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Original Article

The impact of septoplasty on platelet indices

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Abstract

Aim: Nasal septum deviation (NSD) is an important cause of upper respiratory tract obstruction. Alveolar hypoventilation can occur in patients with severe NSD. In some studies, hypoxia has been found to increase platelet activation. Thus,herein weaimed to investigate the impact of the NSD and septoplasty on platelet indices.

Material and Methods: 100 patients with NSD were enrolled in this present study retrospectively between December 2015 and October 2016.NSD diagnosed by anterior rhinoscopy and trans-nasal endoscopic examination. Septoplasty was performed with the help of Killian or hemitransfixion incision under general anesthesia. The haemogram results including platelets indiceswere investigated from recorded hospital database retrospectively.

Results: 56 of the patients were males and 44 of the patients were females. Mean age of the patients was 25.7±10.2 year. Threemonthsafter surgery mean platelet volume (MPV) values were significantly decreased when compared with preoperative values(p value<0.01). Threemonths after surgery platelet count values were not significantly different when compared with preoperative values(p value=0.67).Three months after surgery, there was a statistically significant improvement in symptoms of nasal obstruction according to Nasal Obstruction Symptom Evaluation (NOSE) scoring.

Conclusions: MPV is an important marker of platelet function. In our present study MPV values were decreased 3 months after surgery. According to our results it can be said that septoplasty may improve the risk of aberrant platelet activation in patients with severe NSD.

Keywords: Nasal Septumdeviation; MPV; Platelets.

INTRODUCTION

NSD is a common cause of upper respiratory tract obstruction. Alveolar hypoventilation can occur according to the degree of obstruction (1).

Although very rare in the community, mildly symptomatic NSD is usually ignored and the treatment is referred to when more severe obstructive symptoms occur. Hypoxia resulting from alveolar hypoventilation leads to negative effects on the whole body.

Chronic hypoxic condition is known to trigger hypercoagulability (2). NSD can lead to hypercoagulopathy due to chronic hypoxia.

The value obtained by dividing the total platelet count by plateletcrit on automated blood counts device shows the MPV value, which is related to the platelet size. Being easy to measure and cheap, this test has become widely available around the world.

In a study concluded by Braekkan et al,increased MPV value was identified as a predictor for venous thromboembolism in 25923 subjects aged 25 to 96 years who participated in the Tromso Study in 1994-1995 (3).

In a meta-analysis consisted of 40 studies, conducted by Sansanayudh N et al, larger MPV was associated with coronary artery disease (4).

Herein, we aimed to investigatethe impact of NSD and septoplasty on platelet indices.

MATERIAL and METHODS

Patients and Study Design

A hundredpatients with NSD were enrolled in this present study retrospectively between December 2015 andOctober 2016.Recorded data of the patientswere scanned andevaluated retrospectively.

The diagnosis of subjects with NSD was established by anterior rhinoscopy andtrans-nasal endoscopic examination.

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Septoplasty was performed withthe help of Killian or hemitransfixion incision.All patients were operated under general anesthesia. Blood samples were collected before septoplasty and 3 months after surgery. Patients with diabetesmellitus,renalorhepaticdisease,asthma,coronary artery disease, chronic cardiac failure, neoplastic disease, hypothyroidism and hyperthyroidism, rheumatoid arthritis, psoriasis, hematologic diseasesand thrombocytopenia were excluded from study. Antithrombotic agent usage and having other cause of nasal obstruction such as nasal polyp were additional excluding criteria.

EDTA-based anti-coagulated blood samples drawn from the antecubital vein were evaluated within 2 hours after venipuncture to prevent in vitro platelet activation.The reference values for mean platelet volume were accepted between 6.8-10.8 fl.

In the assessment of degree of patients' nasal complaints, Nasal Obstruction Symptom Evaluation (NOSE) questionnaire was answered by all patients.

Statistical analysis

All the analyses were performed using the SPSS 15.0 package program.The descriptive statistics,paired sample T tests (for parametric paired samples) and Wilcoxon test (for non-parametric paired samples) were used when suitable. The statistical significance level was accepted as a P value of less than 0.05.

RESULTS

Fifty sixof the patients were males and 44 of the patients were females. Mean age of the patients was 25.7±10.2 year (Table 1).

Table 1. Demographicfeatures of thepatients

Parameters	
Age (year)	25.7±10.2
Gender (Male/Female)	56/44

Investigated parameters were compared with Paired Sample Ttest. Before surgery mean MPV values were 9.68±1.58, 3 months after surgery mean MPV values were 8.43±2.2 (p value<0.01). Before surgery mean platelet count values were272.5±85.1,3 months after surgery mean platelet count values were 275.2±61.4 (p value=0.67) (Table 2).

Table 2. Impact of septoplasty on plateletindices

Parameters	Before surgery	After surgery	P* value
MPV (fL)	9.68±1.58	8.43±2.2	<0.01
Platelet count (cells/mcL)	272.5±85.1	275.2±61.4	0.67

*Paired sample T test

There was a statistically significant improvement in symptoms of nasal obstruction 3 months after surgeryaccording to NOSE scoring (Table 3).

Table 3. NOSE scores of the patients

Parameters	Before surgery Mean Rank	After surgery Mean Rank	P* value
NOSE	47.4	2.5	<001

*Wilcoxon test for non-parametric paired samples

DISCUSSION

Upper airway extends from the nasal vestibule to vocal cords. Upper airway obstruction (UAO) is a frequently encountered clinical condition in otolaryngology practice.

Clinically, nasal obstruction is one of the most common encountered complaints of nasal disease. One of the most common causes of nasal obstruction is NSD. Septoplasty, surgical correction of deviated nasal septum, is primary treatment option. There are other cause of the nasal obstruction such as concha hypertrophy, adenoid hypertrophy (AH) and nasal polyposis. We excluded the other cause of the nasal obstruction.

A great number of the general population is presumed to possess NSD in varying degrees (5). The most of them are mild and they are often non-symptomatic and don't need surgical correction.

In our present study, patients had a serious and symptomatic NSD. Thus, septoplasty operation was performed.

Chronic nasal obstruction can interfere with social and business activities with resultant compromise in quality of life (QOL) and results in increased upper respiratory tract resistance (6-7) and then due to alveolar hypoventilation, UAO may cause chronic hypoxia and hypercarbia. Therefore, all pathologies like adenoid vegetation, nasal polyposis, hypertrophied tonsils and considerable NSD contributing UAO can give rise to alveolar hypoventilation, corpulmonale and pulmonary hypertension (8).

It is well known that long-lasting hypoxia can affect coagulation and platelet number and function. Because of the larger thrombocytes are hemostatically more reactive than normal-sized ones, mean platelet volume MPV is accepted as a marker and determinant of platelet function (9). Thus, increased MPV has been considered as an indirect indicator of increased thrombocyte reactivity(10-12).

In this study, we investigated the changes in MPV and other platelet indices before and after septoplasty in patients with NSD.

In a study conducted by Poorey VK et al and Ulu S et al,patients with NSD and healthy subjects were compared in terms of MPV. MPV in patients with NSD was found to be statistically significantly higher compared with healthy subjects (13-14).

When we review the literature, there are a limited number of studies investigating the effect of septoplasty on MPV values.

In a study conducted by Sagit M et al, the effect of MPV on septoplasty was investigated. It has been shown that there was a statistically significant decrease in MPV values after Septoplasty (15).

Our present study before surgery mean MPV values were 9.68±1.58 and 3 months after surgery mean MPV values were 8.43±2.There was a statistically significant decrease in the MPV values after septoplasty (p value<0.01).So this present study confirmsprevious works.

NOSE scale is a valid and specific tool in the evaluation of QOL of patients with nasal obstruction (16). In this present study there was a statistically significant improvement in symptoms of nasal obstruction 3 months after surgery in accordance with the literature.

LIMITATIONS OF THE STUDY

There were some limitations of our study. The most restrictive limitation of our study was the lack of a control group. The retrospective design of the study was the other limitation of this present study.

CONCLUSIONS

MPV is an important marker and determinant of platelet function. NSD is an important cause of nasal obstruction and possibly by mean of hypoxic effects of upper airway obstruction give rise to discomfort in quality of life. Septoplasty is the primary treatment option of symptomatic NSD patients. In our present study, statistically significant decrease in MPV values wasfound after septoplasty. We can saythat septoplasty may improve the risk of aberrant platelet activation.

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