

Current Trends in Upper and Lower Eyelid Blepharoplasty Among American Society of Ophthalmic Plastic and Reconstructive Surgery Members

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Purpose: To assess current practice patterns for management of upper and lower eyelid blepharoplasty by active American Society of Ophthalmic Plastic and Reconstructive Surgery members.

Methods: An invitation to participate in a web-based anonymous survey was sent to the active American Society of Ophthalmic Plastic and Reconstructive Surgery membership via email. The survey consists of 34 questions, both multiple choice and free response, regarding upper and lower eyelid blepharoplasty surgery. Practice patterns for both aesthetic and functional blepharoplasty are assessed.

Results: Thirty-four percent (161/472) of American Society of Ophthalmic Plastic and Reconstructive Surgery members polled responded to the survey. Members perform an average of 196 upper eyelid, 46 lower eyelid, and 53 four-eyelid blepharoplasty procedures per year, with 70% of cases being functional and 30% purely aesthetic. Most members prefer monitored care (71%) to local (21%) or general (8%) anesthesia. Eighty-nine percent of surgeons use topical antibiotics after surgery, erythromycin being the most common (51%). Fourteen percent of members use postoperative oral antibiotics, with cephalexin (81%) being most common. In upper eyelid blepharoplasty, orbicularis muscle is excised by 86% of respondents. Orbital fat is excised, when deemed appropriate, in 97% of cases, with nasal fat excised most commonly (88%). Less commonly, fat repositioning (36%) and adjunctive fat grafting (33%) are performed. In lower eyelid blepharoplasty, surgeons report using one or more of the following approaches: transconjunctival (96%), transcutaneous (82%), and both transconjunctival and transcutaneous (51%). Common adjunctive procedures include

orbital fat excision (99%), fat repositioning (80%), and lateral canthal suspension (96%). Less common adjunctive procedures include laser skin resurfacing (36%) and chemical peels (29%).

Conclusions: This report outlines contemporary practice patterns among active American Society of Ophthalmic Plastic and Reconstructive Surgery members in the management of upper and lower eyelid blepharoplasty. It is important to quantify such data periodically to update the membership as to how this common surgical procedure is approached. This also allows eyelid surgeons to compare their practice patterns with a national group specializing in such surgery.

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Blepharoplasty remains one of the most common contemporary facial surgical procedures performed.¹ While in oculofacial plastic surgery functional upper eyelid blepharoplasty still encompasses the majority of the specialties procedures, cosmetic upper and lower blepharoplasty are rapidly increasing in number.² Currently, blepharoplasty is the third most common aesthetic surgical procedure performed in the United States, comprising 13% of all surgeries, and ranking only behind liposuction and breast augmentation surgery in frequency.³ In 2013, Americans spent nearly \$440 million on cosmetic blepharoplasty surgery with more than 161,000 procedures performed, an increase of nearly 5.4% in procedure number from 2012.³ Furthermore, in patients aged 51 to 64 years, blepharoplasty was roughly equal to facelift and liposuction in frequency of cosmetic surgical intervention, with nearly 73,000 procedures performed.³

As the volume of blepharoplasty surgery has increased, so too has its evolution and the experience with all facets of the procedure. Despite this, it remains a potentially challenging intervention.^{4,5} This is especially true in lower eyelid surgery where complications can lead to significant deformities and functional impairment.^{4–12} Numerous techniques have been described to improve upper and lower eyelid blepharoplasty outcomes^{13–20}; however, there remains considerable debate over the optimal standard approaches and practice patterns. For this reason, preoperative, intraoperative, and postoperative surgical management vary widely among surgeons. As such, the authors

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conducted a web-based survey of current American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) members to determine contemporary surgical trends and management patterns for blepharoplasty surgery. This will allow eyelid surgeons to compare and contrast their preferences to that of this specialty society as a whole. The authors believe that this is a useful tool to monitor progress with this “bread and butter” oculofacial plastic procedure.

METHODS

The current ASOPRS membership was sent a web-based survey on blepharoplasty surgery in January 2013. This was performed through an email link for an online survey at surveymonkey.com, where surgeon input remains anonymous. The survey consists of 34 questions, which are shown in Supplemental Table 1 (Supplemental Digital Content 1, available at <http://links.lww.com/IOP/A150>). The survey includes 3 sections: 1) general blepharoplasty, 2) upper blepharoplasty, and 3) lower blepharoplasty. Both functional and cosmetic blepharoplasty are evaluated. The questions are both multiple choice and free response. Respondents were allowed to skip questions and select more than 1 answer choice for certain questions. Frequencies and percentages of responses are obtained for each question. Percentages add to more than 100% when the question allowed respondents to check more than 1 answer that applied. Skipped questions are excluded from the response count. The data were entered in a computerized database, and practice patterns are assessed.

General questions assess annual blepharoplasty surgical volume, anesthesia preference, antibiotic use, preoperative surgical marking routine, and percentage of functional versus cosmetic procedures performed. Upper blepharoplasty questions center on intraoperative manipulation of orbital fat, orbicularis muscle, and the lacrimal gland. In addition, adjunctive procedures such as upper eyelid fat grafting and internal browpey and postoperative care, including follow up and external photography timing, are evaluated. Lower blepharoplasty questions assess surgical technique (approach and instrumentation), intraoperative manipulation of orbital fat, orbicularis muscle, and skin. As with upper blepharoplasty, adjunctive procedures (chemical peels, laser resurfacing, and canthal suspension) and postoperative care (follow up and external photography timing) are assessed.

RESULTS

Thirty-four percent (161/472) of active ASOPRS members polled responded to the survey. Five surveys were returned but not completed resulting in 156 surveys for final analysis.

General Blepharoplasty Results. On average, ASOPRS members perform 196 upper eyelid, 46 lower eyelid, and 53 four-lid blepharoplasty procedures per year. Seventy percent of cases are for functional indications, and 30% are purely aesthetic. The majority of surgeons perform blepharoplasty using monitored care (71%) followed by local (21%) and general (8%) anesthesia. Eighty-nine percent of respondents prescribe postoperative ophthalmic antibiotic ointment. Erythromycin (51%), bacitracin (20%), and Maxitrol (18%) ointments are the most commonly prescribed. A minority of respondents (14%) prescribe postoperative oral antibiotics, of which cephalexin (81%) is most common followed by amoxicillin clavulanate (10%). Almost half of respondents (48%) mark patients in the preoperative area; of these, 44% mark patients while sitting and 56% mark patients while supine.

Upper Blepharoplasty Results. Orbicularis muscle is excised during surgery by 86% of respondents. Of these, 22% excise muscle in 1% to 20% of cases, 38% excise muscle in 21% to 80% of cases, and 40% excise muscle in 81% to 100% of cases. Orbital fat is excised by 97% of respondents. Of these, 19% excise fat in 1% to 20% of cases, 55% in 21% to 80% of cases, and 26% in 81% to 100% of cases. When fat is

excised, 88% excise nasal fat, 12% excise central fat, and 40% excise both. Upper eyelid fat repositioning is performed by 36% of respondents. When present, prolapsed lacrimal glands are treated by one or more of the following options: partial resection (3%), suture suspension to the lacrimal gland fossa (88%), or left undisturbed (25%).

Adjunctive internal brow suspension is performed by 66% of members. Of these, 76% suspend the brow in 1% to 20% of cases, 23% perform suspension in 21% to 80% of cases, and 1% perform suspension in 81% to 100% of cases. Adjunctive fat grafting to the upper eyelids and eyebrows is performed by 33% of surgeons: 81% do so in 1% to 20% of cases, 19% in 21% to 60% of cases, and 0% in greater than 61% of cases.

Sixty-six percent of surgeons report the first postoperative visit at week 1 (day 6–8), 20% see patients between days 2 and 5, 9% see patients at postoperative day 1, and 5% see patients at postoperative day 9 or later. Postoperative photographs are performed by 37% of surgeons at postoperative month 3 followed by 17% at postoperative month 2 and 15% at postoperative month 1.

Lower Blepharoplasty Results. Surgeons report using one or more of the following approaches for lower eyelid blepharoplasty: transconjunctival (96%), transcutaneous (82%), and both transconjunctival and transcutaneous (51%). Of those who perform a transconjunctival approach, 74% use electrocautery, 21% use scissors, and 5% use a scalpel to create the incision. There was not a specific question asking about the use of the CO₂ laser to make the incision. However, 17 (18%) of the respondents who use electrocautery for this commented that they do this with the CO₂ laser. Transconjunctival incisions are closed by 45% of respondents. The most common suture used to close the transconjunctival incision is 6-0 plain gut (43%) followed by 6-0 fast absorbing gut (23%). Other sutures used include 7-0 vicryl and 6-0 or 7-0 chromic suture.

The orbicularis muscle is excised by 57% of respondents. Of these, 48% excise muscle in 1% to 20% of cases, 38% excise muscle in 21% to 80% of cases, and 14% excise muscle in 81% to 100% of cases. Orbicularis muscle is plicated by 69% of respondents. Of these, 32% plicate orbicularis in 1% to 20% of cases, 41% plicate orbicularis muscle in 21% to 80% of cases, and 27% plicate orbicularis in 81% to 100% of cases. Orbital fat is excised by 99% of respondents; 6% excise fat in 1% to 20% of cases, 52% excise fat in 21% to 80% of cases, and 42% excise fat in 81% to 100% of cases. When orbital fat is excised, one or more of the following fat pads are removed: the lateral fat pad (98%), central fat pad (88%), and nasal fat pad (87%). Fat repositioning is performed by 80% of respondents; 33% reposition fat in 1% to 20% of cases, 50% reposition fat in 21% to 80% of cases, and 17% reposition fat in 81% to 100% of cases. Of these, 70% reposition fat in the suprapariosteal plane versus 30% in the subperiosteal plane. The lower eyelid skin is excised by 97% of respondents. Twenty-six percent of respondents remove skin in 1% to 20% of cases, 50% remove skin in 21% to 80% of cases, and 24% remove skin in 81% to 100% of cases. When skin is removed, respondents use one or more of the following techniques: skin pinch excision (79%), skin-muscle flap excision (75%), and raising a skin only flap with excision (61%).

Adjunctive chemical peels are performed by 29% of surgeons. Of these, 57% perform peels in 1% to 20% of cases, 39% in 21% to 80% of cases, and 4% in 81% to 100% of cases. Laser peels are performed by 36% of surgeons. Forty-three percent of respondents do so in 1% to 20% of cases, 47% in 21% to 80% of cases, and 10% in 81% to 100% of cases. Canthal suspension is performed by 96% of respondents. Twenty-two percent perform suspension in 1% to 20% of cases, 53% in 21% to 80%, and 25% in 81% to 100% of cases. Canthal suspension is performed by one or more of the following techniques: open canthoplasty (71%), closed canthal suspension (no canthotomy: 51%), and open canthopexy (43%). Of the respondents that perform open canthoplasty, 80% shorten the tarsus; of these, 41% shorten the tarsus in 1% to 20% of cases, 42% in 21% to 80%, and 17% in 81% to 100% of cases.

Fifty-seven percent of surgeons report the first postoperative visit at week 1 (day 6–8), 21% see patients between days 2 and 5, 19% see

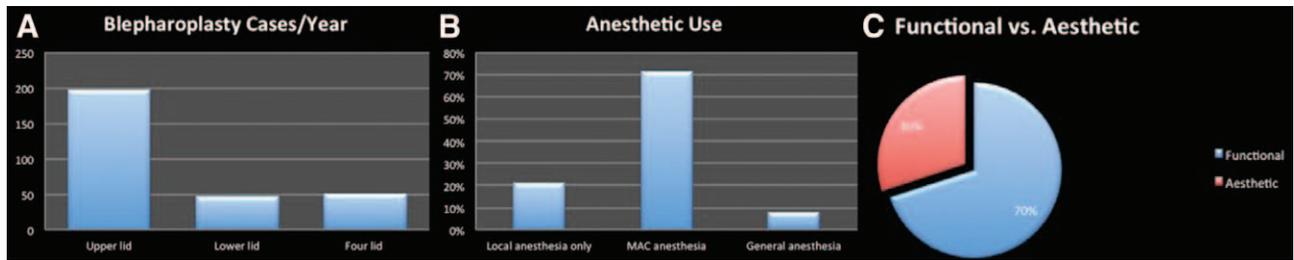


FIG 1. General blepharoplasty: A, blepharoplasty cases/year; B, functional versus cosmetic; C, anesthesia use.

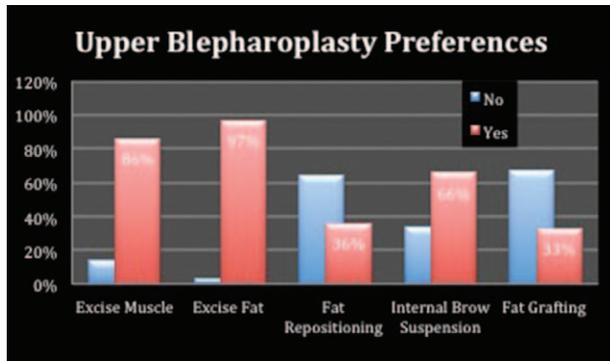


FIG 2. Upper blepharoplasty preferences.

patients at postoperative day 1, and 3% see patients at postoperative day 9 or greater. Postoperative photographs are performed by 38% of surgeons at postoperative month 3 followed by 21% at postoperative month 2 and 13% and 12% at postoperative months 1 and 6, respectively.

Figures 1–3 summarize the major findings from the report, while a detailed analysis of the data is available in Supplemental Tables 2–4 (Supplemental Digital Content 2, available at <http://links.lww.com/IOP/A151>; Supplemental Digital Content 3, available at <http://links.lww.com/IOP/A152>; and Supplemental Digital Content 4, available at <http://links.lww.com/IOP/A153>).

DISCUSSION

Blepharoplasty is one of the most common surgical procedures performed by oculofacial surgeons. In many ways, it is a defining procedure of the specialty, as no other related surgical discipline has equal background or experience with the eye, eyelids, or periorbital. This places oculofacial plastic surgeons at the forefront of eyelid surgery, and in a unique position when

evaluating practice patterns and technical aspects of the procedure, including choice of technique.

As the volume of blepharoplasty surgery has increased, so too has the evolution of the procedure. Traditionally, surgery consisted primarily of aggressive tissue (skin, muscle, and fat) excision.¹⁸ More recently, there has been a general paradigm shift toward tissue preservation and/or augmentation.^{13–16,19,20} What is the best or most correct approach to surgery? No one really knows, and much of the information suggested is anecdotal at best. However, trends do exist. In this report, the authors surveyed whom they thought was best suited to determine these contemporary patterns (ASOPRS active membership) to provide a baseline of data which others can compare their personal experience to. This is critical information that should be revisited on an interim basis to allow continued advancement with the procedure. As the response rate to the survey is 34%, which is higher than the 24% average for nonincentive surveys,²¹ the authors believe that the information gathered is a fair representation of ASOPRS member practice patterns and provides credence to the information gathered.

The first series of survey questions focuses on general blepharoplasty. The most striking finding of the survey is the volume of procedures performed annually by responding ASOPRS members. This totaled 275 surgeries including 196 upper, 46 lower, and 53 four-lid procedures. It is likely that ASOPRS members responding to a blepharoplasty survey have practices skewed toward this procedure, which may artificially inflate the true numbers of the society as a whole. Also, the authors are aware that most respondents answered questions based on estimates rather than true-validated quantification of their surgical volume. That notwithstanding, as stated, with a 34% response rate, there is a general validity to these numbers. In addition, as the majority of these cases are isolated upper eyelid procedures, and functional upper blepharoplasty is a staple in an oculofacial plastics practice, the numbers make sense.

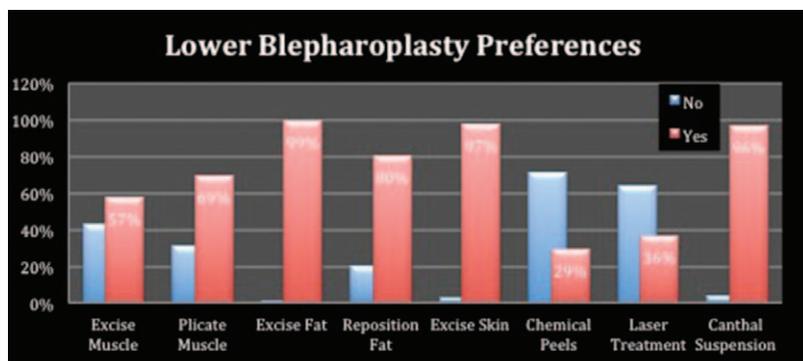


FIG 3. Lower blepharoplasty preferences.

Interestingly, the most common anesthesia preference among respondents is monitored care (71%), with only 21% preferring local anesthesia. This is somewhat surprising as ASOPRS members are generally comfortable and adept at eyelid surgery and keeping patients comfortable. This finding may be attributed to the high percentage of functional blepharoplasty (70%) cases where insurance coverage absorbs the additional cost of anesthesia. Other clear trends include a preference to prescribing postoperative antibiotic ointment (89%); with erythromycin, bacitracin, and Maxitrol being the most common medications prescribed, and only a small number of respondents (14%) prescribing postoperative oral antibiotics. The authors unfortunately did not ask to specify a difference between antibiotic ointment and drops postoperatively, and there were no responses regarding the use of drops. It is also noteworthy that almost 50% of respondents mark patients in the preoperative area, and in these instances, 56% mark patients in the supine position. Finally, the data collected demonstrate that most surgeons perform their first postoperative visit at day 6 to 8 after surgery, and that postoperative photographs are most commonly taken at 3 months after surgery. Although not a surprise, some of the authors believed that many ASOPRS members would prefer postop day 1 visits to evaluate the cornea, assure compliance with instructions and medications, etc. Yet, this only occurs in approximately 20% of cases. While timing of the first postoperative visit is not so surprising, the early timing of photography may be. At least with upper blepharoplasty, this is probably because most surgeons still perform primarily functional surgery, where improvement is clearly noted at 3 months. However, an objective cosmetic result often takes longer to assess.

When evaluating upper eyelid blepharoplasty, the data show that excision of orbicularis oculi muscle during surgery is commonly performed (86%), and that 40% of those that excise muscle do so in the majority of their cases (81–100). This was somewhat surprising with the more contemporary trend toward tissue preservation. It would be interesting to know if there was an increased incidence of postoperative dry eye, incomplete blink, or a difference in subjective surgical outcome assessment in those who routinely excise orbicularis muscle versus those that do not. This has not been shown previously in the few studies that have analyzed this.^{22,23} Like orbicularis muscle, eyelid/orbital fat is excised commonly during surgery, and in fact, almost universally (97%). The proviso is that surgeons generally favor graded removal of the nasal fat pad with sparing of the central fat in the majority (88%) of cases. This trend is supported by the growing body of literature that advocates the preservation of orbital volume to avoid an iatrogenic hollow superior sulcus or A-frame deformity.^{20,24–27} Recently, Korn et al²⁸ demonstrated that clinically, the nasal fat compartment tends to become more prominent with age (true or relative), while the central compartment tends to involute with age. These authors further showed biochemically why this may be the case.²⁹ This paradigm may lend credence to central fat pad preservation and or redistribution (repositioning) during surgery. One of the authors (G.G.M.) has been an advocate of this approach.^{19,26} While the concept of nasal fat redistribution in upper blepharoplasty has not been shown in an evidence-based way to prevent postoperative volume depletion, clearly ASOPRS members are beginning to adopt this technique as 36% of respondents sometimes employ this adjunct. In further support of this trend of volume awareness, 33% of respondents report sometimes adding fat grafting to surgery (although most [81%] in fewer than 20% of cases). Fat grafting requires additional training (i.e., liposuction, fat preparation, processing, and injection) than standard eyelid surgery. That 33% of respondents have taken the time and effort to add this adjunct to their surgical armamentarium is a

testament to the openness of ASOPRS members to continually advance their skill sets.

The authors found it interesting that, when identified, 25% of respondents left a prolapsed lacrimal gland undisturbed. This may be because the survey question did not quantify degree of prolapse that may dictate the decision to reposition.³⁰ Surprising to the authors was that 3% of surgeons still address this issue with partial gland resection³¹ when other, generally complication free, viable options that do not remove native gland parenchyma are available. Some last points of interest are that 66% of respondents perform internal brow suspension during surgery, but most (76%) in fewer than 20% of cases. Again, it would have been interesting to note if this was still true in pure cosmetic procedures where more reproducible and powerful, yet costly, options are available.

Contemporary aesthetic trends in lower eyelid blepharoplasty focus on reducing “eye-bag” prominence while recreating the smooth (youthful) transition of the lower eyelid–cheek interface.^{13,14,32,33} This requires preserving (redistributing) and/or enhancing eyelid volume. In addition, more conservative skin excision, orbicularis muscle preservation, and supportive canthal suspension have become essential components of lower eyelid surgery.³⁴ The survey results support these trends as a majority (80%) of surgeons sometimes perform fat repositioning in lower eyelid blepharoplasty. In these cases, the suprapariosteal plane (70%) is most commonly used for fat repositioning. It has been shown that there is no difference in aesthetic surgical outcome when native eyelid fat is redistributed to either the supra- and subperiosteal plane.³² However, this same report showed that suprapariosteal surgery is faster and technically less demanding,³² so this result is not surprising. While fat transposition has become a frequent adjunct to lower lid blepharoplasty (LLB), some degree of orbital fat is still excised by almost all (99%) respondents (roughly equally dispersed amongst all 3 fat pads).

The survey results also demonstrate that skin excision in LLB is performed as needed by 97% of respondents; of which, 76% do so in most cases and 79% use the skin pinch technique.³⁵ These findings are in line with what the authors expected. The orbicularis muscle is left undisturbed in 43% of cases. Of those respondents (57%) who do excise orbicularis muscle, 48% do so in fewer than 20% of cases, resulting in orbicularis muscle preservation by the majority of surgeons. This is also expected as less disruption of the orbicularis muscle most likely reduces the incidence of postoperative eyelid malposition.³⁶ Conversely, orbicularis plication, likely for sole or added eyelid support, is a commonly performed procedure (69%). These percentages show that while caution, and complication avoidance, is always at the forefront, surgical decision-making is based on the balance of physical findings and the risk/benefit profile. Finally, canthal suspension is performed in conjunction with LLB by most (96%) respondents. The most common suspension is an open approach technique (71% through a canthotomy incision). In these instances, tarsal resection is performed in the majority of cases (80%). This is somewhat surprising in an aesthetic patient population, but is likely a reflection of the society’s expertise and confidence with canthal reconstruction. Closed canthal suspension approaches (no canthotomy or division of commissure)^{37,38} have gained acceptance in eyelid surgery as they are less disruptive of native canthal anatomy and architecture, and potentially may lead to a more aesthetic outcome.³⁹ Fifty-one percent of respondents perform this newer variant of canthal suspension demonstrating its acceptance by ASOPRS members.

A critical finding of this report is the most common access point respondents employ to perform LLB. The data show that

the transconjunctival approach is most universally applied, as it is performed by 96% of respondents. Conversely, transcutaneous surgery is performed by 82% of members, while 51% perform both. In transconjunctival surgery, an electrocautery unit or CO₂ laser is used to make the incision by 74% of respondents, of which 45% suture the incision, most commonly with 6-0 plain gut suture. Finally, adjuncts to improve skin quality and appearance, including chemical peels (29%) and laser skin resurfacing (36%), are performed by the minority of surgeons. This may be because the added benefit of these interventions does not outweigh the prolonged healing time, increased risks, and potential added costs (i.e., laser device) associated with these techniques.

A final point which the authors think warrants attention related to all practice patterns (general, upper, and lower blepharoplasty) evaluated in this report is how practice volume altered the data collected. To evaluate this, the data were subdivided based on only the highest volume (10 surgeons > 400 upper lid blepharoplasty, > 100 LLB) and lowest volume (15 surgeons <50 upper lid blepharoplasty, < 10 LLB) surgeons, and the remaining 128 without these outliers. Interestingly, the percent response rate was strikingly similar showing that volume of procedure performed did not alter the general practice trends. This is interesting and suggests a general consistency among ASOPRS members whether related to training or continuing medical education, or more likely both.

The authors greatly appreciate the time the respondents took to fill out their questionnaires so that the information attained could be shared with the ASOPRS membership. It is often difficult for surgeons to keep abreast of current trends within their specialty, as the day-to-day business of their practice can be time consuming and all encompassing. For this reason, it is prudent for surveys on common surgical procedures to be performed on an interval basis from an educational standpoint, and also to allow continued awareness of how the field is evolving. This is a valued, and in many ways needed, addition to annual scientific meetings. Like all studies, this report has weakness, and in this case, they are hard to overcome. As with all surveys, certain topics are inadvertently omitted. The retrospective nature of the survey has inherent recall bias, non-response bias, and selection bias. Respondents were allowed to skip questions, provide more than 1 answer to some questions (hence total response percentage sometimes greater than 100%), and respond that interventions are sometimes performed, somewhat limiting the data analysis. Question number 4 is worded incorrectly. It asked what percentage of cases (including both upper and lower eyelid blepharoplasty as a whole) are functional versus purely aesthetic. Because the question did not separate upper versus lower eyelid blepharoplasty, the results may be skewed since lower eyelid blepharoplasty is always considered cosmetic. Also, respondent demographics and specific surgical details were not requested, potentially limiting the interpretation of some data. Finally, the results reported in the survey are only reflective of current practice patterns and do not necessarily suggest clinical superiority. As these limitations are inherent to most such surveys, the authors are confident that the report provides a credible summary of contemporary blepharoplasty management practices among ASOPRS members.

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