

The Effect of Preoperative Anxiety and Depression on Edema and Ecchymosis in Rhinoplasty Surgery

Rinoplasti Cerrahisinde Preoperatif Anksiyete ve Depresyonun Ödem ve Ekimoz Üzerine Etkisi

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Abstract

Background: Periorbital edema and ecchymosis are frequently observed after rhinoplasty. Stress response, inflammation and catabolic process affect the formation of edema and ecchymosis. Anxiety and stress response have an effect on wound healing and postoperative recovery. This study aimed to investigate whether preoperative anxiety and depression levels affect periorbital edema and ecchymosis.

Materials and Methods: In this study, 94 (51 female, 43 female) patients were assessed. Beck Anxiety and Beck Depression scales were filled 1 hour before surgery by the patients. The relationship between edema and ecchymosis that may occur after surgery and anxiety, depression and quality of extubation was evaluated.

Results: According to this study there was not correlation between preoperative anxiety, depression, extubation quality and edema, ecchymosis and no statistically significant difference was found ($p>0.05$).

Conclusion: Anxiety and depression, which are commonly seen before surgery, had no effect on periorbital edema and ecchymosis.

Keywords: Rhinoplasty, Edema, Ecchymosis, Anxiety, Depression.

ÖZ

Amaç: Rinoplasti sonrası periorbital ödem ve ekimoz sıklıkla görülür. Stres yanıtı, inflamasyon ve katabolik süreç ödem ve ekimoz oluşumunu etkiler. Anksiyete ve stres cevabın yara iyileşmesi ve ameliyat sonrası derlenme üzerinde etkisi vardır. Bu çalışmanın amacı preoperatif anksiyete ve depresyon düzeylerinin periorbital ödem ve ekimozu etkileyip etkilemediğini araştırmaktır.

Gereç ve Yöntem: Bu çalışmada 94 (51 kadın, 43 kadın) hasta değerlendirildi. Beck Anksiyete ve Beck Depresyon ölçekleri ameliyattan 1 saat önce hastalar tarafından dolduruldu. Cerrahi sonrası görülebilen ödem ve ekimoz ile anksiyete, depresyon ve ekstübasyon kalitesi arasındaki ilişki değerlendirildi.

Bulgular: Bu çalışmaya göre preoperatif anksiyete, depresyon, ekstübasyon kalitesi ile ödem, ekimoz arasında korelasyon yoktu ve istatistiksel olarak anlamlı fark bulunmadı ($p>0,05$).

Sonuç: Ameliyat öncesi sıklıkla görülen anksiyete ve depresyonun periorbital ödem ve ekimoz üzerine etkisi yoktur.

Anahtar Kelimeler: Rinoplasti, Ödem, Ekimoz, Anksiyete, Depresyon

Highlights

- Rhinoplasty patients have mild preoperative anxiety/depression.
- There is no relationship between anxiety/depression and edema /ecchymosis in rhinoplasty patients.
- There is no relationship between patients extubation quality and edema/ecchymosis in rhinoplasty patients.

Introduction

Nasal surgery (rhinoplasty and septoplasty) is a common surgical procedure performed today. Periorbital ecchymosis, edema (1) and pain (2) are common after rhinoplasty and septoplasty surgery. Periorbital edema and ecchymosis that can be seen after rhinoplasty have a negative impact on the quality of recovery and time to discharge. Edema and ecchymosis may cause temporary visual loss, permanent pigmentation, scar tissue formation, and prolonged return to social life (1). The body's stress response, tissue damage, inflammation, and catabolic process are factors involved in the formation of edema and ecchymosis after rhinoplasty.

Anxiety is defined as an emotional state or response consisting of unpleasant tension, worry, nervousness, and activation of the autonomic nervous system (3). Surgical patients may experience anxiety due to surgical procedures and anesthesia. Among adult patients, this rate varies between 48%. Preoperative anxiety leads to more pain, delayed recovery, and decreased patient satisfaction (4).

Preoperative patients frequently have a certain level of anxiety and stress, and anxiety and depression affect inflammation and coagulation (5). After rhinoplasty surgery preoperative anxiety and distress may affect the occurrence of periorbital edema and ecchymosis. This study aimed to investigate whether preoperative anxiety and depression levels affect periorbital edema and ecchymosis, which are commonly seen after rhinoplasty.

Materials and Methods

Study design

This prospective clinical study was conducted between May 2022 and August 2023 and was approved by Tokat Gaziosmanpasa University Clinical Research Ethics Committee (22-KAEK-079). Patients who agreed to participate in the study provided written informed consent and complied with the Declaration of Helsinki. The study included 100 patients aged 18-65 years, with an American Society of Anesthesiology (ASA) classification of I-II, who were identified as eligible for rhinoplasty with the open osteotomy technique. Patients with anxiety, depression, bleeding and coagulation disorders, and anti-inflammatory and anticoagulant drug use were excluded. All surgical procedures were performed by the same surgeon.

Beck Anxiety and Beck Depression scales were filled 1 hour before surgery by the patients who agreed to participate in the study. After routine blood pressure, heart rate, and blood oxygen saturation (SpO₂) monitoring, anesthesia was induced with 1 μ /kg fentanyl, 2 mg/kg propofol, and 0.6 mg/kg rocuronium. Anesthesia was maintained throughout surgery with 50% air, 50% oxygen, 2% sevoflurane, and 0.25 μ /kg remifentanyl infusion. Mean arterial pressure (MAP) was maintained between 60-65 mmHg throughout the operation. All patients were kept in a semi-sitting position with a 45° angle for 24 hours postoperatively. 10 mg/kg paracetamol and 1 mg/kg tramadol were administered intraoperatively for postoperative pain control and 10 mg/kg paracetamol for postoperative pain. At the end of surgery, the quality of extubation was evaluated with a 5-point Likert scale. 1= no cough, easy breathing, 2= mild cough (1-2 times), 3= moderate cough (3-4 times), 4= severe cough and difficult breathing (5-10 times), 5=laryngospasm and severe cough, difficult breathing. The relationship between extubation quality and anxiety and depression was compared in the study. All patients were photographed on days 1, 2, and 7 to evaluate postoperative edema and ecchymosis. The scoring system developed by Kara and Gokalan (6) and scored on a scale of 0-4 was utilized for edema and ecchymosis (**Figure 1-2**). Periorbital edema and ecchymosis were evaluated by 3 independent observers. The relationship between these values and the preoperative anxiety and depression values of the patients was investigated.

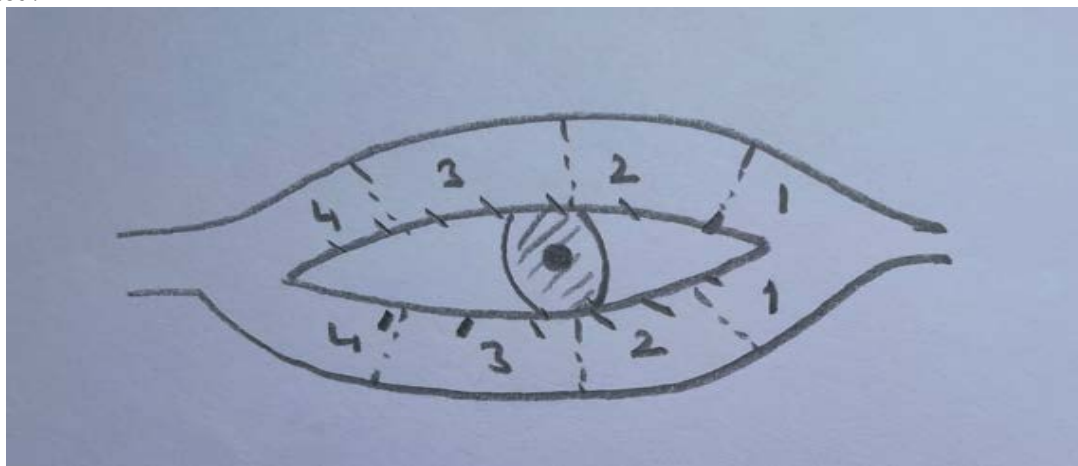


Figure 1. Level for periorbital ecchymosis: 0 (none), 1 (in the medial canthus), 2 (extending to the pupil), 3 (past the pupil), and 4 (extending to the lateral canthus).

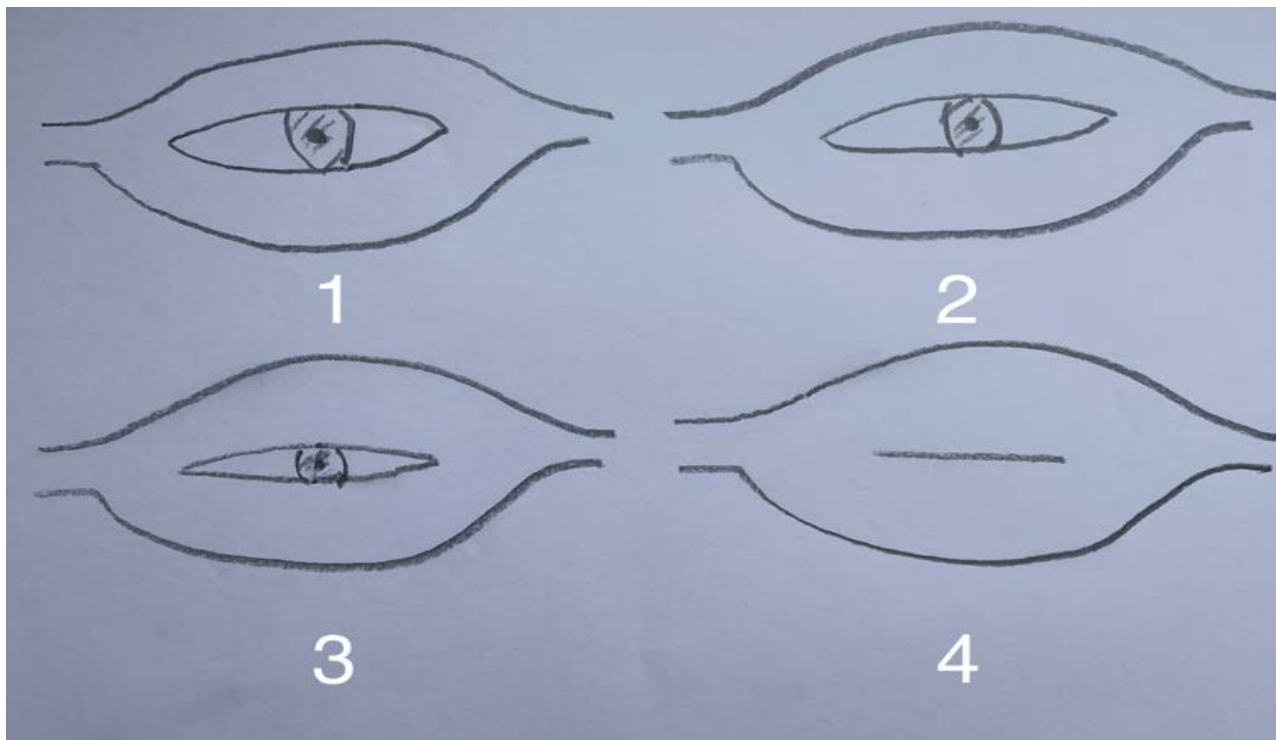


Figure 2. Scale for eyelid edema: 0 (none), 1 (minimal), 2 (covering to the iris), 3 (extending to the pupil), and 4 (massive edema).

Statistical Analysis

The sample size was calculated with a type 1 error value of 0.05, power of 0.80, $\alpha:0.2$, and $r=0.30$ (low-level relationship) between anxiety and edema score, and 85 patients were considered sufficient for the study. Numerical data were expressed as mean and standard deviation and categorical data as numbers and percentages. The normal distribution of the data was evaluated by one sample Kolmogorov-Smirnov test. Correlation analysis was employed to investigate the relationship between anxiety and depression and edema and ecchymosis. Statistical Package for Social Sciences (SPSS, IL) version 21.0 was used to evaluate all data. The statistical significance value was considered as $p<0.05$ when analyzing the data.

Results

In this study, 94 (51 female, 43 female) patients were assessed (**Figure 3**). The patients' demographic information and preoperative anxiety, depression, extubation quality and first day edema, second day edema, seventh day edema and first day ecchymosis, second day ecchymosis, seventh day ecchymosis values is shown in **Table 1**. The average preoperative anxiety and depression values were 10.35 ± 10.96 and 13.25 ± 10.61 , respectively. The mean first day edema, second day edema, seventh day edema and first day ecchymosis, second day ecchymosis, seventh day ecchymosis values were 2.0 ± 0.89 , 2.11 ± 0.92 , 1.17 ± 0.40 , 3.12 ± 0.87 , 3.13 ± 0.85 , 2.47 ± 0.91 respectively. According to the results there was not correlation between preoperative anxiety, depression, extubation quality and edema, ecchymosis and no statistically significant difference was found ($p>0.05$), (**Table 2**).

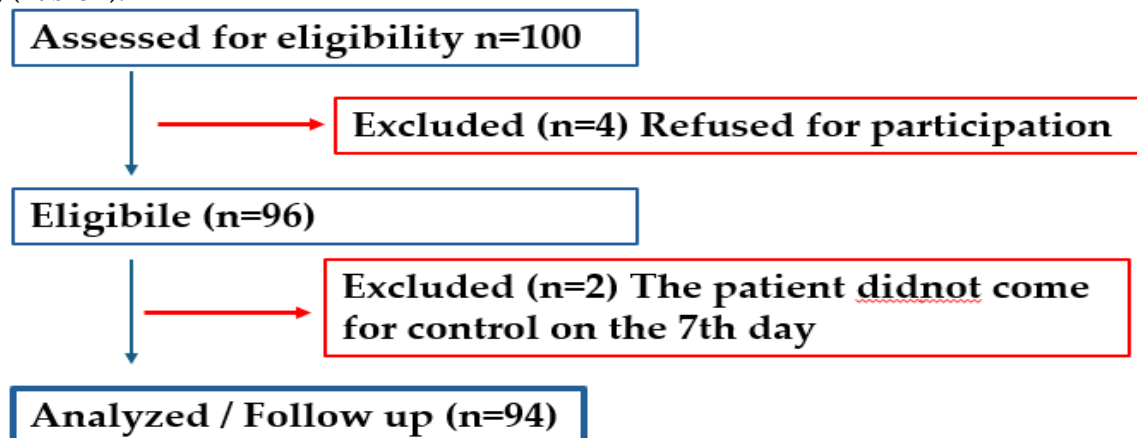


Figure 3. Flow chart

Table 1. Descriptive analysis of the demographics, predictors, and outcomes

| Variable | | n | Mean ± SD |
|---------------------|------------------------------|-------|------------------|
| Demographics | Age (years) | | 26.67 ± 8.6 |
| | Gender (Female/Male) | 51/43 | |
| | ASA(I/II) | 72/22 | |
| | Comorbidity (-/+) | 19/75 | |
| | Duration of surgery(hour) | | 2.11 ± 0.42 |
| | Bleeding during surgery (ml) | | 120 ± 40 |
| Predictors | | | Median (min-max) |
| | Anxiety | | 6 (0-45) |
| | Depression | | 12.5 (0-47) |
| | Extubation quality | | 2 (1-4) |
| | First day edema | | 2 (1-4) |
| | Second day edema | | 2 (1-4) |
| | Seventh day edema | | 1 (1-3) |
| | First day ecchymosis | | 3 (1-4) |
| | Second day ecchymosis | | 3 (1-4) |
| | Seventh day ecchymosis | | 3 (1-4) |

ASA, American Society of Anesthesiologists

Table 2. Correlations among predictors and outcomes

| Predictors | Predictors or outcomes | Correlation coefficients | p |
|---------------------------|------------------------|--------------------------|-------|
| Beck anxiety | First day edema | 0.039 | 0.711 |
| | Second day edema | 0.030 | 0.777 |
| | Seventh day edema | 0.020 | 0.852 |
| | First day ecchymosis | 0.018 | 0.865 |
| | Second day ecchymosis | 0.010 | 0.923 |
| | Seventh day ecchymosis | 0.113 | 0.280 |
| Beck depression | First day edema | 0.038 | 0.718 |
| | Second day edema | 0.053 | 0.614 |
| | Seventh day edema | 0.058 | 0.535 |
| | First day ecchymosis | -0.054 | 0,606 |
| | Second day ecchymosis | -0.008 | 0.938 |
| | Seventh day ecchymosis | 0.004 | 0.968 |
| Extubation quality | First day edema | -0.085 | 0.414 |
| | Second day edema | -0.104 | 0.318 |
| | Seventh day edema | -0.202 | 0.051 |
| | First day ecchymosis | 0.025 | 0,809 |
| | Second day ecchymosis | 0.075 | 0.471 |
| | Seventh day ecchymosis | 0.088 | 0.400 |

Discussion

This is the first study to investigate the effect of preoperative anxiety and depression on edema and ecchymosis in rhinoplasty surgery. The findings of this study showed that there was no correlation between periorbital edema and ecchymosis, which have an impact on the quality of recovery and discharge of patients after rhinoplasty, and the level of anxiety and depression that can often be observed in patients before surgery. The neuroendocrine and neurohumoral response triggered by anxiety is a response to the body's hemostatic system (coagulation and fibrinolysis). Inadequacy in this response leads to changes associated with atherosclerosis and thrombosis (5). Different studies have been carried out investigating anxiety and homeostasis. Numerous studies show that psychological stress and anxiety have an effect on coagulation and fibrinolysis through mediators (7). In a study by Dululas et al. (8), depression was found to be correlated with coronary artery disease and different hemostatic parameters. In the study conducted by Geiser et al. (9), it was observed that fibrinolysis was impaired, and coagulation was activated in patients with anxiety and depressive disorders.

In another study, it was observed that coagulation levels (Factor VII, von Willebrand factor (vWF) were found to be high in the patient group and that these effects on coagulation recovered with the improvement of psychiatric symptoms after psychotherapy and treatment (10).

Stress response after trauma and injury causes immunological, hematological, and endocrine responses.

Inflammation and hemorrhage of soft tissues are the most common causes of edema and ecchymosis (11). The duration of surgery, the procedure performed, and the coagulation status are effective in the formation of ecchymosis (12), which occurs especially with damage to vascular structures (11).

There were studies in which different drugs such as lidocaine, adrenaline, and steroids (1), and various surgical (13) and anesthesia techniques (14) were applied for the prevention of edema and ecchymosis, which affect the quality of recovery and discharge of the patient in rhinoplasty surgery. This study, which investigated the relationship between preoperative anxiety and depression levels and edema and ecchymosis in a different way, found no significant relationship. It is accepted that there is a relationship between anxiety and depressive symptoms with coagulation. The absence of such a relationship in this study may be related to the duration and level of preoperative anxiety.

Study limitations

The first limitation of this study is that blood coagulation parameters were not studied. The second limitation is the subjective assessment of edema and ecchymosis. The third limitation is the relatively small sample size.

Conclusion

Despite the apparent effect of anxiety and depression on the quality of recovery and discharge of patients, preoperative anxiety and depression showed no effect on the occurrence of edema and ecchymosis.

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Ethical Approval: This study was approved by Tokat Gaziosmanpaşa University Clinical Research Ethics Committee (DecisionNo:22/KAEK/079).

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