Assessment of the Cosmetic Effect of Eye Bag Surgery on Facial Morphology Changes

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Abstract: Blepharoplasty, or eye bag surgery, removes skin, fat, and muscle from the eyelids to improve their look. This article examines how blepharoplasty changes facial morphology by evaluating surgical methods, preparation, assessment criteria, and measurement instruments. Patient satisfaction questionnaires, panel assessments and photographic comparisons show how blepharoplasty reduces eye bag prominence, improves skin elasticity, and changes facial topography. Success is extensively established, although the best results depend on patient selection, careful and detailed surgery planning, and technical execution by skilled surgeons. The assessment also suggests blepharoplasty for periorbital rejuvenation but emphasizes the need for more research to better meet patients’ demands.

Keywords: Blepharoplasty; Facial morphology; Reshape the facial contour; Surgical Methodperiorbital region

1. Introduction

1.1. Background on Eye Bag Surgery (Blepharoplasty)

As highlighted by Kato et al. (2023), eye bag surgery, or blepharoplasty, is a cosmetic surgical process that aims to enhance the cosmetic appearance of the periorbital area, emphasizing the upper and lower eyelids[7]. Over the years, the skin around the eyes becomes wrinkled due to the loss of elasticity, and the muscles that hold the eyelids also degenerate (Peng & Peng (2020)[13]. This natural process results in the formation of eye bags, wrinkles, and skin that sags and forms fatty deposits of skin, fat and muscles. Such physical alterations may make the individual look tired, aged or sad, unsuitable for morale or self-esteem. These issues are corrected through blepharoplasty by removing the excess skin and tightening the remaining skin and muscles to give the eyes a youthful, alert and refreshed look.

According to Kołodziejczak & Rotsztejn (2022), eye bag surgery is mainly aimed at achieving the improvement of the contour of the area around the eyes to have a more pleasant appearance by removing the bulging or sagging skin characteristic of eye bags[9]. This is made possible through various approaches, which may involve excision of skin, mobilization or excision of fatty tissues, and pulling of relaxed muscles. Consequently, blepharoplasty can give the periorbital area a youthful appearance when focused on these areas, thus enhancing facial aesthetics.

1.2. Importance of Facial Morphology in Cosmetic Surgery

As Mohamed et al. (2020) noted, improving facial morphology is the central goal of cosmetic surgery because facial morphology contributes to every person's appearance, attractiveness and attitude toward the self[12]. For instance, as noted by Wang et al. (2020), the periorbital area is the area of skin surrounding the eyes[20], it can also be referred to as the eyelid region, and this area is of paramount importance and one of the most attractive, relevant and exciting facial parts. According to Flament et al. (2020), as a result, the changes, betterments or reparations conferred to this region present potential for gross alterations in the general facial morphology and cosmetic appearance[4].

Flament et al. (2020) state that cosmetic operations mainly implicated in the periorbital region, including eye bag surgery, are intended to make a sculpted and harmonized face form to morphological liaison. According to Borba and Rodrigues (2022)[2], the symptoms associated with being overweight could be conquered by undergoing blepharoplasty, as it has the benefits of rectifying imbalance at the...
upper and lower eyelids, reducing fatigue signs, and promoting facial rejuvenation to achieve a more open and alert appearance. As Luong et al. (2024) noted, these changes in facial morphology enhance an individual's self-esteem and increase a more positive attitude toward the self. Moreover\cite{10}, the assessment of facial morphology is critical not only for the outcomes of the specific patient during cosmopolitan operations but also for the Rising development of surgical skills and appreciation of relations of face structures that contributed to the shift from the originally very dramatic-looking lifts to the subtle structural changes that effectively correct the characteristics but do not radically alter the face. As stated by Wang et al. (2021), with a focus on facial shape and morphology in the cosmetically enhanced patient, surgeons seek to provide the most visually satisfying and structurally balanced conclusions for these procedures\cite{19}, avoiding complications likely to transpire in cases that do not align with the patient's facial symmetry.

1.3. Purpose and Significance of the Assessment

This assessment aims to review how effectively the procedure of eye bag surgery can alter the upper facial morphology for cosmetic improvement of the periorbital area. Through analysis of the surgical procedures utilized, the measures employed to assess cosmesis, and the findings established from differently conducted assessments, this study proposes to add to the existing body of knowledge regarding blepharoplasty and its potential implications on facial aesthetics.

This procedure is essential because it can help realize diffusion, enhance clinical practices, improve patients' decision-making processes, and advance future studies regarding cosmetic surgery. As a result, the present research can provide helpful information for further developing surgical approaches for eye bag removal, describing the benefits and undesirable effects of the surgery, and increasing surgeons' and patients' awareness of the possibilities and limitations of the surgery. Furthermore, the outcome of this evaluation may help an individual decide whether or not to go for a blepharoplasty surgery since the tool offers a more comprehensive depiction of what the patients are likely to gain and lose or otherwise face from this procedure.

In addition, this assessment can provide information that can help establish guidelines for evaluating esthetic outcomes of blepharoplasty and evaluating the effectiveness of other facial rejuvenation procedures. Due to the objective evaluations as well as the patient satisfaction survey, the assessment by an expert panel, and the photography comparison, the present study can make a better evaluation standard for evaluating the cosmetic results of the eye bag surgery to make the further accumulation of body cosmetic surgery data.

Therefore, the results derived from this study can be helpful for further research in the field of cosmetic surgery and, in particular, in studying the area around the eyes and their contribution to the morphological features of the face. Through understanding specific strengths and weaknesses of the current surgical procedures and assessment methods, the findings of this study can help suggest avenues for further research in the field of cosmetic surgery, thereby bringing the process closer to the development of improved, efficient, and tailored methods of surgery for individual patients.

2. Surgical Techniques and Methods

2.1. Types of Eye Bag Surgery

According to Jin et al. (2022), there is a variety of blepharoplasty, an eye bag surgery aimed at achieving particular objectives when removing or minimizing certain aesthetic defects in the periorbital area\cite{5}. Upper blepharoplasty targets the upper eyelids specifically with attention directed at the skin and fat that is excised to increase the aesthetic appeal by positively altering the look of the eyes. This is useful to persons with hooded or low eyebrows, which are attributed to causing a tired and aging appearance. In this intervention, the initial incision is made along the natural line of the crease in the upper eyelid to resect the skin and fix the remaining skin and muscle tissue.

According to Zhou et al. (2023), lower eyelid blepharoplasty, on the other hand, aims to eliminate unnecessary skin\cite{21}, fat and muscle within the area of the lower eyelids, which contributes to removing bags and wrinkles in the eye area. This method is effective provided a patient suffers from increased prominence of bags below the eyes, droopiness of the skin on the lower eyelids or deep creases in the face. As stated by Maione et al. (2021), in some cases, the surgeon may incise the skin right on the margin of the lashes or in the lid crease of the lower eyelid to enable him or her to access the area where required.
tissues are to be removed or redistributed\cite{11}.

Transconjunctival blepharoplasty is a specific method that includes an incision made internally and inferior to the eyelid to not leave any scar or mark externally (Sullivan et al., 2023)\cite{17}. Kam et al. (2022) noted that this approach is most effective in treating fixed fat herniation with minimal skin redundancy compared to the selected subcarnuncular pockets\cite{6}. This is a less invasive method, which entails easier access to the fat pads through the conjunctiva of the inner aspect of the eyelid; this makes for less chance of contracting a scar or even position maladjustment of the eyelids. Laser blepharoplasty is a cosmetically invasive procedure compared to the generally invasive classic surgery that uses lasers to tighten the skin around the eyes and remove redundant skin. The approach has several benefits, such as minimal work disruption in that the patient does not need time off work, minor inflammation and development of bruises and scarring. However, laser blepharoplasty may not be ideal for all patient candidates, especially those requiring more extensive surgical intervention due to added skin looseness or deeper wrinkling.

Regarding the surgical technique to be used during eye bag surgery, numerous factors have to be considered and reviewed below: The patient's requirement and expectation of the amount of skin and fat must be eliminated, the condition of the skin as well as its elasticity, and the expertise and decision of the surgeon. As stated by Varman et al. (2021), in some cases, one may use a combination of techniques deemed more cosmetologically appropriate to address the upper and lower eyelids simultaneously, given the collaboration of the upper and lower eyelids in the aesthetic appearance of the facial area\cite{18}.

2.2. Pre-Surgical Evaluation and Planning

According to Bouguila et al. (2022), it is essential to evaluate patients and plan surgery before the operation to make the process. These include the opportunity to control the diagnosis and determine the general and individual contraindications, as well as possible complications and limitations, and select the most appropriate and effective strategy for further cosmetic surgery operation\cite{3}.

As noted by Raffaini et al. (2022), part of the reception and preparation of the patient for surgery is the initial consultation with a cosmetic surgeon\cite{14}. At this point, the patient can voice their concerns. It is a crucial step as the surgeon listens to the patient's wishes and evaluates the facial structure, texture of the skin, and volume of the skin, fat, and muscles in the periorbital region. This preliminary evaluation assists the surgeon in determining if the patient is a good candidate for eye bag surgery and which procedures could be ideal for the best outcome. According to Keyhan et al. (2021), in addition to a physical check-up, a surgeon must be aware of the patient's medical history and any problems they might have before, as well as current medicines, known allergies, or past operations\cite{8}. Some information helps identify other risks or consequences that may raise the risk of operation failure or complication. Surgeons question patients about their lifestyle, including smoking, alcohol use, and sunshine exposure, which affects recovery and surgery outcomes.

Based on the patient's consultation and medical history, the surgeon may propose further tests or inspections before eye bag surgery. These may involve haematologic tests, an eye exam to determine patients' physical health, or imaging to observe the eyelids and other tissues' structures. If the patient qualifies for eye bag surgery, the surgeon plans it. This includes detailing the sorts of procedures, their methodologies, incisions, and outcomes. The surgeon and patient review each treatment's dangers, side effects, and problems. Sometimes, before the treatment planning process, the surgeon may willingly take photographs of the patient's eyes and face and some measurements (Jin et al., 2022). These images help compare the preoperative images with the pictures taken during surgery, planning the strategy used, and observing the results after the operation. According to Alghoul et al. (2020), there are also instances where the surgeon may employ other innovative imaging techniques like 3D imaging or computational modeling that would assist the patient in deciding on the process to undertake, the possibilities of the surgery, or the likely results to expect from the specific procedure.

During the preparation process at the surgical ward, the surgeon ensures the patient is informed of different questions or issues that may arise and advises the patient on the requisite preparations before the surgery and physical rehabilitation after the surgery. It is essential to develop efficient communication between the patient and the surgeon; this strengthens the bond between the two, which creates the backdrop for the surgical procedure and resultant cosmetic results.

2.3. Surgical Procedure and Techniques

According to Zhou et al. (2023), eye bag surgery is covered under general blepharoplasty, where
several procedures may be performed based on the physician's or surgeon's recommendation and the patient's physical characteristics. Maione et al. (2021) noted that several basic principles and approaches are practiced almost universally during eye bag surgery to attain high safety, efficacy, and beauty.

Anesthesia is the first stage of the surgical procedure and is administered to the patient to prevent them from feeling any pain (Sullivan et al., 2023) [16]. This will depend on the type and extent of the surgery to be performed, and depending on the patient's choice, this may be local anesthesia with a sedative agent or general anesthesia. As stated by Kam et al. (2022), in most cases, eye bag surgery may only require local anesthesia; the surgeon does not put the patient to sleep but numbs the area where the surgery will be performed. For more complex or simultaneous operations, general anesthesia may be preferential to minimize discomfort for the patient and reduce potential dangers. Basically, after administering anesthesia, the surgeon proceeds with the operation by carefully using scissors to incise the necessary areas. In the case of upper eyelid blepharoplasty, one stays in the dermatochalasis in the crease, limiting scars as less visible as possible. According to Sharma & Asaria (2021), for lower eyelid blepharoplasty, the incisions may be taken below the lash line or in the conjunctival fornix (transconjunctival approach), depending on the chosen technical type and type of deformity [15].

Through these cuts, the surgeon can excise and sculpt the underlying tissue comprising the skin, fatty tissue, and muscle, which causes eye bags and eye bag-related eyelid sagging (Rathgeb et al., 2020) [15]. Employing specialized sharp knives and scissors, the surgeon gently 'peels off' the skin from different layers so that only the required amount of fat is removed or the entire skin is lifted and stretched to the desirable position (Varman et al., 2021).

As in any other aesthetic operation, the excess skin is meticulously excised, leaving sufficient skin so the patient can blink satisfactorily. The redundant skin is carefully removed, leaving just enough skin to allow the patient to close the eye sufficiently. Care must be taken not to over-resect the face, but if required, the surgeon may also reduce or reposition small volumes of fat to fine-tune the face and provide the 'youthful' aesthetic (Raffaini et al., 2022). As stated by Keyhan et al. (2021), in the case of lower eyelid blepharoplasty, the surgeon mainly aims at narrowing down and managing the fatty deposits that develop beneath the eyes to achieve an aesthetically pleasing shape. If there is still some loose redundant skin, this is also excised to best contour the lower lid.

Depending on the treatment requirements, the surgeon may also engage in other procedures that help improve the appearance of the patient's eyes after the eye bag surgery. For instance, the surgeon may perform a direct muscle rejuvenation and tighten the underlying muscles, often referred to as orbicularis oculi, to support the eyelids and offer an excellent figure. It benefits patients with low tone or ptotic eyelids, meaning that those with a poor or weak ability to hold the eyelids up have benefits.

When the necessary corrections are required, the surgeon carefully and dexterously manages to suture the incisions using fine sutures or other glue, operative tape or skin adhesives. As stated by Alghoul et al. (2020), patients should discuss the surgical closure method with the surgeon before the procedure so that the most appropriate technique, given the location and size of the incision, the surgeon's experience, and the patient's healing traits, is used. The desired outcome is to have a tight and secure closure, which will not stretch the skin excessively and the best possible healing results with minimal scar appearance. In the post-operation period, the clients are closely observed in a special ward to ensure the complete elimination of the anesthetic effects [1]. The surgeon then gives the patient directions on how to care for the surgical site and instructs what to do in case of developments such as swelling, bruising, and pain experienced after surgery. To avoid worsening the condition, one is advised to refrain from rubbing the eyes, washing them roughly, or using any eye makeup until the doctor gives the green light; using cold compresses, gentle washing of the eyes, using prescribed eyedrops or ointments.

According to Zhou et al. (2023), after the eye bag surgery, the patient must schedule follow-up visits in the subsequent weeks and months as the body heals and the cosmetic benefits are revealed, follow-up appointments with the surgeon are necessary to evaluate the functional and aesthetic results of the surgery, to address any difficulties the patient may have, and to ensure that the patient is receiving a satisfactory result (Maione et al. 2021).

3. Medical Cosmetic Effect Evaluation

3.1. Criteria for Evaluation

Several factors are taken into account for a more comprehensive evaluation of the cosmetic impact
of eye bag surgery on facial morphology changes. These criteria help to define the procedure's results in achieving the target effects on the appearance of the periorbital region.

When assessing the cosmetic result of eye bag surgery, one of the measures for comparison is the size of the eye bags. Dark circles, which are folds of excess skin and fatty tissue under the eyes, could be hereditary or develop as one age, giving a tired, sad or rather old look to the face (Varman et al., 2021). The extent to which the symptoms of active eye bags may be reduced after blepharoplasty can be determined to be a prime measure of the procedure's efficacy. The appearance of eye bags in different individuals may vary in terms of size, color and location; thus, a marked minimization in the size and conspicuousness of eye bags as well as the creation of a smooth and youthful blind spot beneath the eyes is regarded as a positive outcome in the cosmetic sense.

The other criterion of consideration is the texture of the skin after treatment. With age, the skin around the eye area also becomes less tight and firm, which shows fine lines, wrinkles and crepeyskin (Raffaini et al., 2022). Specifically, eye bag surgery, especially if combined with a skin lifting technique, refreshes the skin assessed in the periorbital region as to elasticity and overall condition. The success of this procedure can be deduced from noticeable signs of skin tightness, smoothness, and firmness immediately after the process.

Another criterion that should be considered when assessing the result achieved through the surgery aimed at removing eye bags is the shaping of facial contour. The periorbital region contributes to the entire facial aesthetic and contouring, and the effect of eye bags or eyelid ptosis impairs this. It is possible to state that blepharoplasty improves facial shape and, in particular, helps achieve more youthful facial structure by removing the skin and fat tissues and tightening the muscles (Jin et al., 2022). In a successful procedure, the sightedness of the eyes, the elimination of bags and swelling, and the overall symmetry of the face will make the eyes more expressive and harmonious with the rest.

3.2. Evaluation Methods

More dimensions are considered in the assessment to accurately determine the cosmetic effect of eye bag surgery in changing the face's morphology. This approach includes and integrates quantitative and qualitative aspects that enable one to assess the results of the particular procedure to get a comprehensive picture of the success in achieving and delivering the overall beauty goals (Sullivan et al., 2023).

The patients' satisfaction levels are among the critical assessment tools generally applied. Surveys allow people to share their eye bag surgery experience and satisfaction with the new look. Patients can evaluate eye bag reduction, skin roughness, and facial features using panelists' knowledge, which is another proper evaluation method. A committee of cosmetic surgeons or other aesthetic professionals not affiliated with the surgeon under review studies preoperative and postoperative photos of eye bag surgery patients who don't know the surgeon's name. The specialists assess cosmetic results by eradicating eye bags, increasing skin quality, and shaping the face. Panel members assess if the surgery has achieved its purpose of beautifying the patient's face and body and make suggestions for improving it. Further, the postoperative cosmetic expert panel assessments help to achieve an impartial opinion from an expert who has no prior knowledge of the surgery and who can assess the degree and quality of the cosmetic outcomes as well as the techniques used effectively to promote and improve the cosmetic aspects of the face.

4. Results and Analysis

4.1. Data Collection and Processing

A broad and elaborate process of data collection and data processing was followed to evaluate the cosmetic effect of eye bag surgery on the changes in facial morphology. A cross-sectional, descriptive study was done using a prospective design and patients were recruited if they presented for eye bag surgery in the participating cosmetic surgical centers. The patients were selected according to the inclusion and exclusion factors set before the study; thus, the sample of patients who wanted periorbital rejuvenation treatment was quite diverse but not random.

Data gathering embraced various techniques, such as the quick satisfaction questionnaires completed by the patients, review and evaluation by the panel of experts and the digital photographs taken both before and after the procedure. The patients completed questionnaires that used a format of items and response options at different points, such as before the operation, one month, three months, six months,
and 12 months after the operation. The surveys above collected patient data, including specifics regarding their satisfaction with the procedure's aesthetic outcome, perceived enhancement of eye bags, and overall impact on their quality of life. The assessments made by the panels of experts involved the opinion of a group of prominent cosmetic surgeons and aestheticians. The panel members were asked for pre- and postoperative photographs of each patient, and the cosmetic results were graded based on specific criteria, including reduction of eye bags and improvements of skin texture and facial contour. These assessments afforded the panel an independent set of references to evaluate the surgical results.

The photographic comparison was done using initial and final pictures, properly calibrated same-sized and high-resolution photos shot in uniform lighting. The before and after images were studied with the help of photo analysis software with the option to measure the degree of change in volumetric dimensions of the eye bags, skin coarseness, and face metrics. The software also allowed for the registration and perfect superimposition of the preoperative and postoperative images, thus helping the patient understand the extent of transformation after the surgery.

4.2. Analysis of Evaluation Results

The data gathered showed some favorable changes in facial morphology after undergoing an eye bag surgery. Credible assessment from the patients indicated that they have a high level of satisfaction based on the aesthetics of the results, with most of the patients expressing satisfaction in the reduction in the eye bags and the general facial appearance. Patients also reported improved self-esteem, social contacts, interpersonal relationships, and overall quality of life.

The outcomes of the patient ratings were further validated by expert panel assessments of the patients, in which the panel of members again rated the postoperative results as highly beneficial to appearance compared to the preoperative situation. The panel also stated that some of the main aspects that positively impact cosmetic outcomes include controlling the presence of eye bags, changes in skin texture, and improved facial contour. Purely pictorial records, including before-and-after photo comparisons, offered assessable means that detailed the makeovers attained from eye bag surgeries. The difference in the volume of eye bags before and after surgery could be established from the images; the mean reduction in eye bags was 70%. Thus, the analysis also showed enhancement of skin smoothness, which indicated a decrease in wrinkles, fabulous lines, skin tightness, and tone.

By exploring the data gathered through the thematic content analysis, several significant themes emerged that illustrated cosmetic enhancements from eye bag surgery. The study concluded that other evidence-based themes include a "Substantial decrease in the protrusion of eye bags," "Improvement in skin texture and elasticity," and "Holistic facial re-sculpting." These relatable themes included patient satisfaction surveys comprising expert disposition appraisal and preoperative and postoperative comparisons through photographs. The present study also revealed other themes under patient characteristics or variables like age, skin quality and surgical technique, suggesting that the two might impact the outcomes of eye bag surgery.

4.3. Discussion of Findings

The findings of this study suggest that eye bag surgery effectively enhances facial appearance and yields favourable esthetic changes in facial form. These include a gross reduction in eye bag prominence, the skin texture of the face, and the general contour of the face, which are some of the main objectives of periorbital rejuvenation.

In light of this study, the results depicting enhanced patient satisfaction levels give credence to eye bag surgery's effectiveness in transforming candidates' faces and lives. Not only are the cosmetic expectations, which would be the changed looks brought by surgery, met, but the quality of life of those undergoing surgery is enhanced through increased confidence and social relations. These findings indicate the necessity of both somatic and psychologic approaches to cosmetic treatments.

The evaluations of the cosmetic outcomes are comprehensive and relatively objective in this paper due to the inclusion of expert panel assessments and the objective photograph analysis. That outcome data matches with evaluations made by oculoplastic surgeons, enhances the results' reliability and supports eye bag surgery's efficacy in pursuing the intended aesthetic goal. However, caution needs to be taken when interpreting the results of this research study without realizing certain limitations of this work. The patients included in the study may also be selected from the particular centers providing the eye bag surgery, and the study may not include the entire spectrum of patients or the various techniques that may

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be used in the field. Further, 12 months might not always be sufficient to assess the durability and stability of the cosmetics results.

Nonetheless, the implication of the findings of this study has profound vitality in clinical practice and avenues for further research. The findings appear to endorse eye bag surgery as a viable solution to patients demanding periorbital rejuvenation while paying important lessons on functionalities affecting cosmetic consequences. The study also points to the importance of developing a transparent methodology of assessment and reporting technology so that results may be compared based on different research that can help propel the field of cosmetic surgery.

### Table 1: Changes in Eye Bag Volume, Skin Coarseness, and Facial Metrics in 20 Patients Undergoing Eye Bag Surgery

<table>
<thead>
<tr>
<th>Patient</th>
<th>Eye Bag Volume (mm²)</th>
<th>Skin Coarseness (Ra value)</th>
<th>Facial Metrics</th>
<th>Inter-canthal Distance (mm)</th>
<th>Pre-palpebral Fissure Width (mm)</th>
<th>Margin Reflex Distance 1 (mm)</th>
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Figure 1: Changes in Eye Bag Volume, Skin Coarseness, and Facial Metrics in 20 Patients Undergoing Eye Bag Surgery

The data shows consistent improvements across all 20 patients in terms of eye bag volume reduction (65-70%), decreased skin coarseness (48-56%), and enhanced facial metrics, particularly in the palpebral fissure width, margin reflex distance 1, and lower lid contour. As expected, the inter-canthal distance remained unchanged since eye bag surgery does not typically affect this parameter. The pre-and postoperative images for each patient allowed for a clear visual comparison of the transformative effects of the eye bag surgery on their facial appearance, supporting the quantitative data presented in the figure 1.

5. Conclusion

This assessment thoroughly reviewed how eye bag surgery effectively alters facial morphology for cosmetic improvement of the periorbital area. Findings from patient surveys, expert panels, and photo analyses demonstrate blepharoplasty's ability to reduce eye bag prominence, enhance skin texture, and reshape the facial contour for a more youthful, harmonious appearance. While positive outcomes are established, proper patient selection, surgical planning, and technique execution are crucial. This assessment underscores blepharoplasty's viability for periorbital rejuvenation while highlighting the need for continued refinement to optimize individual results.

References


