



# The Pendulum Movement of Orbital Fat and Retro-Orbicularis Oculi Fat: A New Strategy for Correction of Sunken Eyelid Deformity in Revision Upper Blepharoplasty for Asian Patients



Xiuxia Wang<sup>1</sup> · Ruishan Li<sup>3</sup> · Cecil S. Qiu<sup>2</sup> · Zhizhong Deng<sup>1</sup> · Wenjie Yu<sup>4</sup> · Rui Jin<sup>1</sup> · Xianyu Zhou<sup>1</sup> · Fei Liu<sup>1</sup> · Jun Yang<sup>1</sup>

Received: 19 September 2023 / Accepted: 18 December 2023 / Published online: 5 February 2024  
© Springer Science+Business Media, LLC, part of Springer Nature and International Society of Aesthetic Plastic Surgery 2024

## Abstract

**Background** With an increasing number of East Asians undergoing blepharoplasty, the number of patients with secondary upper eyelid deformities is increasing. The sunken eyelid deformity is a common deformity after upper blepharoplasty in Asians due to over-resection, retraction, or atrophy of the nasal and central orbital fat pads. Herein, we present a novel procedure, the pendulum movement of orbital fat and retro-orbicularis oculi fat (“POR” technique), for correction of sunken eyelid deformity in secondary Asian blepharoplasty.

**Methods** Patients who underwent secondary upper blepharoplasty with the POR technique by the senior author between January 2020 and October 2021 were identified retrospectively. Those with fewer than 6 months of follow-up were excluded. Patient charts and images were reviewed for demographic data, comorbidities, concomitant eyelid deformities, and postoperative complications. Pre- and postoperative aesthetics, including degree of sunken eyelid

deformity, were assessed by two independent raters and by self-reported patient satisfaction.

**Results** Forty-nine consecutive patients were identified, all of whom were female and had grade I or II sunken eyelid deformity. Median follow-up was 8 months. Concomitant deformities included high tarsal crease ( $N = 31$  patients, 63.3%), ptosis ( $N = 13$ , 26.5%), and upper eyelid retraction ( $N = 5$ , 10.2%). Almost patients had improvement in their eyelid volume, and 95.9% had improvement in their aesthetic rating. Approximately 93.9% of patients were satisfied with the outcome.

**Conclusions** The POR technique is an effective technique for correction of sunken eyelid deformity and can be utilized in conjunction with other techniques during secondary blepharoplasty.

**Level of Evidence III** This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors [www.springer.com/00266](http://www.springer.com/00266).

**Keywords** Bridge technique · POR · Sunken eyelid deformity

Xiuxia Wang and Ruishan Li are recognized as the co-first author.

✉ Fei Liu  
plasticliu@hotmail.com

✉ Jun Yang  
100580@sh9hospital.org.cn

<sup>1</sup> Department of Plastic and Reconstructive Surgery, Shanghai Ninth People’s Hospital, Shanghai Jiaotong University School of Medicine, 639 Zhizaoju Road, Shanghai 200011, China

<sup>2</sup> Department of Plastic and Reconstructive Surgery, Johns Hopkins University School of Medicine, Baltimore, USA

<sup>3</sup> Liudalie Medical Group, Shenzhen, China

<sup>4</sup> Shang Shi Aesthetic Medicine, Shanghai, China

## Introduction

Double eyelid blepharoplasty is the most popular aesthetic surgical procedure in East Asia, because eyes with a well-defined tarsal crease are considered more attractive in Asian aesthetics [1]. Most techniques for double eyelid blepharoplasty require reduction or superior repositioning of the retroseptal orbital fat and retro-orbicularis oculi fat (ROOF) in order to create direct adhesions between the levator aponeurosis and skin in order to define a tarsal crease. However, manipulation of these structures may

result in a sunken eyelid deformity, in which there is hollowing of the medial and central upper eyelid [2]. This can occur simultaneously with a variety of other deformities, such as high tarsal crease, lid retraction, multiple creases, blepharoptosis, and asymmetry [3–5].

In the experience of the senior author, most patients requesting revision blepharoplasty have a sunken eyelid deformity, and correction of their other deformities without correction of the sunken eyelid deformity yields sub-optimal results. Therefore, it is important to recognize the sunken eyelid deformity in the Asian patient and to have an effective surgical technique to address it. Free fat grafting has been used to augment volume at the upper eyelid [6], but the survival rate of the grafted fat is difficult to predict and control. Using vascularized tissue would offer more predictable volume restoration [7, 8].

Orbital septal fat is white adipose tissue that is essential for supporting, sliding, and providing mechanical protection to the orbit [9]. Retro-orbicularis oculi fat (ROOF) is adipo-fascial tissue located in the fat compartment between the periorbital muscles (the orbicularis oculi and frontalis muscles) and orbital septum/frontalis fascia [10, 11]. The orbital fat and ROOF can be easily transposed by dissection and partial release of their vascular pedicle. Thus, we presumed that proper repositioning of the orbital fat and ROOF may help correct most sunken upper eyelids with various deformities. Specifically, we propose caudal and medial transposition of the orbital fat and ROOF to achieve harmonious redistribution of volume according to Eastern aesthetics, a technique dubbed the Pendulum movement of Orbital fat and ROOF (“POR” technique). Herein, we present a retrospective analysis of 49 Asian patients who underwent secondary upper blepharoplasty with POR technique.

## Methods

### Patients and Study Design

We performed a retrospective chart review of patients undergoing secondary upper blepharoplasty with the POR technique at our institution between January 2020 and October 2021. All surgeries were performed by the same surgeon (senior author, J. Y.).

Patients were excluded if they had fewer than 6 months of follow-up at their most recent visit. Patient charts and images were reviewed for demographic data, comorbidities, concomitant eyelid deformities, and postoperative complications. Concomitant eyelid deformities included high tarsal crease, eyelid retraction, and ptosis. Detailed operative reports were reviewed to confirm utilization of the POR technique or other techniques, and all complications during the follow-up period were recorded. All pre- and postoperative photos were reviewed and assessed by criteria described below.

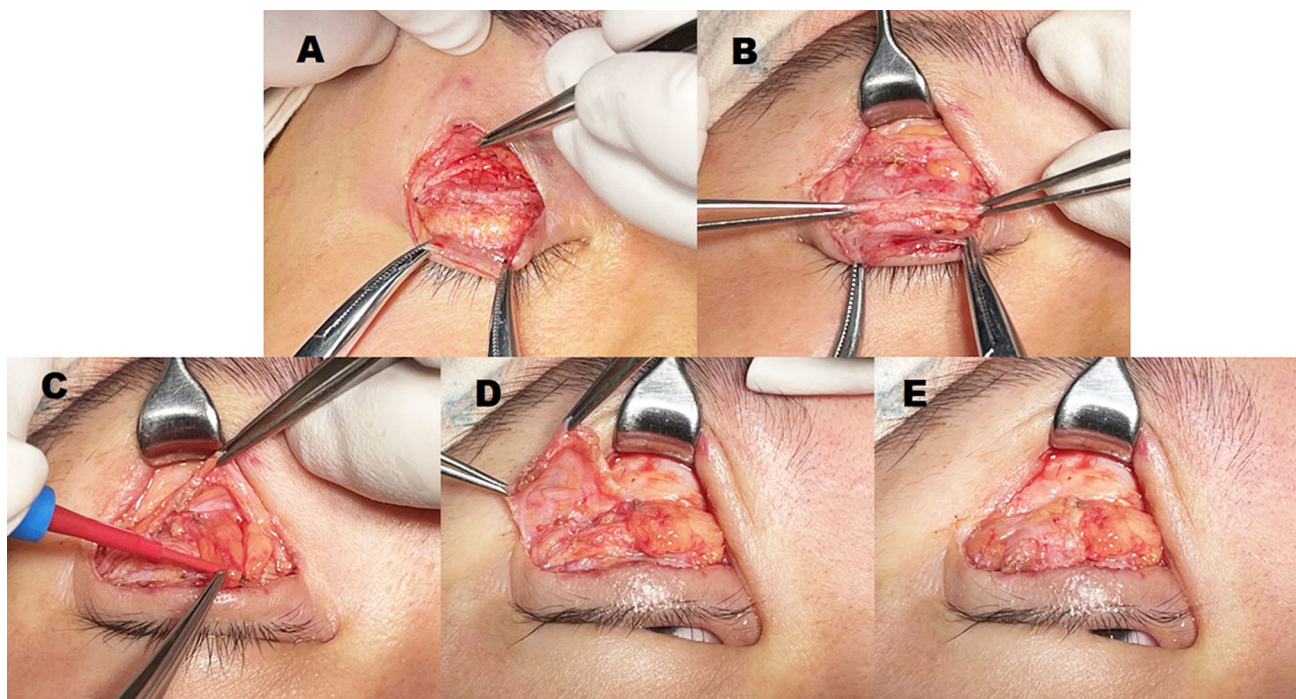
## Operative Procedure

### Preoperative Evaluation

All patients desired revision blepharoplasty and had some degree of dissatisfaction of their primary result. Indications for POR technique included grade I or II sunken eyelid deformity (greater than 0 and less than 1cm of depression). Patients were not considered a candidate for POR technique if they had severe eyelid tissue deficiency, including of local skin and orbital septal contents, or degree of upper eyelid depression more than grade 2 (greater than 1cm of depression). Patients with blepharoptosis or lid retraction must have normal lid excursion. The goals of revision blepharoplasty were determined on a case-by-case basis by consensus between the surgeon and patient. All patients were preoperatively informed of the possible complications of revision blepharoplasty with POR technique. Informed consent was obtained from all patients, and the study adhered to the principles of the Declaration of Helsinki.

### Separation of Orbital Fat and ROOF

The entire procedure is performed under local anesthesia. We marked the planned incision (i.e., the position of the new tarsal crease) with a solid line and the previous incision with a dotted line. After local anesthesia, a No. 11 blade was used to make an incision along the solid line. The orbicularis oculi muscle was incised at the level of the skin incision and dissection proceeded caudally and immediately deep to the orbicularis oculi for 1–2mm toward the upper eyelid margin; this exposes the superficial surface of the tarsal plate (Figure 1A). On the superior flap, an electrotonne was used to separate the residual orbital fat off the levator palpebrae superioris muscle, and its aponeurosis was fully exposed (Figure 1B). The ROOF was identified superficial to the orbital fat and deep to the orbicularis oculi. It was grasped at the edge of the incision and sharply dissected from the orbicularis oculi. The orbital fat can then be bluntly or sharply released from the ROOF (Figure 1C). Conservative excision of the orbital fat and ROOF is performed as needed. The remaining orbital fat is then mobilized with lateral incision as needed and positioned medially to prioritize correction of medial hollowing. A releasing incision is made medially on the ROOF, which is then transposed over the central and lateral upper eyelid to fill any insufficiency resulting from the orbital fat transposition. At the end of dissection, the orbital fat should lay medially and the ROOF flap centrally and laterally, both with minimal tension (Figure 1E). Video 1 demonstrates this portion of the surgical procedure. Finally, if lid position required correction, the levator aponeurosis-Müller’s muscle complex was carefully detached from the anterior surface of the tarsus.



**Fig. 1** Photographic diagram of resetting the orbital fat and ROOF. **A** Exposed tarsal. **B** Completely exposed levator palpebrae superioris muscle. **C** Separated the orbital fat and ROOF. **D** Broken pedicle of the orbital fat and ROOF. **E** Reset the position of the orbital fat and ROOF

### Fixing of Orbital Fat and ROOF

A bridge technique, reported in our previous articles [12, 13], was initiated by first fixing the levator aponeurosis-Müller’s muscle flap to the tarsal plate at the double-fold line with 6-0 silk (Figure 2B). Patients were asked to open or close their eyes to review lid position and the height and curvature of their planned tarsal crease. If necessary, we first anchored the orbital fat and ROOF using 6-0 nylon sutures. After fixing the bridge, its flaps were trimmed according to the thickness of the lower flap skin and orbicularis oculi muscle. Next, an interrupted 7-0 Prolene suture was used to fix the orbital fat to the floating bridge medially and the ROOF to the bridge laterally (Figure 2C). In the central transition area, there may be overlap between the orbital fat and the ROOF, and both may be secured to the bridge. The fixation is performed by sandwiching the bridge (levator-Müller flap) and orbital fat and/or ROOF between the two edges of the orbicularis oculi (Video 2). In essence, the orbital fat and ROOF are incorporated into the bridge between the tarsal plate and the orbicularis oculi.

### Wound Closure

The skin and subcutaneous orbicularis oculi muscle of the upper flap was flattened, and excess tissue below and above the dotted line was removed. A 7-0 Prolene suture was used to fix the skin of the upper and lower flap and orbicularis

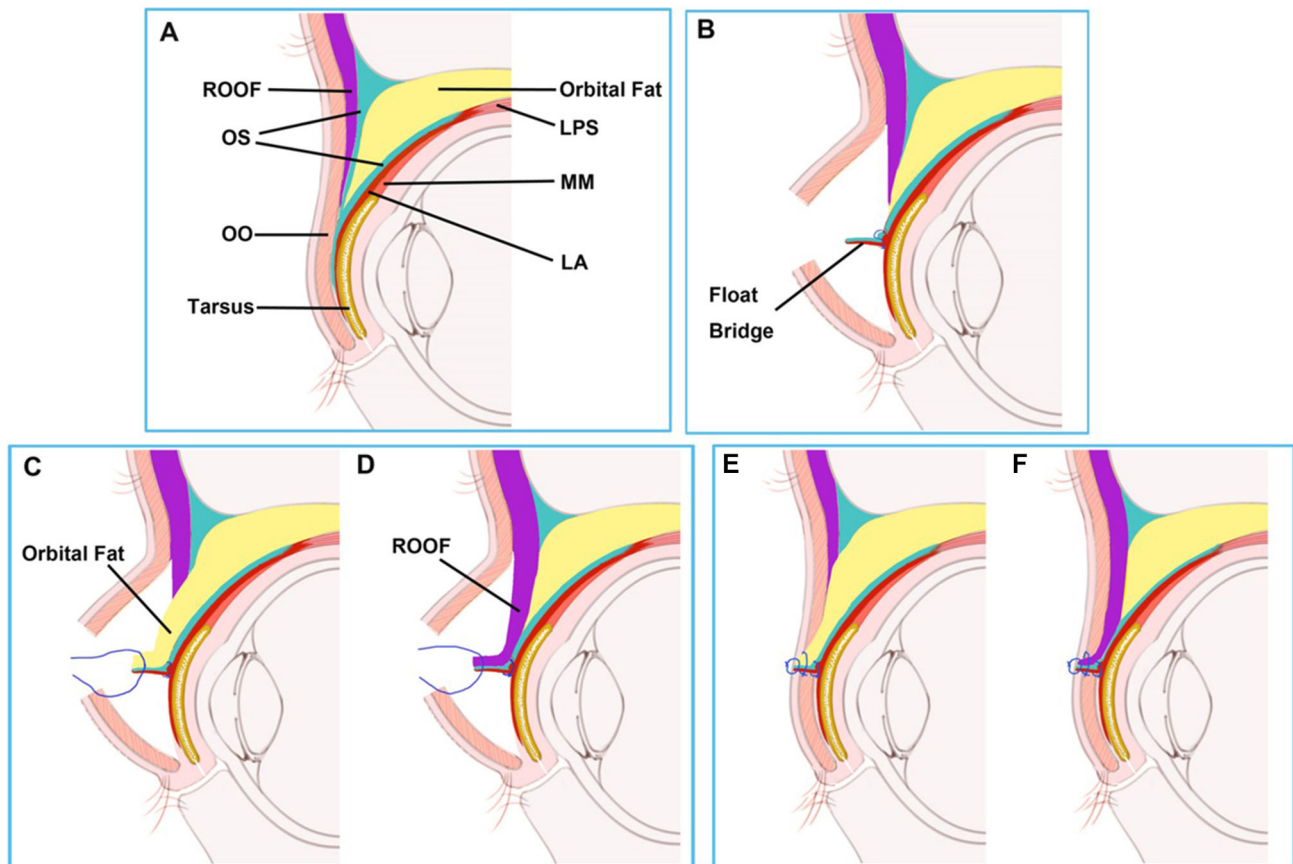
oculi muscle to the sandwich-like structure described in step 3 and close the incision (Figure 2D). On the table, patients were asked to open their eyes again to recheck the shape and symmetry of the operated eyelids.

### Outcome Assessment

Outcome assessments include three aspects: change in pre- and postoperative aesthetics which is based on the grading of sunken eyelid deformity defined as follows: grade 0: No sunken eyelid deformity; grade 1: Between 0 and 0.5 cm depression of the upper eyelid at the deepest point; grade 2: Between 0.5 and 1.0 cm depression of the upper eyelid at the deepest point; grade 3: 1.0 cm or greater depression of the upper eyelid at the deepest point [14]. Postoperative patient satisfaction and the incidence of postoperative complications were recorded. The aesthetic outcomes were assessed at the 6-month follow-up by two blinded, independent, plastic surgeons (XX.W. and RS.L.) by review of photographs.

The aesthetic outcomes were graded as follows:

- *Good* there is no depression of upper eyelids; upper eyelid deformities were completely corrected.
- *Fair* the depression of upper eyelids is less than 0.5cm; upper eyelid deformities were partly corrected.
- *Poor* the depression of upper eyelids is more than 0.5cm; upper eyelid deformities were rarely corrected.



**Fig. 2** Diagram of operative process. **A** Preoperative view. **B** Fixation of the orbital septum-levator aponeurosis flat (float bridge) to the tarsus. **C** Fixation of the medial orbital fat through the orbicularis oculi muscle, middle of the bridge, and partial orbital fat. **D** Fixation of the roof layer through the orbicularis oculi muscle, middle of the

bridge, and partial roof tissue. **E** Postoperative view of the medial side of the eyelid. **F** Postoperative view of the lateral side of the eyelid. ROOF, retro-orbicularis oculi fat; OS, orbital septum; OO, orbicularis oculi; LPS, levator palpebrae superioris; MM, Muller's muscle; LA, levator aponeurosis

Patient satisfaction was assessed based on an anonymous survey completed during follow-up visits as follows:

- *Fully satisfied* subjects are satisfied with the results.
- *Somewhat satisfied* subjects are generally satisfied with the results, no demand for reoperation.
- *Unsatisfied* subjects are unsatisfactory and reoperation is demanded.

## Results

Forty-nine consecutive patients underwent secondary upper blepharoplasty with the POR technique between January 2020 and October 2021 and were included in this study (Table 1). Forty-two had Grade I sunken upper eyelid deformity and seven had Grade II sunken eyelid deformity. Concomitant deformities included 31 (63.3%) high tarsal creases, 13 (26.5%) mild-to-moderate blepharoptosis, and five (10.2%) upper eyelid retraction. Figures 3 show

representative patients with different upper eyelid deformities. They were all female Asians aged 24–62 (mean 36) years. Median follow-up time was 8 months.

## Aesthetic Outcomes Analysis

Blinded preoperative assessment of photographs indicated that 0, 42, and 7 patients had good, fair, and poor primary aesthetic results. Postoperatively, 41 patients (83.7%) were graded as good and eight patients (16.3%) were graded as fair, with improvement observed in 95.9% of patients (Table 2).

Pre- and postoperative photographs showed that all 31 patients with high upper eyelid folds had their eyelid fold narrowed to standard criteria (Supplementary table 1). The 13 patients with mild-to-moderate blepharoptosis had their symptoms effectively alleviated through external levator advancement and had upper eyelids fullness by P.O.R technique. Normal morphological features but with slight depression of upper eyelids were restored in the five patients with upper eyelid retraction.

**Table 1** Patient characteristics

|   |                 |
|---|-----------------|
| Total patients                          | 49 (100%)       |
| Female                                  | 49 (100%)       |
| Age (mean, SD)                          | 24–62 (36 ± SD) |
| <i>Comorbidities</i>                    |                 |
| Hypertension                            | 4 (8.2%)        |
| Diabetes                                | 0               |
| <i>Grade of Sunken Eyelid Deformity</i> |                 |
| Grade 0 (0 cm)                          | 0 (0%)          |
| Grade 1 (0–0.5 cm)                      | 42 (85.7%)      |
| Grade 2 (0.5–1 cm)                      | 7 (14.3%)       |
| Grade 3 (>1 cm)                         | 0 (0%)          |
| <i>Concomitant Deformity</i>            |                 |
| High tarsal crease                      | 31 (63.3%)      |
| Retracted eyelid                        | 5 (10.2%)       |
| Blepharoptosis                          | 13 (26.5%)      |
| Follow-up Time (median, min-max)        | 8 (6–18)M       |

### Patient's Satisfaction Rate

Among the patients, 93.9% expressed satisfactory feedback (Supplementary table 2) with 46 patients satisfied and three patients dissatisfied. Moreover, 43 out of 46 patients were fully satisfied and three out of 46 were basically satisfied. Patients in the good and fair groups have higher satisfaction rate.

### Postoperative Complications

Three patients experienced temporary minor complications during recovery, including bleeding, asymmetrical, and localize depression, and no severe postoperative complications were observed during the entire follow-up period (Supplementary table 3). On the third postoperative day, one patient had bleeding, which stopped spontaneously. One patient with bilateral high tarsal creases had an initial asymmetrical recovery, and regained a symmetrical



**Fig. 3** (left) A 26-year-old female with Grade I sunken eyelid deformity (white arrows) and high tarsal creases after blepharoplasty before POR treatment. The Marginal reflex distance1 (MRD1) before treatment was 4 mm on the left and 4 mm on the right and fair preoperative aesthetic assessment. Postoperatively, she demonstrates improved volume of her upper eyelid with a more well-defined and well-positioned tarsal crease with corrected sunken eyelid deformity and MRD1 unchanged. The aesthetic assessment improved to be good after POR treatment. (middle) A 38-year-old female with Grade I sunken eyelid deformity (white arrows) before POR treatment and blepharoptosis of the left eye, with high tarsal crease. The aesthetic assessment was graded as poor preoperatively. The MRD1 of the patient was 2 on the right and 1 on the left. Postoperatively she

demonstrates improved positioning of her tarsal crease with appropriate volume distribution medially and caudally. The MRD1 changed to 3 on the right and 2 on the left, and the aesthetic assessment improved to be good. (right) A 54-year-old female with Grade II sunken eyelid deformity, retracted right eyelid, and multiple folds of her left eyelid before treatment with aesthetic assessment graded as poor. The MRD of the patient before treatment was 6 on the right and 4 on the left. After correcting her lid position and release of adhesions that caused the multiple folds, POR technique allowed for redistribution of tissue over her upper eyelids, resulting in more pleasing contour and prevention of new adhesions. The aesthetic assessment improved to fair and the MRD changed to 4 on the right and 4 on the left

**Table 2** Differences in pre- and postoperative aesthetic assessment

|                    |       | Postoperative Grade |           |        | Total      |
|--------------------|-------|---------------------|-----------|--------|------------|
|                    |       | Good                | Fair      | Poor   |            |
| Preoperative Grade | Good  | 0                   | 0         | 0      | 0(0%)      |
|                    | Fair  | 40                  | 2         | 0      | 42 (85.7%) |
|                    | Poor  | 1                   | 6         | 0      | 7 (14.3%)  |
|                    | Total | 41 (83.7%)          | 8 (16.3%) | 0 (0%) | 49         |

bilateral appearance three months after revision. One patient complained of minor localized depression in their upper eyelid, which relieved after ten days as we instructed the patient to stretch the depressed eyelid skin.

## Discussion

The important features of beautiful and youthful eyes consist of a sharp, well-defined supratarsal fold and appropriate fullness of upper eyelid tissue [15, 16], which has led to the lasting popularization of blepharoplasty among Eastern Asians and, consequently, an increase in the number of patients with secondary deformities. Sunken eyelid deformity is an under-recognized and challenging deformity to correct. This retrospective study of 49 patients demonstrates that redistribution of the orbital fat and ROOF via the POR technique could be employed in conjunction with correction of other upper eyelid deformities.

Sunken eyelid deformity occurs when orbital contents are over-resected, retracted, or atrophied. Local scars and adhesions can further contribute to flattening and loss of a youthful appearance [17]. Kim et al. reported wide dual-plane dissection (interrupting the levator aponeurosis connection to the prior fold at two separate layers between the orbicularis oculi muscle and orbital fat) to prevent re-adhesion [18]. However, this method only restores the morphological malformation and does not improve the concomitant sunken eyelids. Fat grafting is a well-established method of restoring eyelid volume, especially in the case of severe hollowing, but its results are not as predictable. Additionally, it cannot be well-controlled, since injected fat will preferentially redistribute toward areas of least resistance, which tends to be superiorly; in Asian eyelids, it is desirable to have some—but not too much—volume just above the tarsal crease. What is needed is a technique that enables the surgeon to transpose and durably affix vascularized tissue with a high degree of control.

During the POR procedure, we used the residual deep orbital fat to fill the medial upper eyelid of the patients and the ROOF to supplement the central lid (Figure 1E). The orbital fat and ROOF are then fixed to the bridge using a non-absorbable suture (Figure 2C). This enables correction of upper lid hollowing, recruits vascular tissue over the tarsus, prevents local adhesions, and establishes a crisp tarsal crease. It also enhances aesthetic outcomes after correction of other eyelid deformities.

High tarsal creases are associated with hollowed and sunken eyelids, in which the orbital fat has been over-resected or the orbicularis oculi has atrophied or dehiscid [19]. The combination of POR and bridge techniques allows for re-establishment of the new tarsal crease and fixation of vascularized fat caudally at the level of the new

crease. This promotes the formation of a full and delicate double eyelid line. Similarly, patients with blepharoptosis develop sunken eyelids because the increased retroseptal volume may lead to a relative shortage of orbital septum contents [20, 21]. After shortening the levator palpebrae superioris aponeurosis, judicious transposition of the orbital fat and ROOF to fill the retroseptal space will further augment volume and improve overall aesthetics (as presented in Figures 3). Finally, in patients with upper eyelid retraction, in which the levator aponeurosis must be lengthened, the POR technique helps recruit much-needed tissue to fill the subsequently larger retroseptal space. In summary, the POR technique is a dynamic technique that offers the surgeon greater control of upper eyelid volume to suit each patient's needs.

Our study showed that most patients undergoing revision blepharoplasty with POR technique were satisfied (93.9%) and had good aesthetic outcomes (83.7%). POR technique was effective in specifically correcting the upper eyelid volume deficiency, with 95.9% of patients having improvement in their sunken eyelids. Postoperative complications were minor and rare, with none being directly attributable to the POR technique portion of their surgeries.

The POR technique is limited by the amount of available residual orbital fat and ROOF tissue available after primary blepharoplasty, so it is not suited for patients with severe hollowing (greater than 1cm of depression). Fat graft may still be necessary for these patients. Indeed, dissatisfaction and poor aesthetic rating were associated with a higher degree of preoperative hollowing. Limitations of this present study include its retrospective, case-series nature. Outcomes are also subject to selection bias according to the senior author's expertise, which limits the generalizability of results to other patients and surgeons. Additional comparative studies are needed to better assess the utility of the POR technique.

## Conclusions

Sunken eyelid deformity is an under-recognized but important consequence of blepharoplasty in Asian patients. By utilizing local vascularized tissues (ROOF and residual orbital fat), POR technique offers the surgeon a high degree of control in correcting volume deficiency of the upper eyelids, yielding reliably good aesthetic outcomes in patients with mild-to-moderate sunken eyelids. Additional studies are necessary to assess the generalizability of this technique.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s00266-023-03827-9>.

**Acknowledgements** The all authors declare that they have no conflict of interest. This research was supported by grants from the National Natural Science Foundation of China (grant no. 82102319).

#### Declarations

**Informed consent** We received informed consent from the patients for publication.

#### References

- Suo LL, Li JQ, Fu R et al (2020) A four-step technique for creating individual double-eyelid crease shapes: a free-style design. *Plast Reconstr Surg* 146:756–765
- Rohrich RJ, Coberly DM, Fagien S et al (2004) Current concepts in aesthetic upper blepharoplasty. *Plast Reconstr Surg* 113(3):32e–42e
- Cho IC (2015) Revision upper blepharoplasty. *Semin Plast Surg* 29:201–208
- Zhu Z, Yuan ZQ, Lu L et al (2021) Unsatisfactory upper blepharoplasty revision technique: reconstruction of the upper orbital septum and its fusion point. *Aesthetic Plast Surg* 45(6):2790–2797
- Mangan MS, Cakir A, Ercalik NY et al (2021) Efficacy of the Müller muscle-conjunctival resection for the correction of unilateral ptosis following external levator operations in patients with bilateral involuntional ptosis. *Plast Reconstr Surg* 148:195e–199e
- Tonnard PL, Verpaele AM, Zeltzer AA (2013) Augmentation blepharoplasty: a review of 500 consecutive patients. *Aesthet Surg J* 33(3):341–352
- Kim BG, Youn DY (2006) Management of adhesion using a pretarsal fibromuscular flap or graft in secondary blepharoplasty. *Plast Reconstr Surg* 117:782–789
- Lee W, Kwon SB, Oh SK et al (2017) Correction of sunken upper eyelid with orbital fat transposition flap and dermofat graft. *J Plast Reconstr Aesthet Surg* 70:1768–1775
- Bremond-Gignac D, Copin H, Cussenot O et al (2004) Anatomical histological and mesoscopic study of the adipose tissue of the orbit. *Surg Radiol Anat* 26:297–302
- Wang X, Wang H (2020) Anatomical study and clinical observation of retro-orbicularis oculi fat (ROOF). *Aesthetic Plast Surg* 44:89–92
- Blandford AD, Bachour SP, Chen R et al (2019) Dimensions and Morphologic Variability of the Retro-Orbicularis Oculi and Frontalis Muscle Fat Pad. *Ophthalmic Plast Reconstr Surg* 35(5):447–450
- Jin R, Shen YR, Yu WJ et al (2020) Tarsal-fixation with aponeurotic flap linkage in blepharoplasty: bridge technique. *Aesthet Surg J* 40:NP648–NP654
- Shen YR, Yu WJ, Ding FX et al (2022) Aesthetic correction of mild-to-moderate blepharoptosis among Asians: the bridge technique. *Ophthalmol Ther* 11:151–160
- Park S, Kim B (2011) Correction of superior sulcus deformity with orbital fat anatomic repositioning and fat graft applied to retro-orbicularis oculi fat for Asian eyelids. *Aesthet Plast Surg* 35:162–170
- Lee W, Kwon SB, Oh SK et al (2017) Correction of sunken upper eyelid with orbital fat transposition flap and dermofat graft. *J Plast Reconstr Aes* 70(12):1768–1775
- Hwang K (2013) Surgical anatomy of the upper eyelid relating to upper blepharoplasty or blepharoptosis surgery. *Anat Cell Biol* 46:93–100
- Guo S, Yang M, Zhou C et al (2019) Corrective strategies for a complex deformity caused by “European-Style Double Eyelid” blepharoplasty in Asians. *Aesthetic Plast Surg* 43(2):395–403
- Kim KK, Kim WS, Oh SK et al (2017) High double eyelid fold correction using wide dual-plane dissection. *Ann Plast Surg* 78:365–370
- Jiang L, Li H, Yin N et al (2020) Free orbital fat grafting during upper blepharoplasty in Asians to prevent multiple upper eyelid folds and sunken upper eyelids. *J Craniofac Surg* 31:685–688
- Saonanon P, Sithanon S (2018) External levator advancement versus muller muscle-conjunctival resection for aponeurotic blepharoptosis: a randomized clinical trial. *Plast Reconstr Surg* 141:213e–219e
- Cohen LM, Rootman DB (2021) Blepharoptosis repair: external versus posterior approach surgery: why I select one over the other. *Facial Plast Surg Clin North Am* 29:195–208

**Publisher’s Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.