Advanced Medical Journal, Vol.10, No.4, P.48-55,2025 https://doi.org/10.56056/amj.2025.397

Evaluation of Efficacy of Perioperative Oral Dexamethasone in Reducing Swelling and Ecchymosis After Blepharoplasty Surgery

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Abstract

Background and objectives: Blepharoplasty, a common cosmetic procedure, can lead to postoperative issues like swelling and bruising. Steroids are occasionally used to address these concerns and speed up recovery. This study aims to evaluate how effective steroids are in reducing periorbital swelling and bruising in blepharoplasty patients.

Methods: From November 2022 to June 2023, a descriptive analysis was conducted on forty participants at Dermodento Center and Safin private hospitals in Kurdistan/Iraq. The participants were divided into two groups. Group 1 (twenty individuals) received Dexamethasone 8 mg tablets thirty minutes before surgery, continuing for three days post-surgery. Group 2 (twenty participants) did not receive steroid treatment. Periorbital swelling and bruising were assessed using a standardized visual inspection scale, enabling objective measurement and comparison between the steroid-treated and non-treated groups.

Results: Among the 40 patients, 35 were female and 5 were male, with an average age of 39.19. Median swelling scores decreased from 1.5 (range: 1.0-2.0) on POD 1 to 0 (range: 0.0-1.0) on POD 7. Similarly, median ecchymosis scores decreased from 2.0 (range: 1.0-2.0) on POD 1 to 0 (range: 0.0-1.0) on POD 7. The study demonstrated a significant reduction in swelling and ecchymosis among participants who received steroid treatment compared to the control group, with statistically significant results ($p < 0.05$).

Conclusion: Steroids reduce periorbital swelling and bruising after blepharoplasty, enhancing outcomes and patient satisfaction, and highlighting their procedural benefits.

Keywords: Blepharoplasty, Dexamethasone, Ecchymosis, Edema

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Introduction

In the world of cosmetic surgery, procedures such as blepharoplasty are undergoing a substantial surge in popularity. This upswing in demand arises from its impressive ability not only to rectify visible cosmetic flaws but also to notably enhance the overall facial appearance. Beyond simply improving looks, blepharoplasty can also enhance facial symmetry and give a more youthful and vibrant look. Its ability to deliver such comprehensive results has caught the attention of many people looking for a complete facial rejuvenation, making blepharoplasty a highly sought-after choice in the field of cosmetic enhancement.[1] Blepharoplasty, despite its potential to enhance facial aesthetics, presents its own set of challenges. Following surgery, patients frequently encounter discomfort, swelling, and bruising. The severity and duration of these complications hinge on various factors, including the complexity of the surgical procedure and each individual's unique healing responses. Consequently, effectively managing these postoperative issues is imperative to ensure optimal patient outcomes and satisfaction, underscoring the importance of comprehensive care throughout the recovery process.[2-4] Furthermore, when multiple facial procedures are performed simultaneously, like combining rhinoplasty with blepharoplasty, the chances and severity of postoperative swelling and bruising increase. This highlights the importance of thorough preoperative assessment and patient education. It's crucial to manage expectations and minimize possible complications associated with combined procedures to achieve the best results and ensure patient satisfaction. Therefore, conducting a comprehensive evaluation and maintaining transparent communication with patients are vital steps to prepare them for potential challenges and ensure they are fully informed and engaged in their treatment process.[5] Over the course of medical history, corticosteroids have played a crucial part in managing postoperative bruising and swelling, especially in complex maxillofacial surgeries. Leveraging their powerful anti-inflammatory properties, steroids have shown significant effectiveness in reducing tissue swelling and inflammation. This therapeutic ability has been invaluable in speeding up recovery and easing discomfort for patients undergoing intricate facial procedures. Consequently, the strategic use of corticosteroids in perioperative care routines has become fundamental in improving patient outcomes and enriching the overall surgical experience for complex facial surgeries.[3–9] In the field of Cranio-Facio-Maxillary surgeries, steroids are commonly used perioperatively to reduce swelling after surgery and accelerate the healing process. Several reports and studies have emphasized the effectiveness of systemic steroid administration, as well as other agents like Bromelain and topical products such as arnica, in minimizing facial swelling following various procedures. These procedures include orbital floor exploration, bimaxillary osteotomy, third molar extraction, hair transplant, and rhinoplasty, among others. Such research highlights the versatility and efficacy of steroids in managing postoperative swelling across a range of craniofacial surgeries, providing valuable insights for improving patient outcomes in these intricate surgical settings.[4,5,10] In consideration of this background, our research was designed to meticulously investigate the role of corticosteroids in addressing the occurrence of postoperative bruising and swelling after blepharoplasty surgery. Our study's focal point on this specific aspect of perioperative care was intended to offer a comprehensive understanding and provide actionable insights aimed at refining patient outcomes

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and enhancing the overall journey for individuals undergoing blepharoplasty procedures. Through a thorough exploration of the efficacy of corticosteroids in this context, we aimed to contribute substantively to the advancement of clinical practices in the field of cosmetic surgery, ultimately striving to elevate the standard of care and satisfaction for patients undergoing blepharoplasty.

Patients and methods:

The research involved 40 randomly selected healthy adult individuals who sought blepharoplasty surgery treated at Dermodento Center and Safin private hospitals in Kurdistan/Iraq. The patients represented wide range of demographics, including an age, gender distribution, diverse socioeconomic backgrounds, occupations and comprehensive recording of the patient's data after operations. After receiving comprehensive information about the procedure, as well as the benefits and potential risks associated with steroid use, the patients are provided explicit consent for both the surgical intervention and the administration of steroids. Exclusion criteria included systemic disorders, history of chemotherapy or radiation therapy, pregnancy or lactation, smoking, wound healing therapies, anticoagulant drugs, and hypersensitivity. Patients underwent blepharoplasty surgery performed by the same author under local anesthesia with 1-3 dental carpules (1.8ml) containing a 1:100,000 epinephrine solution. Patients were divided into two groups: the treatment group (n = 20) received dexamethasone 8mg tablet one day before and half an hour before the procedure, continuing for 3 days postoperatively, while the control group (n = 20) did not receive perioperative steroids. Patient scores for ecchymosis and swelling were recorded and assessed at the same surgical clinic using a visual inspection scale by three different observers on postoperative days 1, 3, and 7, following the Totonchi method.[11] For ecchymosis, grading ranged from 0 to 4: 0 represented no color change, 1 indicated a yellowish color, 2 denoted a light purple color, 3 signified a dark purple color, and 4 represented a very dark purple color. Meanwhile, the swelling was graded on a scale of 0 to 4: 0 indicated no edema, 1 denoted minimal edema, 2 indicated swelling covering the iris, 3 represented swelling extending to the pupil, and 4 indicated massive edema. With the accordance of Helsinki Declaration, the study was approved by the ethical committee of Kurdistan Higher Council of Medical Specialties (Reference number 844, dated April 12, 2023). Data was entered using IBM SPSS version 22 software. Ecchymosis and swelling were recorded and assessed using a visual inspection scale on postoperative days 1, 3, and 7. Gender differences were analyzed using Pearson's chi-square test, and continuous variables between groups were compared using Kruskall Wallis analysis of variance.

Results

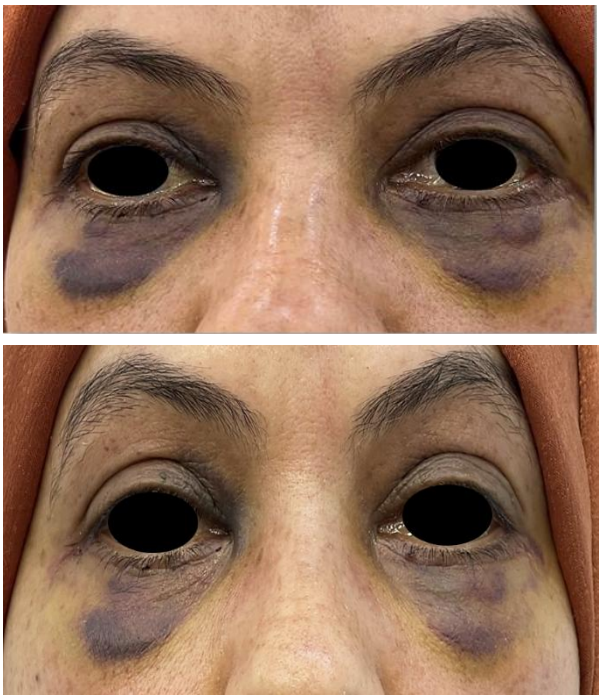
Of those 40 patients who underwent a blepharoplasty operation, 35 were women and the other 5 were men. The patients were between the ages of 25 and 65, with an average age of 39.19. The study included a treatment group (20 patients) receiving steroid injections and a control group (20 patients) without receiving the injections.Regarding age, gender, and the duration of operation, there was not a statistically significant difference between the treatment and control groups. Neither the operation nor the use of steroids caused any negative effects. The mean score of swelling and ecchymosis at postoperative days 1 and 3 was significantly lower in the group that received dexamethasone treatment than that of the control group. The edema was still diminished at postoperative day 7. However, this fast reduction in the swelling and ecchymosis was not seen in the control

https://doi.org/10.56056/amj.2025.397

group. Postoperative edema and ecchymosis were significantly reduced in the group receiving dexamethasone on postoperative days 1, 3, and 7 with a statistically significant difference (P value <0.001). The surgical outcomes regarding edema and ecchymosis are summarized in Table (1) and illustrated in Figures (1, and 2).

Table (1): Median value of swelling and ecchymosis in study groups:

Variable	Treatment group (n=20)	Control group (n=20)	p value
Swelling POD* 1 POD 3 POD 7	 1.5 (1.0-2.0) 1 (1.0-1.0) 0 (0.0-1.0)	 3 (2.75-4.0) 2.5 (1.0-3.0) 1 (1.0-2.0)	 < 0.001 < 0.001 < 0.004
Ecchymosis POD 1 POD 3 POD 7	 2 (1.0-2.0) 1 (1.0-2.0) 0 (0.0-1.0)	 3.5 (3.0-4.0) 3 (2.0-3.25) 1 (1.0-2.0)	 < 0.001 < 0.001 < 0.013
POD* =Post Operative Day			



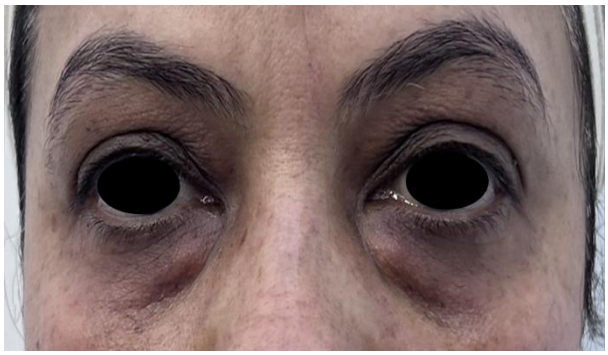


Figure (1): A patient in the control group, from above to below, A=1st, B=3rd, and C=7th postoperative day.

Figure (2): A patient in the treatment group, from above to below, A=1st, B=3rd, and C=7th postoperative day.

https://doi.org/10.56056/amj.2025.397

Discussion

The Glucocorticoids' anti-inflammatory properties reduce vascular permeability, resulting in reduced exudates and edema. Dexamethasone is a very effective anti-inflammatory steroid having a biological half-life of 36-45 hours.[2-4] Recently, many surgeons have advocated for reducing postoperative bruising and swelling following cosmetic surgery. To address this concern, steroids are administered in different doses both before and after the surgical procedure.[4–9] In this study, a specific grading system was devised to evaluate ecchymosis severity and edema degree. Consistent with prior research, our findings revealed reduced peri-orbital edema scores on postoperative days 1 and 4 among patients administered dexamethasone, underscoring its anti-edema efficacy in the early postoperative phase. Nevertheless, it is crucial to note that potential adverse effects were associated with long-term steroid use.[7,12] Long-term steroid usage can result in mineral deficiencies, edema, coronary artery disease, hypertension, Diabetes, and renal failure in addition to infection. Gastric ulcers and pancreatitis are gastrointestinal complications; skin atrophy, pimples, hirsuteness hair loss, and tendency to get bruising are dermatologic side consequences; osteoporosis, osteonecrosis, and myopathy are musculoskeletal complications; and cataracts and myopia are ophthalmological complications.[12–16] However, for those who do not have particular contraindications, short-term corticosteroid treatment usually has few side effects. Edema and ecchymosis commonly occur as side effects of facial surgery. To counteract these effects, varying doses of steroids were administered before, during, and after the surgical procedure.[16,17] The majority of studies revealed that steroids minimize the amount of swelling and ecchymosis in the facial region.[6-11,18-22] A study observed that steroids reduced facial edema in 158 individuals who underwent various facial procedures after administering a single bolus (1g dosage) of methylprednisolone. In the field of faciomaxillary surgery[17], the use of steroids is approved for the surgical extraction of third molars and facial osteotomies.[2,3,22] In a study of third molar surgery, one dose of 125 mg methylprednisolone was found to reduce trismus, edema, and face pain.[18] Similarly, another author investigated the effects of one dose each of 1.5 mg/kg and 3 mg/kg of methylprednisolone following mandibular third molar surgery. Their study revealed that steroids effectively reduced both pain and facial swelling, with no significant advantage observed for the higher dose (3 mg/kg) compared to the lower dose (1.5 mg/kg).[21] In a study involving 40 patients undergoing rhinoplasty with osteotomy, Gurlek, administered high doses of methylprednisolone (250 and 500 mg). Their findings revealed that a larger dose of methylprednisolone was effective in avoiding and lowering periorbital edema after open rhinoplasty with osteotomy.[5] In another study involving 42 patients undergoing open rhinoplasty, the statistical analysis of patient outcomes indicates that a supraperiosteal injection of dexamethasone did not effectively reduce swelling and bruising after rhinoplasty.[9] Daniel et al. demonstrated that short-term steroid administration effectively reduces periorbital swelling after orbital surgery.[17] Palpebral edema after rhinoplasty may impede vision during the initial postoperative period. Furthermore, postoperative peri-orbital edema and ecchymosis might cause discomfort and anxiety.[10] In a randomized trial with 84 open rhinoplasty patients, two doses of 10 mg dexamethasone were given during and after surgery. Results showed reduced periorbital swelling, bruising, and intraoperative bleeding compared to a placebo, possibly due to the

https://doi.org/10.56056/amj.2025.397

interaction between steroids and adrenaline.[23] Bian, X. et al, in a systematic review of ten articles involving 374 participants support using dexamethasone during rhinoplasty to reduce intraoperative blood loss, edema, and ecchymosis compared to normal saline. Meta-analysis indicates significant benefits, with medium to large effect reductions in these parameters compared to placebo groups receiving normal saline. [24] The present study demonstrated statistically significant differences in postoperative swelling and ecchymosis between the treatment and control groups, highlighting the efficacy of dexamethasone.

Limitations:

However: the sample size is relatively small, which may limit the generalizability of the findings. Larger studies are needed to confirm these results. And The study population consisted predominantly of women, which may limit the applicability of the findings to male patients or more diverse demographic groups.

Conclusion

The study demonstrates differences between the group who received steroids and the control group that are statistically and clinically significant. Periorbital ecchymosis and edema can be prevented and reduced with the use of preoperative steroid injection.

Recommendations

Future studies should include a larger number of participants to enhance the statistical power and generalizability of the findings.

Acknowledgment:

The authors would like to acknowledge the Oral and Maxillofacial Department, University of Sulaimani, and Kurdistan Higher Council of Medical Specialties for supporting the study.

Conflict of Interest:

There is no conflict of interest to declare.

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