a steep learning curve to avoid potential problems with irregularities, visibility, absorption, and fibrosis.

Adequate removal of fat, combined with meticulous transposition and septal reset, effectively restores youthfulness to the lower eyelids.<sup>3,4,7</sup> In our practice, we often encounter patients who had prior lower blepharoplasty procedures but are not satisfied with the results because of persistent lateral fat pad bulging. The lateral fat pad contains the greatest volume of fat yet is often overlooked in both subciliary and transconjunctival lower blepharoplasty.<sup>8</sup> We introduced the septal window, a small opening of the septum on the most prominent part of the lateral fat compartment, to help with precise removal of lateral fat and allow for additional fat excision after septal reset without disrupting the arcuate expansion. The addition of a septal window to fat excision, transposition, and septal reset facilitates a more precise and reproducible technique for the management of fat in lower blepharoplasty. This article describes our surgical approaches and documents our experience and outcomes with adding the septal window to our lower lid blepharoplasty technique over the past 10 years.

## METHODS

### Anatomy

Fat of the lower eyelids is organized into 3 compartments: medial, central, and lateral. The lateral fat pad resides slightly higher than the central and medial fat pads and is separated from them by the arcuate expansion.<sup>4,6,9–14</sup> The superficially located inferior oblique muscle separates the central from the medial fat pad.<sup>13,14</sup> Injury to this muscle can cause temporary or permanent diplopia. Connective tissue components, nerves, and blood vessels are different in each fat compartment and are responsible for the difference in color of the fat. The septum orbitale of the lower eyelid is located under the orbicularis oculi muscle and skin, which covers the 3 fat pads. Progressive weakening of the overlying septum causes fat herniation and bulging of the lower eyelid.

### Preoperative Evaluation

A lateral pull test (LPT) is done preoperatively to determine the need for fat excision versus fat transposition from the medial and central pockets of the lower eyelids. The examiner performs the test by using an index finger to pull the lateral corner of the lower eyelid upward and laterally with the patient in a sitting position. If the medial and central bulging of the lower eyelids disappears with this maneuver, this is called a negative test. No fat should be removed from the lower eyelids in this case. If the bulging persists with this maneuver, the test is positive; some fat should be removed from the medial and central fat pockets. After opening the arcus marginalis, the medial and central fat is evaluated by holding the inferior edge of septum and redraping it inferiorly. If fat is bulging, it should be excised. The LPT clinically reproduces the

Received December 3, 2021, and accepted for publication, after revision December 6, 2021.

From the <sup>a</sup>Plastic and Reconstructive Surgery, Department of Surgery, Rutgers New Jersey Medical School, Newark; and <sup>b</sup>Plastic and Reconstructive Surgery, Saint Barnabas Medical Center, Livingston, NJ.

Conflicts of interest and sources of funding: none declared.

Reprints: Mokhtar Asaadi, MD, Department of Plastic and Reconstructive Surgery, Saint Barnabas Medical Center, 101 Old Short Hills Road, Suite 504, West Orange, NJ 07052. E-mail: mokhtarasaadi@gmail.com.

Copyright © 2022 Wolters Kluwer Health, Inc. All rights reserved.

ISSN: 0148-7043/22/8803–S214

DOI: 10.1097/SAP.00000000000003129

TABLE 1. Patient Demographics

No. patients	224
Average age	58.2
Age range	31–84
Sex (female/male)	201/23

effect of orbicularis oculi muscle suspension of the lower eyelids. Lateral fat is removed aggressively in every patient.

Surgical Approaches

All cases are done as outpatient procedures under general anesthesia. Our lower blepharoplasty is performed through a subciliary incision, with lateral fat pad excision through a septal window, medial and central fat excision, transposition, septal reset, canthopexy, and orbicularis muscle suspension. We intentionally preserve the bulk of muscle and do not excise skin medially to the pupil to prevent lid retraction, especially in elderly patients with poor lid tone and those with a history of previous lower blepharoplasty.

Fat excision and/or transposition is done according to preoperative LPT. With a negative LPT, only a limited lateral subciliary incision is needed, as there is no need to remove any medial or central fat or to perform a septal reset. In these cases, the septal window still gives access for lateral fat pad excision. With a positive LPT, however, a full subciliary incision is needed. The septum edge and underlying fat is moved below the inferior orbital rim and evaluated for any bulging of fat. Septal reset should create a smooth appearance of the preseptal space. The inferior edge of the septum is sutured to a small bite of the maxillary origin of the orbicularis muscle medially and to the Suborbicularis Oculi Fat (SOOF) laterally below the inferior orbital rim. In secondary cases with a scarred septum, care is taken not to shorten the septum. If the septal reset pulls down the lower lid, it is better not to suture the septum and to allow the fat to freely drape and fill the hollowness of the tear trough and lid/cheek junction. For patients who have lid retraction and ectropion, a spacer made of material such as an acellular dermal collagen matrix [eg, Enduragen (Tissue Science Laboratories, Aldershot, UK)] can be placed. After septal reset, any excess fat can be removed through the septal window. The septum is evaluated, and any bulging of fat under the septum can be corrected by lightly touching the septum with Colorado electrocautery. The septal window is not closed. Using a septal window uniquely enables aggressive yet precise removal of the lateral fat after septal reset.

RESULTS

Over a 10-year period, we performed 224 lower blepharoplasty procedures; 90% of our patients were women with a mean age of

58.2 years (Table 1, Figs. 1–4). Of these patients, 2 required reoperation to remove more lateral fat in the lower lids. Three patients required reoperation for revision of scar and to trim the orbicularis oculi muscle in the subciliary area. The most common postoperative morbidities in our patients included eyelid edema, malar edema, and chemosis, all of which were self-limiting within 6 weeks. This is a lymphatic-rich area, and disruption of these delicate tissues frequently causes prolonged edema. We routinely treat these cases with short courses of oral steroid and diuretics with excellent results.

Orbicularis muscle excess along the lower lid margin occurred in 15% of our patients immediately postoperatively. We intentionally leave excess muscle to preserve bulk and prevent lid malposition, especially in elderly patients with poor lid tone and in revision cases. Watchful waiting was instituted for this complication with resolution in all patients. Microinjections of neurotoxin to decrease visible bulging were performed on 5 patients with good results. Excess skin in the subciliary area occurred in 10% of our cases, almost all of which were transient in nature. One patient with this issue required subsequent excision. Incidence of transient bunching of the skin in the lateral canthal area was 10% for our cohort. None of the affected patients required surgical intervention for correction. Two patients experienced lid retraction; one of which had a previous facial nerve paralysis after a facelift by an unknown surgeon, and the other patient chose not to have a canthopexy done and developed transient unilateral lid retraction that resolved with conservative treatment.

Immediately, postoperative asymmetry was demonstrated in 20% of our patients, none of whom required revision. Eyelids are quite forgiving; any asymmetry can be corrected with frequent blinking and light massage of the eyelids. There was no incidence of diplopia, changes in vision, loss of vision, sensory deficit, hyperesthesia, facial motor weakness, hypertrophic scarring, or permanent change eye shape (Table 2). Resumption of full activities and exercise was feasible for all patients between 6 and 16 weeks depending on the level of lid edema.

DISCUSSION

The lateral fat pad of the lower eyelid is located higher than, and separated from, the medial and central compartments by the arcuate expansion. As a result, this compartment contributes the most to fat herniation and yet is the most overlooked compartment in both subciliary and transconjunctival blepharoplasty approaches. The addition of a septal window facilitates aggressive resection of lateral fat pad, as well as additional fat excision after septal reset to create smooth lid-cheek junction without disruption of arcuate expansion. In our practice, it is a critical component in a successful lower blepharoplasty.

Many of our cases are secondary lower blepharoplasty procedures because of persistent bulging of the lower eyelids, predominantly in the lateral fat compartment. As such, we are extremely aggressive with lateral fat excision but remain conservative with skin and orbicularis oculi



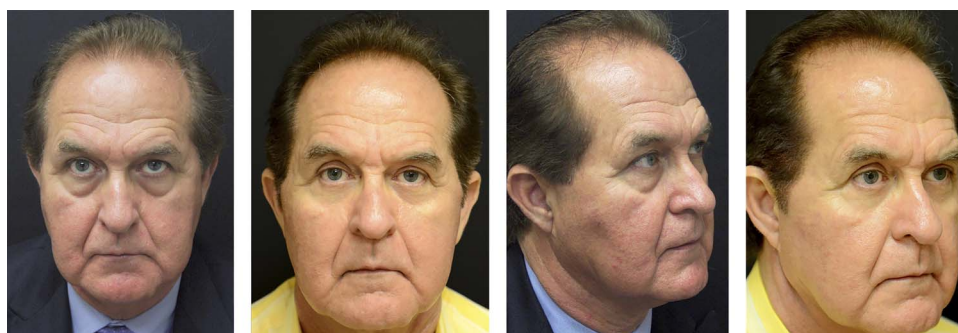
FIGURE 1. A 69-year-old man 6 months postoperative from a bilateral upper and lower blepharoplasty with septal reset, canthopexy, temporary tarsorrhaphy, and bilateral internal browpexy. full color online



**FIGURE 2.** A 65-year-old woman 3 months postoperative from a bilateral upper and lower blepharoplasty with septal reset, canthopexy, and short scar temporal lift. [full color online](#)



**FIGURE 3.** A 49-year-old woman 1 year postoperative from a bilateral upper and lower blepharoplasty with septal reset, canthopexy, orbicularis muscle suspension, correction of festoons, and browpexy. [full color online](#)



**FIGURE 4.** A 66-year-old man 3 years postoperative from bilateral upper and lower blepharoplasty, with septal reset, canthopexy, temporary tarsorrhaphy, face and neck lift, suction lipectomy of the face, excision of jowls, platysmaplasty, palpebral corrugator excision, and fat grafting of the superficial musculoaponeurotic system (SMAS) to nasolabial folds. [full color online](#)



**TABLE 2.** Postoperative Complications

Occurrence	n	%
Immediate postoperative asymmetry	44	20
Orbicularis muscle excess	34	15
Excess skin in subciliary area	22	10
Transient bunching of skin in lateral canthal area	22	10
Surgical scar revision with muscle trimming in subciliary area	3	0.01
Surgical reexcision of lateral fat	2	0.01
Lid retraction	2	0.01
Diplopia	0	0.0
Changes in vision/loss of vision	0	0.0
Sensory deficit	0	0.0
Hyperesthesia	0	0.0
Facial motor weakness	0	0.0
Hypertrophic scar	0	0.0
Change in eye shape	0	0.0

muscle excision. In both primary and secondary cases, a large amount of fat can be excised from the lateral fat pad as depicted in Figures 5 and 6. The traditional lower blepharoplasty places emphasis on excision of skin, muscle, and fat, which can lead to lid retraction and hollowness. Recently, there has been a paradigm shift that favors preservation and thoughtful fat

**FIGURE 5.** Lateral fat pad excision in primary lower blepharoplasty. [full color online](#)**FIGURE 6.** Lateral Fat pad excision in secondary lower blepharoplasty. [full color online](#)

excision, transposition, septal reset, orbicularis oculi muscle suspension, canthopexy, and minimal skin resection.

Careful preoperative assessment of fat compartments through inspection and LPT is critical in deciding the appropriate surgical approach. Patients with no fat herniation in LPT, which simulates orbicularis oculi muscle suspension, do not require a full incision, medial or central fat excision, or a septal reset. This limited incision approach will help with faster recovery and less postoperative edema. Those with a positive LPT will undergo a full incision with fat transposition and septal reset. In both cases, a septal window can be performed to address the lateral fat pad independently.

Fat herniation can exacerbate the lid/cheek junction, whereas orbital and malar rim retrusion result in a hollow undereye.<sup>7</sup> The surgeon's judgment and experience are crucial in deciding where and how much fat to be removed. Fat excision, transposition, and grafting have been used to soften the nasojugal groove and add bulk to a hollow undereye.<sup>2,3,5-7,9,15-21</sup> Fat grafting is often used during lower blepharoplasty to smooth the lid cheek junction. Loeb et al<sup>15,18</sup> advocated the use of fat grafting to correct lower eyelid depression in addition to sliding the postseptal fat pads into the cheek. Other plastic surgeons favor the use of diluted fat (70% fat with saline and infranatant fluid as diluent) to volume correct undereye hollowing.<sup>22</sup> Huang et al<sup>23</sup> proposed removal of all 3 postseptal fat pads with the use of microautologous fat grafting to the medial canthus and tear trough. A gun is used to layer the fat in specific microparcel aliquots.<sup>23</sup> Although grafting has produced good aesthetic outcomes, it can be time-consuming, requires a donor site, and may prove tedious when done in conjunction with other blepharoplasty techniques. Furthermore, grafting is unforgiving under the thin undereye tissue and

often requires significant experience to perfect—lumpiness and irregularity frequently can only be corrected with surgical excision.<sup>22</sup>

As a result, we favor preservation of the central and medial fat compartment for fat transposition and septal reset, and removal of any fat bulging through the septal window subsequently. The addition of lateral septal windows provides a seamless, reproducible mechanism for fat management in the lower eyelids (Figs. 1–4).

There are several limitations to this study. First, this is a retrospective review of a single surgeon's experience with the technique over 10 years. Positive outcomes might be confounded with the author evolution and refinements in techniques. Our preferred incision is subciliary; therefore, the ease of incorporating septal window to a transconjunctival lower blepharoplasty is unknown. As this study is retrospective in nature, the outcome reporting relies heavily on the accuracy of documentation.

## CONCLUSION

The septal window allows for easy access to the lateral fat pad and subsequently affords the surgeon opportunity to make precise refinements of the postseptal infraorbital fat pads after septal reset. This technique has yet to be described in the literature. It is a simple maneuver to adjust lower lid volume, obviating the need for autologous grafting. In our practice, it is a critical component in a successful lower blepharoplasty.

## REFERENCES

- Bourguet J. Fat herniation of the orbit: our surgical treatment. *Bull Acad Med.* 1924;92:1270.
- Castanares S. Blepharoplasty for herniated intraorbital fat; anatomical basis for a new approach. *Plast Reconstr Surg (1946).* 1951;8:46–58.
- Barton FE Jr., Ha R, Awada M. Fat extrusion and septal reset in patients with the tear trough triad: a critical appraisal. *Plast Reconstr Surg.* 2004;113:2115–2121; discussion 2122–3.
- Hamra ST. The role of the septal reset in creating a youthful eyelid-cheek complex in facial rejuvenation. *Plast Reconstr Surg.* 2004;113:2124–2141; discussion 2142–4.
- Hamra ST. The role of orbital fat preservation in facial aesthetic surgery. A new concept. *Clin Plast Surg.* 1996;23:17–28.
- Mendelson BC. Fat preservation technique of lower-lid blepharoplasty. *Aesthet Surg J.* 2001;21:450–459.
- Chiu CY, Shen YC, Zhao QF, et al. Treatment of tear trough deformity: fat repositioning versus autologous fat grafting. *Aesthetic Plast Surg.* 2017;41:73–80.
- Codner M, Mejia JD. Lower eyelid belfaroplasty. In: Nahai F, ed. *The Art of Aesthetic Surgery.* New York: Thieme; 2020:410–424.
- Hamra ST. Arcus marginalis release and orbital fat preservation in midface rejuvenation. *Plast Reconstr Surg.* 1995;96:354–362.
- Jelks GW, Glat PM, Jelks EB, et al. The inferior retinacular lateral canthoplasty: a new technique. *Plast Reconstr Surg.* 1997;100:1262–1270; discussion 1271–5.
- Rees TD, Tabbal N. Lower blepharoplasty with emphasis on the orbicularis muscle. *Clin Plast Surg.* 1981;8:643–662.
- Furnas DW. The orbicularis oculi muscle. Management in blepharoplasty. *Clin Plast Surg.* 1981;8:687–715.
- Muzaffar AR, Mendelson BC, Adams WP Jr. Surgical anatomy of the ligamentous attachments of the lower lid and lateral canthus. *Plast Reconstr Surg.* 2002;110:873–884; discussion 897–911.
- Haddock NT, Saadeh PB, Boutros S, et al. The tear trough and lid/cheek junction: anatomy and implications for surgical correction. *Plast Reconstr Surg.* 2009;123:1332–1340.
- Loeb R. Fat pad sliding and fat grafting for leveling lid depressions. *Clin Plast Surg.* 1981;8:757–776.
- Goldberg RA, Edelstein C, Balch K, et al. Fat repositioning in lower eyelid blepharoplasty. *Semin Ophthalmol.* 1998;13:103–106.
- Mendelson BC. Herniated fat and the orbital septum of the lower lid. *Clin Plast Surg.* 1993;20:323–330.
- Loeb R. Naso-jugal groove leveling with fat tissue. *Clin Plast Surg.* 1993;20:393–400; discussion 401.
- McCord CD Jr., Codner MA, Hester TR. Redraping the inferior orbicularis arc. *Plast Reconstr Surg.* 1998;102:2471–2479.
- Huang T. Reduction of lower palpebral bulge by plicating attenuated orbital septa: a technical modification in cosmetic blepharoplasty. *Plast Reconstr Surg.* 2000;105:2552–2558; discussion 2559–60.
- Goldberg RA. Transconjunctival orbital fat repositioning: transposition of orbital fat pedicles into a subperiosteal pocket. *Plast Reconstr Surg.* 2000;105:743–748; discussion 749–51.
- Pelle-Ceravolo M, Angelini M. Properly diluted fat (PDF): an easy and safe approach to periocular fat grafting. *Aesthet Surg J.* 2020;40:19–33.
- Huang SH, Lin YN, Lee SS, et al. Three simple steps for refining transcutaneous lower blepharoplasty for aging eyelids: the indispensability of micro-autologous fat transplantation. *Aesthet Surg J.* 2019;39:1163–1177.