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Original Article

Effects of Bilateral Infraorbital–Supraorbital Nerve Block on Postoperative Pain Control and Drug Consumption in Rhinoplasty

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ABSTRACT

Objective: Rhinoplasty is a common procedure performed in plastic surgery. Postoperative pain, edema, and periorbital ecchymosis are the most common acute complications of this surgical procedure. In this study, we aimed to evaluate the postoperative pain and analgesic consumption after rhinoplasty of patients who had bilateral supraorbital and infraorbital nerve block.

Methods: Eighty-four patients who underwent rhinoplasty under general anesthesia, between 17 and 41 years of age, and who underwent intravenous patient-controlled morphine analgesia for postoperative analgesia were included in this study. The cases were divided into two groups: bilateral supra-infraorbital block with intravenous analgesic (Group B) and only intravenous analgesic (Group C). Demographic data, hemodynamic data, operation time, visual analog scale values, patient-controlled analgesia device data, complaints of nausea-vomiting, and antiemetic drug use were recorded.

Results: The hemodynamic data of the cases included in this study were similar ($P > .05$). When compared with Group C, postoperative 1st, 6th, and 24th hour visual analog scale (VAS) scores were found to be significantly lower in Group B ($P < .05$). Morphine consumption at the end of the postoperative 24 hours was found to be significantly lower in Group B compared with Group C ($P < .05$).

Conclusion: In this study, which cases undergoing bilateral supraorbital-infraorbital nerve block and IV morphine was used for postoperative analgesia after rhinoplasty, significant reductions were achieved in the postoperative VAS values and analgesic consumption of the cases where the block was used.

Keywords: infraorbital nerve block, supraorbital nerve block, rhinoplasty, postoperative pain

INTRODUCTION

It is thought that factors such as the degree, location, duration of the surgical intervention, the type of anesthesia, the subjective nature of the pain, the patient's treatment, and the importance attributed to the pain may cause different rates of surgical pain incidence. Whatever the cause, pain is a threat to the organism, and the organism creates a stress response to this situation. In this situation, if the pain, which is considered as a stressor, persists for a long time, physiopathological responses to pain develop in the organism.[1,2] Postoperative pain management is an important part of postsurgical perioperative care. It is known that proper treatment of postoperative pain reduces perioperative morbidity, complications, hospital stay, and costs.[3]

Rhinoplasty is a common procedure performed in plastic surgery. Intravenous (IV) analgesics are frequently used for postoperative pain control in rhinoplasty surgery. In addition, regional nerve blocks and local anesthetic injections are among the options in postoperative pain control.[4–6] Multimodal analgesia applications are frequently preferred in combating acute pain.[7–9]

The use of peripheral nerve blocks for postoperative analgesia has been found to be beneficial for patient recovery and economics. In addition to improvements in pain control, reductions in opioid use can be achieved in many surgical procedures. By reducing the use of analgesic drugs, recovery is supported and the length of hospital stay can be shortened.[10,11]

In this study, it was aimed to compare the postoperative pain and analgesic drug consumption of the patient-controlled IV morphine group and the bilateral supraorbital and infraorbital nerve block (BSIB) groups after the rhinoplasty surgery.

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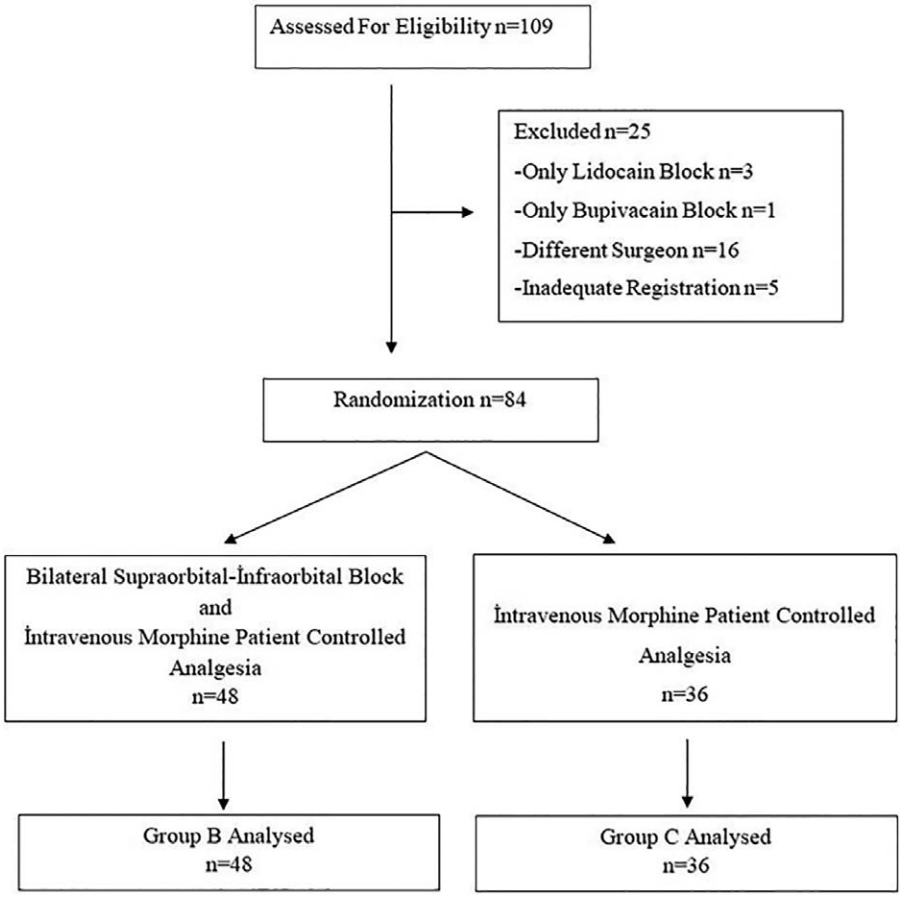
Figure 1. Flow diagram of the study.



METHODS

Setting and Participants

This study was conducted in accordance with the Helsinki declaration after the ethics committee approval (date-number: 2018/17-83116987-577) was obtained. Files of patients who underwent rhinoplasty under general anesthesia between January and December 2018 were reviewed. Information concerning the trial was explained both orally and in a written form to all patients, and a written informed consent form was signed by each patient. Rhinoplasty was performed in all patients using the lateral-medial oblique osteotomy technique. Eighty-four patients, whose physical status was ASA I according to the American Society of Anesthesiology (ASA) classification, between the ages of 17 and 41, and who were followed-up with patient-controlled morphine analgesia, were included in this study. The cases were divided into two groups. According to the postoperative analgesia plan, the groups were determined as BSIB (Group B) and IV morphine (Group C) for postoperative analgesia.

The cases in Group B, in which a local anesthetic mixture including 5 mg bupivacaine and 10 mg lidocaine for a total of 1.5 mL was preferred as local anesthetics, were included in this study. In cases where morphine was used for postoperative analgesia, cases where morphine at a dose of 0.1 mg kg^{-1} was preferred were included in this study. All of the included cases were defined as those who were operated on by the same anesthesiologist and the same surgeon. Cases with disorientation and cooperation, patients with additional systemic disease, regular medication using, and intraoperative additional local anesthetics applying were excluded from this study. In addition, cases with insufficient records, preferred different IV analgesics or local anesthetics, and operated by different anesthesiologists or surgeons were also excluded from this study (Figure 1).

Main Points

- BSIB in rhinoplasty can reduce postoperative pain in the first 24 hours.
- BSIB can reduce the need and consumption of analgesics in the early postoperative period.
- Regional anesthesia techniques can be used effectively in postoperative pain control in accordance with surgery.

Supraorbital and Infraorbital Nerve Blocks

In routine block applications in our clinic, the hemodynamic values (heart rate, systolic blood pressure, diastolic blood pressure, and pulse oximetry) are recorded after the patient is taken

Table 1. Comparison of Demographic Data and Operation Time

	Group B (n = 48)	Group C (n = 36)	*P* Value
Age (mean ± SD)	26.88 ± 5.45	25.67 ± 5.19	.978
BMI (mean ± SD)	20.65 ± 2.80	20.25 ± 2.84	.536
Gender			
Female (n/%)	32/55.2	26/44.8	.586
Male (n/%)	16/61.5	10/38.5	
Operation time (mean ± SD)	91.35 ± 20.57	85.83 ± 19.62	.600

to the operating room. BSIBs are applied before anesthesia induction. A 27-gauge needle is used for the block. For the supraorbital nerve, the supraorbital ridge is palpated, the supraorbital foramen is detected in the medial region, and local anesthetic injection is applied. For the infraorbital nerve, the infraorbital foramen is palpated, and local anesthetic injection is made. Then, anesthesia is induced.

Data Collection and Randomization

Demographic data (age, gender, and BMI), hemodynamic data (basal, postinduction, 15, 30, 45, and 60 minutes, and the end of the operation), operation time, visual analog scale (VAS) values (1st, 6th, and 24th hour), patient-controlled analgesia (PCA) device records (24th hour delivery-morphine consumption amount), complaints of nausea-vomiting, and antiemetic drug use of the patients were recorded.

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) version 18.0 (SPSS Inc.; Chicago, IL, USA) program was used for the analysis of the collected data. Continuous variables obtained were expressed as mean ± SD or number (%). Number and percentage values were used in the presentation of categorical variables. Compliance of the obtained data to normal distribution was checked using the "Kolmogorov–Smirnov test." "Mann–Whitney-U" test was used for the analysis of continuous variables (age, weight, etc.). "Chi-square test" was used to compare the two groups and to examine categorical variables. A *P* value of <.05 was considered significant in the analyzes.

RESULTS

A total of 109 cases were included in the evaluation of the cases. In addition to the three cases using lidocaine only for BSIB for postoperative analgesia, one case using only bupivacaine, 16 cases operated by a different surgeon, and five cases with insufficient file records were excluded from this study. A total of 25 cases were excluded, and 84 cases were included in this study.

The average age of Group B was 26.88 ± 5.45 (n = 48), and it was 25.67 ± 5.19 (n = 36) for Group C. There was no statistical difference between the groups in terms of age, BMI, and sex. Operation time of the groups was 91.35 ± 20.57 minutes in Group B, while it was 85.83 ± 19.62 minutes in Group C, and no statistically significant difference was found between the groups ($P = .60$) (Table 1). When the hemodynamic follow-up values were compared, there was no significant difference between the groups ($P > .05$) (Table 2).

In the comparison of the VAS scores of the 1st, 6th, and 24th hours in the postoperative pain assessment, VAS scores were found to be significantly lower in Group B at all times ($P < .05$) (Table 3). Twenty-four-hour delivery and morphine consumption amount in PCA records were found to be significantly lower in Group B (Table 3). In the postoperative nausea-vomiting comparison, there was no difference between the groups, and antiemetic drugs were administered in all cases ($P > .05$) (Table 3).

DISCUSSION

In this study, which compared the pain scores and analgesic consumption in the first 24 hours of the patients who were used BSIB for postoperative analgesia in rhinoplasty and the patients who received analgesia with IV morphine, it was shown that the patients who underwent block had significant reductions in postoperative VAS values and analgesic consumption.

Postoperative pain management is globally reported to be insufficient.[12,13] After surgical interventions, pain is one of the important parameters affecting patient comfort. Having a comfortable postoperative experience, especially in the early period, increases the comfort and satisfaction of the patients. In addition to regular analgesia in the early period, it is important to perform additional interventions that reduce the need for analgesia and increase patient comfort.[14,15] Szychta et al.[16] stated in their study that patients need analgesics for 3 days after a septorhinoplasty operation. They reported that this pain worsened in the evening, with significantly higher pain scores in the first 3 days postoperatively. They recommended the use of PCA and opioids for pain control.

Various methods have been tried in the perioperative period to prevent postoperative pain in rhinoplasty.[1,2] In rhinoplasty, it has been shown that pregabalin given 1 hour before the operation reduces the postoperative analgesic requirement.[17] Gozeler et al.[18] reported that preoperative single dose IV ibuprofen administration reduced the postoperative fentanyl consumption. Vahabi et al.[19] reported that esmolol infusion reduced

Table 2. Comparison of Hemodynamic Data Over Times

	Heart Rate (Mean ± SD)			Pulse Oximeter (Mean ± SD)			Systolic Blood Pressure (Mean ± SD)			Diastolic Blood Pressure (Mean ± SD)		
	Group B (n = 48)	Group C (n = 36)	*P* Value	Group B (n = 48)	Group C (n = 36)	*P* Value	Group B (n = 48)	Group C (n = 36)	*P* Value	Group B (n = 48)	Group C (n = 36)	*P* Value
Preoperative	81.94 ± 14.62	82.08 ± 14.90	.986	95.88 ± 1.89	95.61 ± 2.10	.783	148.27 ± 18.68	147.53 ± 19.07	.955	81.38 ± 12.91	81.64 ± 9.57	.054
Anesthesia induction	74.31 ± 10.47	72.44 ± 9.30	.619	98.75 ± 1.62	99.19 ± 1.12	.030	109.29 ± 21.88	117.61 ± 18.05	.946	62.67 ± 9.54	64.25 ± 10.85	.483
15 minute after induction	65.46 ± 11.31	68.94 ± 12.17	.747	98.79 ± 1.35	98.94 ± 1.19	.554	116.13 ± 19.04	112.28 ± 28.92	.082	66.38 ± 15.15	65.25 ± 12.75	.267
30 minute after induction	64.98 ± 12.00	66.69 ± 10.05	.494	98.50 ± 1.31	98.75 ± 1.34	.933	123.00 ± 23.25	118.44 ± 29.94	.307	69.48 ± 15.57	69.19 ± 13.30	.487
45 minute after induction	63.88 ± 9.55	65.61 ± 9.48	.812	98.63 ± 1.28	98.44 ± 1.38	.505	121.44 ± 20.20	120.47 ± 21.75	.276	67.21 ± 12.91	66.72 ± 14.68	.718
60 minute after induction	62.54 ± 9.74	64.19 ± 10.16	.735	98.71 ± 1.03	98.39 ± 1.38	.094	115.85 ± 28.05	117.25 ± 27.46	.692	68.60 ± 15.47	66.53 ± 16.09	.920
End of the surgery	60.31 ± 8.68	60.94 ± 8.88	.818	98.63 ± 1.27	98.97 ± 1.11	.156	114.19 ± 25.53	122.14 ± 25.14	.742	65.98 ± 11.44	70.42 ± 14.37	.106

Table 3. Comparison of Pain Values and Drug Consumption Amounts of the Groups

	Group B (n = 48)	Group C (n = 36)	*P* Value
Visual analog scale (VAS)			
First hour (mean ± SD)	2.21 ± 0.87	8.06 ± 1.07	**<.001***
Sixth hour (mean ± SD)	2.75 ± 0.94	8.28 ± 1.16	**<.001***
Twenty–fourth hour (mean ± SD)	4.00 ± 1.22	8.95 ± 1.15	**<.001***
Patient control analgesia (PCA) records			
Delivery (count) (mean ± SD)	3.88 ± 2.47	17.17 ± 4.98	**<.001***
Morphine consumption (mg) (mean ± SD)	2.60 ± 1.37	11.78 ± 2.80	**<.001***
Postoperative nausea and vomiting			
Positive (n/%)	19/50	19/50	.229
Negative (n/%)	29/63	17/37	

* statistically significant difference ($P < .05$)

postoperative pain in rhinoplasty surgeries performed with propofol and remifentanil infusion. It has been shown that packs impregnated with local anesthetic reduce postoperative pain.[4]

Regional nerve blocks and local anesthetic applications have also taken their place among the methods used in postoperative pain control in nasal surgeries. Higashizawa and Koga[20] reported that infraorbital nerve block reduces anesthetic drug consumption and postoperative pain in endoscopic nasal surgeries under general anesthesia.[20] Similarly, it reduces postoperative opioid consumption in children and also reduces pain.[5] In the comparison of the patients who underwent total nasal block and central facile block, a significant reduction in pain was observed in the central facile block on the 1st and 2nd days compared to the total nasal block and control groups. The more effective total nasal block is attributed to the infraorbital nerve block, which is not present in facile block.[6]

Postoperative pain levels are at their maximum in the first 24 hours of surgery.[1,2] In the previous studies, first day of postoperative pain after rhinoplasty investigated different time intervals.[19,21–23] In this study which pain control was performed most frequently, time intervals were planned as 5th, 15th, 30th minutes and 1st, 2nd, 4th, 6th, 8th, 16th, and 24th hours.[21] In data collection, it was observed that in line with previous studies, postoperative pain controls in the first 24 hours were obtained regularly in the 1st, 6th, and 24th hours. In our study, significant decreases were found in the VAS values of the block group at all time intervals. When the 24th hour PCA records were examined, a significant decrease was observed in both delivery and morphine consumption values in cases where block was applied. These findings show that postoperative opioid need and opioid consumption decreased with nerve block.

"Postoperative nausea and vomiting" (PONV) is defined as nausea, retching, or vomiting within 24-48 hours after surgery. When no prophylaxis is applied, it is seen in 20-30% of all patients undergoing surgery. It is seen in 70-80% of patients with drugs used for anesthesia and analgesia, and surgical risk factors.[24] Anesthetic factors that play a role in the development of PONV are inhalation anesthetic use, duration of anesthesia, postoperative opioid use, and nitrite oxide.[25] It has been reported that opioids used in the postoperative period increase the risk of PONV, depending on the dose.[26] In this study, because the use of morphine was significantly higher in Group K, it can be expected that the symptoms of nausea and vomiting would be more. However, there was no significant difference between the groups in terms of nausea and vomiting. This has been attributed to the use of prophylactic antiemetics in all cases.

This study has some limitations. It is a retrospective study. Data in the first 24 hours were evaluated in this study. Postoperative pain levels are expected to be at the highest level in the first 24 hours, and with the use of multimodal analgesia, pain levels and analgesic consumption after 24 hours are expected to be lower.

CONCLUSION

In conclusion, bilateral infraorbital-supraorbital nerve block application in rhinoplasty provided significant pain relief for the first 24 hours. Thus, it reduces the need and consumption of analgesics in the early postoperative period. Randomized controlled studies are needed to evaluate local anesthetic preference and dose.

Ethics Committee Approval: Ethical committee approval was received from the Gaziosmanpaşa University (date-number: 2018/17-83116987-577).

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

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