The Journal of Laryngology & Otology (2010), ***124***, *1194–1199.*

doi:10.1017/S0022215110001519

Main Article

Assessment of early post-operative pain following septorhinoplasty

P Szychta, B Antoszewski

Abstract

Objective: To evaluate pain incidence and intensity in patients undergoing septorhinoplasty, and to assess analgesic treatment effectiveness, in the first 7 days after surgery.

Design: Prospective outcomes analysis using visual analogue scale assessment of pain intensity in the first 7 post-operative days.

Subjects: Fifty-seven patients were enrolled in the study, 29 women and 28 men, aged 18 to 51 years. All were treated for post-traumatic deformity of the external nose and/or nasal septum, with either septorhinoplasty or septoplasty.

Results: In the first 3 days after septorhinoplasty, patients' mean visual analogue scale pain score exceeded the range denoting 'analgesic success', and showed considerable exacerbation in the evening. Patients' pain decreased to a mean score of 15.4 one hour after administration of a nonsteroidal anti-inflammatory drug (metamizole).

Conclusion: Analgesia is recommended for all patients in the first 3 days after septorhinoplasty, especially in the early evening.

Key words: Rhinoplasty; Nose Deformity; Postoperative Pain; Patient Controlled Analgesia; Analgesics; NSAIDs; Metamizole

Introduction

Corrective and reconstructive plastic surgery procedures can cause intense post-operative pain. These include post-traumatic nasal reconstruction procedures.

Pain is a subjective, unpleasant sensory and emotional sensation. The extent of post-operative pain depends on the kind of premedication given, the operation type, the general anaesthesia used and the patient's individual sensitivity. Post-operative pain can contribute to raised arterial pressure and pulse rate, as well as to decreased effectiveness of breathing (due to shallow breathing), resulting in a decreased partial pressure of oxygen and increased partial pressure of CO_2. Post-operative pain can also result in excessive perspiration, nausea, vomiting and impaired wound healing.[1,2]

In pain assessment, the most frequently used research tool in the early post-operative period is the visual analogue scale (VAS). This scale consists of a line extending from 0 (= lack of pain) to 100 (= unbearable pain).[3,4] In post-operative pain assessment, VAS scores from 0 to 29 indicate adequate analgesia – termed 'analgesic success'.[5] In this same setting, VAS scores above 70 indicate intense pain which requires immediate pharmacological treatment.

Patients with a VAS pain score of 0 to 29 should be given one of the medications included in step one of the 'analgesic ladder' (e.g. a nonsteroidal anti-inflammatory drug (NSAID)). Paracetamol can be added to enhance analgesia. For patients with VAS pain scores of 30 to 59, medications from step two of the analgesic ladder – the so-called weak opioids – are recommended (e.g. tramadol, codeine and dihydrocodeine). Patients with VAS pain scores of 60 to 100 should be given analgesic ladder step three painkillers – the strong opioids (e.g. morphine, fentanyl, buprenorphine and methadone).[6] In clinical practice, assessment of the analgesic effectiveness of such therapy is also important.

In the available literature, we identified a small number of reports describing pain in the first 24 hours post-operatively, in patients undergoing post-traumatic surgical nasal reconstruction; however, there were no studies assessing pain in the whole of the early post-operative period.[7,8]

Thus, the current study aimed to evaluate the incidence and intensity of post-operative pain in this group of patients, as well as to assess the effectiveness of analgesic treatment.

From the Plastic, Reconstructive and Aesthetic Surgery Department, Medical University of Łódź, Poland.
Accepted for publication: 6 April 2010. First published online 6 July 2010.

Materials and methods

The Medical University of Łódź Review Board gave permission to perform the study (approval number RNN/190/09/KE).

Informed consent was obtained from 57 patients undergoing post-traumatic surgical reconstruction of the external nose and/or nasal septum, between February and October 2008, within the plastic, reconstructive and aesthetic department at the Medical University of Łódź, Poland. These patients comprised 29 women and 28 men, aged 18 to 51 years.

All patients were asked to complete a pain assessment questionnaire, as below.

Patients were divided into two groups depending on the type of surgery: group one patients underwent septorhinoplasty and group two patients septoplasty. Group one patients were further divided into two subgroups depending on their post-operative pain management (see below).

On admission, all patients received detailed information about the VAS pain assessment system. Pain intensity was classified according to a 101-point scale as follows: VAS_A = a VAS score of 0 to 29, VAS_B = 30 to 59 and VAS_C = 60 to 100. During the post-operative period, the patients were asked to record their pain intensity on a VAS scale. Patients recorded their VAS pain score twice on the day of surgery (two hours after the operation (at approximately 2 p.m.) and again at 8 p.m.), and then three times a day on the five subsequent days (at 8 a.m., 2 p.m. and 8 p.m.). In addition, those patients who received analgesia assessed the effect of the medication, using a VAS pain score, one hour after administration. During their follow-up appointment at the plastic surgery out-patient clinic, 7 days after surgery, patients were asked to record a final VAS pain score.

Prior to surgery, patients were given midazolam as premedication. General intratracheal anaesthesia was then induced with sevoflurane, and intra-operative analgesia maintained with intravenous fentanyl administered as an average total dose of approximately 0.3 mg (the mean patient weight was 69 kg). Lidocaine (10 mg) with adrenaline (0.00625 mg) was used intra-operatively to standardise local anaesthesia.

All patients underwent partial resection and repositioning of the nasal septum, to correct deviation from the median plane, and final stabilisation of the septum using internal packing (plus ointment) placed in both nasal cavities.

Corrective surgery on the septum itself was carried out in 11 patients (group two); this lasted 60 minutes on average, and these patients required general anaesthesia for about 80 minutes.

Additional, simultaneous osteotomy of the osseous nasal skeleton was performed in the remaining 46 patients (group one), involving reconstruction of the external nose and septum. After completion of surgery, a plaster cast was placed on the operated area. In these 46 patients, the mean time for corrective surgery of the nose and septum was approximately 80 minutes; this required a mean general anaesthesia time of 100 minutes.

All patients were extubated in the operating theatre.

The mean time period from the end of the operation to the patient's first request for analgesia was 5.5 hours. A patient-controlled analgesia regime was instituted, in order to temporarily relieve pain in the post-operative period. When patients reported pain, they were administered intravenous metamizole in a single 1 g dose, not more frequently than 8-hourly.

Patients undergoing corrective surgery of the entire nose (group one) were divided into two subgroups: those requiring patient-controlled analgesia (group one A) and those not requiring analgesia (group one B).

Of those patients undergoing surgery of the nasal septum itself (group two), none required analgesia in the post-operative period studied.

Internal packing was removed from the nasal cavities a mean of 3.21 days after septorhinoplasty (group one) and 3.09 days after septoplasty (group two), and the patients were discharged home.

On the seventh post-operative day, the plaster cast was removed from group one patients at the plastic surgery out-patient clinic, and the symmetry of the nose and/or septum was assessed.

Results

In the first 7 days after septorhinoplasty, our group one patients' mean VAS pain score was 12.91. The mean VAS pain score was 14.23 for women and 11.38 for men. Detailed analysis of mean VAS pain scores in group one patients is shown in Figure 1. During the first 3 post-operative days, 4.3–21.7 per cent of patients had a VAS pain score of 60–100, depending on the hour of measurement, while 15.2–41.3 per cent had a pain score of 30–59. A marked increase in pain scores was observed in the evening. During subsequent days, no patients had pain scores above 60, but a few recorded scores in the 30–59 range (Figure 2).

Post-operative analgesia (metamizole) was requested by 67.3 per cent of group one patients (number of patients: group one – 46, including: group one A – 31, group one B – 15; group two – 11) during the first 7 post-operative days. Of these patients (i.e. group one A), 46 per cent were women and 54 per cent men. Of the group one A patients, during first 3 post-operative days, 64.6 per cent recorded a VAS pain score of 30–59 at the point of analgesia administration. However, 3.2–12.9 per cent of group one A patients recorded VAS pain scores of 60–100 until the third post-operative day (Figure 3). Of the group one A patients, 3.2–22.5 per cent recorded VAS pain scores of 0–29. During the first 3 post-operative days, the VAS pain scores reported by group one A patients exceeded the range of analgesic success, with exacerbation of pain in the evening.

Group one A patients had a mean VAS pain score of 43.2. Their pain scores fell to a mean of 15.4 one hour after analgesia administration.

https://doi.org/10.1017/S0022215110001519 Published online by Cambridge University Press

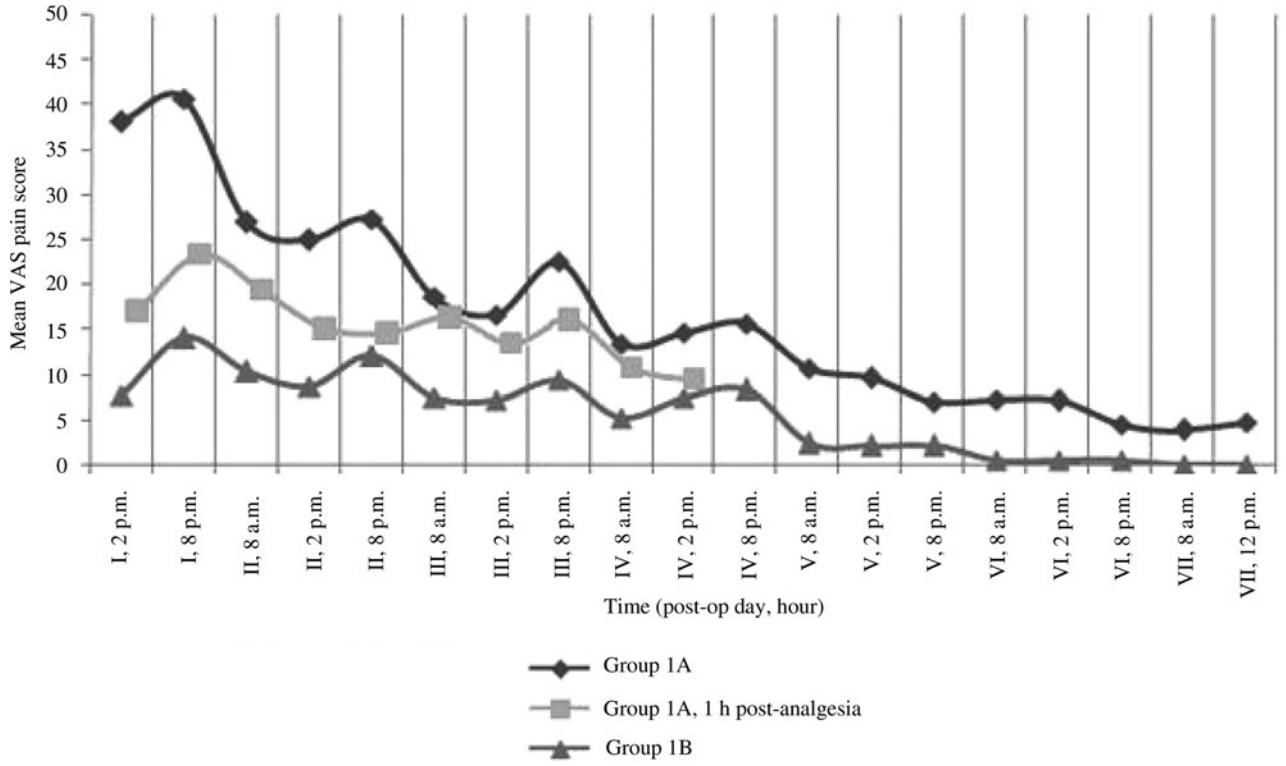

FIG. 1
Mean visual analogue scale (VAS) pain scores for group one patients in the first 7 post-operative days.

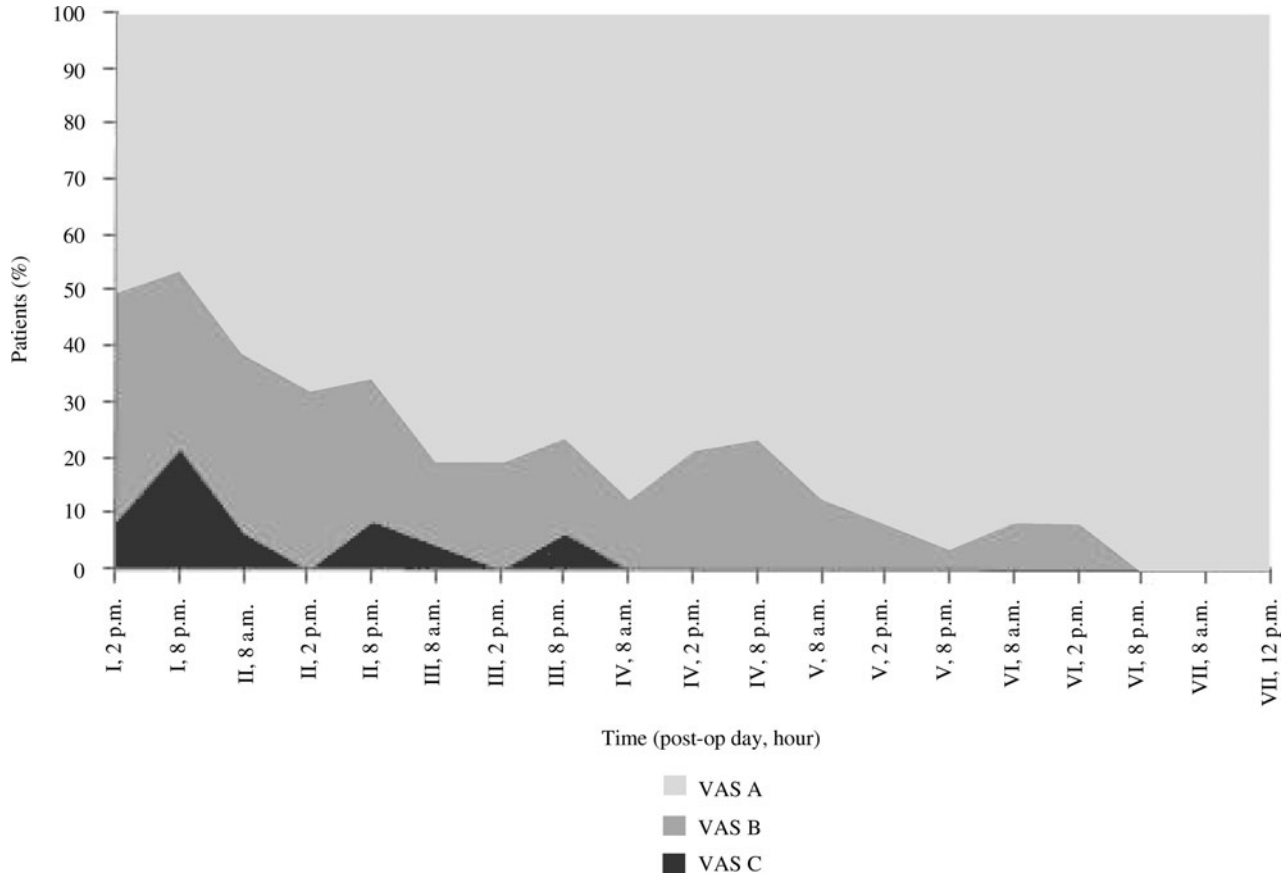

FIG. 2
Percentage of group one patients with visual analogue scale (VAS) pain scores of 1–29 (VAS A), 30–59 (VAS B) and 60–100 (VAS C), in the first 7 post-operative days.

https://doi.org/10.1017/S0022215110001519 Published online by Cambridge University Press

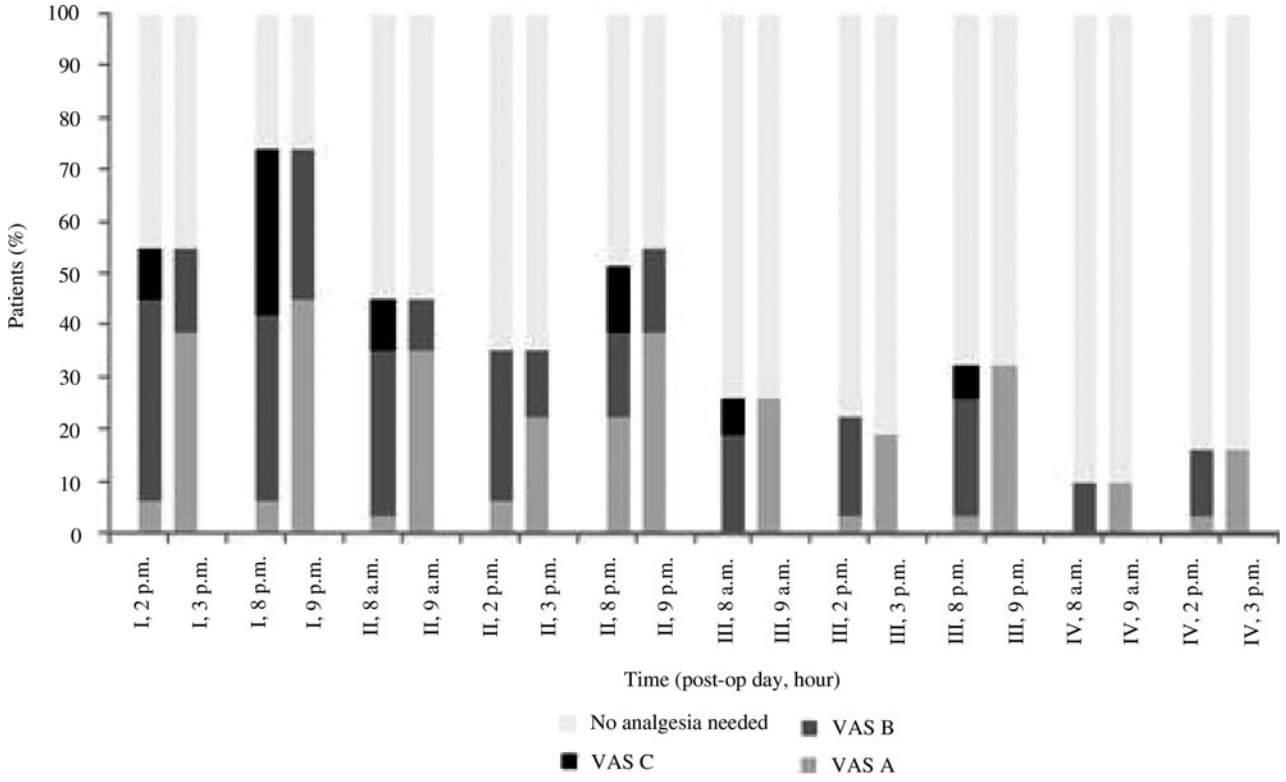

FIG. 3

Percentage of group 1A patients reporting various pain score ranges, at the point of analgesic administration and one hour later, in the first 7 post-operative days. Visual analogue scale (VAS) pain score ranges: 1–29 = VAS A; 30–59 = VAS B; and 60–100 = VAS C.

Group one patients not reporting any analgesia requirement (i.e. group one B) recorded a mean VAS pain score of 5.5.

Group one patients recorded the most severe mean VAS pain scores on the first day after the surgery; these pain scores were outside the range of analgesic success. Over the next 4 days, the group one patients' recorded pain scores decreased gradually. From the sixth post-operative day, group one patients reported pain scores equal to those recorded by group two patients.

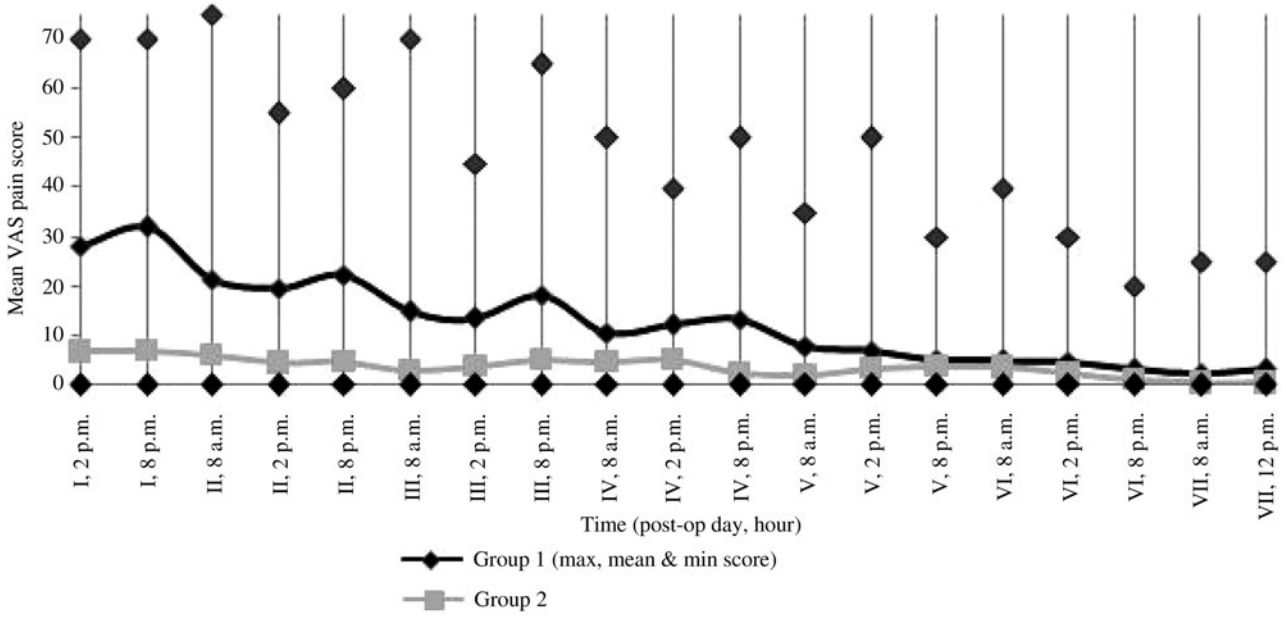

FIG. 4

Visual analogue scale (VAS) pain scores for group one patients (showing maximum (max), mean and minimum (min) scores) and group two patients (mean scores), in the first 7 post-operative days.

https://doi.org/10.1017/S0022215110001519 Published online by Cambridge University Press

Group two patients reported a constant, low level of pain, with a mean VAS pain score of 3.7 (Figure 4).

Discussion

Previous studies have stated the necessity of pain management in the majority of patients during the first 24 hours after surgery to correct traumatic nasal deformity.[9–11] In the present study, group one patients' mean pain level after septorhinoplasty exceeded the range of analgesic success during the first 3 days, and showed considerable exacerbation in the evening. The majority of these group one patients reported the need for post-operative analgesia. The average pain score in this group was considerably higher than that of patients who reported no need for post-operative analgesia.

Female and male patients reported similar mean pain scores and requested analgesia with similar frequency. Other authors' findings have been ambiguous in this respect. Li *et al.* found no statistically significant differences between the post-operative pain of female and male patients.[12] However, Gagliese *et al.* found a statistically significantly greater post-operative pain level in female patients treated with a patient-controlled analgesia pattern.[9] Both Greenspan *et al.* and Berkley investigated this discrepancy as a more complex phenomenon, by analysing gender-related pain levels together with anatomical and hormonal differences.[13,14] They concluded that differences in pain sensitivity could not be accurately predicted.

Many studies have assessed the role of NSAIDs in post-operative pain management, and have found them to be effective and to have fewer side effects compared with opioids.[10,15–20] Saray *et al.* found metamizole to be more effective than diclofenac, whereas Marín-Bertolín *et al.* found metamizole to be more effective than ketorolac.[8,21]

Hudcova *et al.* assessed the impact of opioid analgesia delivery mode, and demonstrated that patients managed with patient-controlled analgesia felt decreased pain compared with those receiving analgesia at predetermined time intervals.[19] In accordance with these results, in our study we used patient-controlled analgesia with intravenous metamizole which resulted in a considerable decrease in pain level (to a mean VAS pain score of 27.7, i.e. within the range of analgesic success). However, during the first 2 days several patients did not report sufficient pain relief despite analgesic treatment. Moreover, during the first 3 days the administration of opioids could be recommended on account of the high reported VAS pain scores, particularly in the evening.

As per current recommendations, all our septorhinoplasty patients received a nasal plaster cast and internal nasal cavity packing during the early post-operative period, in order to protect the area and to stabilise the nasal bones and septum. The ointment used in the study was 0.2% nitrofural. However, Camirand *et al.* managed 812 post-septorhinoplasty patients without any external splint or internal packing, and reported only a small amount of tissue swelling and hardly any pain.[22] Thus, the effect of post-operative dressings on pain is contentious. We consider that pain in post-septorhinoplasty patients is largely the result of osteotomy.

- **This study investigated post-operative pain in patients undergoing nasal framework surgery**
- **Septorhinoplasty involved significantly greater post-operative pain than did septoplasty**
- **Analgesics should be administered to all patients undergoing septorhinoplasty during the first 3 days following surgery; we recommend a patient-controlled analgesia regime**
- **Opiate analgesia may be required when pain is severe**

Aydil *et al.* compared post-operative pain in patients undergoing different plastic surgery nasal procedures, and found that pain was considerably greater in individuals undergoing septorhinoplasty compared with septoplasty.[23] The outcomes of the present study confirm such earlier findings. Our patients undergoing septoplasty did not require post-operative analgesia, and remained within the range of analgesic success for the whole 7-day post-operative period studied. Our patients undergoing surgical correction of the entire nose reported gradually decreasing pain, which reached the level observed in the post-septoplasty patients only after 6 days post-operatively.

Conclusion

In conclusion, high pain intensity is common in patients undergoing septorhinoplasty and low pain level is expected in patients undergoing only septoplasty. Therefore, the authors suggest administering the painkiller to all patients subjected to septorhinoplasty during the first three days after the operation, especially in the early evening hours (before 8:00 p.m.), on account of high pain levels and high frequency of requests for the analgesic in the early post-operative period. As metamizole did not decrease pain sufficiently in several patients during the first two post-operative days, one should consider administering different drugs from the NSAID group. In the case of very severe pain, not abating after instituted treatment, the use of a painkiller from the higher steps of the analgesic ladder is suggested. Further research is required to formulate uniform standards for premedication, intraoperative anaesthesia and pain management during the post-operative period in patients undergoing corrective surgery of the external nose and/or nasal septum.

References

1 Pavlin DJ, Chen C, Penaloza DA, Polissar NL, Buckley FP. Pain as a factor complicating recovery and discharge after ambulatory surgery. *Anesth Analg* 2002;**95**:627–34
2 Carr DB, Goudas LC. Acute pain. *Lancet* 1999;**353**:2051–8
3 DeLoach LJ, Higgins MS, Caplan AB, Stiff JL. The visual analog scale in the immediate postoperative period:

https://doi.org/10.1017/S0022215110001519 Published online by Cambridge University Press

intrasubject variability and correlation with a numeric scale. *Anesth Analg* 1998;**86**:102–6
4 Ohnhaus EE, Adler R. Methodological problems in the measurement of pain a comparison between the verbal rating scale and the visual analogue scale. *Pain* 1975;**1**: 379–84
5 Mantha S, Thisted R, Foss J, Ellis JE, Roizen MF. A proposal to use confidence intervals for visual analog scale data for pain measurement to determine clinical significance. *Anesth Analg* 1993;**77**:1041–7
6 Wewers ME, Lowe NK. A critical review of visual analogue scales in the measurement of clinical phenomena. *Res Nurs Health* 1990;**13**:227–36
7 Iverson RE, Lynch DJ. Practice advisory on pain management and prevention of postoperative nausea and vomiting. *Plast Reconstr Surg* 2006;**118**:1060–9
8 Marín-Bertolín S, De Andrés J, González-Martínez R, Valia Vera JC, Amorrortu-Velayos J. A controlled, randomized, double-blind study of ketorolac for postoperative analgesia after plastic surgery. *Ann Plast Surg* 1997;**38**: 478–84
9 Gagliese L, Gauthier LR, Macpherson AK, Jovellanos M, Chan VW. Correlates of postoperative pain and intravenous patient-controlled analgesia use in younger and older surgical patients. *Pain Med* 2008;**9**:299–314
10 Sener M, Yilmazer C, Yilmaz I, Caliskan E, Donmez A, Arslan G. Patient-controlled analgesia with lornoxicam vs. dipyrone for acute postoperative pain relief after septorhinoplasty: a prospective, randomized, double-blind, placebo-controlled study. *Eur J Anaesthesiol* 2008;**25**: 177–82
11 Demiraran Y, Ozturk O, Guclu E, Iskender A, Ergin MH, Tokmak A. Vasoconstriction and analgesic efficacy of locally infiltrated levobupivacaine for nasal surgery. *Anesth Analg* 2008;**106**:1008–11
12 Li L, Liu X, Herr K. Postoperative pain intensity assessment: a comparison of four scales in Chinese adults. *Pain Med* 2007;**8**:223–34
13 Greenspan JD, Craft RM, LeResche L, Arendt-Nielsen L, Berkley KJ, Fillingim RB *et al*. Studying sex and gender differences in pain and analgesia: a consensus report. *Pain* 2007;**132**:s26–s45
14 Berkley KJ. Sex differences in pain. *Behav Brain Sci* 1997; **20**:371–80
15 Dahl JB, Kehlet H. Non-steroidal anti-inflammatory drugs: rationale for use in severe postoperative pain. *Br J Anaesth* 1991;**66**:703–12
16 Kehlet H, Dahl JB. Anaesthesia, surgery, and challenges in postoperative recovery. *Lancet* 2003;**362**:1921–8
17 White PF. The role of non-opioid analgesic techniques in the management of pain after ambulatory surgery. *Anesth Analg* 2002;**94**:577–85
18 White PF. The changing role of non-opioid analgesic techniques in the management of postoperative pain. *Anesth Analg* 2005;**101**:5–22
19 Hudcova J, McNicol E, Quah C, Lau J, Carr DB. Patient controlled opioid analgesia versus conventional opioid analgesia for postoperative pain. *Cochrane Database Syst Rev* 2006;(4):CDOO3348
20 Nikoda VV, Maiachkin RB, Bondarenko AV. Clinical aspects of using patient-controlled analgesia with nonsteroidal anti-inflammatory agents in postoperative period [in Russian]. *Anesteziol Reanimatol* 2003;**5**:56–9
21 Saray A, Büyükkocak U, Cinel I, Tellioglu AT, Oral U. Diclofenac and metamizol in postoperative analgesia in plastic surgery. *Acta Chir Plast* 2001;**43**:71–6
22 Camirand A, Doucet J, Harris J. Nose surgery (rhinoplasty) without external immobilization and without internal packing: a review of 812 cases. *Aesthetic Plast Surg* 1998;**22**:245–52
23 Aydil U, Yilmaz M, Akyildiz I, Bayazit Y, Keseroglu K, Ceylan A. Pain and safety in otorhinolaryngologic procedures under local anesthesia. *J Otolaryngol Head Neck Surg* 2008;**37**:851–5

Address for correspondence:
Dr Paweł Szychta,
Plastic, Reconstructive and Aesthetic Surgery Department,
University Hospital No 1,
ul Kopcińskiego 22,
90-153 Łódź, Poland.

Fax: +48 42 677 67 49
E-mail: szychta@yahoo.pl

Dr P Szychta takes responsibility for the integrity of the content of the paper.
Competing interests: None declared