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EFFICACY AND SAFETY OF LOWER BLEPHAROPLASTY WITH FAT PRESERVATION: COMPREHENSIVE SYSTEMATIC REVIEW OF CONTEMPORARY EVIDENCE

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Abstract: Introduction: Traditional lower blepharoplasty based on orbital fat excision has been associated with late deformities, such as orbital excavation, eyelid retraction, and unsatisfactory aesthetic results. Techniques involving fat preservation and repositioning have emerged as an alternative to restore eyelid contour and reduce complications. **Objective:** To comprehensively evaluate the efficacy and safety of lower blepharoplasty with fat preservation compared to techniques based on fat excision. **Methods:** Systematic review conducted according to PRISMA guidelines. The PubMed/MEDLINE, Scopus, and Web of Science databases were searched, including studies published between January 2000 and December 2025. Original clinical studies evaluating lower blepharoplasty with preservation or repositioning of orbital fat were included. The outcomes analyzed included aesthetic satisfaction, objective evaluation of eyelid contour, complication rates, eyelid malpositions, functional changes, and the need for reoperations. **Results:** Twenty-one studies were included, totaling 1,284 patients. Patient satisfaction ranged from 85% to 96%. Fat preservation techniques had lower rates of orbital excavation (2–6%), apparent sclera (1–4%), and ectropion (<2%) compared with traditional excision techniques (15–35%, 5–12%, and up to 6%, respectively). The reoperation rate ranged from 2% to 7%. **Conclusion:** Lower blepharoplasty with fat preservation is an effective and safe technique, associated with better long-term aesthetic results and a lower risk of functional and structural complications. Current evidence supports its adoption as the preferred approach in modern lower blepharoplasty.

Keywords: Lower blepharoplasty; fat preservation; fat repositioning; periorbital rejuvenation; cosmetic plastic surgery.

Introduction

Aging of the lower eyelid is the result of a complex anatomical and pathophysiological process involving skin, muscle, ligament, bone, and volumetric changes. Loss of skin elasticity, laxity of the orbicularis oculi muscle, attenuation of the orbital septum, and descent of the middle third of the face contribute to pseudo-herniation of orbital fat and formation of the nasojugal groove, central elements of the aged appearance of the periorbital region.

Historically, lower blepharoplasty was conceived under the logic of tissue resection. The excision of herniated orbital fat, whether or not associated with skin resection, was the dominant technical standard for decades. Although effective in immediately reducing eyelid bags, this approach has been associated with a high incidence of late complications, including orbital excavation, skeletal appearance of the lower eyelid, accentuation of the lacrimal groove, lower eyelid retraction, apparent sclera, and ectropion.

With the advancement of knowledge about facial aging, the concept that this process is predominantly volumetric and redistributive, rather than simply tissue redundancy, has become established. Excessive removal of orbital fat has come to be recognized as an important cause of iatrogenic deformities that are difficult to correct.

In this context, techniques for preserving and repositioning orbital fat have been developed with the aim of maintaining

periorbital volume, smoothing the eyelid--cheek transition, and reducing the incidence of eyelid malpositions. These techniques include release of the arcus marginalis, repositioning of fat over the infraorbital rim, and volumetric redistribution for simultaneous correction of pseudoherniation and nasojugal groove.

Despite the widespread use of these techniques, the literature presents significant heterogeneity regarding the outcomes evaluated, the definitions of aesthetic success, and the actual complication rates. The present systematic review aimed to gather and critically analyze the available evidence on the efficacy and safety of lower blepharoplasty with fat preservation.

Methods

Study design

Systematic review of the literature conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) recommendations.

Search strategy

Electronic searches were performed in the PubMed/MEDLINE, Scopus, and Web of Science databases using combinations of the following descriptors:

- "lower blepharoplasty"
- "fat preservation"
- "fat repositioning"
- "transconjunctival blepharoplasty"
- "periorbital rejuvenation"

The inclusion period was from January 2000 to December 2025.

Eligibility criteria

Inclusion criteria:

- Original clinical studies (clinical trials, prospective or retrospective studies, case series with ≥20 patients)
- Adult patients undergoing lower blepharoplasty with preservation or repositioning of orbital fat
- Report of at least one aesthetic or safety outcome
- Minimum follow-up of 6 months

Exclusion criteria:

- Case reports, narrative reviews, technical notes without clinical outcomes
- Studies exclusively on upper blepharoplasty
- Pediatric studies
- Publications in languages other than English

Data extraction

The following data were extracted:

- Author, year, country, and study design
- Number of patients and demographic characteristics
- Surgical technique used
- Approach (transconjunctival, transcutaneous, or combined)

- Follow-up time
- Subjective and objective aesthetic outcomes
- Early and late complications
- Reoperation rate

Extraction was performed by two independent reviewers, with disagreements resolved by consensus.

Methodological evaluation

Methodological quality was assessed descriptively, considering study design, clarity in the definition of outcomes, follow-up time, and data completeness.

Results

Study selection

A total of 1,246 initial records were identified. After removing duplicates and screening by title and abstract, 78 studies were selected for full-text reading. Of these, 21 met all inclusion criteria and were qualitatively analyzed.

Sample characteristics

The 21 studies included 1,284 patients, with a mean age of 47.6 years (range 32 to 68 years). Females accounted for 71% of the sample. The mean follow-up time ranged from 6 to 60 months.

Most studies employed a transconjunctival approach with repositioning of orbital fat over the infraorbital rim. In five studies, limited skin resection via transcutaneous or skin pinch was associated.

Aesthetic outcomes

Patient satisfaction was high in all studies, ranging from 85% to 96%. Surgeons rated the results as good or excellent in 82–94% of cases.

The main aesthetic benefits reported were:

- Consistent smoothing of the eyelid-cheek transition
- Reduction of the nasojugal groove
- Long-term maintenance of periorbital volume
- Lower incidence of late hollowing

Compared to historical series of fat excision, preservation techniques showed:

- Orbital excavation in 2–6% versus 15–35%
- Greater contour stability after 12 months of follow-up

Complications

The overall complication rate ranged from 5% to 14%.

The most frequent complications were:

- Transient chemosis: 3–8%
- Persistent edema beyond 4 weeks: 4–10%
- Prolonged conjunctival hyperemia: 2–6%

Eyelid malpositions occurred in:

- Apparent sclera: 1–4%
- Ectropion: <2%
- Mild eyelid retraction: 2–5%

These rates were consistently lower than those reported in series with fat exci-

sion, in which apparent sclera ranged from 5% to 12% and ectropion reached 6%.

Significant hematomas and infections were rare, with an incidence of less than 1%.

Reoperations

The reoperation rate ranged from 2% to 7%. The main indications were:

- Residual asymmetry
- Persistence of lateral bags
- Contour irregularities

Analysis by technique

The transconjunctival approach with fat repositioning presented:

- Lower risk of visible scarring
- Lower incidence of eyelid retraction
- Lower rate of apparent sclera

Combined transcutaneous approaches demonstrated better control of skin laxity in patients with marked dermatocalasis, but with a slightly higher risk of inferior retraction.

Discussion

The findings of this systematic review demonstrate that lower blepharoplasty with fat preservation represents a technical evolution based on the contemporary understanding of facial aging. The maintenance of periorbital volume has proven to be decisive in obtaining more natural and lasting aesthetic results.

The repositioning of orbital fat simultaneously corrects pseudo-herniation and the nasojugal groove, addressing two central components of periorbital deformity. In addition, the release of the arcus marginalis allows for a more physiological redistribution of volume, reducing the abrupt transition between the eyelid and cheek.

The lower incidence of ectropion and apparent sclera reflects the preservation of the anterior support structures, particularly when using the transconjunctival approach. These findings reinforce the importance of avoiding aggressive resections in an anatomically delicate region.

However, the technique is not without limitations. In patients with significant skin laxity or canthal laxity, isolated fat preservation may be insufficient, requiring combination with cantopexy, cantoplasty, or limited skin resection.

The main limitations of this review include the heterogeneity of outcomes, the lack of standardization in aesthetic evaluation, and the predominance of retrospective studies. Randomized clinical trials directly comparing fat preservation and excision remain scarce.

Conclusion

Lower blepharoplasty with fat preservation is an effective and safe technique, associated with high patient satisfaction, better preservation of the eyelid contour, and a lower incidence of functional and aesthetic complications. Current evidence supports its adoption as the preferred approach in modern lower blepharoplasty, particularly when combined with the transconjunctival approach and precise repositioning of orbital fat.

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