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The Effect of Prilocaine or Levobupivacaine Infiltration on Pain during Nasal Packing Removal

Tayfun Apuhan, MD¹, Yavuz Selim Yıldırım, MD², Nebahat Gulcu, MD³, Hasan Koçoğlu, MD⁴, and Yalçın Karagöz, PhD⁵

Abstract

Objective. The aim of this study was to evaluate the efficacy of rehydration of Merocel nasal packs with prilocaine or levobupivacaine on reducing pain and discomfort of nasal packing removal in patients who had undergone septoplasties or endoscopic sinus surgery.

Study Design. Prospective clinical study.

Setting. Tertiary referral center.

Methods. This prospective study was conducted on 72 patients, aged 18 to 55 years, who had undergone septoplasty, bilateral functional endoscopic sinus surgery, or both. The patients were divided into 2 groups: prilocaine group (group P, n = 36), who received 2.5 mL of 2% prilocaine, and levobupivacaine group (group L, n = 36), who received 2.5 mL of levobupivacaine hydrochloride dilution. These solutions were diluted with 2.5 mL saline to a final volume of 5 mL, which was then injected into the Merocel packing 15 minutes before removal of the pack. In both groups, 5 mL of saline was injected into the packing in the contralateral nostril as a control 15 minutes before removal of the pack. Visual analog score (VAS) and the Ramsay sedation score were recorded.

Results. Statistically significant differences were found in VAS and Ramsay sedation scale scores of levobupivacaine and prilocaine groups compared to controls. No significant difference was noted between the groups in terms of levobupivacaine and prilocaine.

Conclusions. Levobupivacaine or prilocaine infiltration before removal of nasal packs in patients who undergo septoplasties or endoscopic sinus surgery can decrease discomfort and improve patient tolerability.

Keywords

septoplasty, endoscopic sinus surgery, nasal packing, prilocaine, levobupivacaine

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Nasal packing is a commonly performed application following nasal surgery. It is used primarily to control hemostasis but also prevents complications of septal surgery, including septal hematoma, postoperative adhesion, infection, and abscess formation. Another reason is the internal stabilization of the cartilaginous/bony skeleton of the nose to prevent postoperative deviation. However, nasal packing removal is an important complaint for most patients as this procedure may cause substantial discomfort. Nasal surgery patients report that the most painful part of this experience is during and just after removal of the pack. Previous reports have indicated that injection of a local anesthetic such as prilocaine plus meperidine into the nasal pack provides effective analgesia during nasal packing removal.

Prilocaine is a local anesthetic of the amino amide type. Another local anesthetic, levobupivacaine, has been used for the treatment of acute and chronic pain. Clinical studies that have tested the efficacy of levobupivacaine in a wide spectrum of operations have shown it to be generally well tolerated and to have vasoconstrictive activity. At present, no controlled trial has yet examined the efficacy of levobupivacaine for pain relief during nasal packing removal. Therefore, the aim of the present study was to compare the analgesic and sedative effects of prilocaine and levobupivacaine infiltration before removal of nasal packs placed in patients who had undergone septoplasties and endoscopic sinus surgery.
Material and Methods

This prospective study was conducted on 72 patients, aged 18 to 55 years, in Abant İzzet Baysal University Izzet Baysal Medical Faculty, Bolu, Turkey, who had undergone septoplasty, bilateral functional endoscopic sinus surgery, or both and who were categorized as American Society of Anesthesiologists physical status I to II. The study was conducted with the approval of the Ethics Committee of the Medical Faculty of Abant İzzet Baysal, Bolu, Turkey. Informed consent was obtained from all patients recruited into the study. Exclusion criteria included pregnancy; patients receiving analgesic, hypnotic, anxiolytic, or antidepressant medications; severe cardiovascular, renal, hematologic, hepatic, or respiratory disease; and preexisting neurological or psychiatric illness. Patients with diabetes or peripheral neuropathy or a history of serious adverse reaction or allergy to any study drug were also excluded from the study. In all patients, the nasal pack was made of Merocel packs (expandable polyvinyl acetate nasal packing; Medtronic Xomed, Jacksonville, Florida) that expand upon contact with fluid. The postoperative analgesia included diclofenac or acetaminophen orally as needed. The packs were removed on the second postoperative day. Subjects were divided into 2 groups: the prilocaine group (group P, n = 36) and the levobupivacaine group (group L, n = 36). A 25-gauge needle was used for direct application of the treatment to the Merocel, with care taken not to touch the patient. The patients were reassured that the needle was going to be applied only to the pack. A 2.5-mL volume of 2% prilocaine (Citanest 2%; AstraZeneca, London, UK) was diluted with 2.5 mL saline, and the entire 5-mL solution was injected into the Merocel pack 15 minutes before removal of the pack. In the levobupivacaine group (group L, n = 36), 2.5 mL levobupivacaine hydrochloride (Chirocaine 25 mg/10 mL; Abbott, Nycomed Pharma AS, Elverum, Norway) was diluted with 2.5 mL saline, and the entire 5-mL solution was injected into the Merocel pack 15 minutes before removal of the pack. In both groups, 5 mL saline (S) was injected into the packing in the contralateral nostril as a control 15 minutes before removal of the pack.

All patients were blinded to which side was anesthetic and which side was saline. The surgeon was not blinded to which treatment the patient received. All patients were asked to evaluate the severity of pain during nasal packing removal by a visual analog scale (VAS) (range, 0-10; 0 = no pain and 10 = intolerable pain). The VAS was recorded for each side during injection, at removal, and 5, 15, and 30 minutes after packing removal. The Ramsay sedation scale was also recorded during injection, packing removal, and 15 and 30 minutes after packing removal as reported previously\(^1\) (1 = patient is anxious and agitated, restless, or both; 2 = patient is cooperative, oriented, and tranquil; 3 = patient responds to commands only; 4 = patient exhibits a brisk response to a light labellar tap or a loud auditory stimulus; 5 = patient exhibits a sluggish response to a light labellar tap or a loud auditory stimulus; and 6 = patient exhibits no response).

Cardiorespiratory monitoring included pulse oxymetry (SpO\(_2\)), systolic arterial pressure (SAP), diastolic arterial pressure (DAP), mean arterial pressure (MAP), and heart rate (HR). Adverse events such as vomiting and nausea were recorded. These events were attended to by the same medical team to minimize observer variations.

Statistical Analysis

All statistical analyses were performed using the SPSS program, version 18.0 (SPSS, Inc, an IBM Company, Chicago, Illinois) for Windows XP. Unless otherwise stated, values are expressed as means ± SD. The analysis was conducted using the \(\chi^2\) test for categorical data and the Mann-Whitney \(U\) test for the variables with abnormal distribution that were collected on the basis of the ratio. \(P < .05\) was recognized as statistically significant.

Results

Our series consisted of 72 patients (28 women and 44 men) aged 18 to 55 years (mean 31.7 ± 1.5 in the levobupivacaine group and 32.2 ± 1.6 in the prilocaine group). Statistically significant differences were obtained in VAS and Ramsay sedation scores between the levobupivacaine and the saline groups during infiltration, nasal packing removal, and after 30 minutes (\(P < .05\)). The same differences were found between the prilocaine and saline groups (\(P < .05\)). No statistically significant differences were found for VAS and Ramsay sedation scores between the levobupivacaine and prilocaine groups during infiltration, nasal packing removal, and 30 minutes later (Tables 1 and 2, Figure 1). No complications or side effects regarding the intranasal use of levobupivacaine and prilocaine were observed.

Discussion

Nasal packing is one of the leading causes of postoperative pain. The anxiety of the patient adds another level of complication. Nasal packing removal is an uncomfortable, often painful process with most discomfort occurring during and immediately after removal. The process is a distressing incident in nasal surgery, and the most painful event in the postoperative period is removal of nasal packing.\(^2\) Various methods have been described to decrease pain and to increase patient comfort during removal of the packs. The ideal agent should be safe, inexpensive, and easy to administer.\(^5\)

Yilmazer et al\(^9\) concluded that preemptive analgesia for removal of nasal packing can decrease discomfort suffered by patients during the procedure and improves patient tolerability. The number of studies on preemptive analgesic use for postoperative pain relief has increased; however, only a limited number of these studies have focused on preemptive analgesia in otorhinolaryngological practice.

The rehydration of the nasal package with 4% lignocaine solution was assessed by Lavy et al\(^10\) who found that topical 5% lignocaine ointment considerably decreased pain in the first 3 hours of an operation, but relief disappeared within 6 hours of the operation.

Durvasula et al\(^12\) compared the effect of 10 mL of either 2% lignocaine or 0.9% saline applied topically to the packs 10 minutes prior to their removal. The pain score experienced on removal was recorded on a visual analog scale. These researchers found no statistical evidence of a difference between the 2 groups. Lignocaine used in this way did not reduce the pain of pack removal after nasal surgery.
Lachanas et al. concluded that rehydration of Merocel packing with a 0.25% tetracaine solution is an easy, safe, inexpensive, and effective analgesia method for nasal packing removal following septoplasty. Karaaslan et al. suggested an injection of prilocaine plus meperidine into the nasal pack 15 minutes before nasal packing removal to provide mild sedation and effective analgesia during the procedure. They showed that prilocaine supplemented with meperidine provided significantly lower anxiety levels.

Demiraran et al. compared the use of preincisional 2% levobupivacaine with epinephrine and 0.25% plain levobupivacaine for postoperative analgesia and vasoconstriction in patients undergoing nasal surgery. They concluded that local infiltration of levobupivacaine for postoperative analgesia in nasal surgery was significantly longer lasting and more potent than that achieved by lidocaine plus epinephrine.

Intranasal anesthetics are absorbed systemically to some degree. Levobupivacaine, as a long-acting local anesthetic,

### Table 1. Visual Analog Scores in All Groups (N = 72)

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<th>L1</th>
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<td>VAS L and S</td>
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<tr>
<td>Mean ± SD</td>
<td>1.83 ± 0.61</td>
<td>1.83 ± 0.61</td>
<td>2.97 ± 0.7</td>
<td>5.11 ± 0.82</td>
<td>1.86 ± 0.54</td>
<td>4.19 ± 0.92</td>
<td>1.36 ± 0.49</td>
<td>2.39 ± 0.99</td>
<td>1.14 ± 0.35</td>
<td>1.47 ± 0.51</td>
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<tr>
<td>Mean difference (CI)</td>
<td>0.00 (–0.29 to 0.29)</td>
<td>–2.14 (–1.78 to –2.50)</td>
<td>–2.33 (–1.99 to 2.69)</td>
<td>–1.03 (–0.66 to 1.40)</td>
<td>–0.33 (–0.13 to 0.54)</td>
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<td>P value</td>
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### Table 2. Ramsay Sedation Scores in All Groups (N = 72)

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<th>L1</th>
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<td>Ramsay L and S</td>
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<tr>
<td>Mean ± SD</td>
<td>1.58 ± 0.50</td>
<td>1.58 ± 0.50</td>
<td>1.78 ± 0.42</td>
<td>1.28 ± 0.45</td>
<td>1.97 ± 0.17</td>
<td>1.89 ± 0.32</td>
<td>2.00 ± 0.00</td>
<td>2.00 ± 0.00</td>
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<tr>
<td>Mean difference (CI)</td>
<td>0.00 (–0.23 to 0.23)</td>
<td>0.50 (0.29 to 0.71)</td>
<td>0.08 (–0.04 to 0.20)</td>
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<tr>
<td>P value</td>
<td>.999</td>
<td>.000</td>
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<td>.167</td>
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### Abbreviations:
- CI, confidence interval; L, levobupivacaine infiltration; Lr, levobupivacaine group packing removal; L1, 5 minutes after levobupivacaine group packing removal; L2, 15 minutes after levobupivacaine group packing removal; L3, 30 minutes after levobupivacaine group packing removal; S, saline infiltration; S1, 5 minutes after saline group packing removal; S2, 15 minutes after saline group packing removal; S3, 30 minutes after saline group packing removal; Pi, prilocaine infiltration; Pr, prilocaine group packing removal; Pi, 5 minutes after prilocaine group packing removal; Pr, 15 minutes after prilocaine group packing removal; Pi, 30 minutes after prilocaine group packing removal; VAS, visual analog scale.

**P < .01.

*P < .05.

**P < .01.

Lachanas et al. concluded that rehydration of Merocel packing with a 0.25% tetracaine solution is an easy, safe, inexpensive, and effective analgesia method for nasal packing removal following septoplasty. Karaaslan et al. suggested an injection of prilocaine plus meperidine into the nasal pack 15 minutes before nasal packing removal to provide mild sedation and effective analgesia during the procedure. They showed that prilocaine supplemented with meperidine provided significantly lower anxiety levels.
has also been used for the treatment of acute and chronic pain. Clinical studies have tested the efficacy of levobupivacaine in a wide spectrum of operations and found it to have vasoconstrictive activity and to be generally well tolerated.

When compared to the control group, both levobupivacaine and prilocaine were effective in reducing patient pain or discomfort. In the present study, the physicians were blinded to both injected drugs. Levobupivacaine is longer lasting than prilocaine, but in the present study, this was not found to be statistically significant for removal of nasal packs placed in patients who had undergone septoplasty or endoscopic sinus surgery.

Conclusion

Nasal packing removal is an uncomfortable and often painful process. In the present study, we injected a local anesthetic, either levobupivacaine or prilocaine, into the pack, using a method that could be easily applied with few complications in a standard otorhinolaryngology practice. Both anesthetics could decrease the discomfort experienced by the patients during the procedure and improved patient tolerability. We conclude that many patients could benefit from Merocel packing rehydration with levobupivacaine or prilocaine solution because it is an easy, inexpensive, safe, and effective method of analgesia for nasal packing removal in patients who have undergone septoplasty or endoscopic sinus surgery.

Acknowledgment

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Author Contributions

Tayfun Apuhan, substantial contributions to conception and design and acquisition of data; Yavuz Selim Yildirim, analysis and interpretation of data and performed statistical analysis of the data; Nebehat Gulcu, drafting the article and revising it critically for important intellectual content; Hasan Koçoğlu, drafting the article and revising it critically for important intellectual content; Yalçın Karagöz, performed statistical analysis of the data.

Disclosures

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