

How we do it: Septoplasties under local anaesthetic are suitable for short stay surgery; the clinical outcomes

Hytönen, M., Blomgren, K., Lilja, M., & Mäkitie, A.A.

ENT Hospital, Helsinki University Central Hospital, Helsinki, Finland

Accepted for publication 1 December 2005

Keypoints

- Septoplasties can be performed under local anaesthesia. However, careful prevention and treatment of pain during the operation is essential.
- Septoplasties are suitable operations for short-stay surgery.
- Two-years post-operative, septoplasty relieved the symptoms well or excellently in 55% and moderately in 27% of the cases.
- Specialists prescribe more prophylactic antibiotics than residents (47% versus 29% $P = 0.02$).
- Post-operative antibiotics do not appear to prevent the development of post-operative infections.

Septoplasty is one of the most common operations performed at ear, nose and throat (ENT) hospitals. For example, at the Helsinki University Central Hospital altogether 655 septoplasties were done during the year 2002. Although septoplasty is a common operation, there are few studies concerning which factors have an effect on the outcome and satisfaction of patients.^{1,2}

The decision to do the septoplasty is mostly based on patient's symptoms and the septal deformation seen in anterior rhinoscopy and/or endoscopy. The development of measurements for the nasal cavity such as rhinomanometry (RMM) and acoustic rhinometry (ARM) has given objective tools to evaluate the nasal pre- and post-operative function and the anatomy.³ There are some studies showing that RMM or ARM are valuable methods for both pre- and post-operative evaluation of nasal obstruction.^{4,5} However, opposite results have also been observed.⁶

Complications of septoplasty include for example haemorrhage, haematoma, septal abscess, septal perforation, saddle nose formation and infection. Bacteraemia has been observed during septoplasty.⁷ However, the conclusion in a review by Weber *et al.*⁸ was that there is no benefit from prophylactic antibiotics in nasal surgery even if nasal packing is used.

There are no uniform guidelines for post-operative follow-up of septoplasty patients and the practice varies between hospitals and individual doctors. For example, at our hospital, it is common to see the patient 1–3 months after the operation in the final follow-up visit and later only if needed. However, some doctors follow the patients using 'no news is good news'-method, i.e. the patients are asked to contact only if problems or complications occur.

Our aim was to study the post-operative complication rate, satisfaction rate and contributing factors of septoplasty patients at an academic tertiary care center where septoplasties are performed by both specialists and residents, and most septoplasties are performed under local anaesthesia.

Materials and methods

In the first part of the study, a questionnaire concerning the patients' opinion of the pre-, peri- and post-operative treatment and outcome was sent 2 years after the operation to 219 consecutive septoplasty patients operated on between January and April 2002. Septoplasty involved correction by mobilizing, straightening and re-inserting the cartilage. No submucous resection operations were done.

The given alternative scores were: 1, very poor/very poorly; 2, poor/poorly; 3, moderate/moderately; 4, good/well; and 5, excellent/excellently. Altogether 167 patients (76%) replied. The mean age of the patients was 44.3 years (range 19.3–72.7). Thirty-one percentage were women.

Correspondence: Majja Hytönen, ENT Hospital, Helsinki University Central Hospital, P.O.Box 220, FIN-00029 HUS, Helsinki, Finland, Tel.: +358 50 5520942; fax: +358 9 47175010; e-mail: majja.hytonen@helsinki.fi.

In the second part of the study, the data concerning the pre-operative symptoms, rhinoscopy findings, pre- and post-operative RMM and ARM measurements, operative information, number of follow-up visits and infections were collected from the medical case records. Statsoft Statistica (Statistica™ v.5.1, Statsoft Inc., Tulsa, OK, USA) software was used for analysis. The statistical significances between the groups were tested using the *t*-test for independent samples and Mann–Whitney *U*-test. The Pearson Chi-square was used to test for significance of the relationship between categorical variables. The $P < 0.05$ were considered significant. The study was approved by the Ethical Committee of the Helsinki University Central Hospital.

Results

Sixty-three percentage of the patients were treated as day-case surgery patients and 37% stayed one night at the hospital and were discharged the next morning. Those who stayed at the hospital were somewhat older compared with those operated on as day-case surgery patients, mean age 47.0 *versus* 42.5 years ($P = 0.018$).

The aetiology of septal deviations was unknown in 68% of the cases. A non-specified trauma (14%), sports accident (6.7%), childhood trauma (4.3%), congenital malformation (3.0%) and assault (2.4%) were the reasons known. One complication of epistaxis treatment and one complication of nasal infection were also reported as a cause. The main and secondary pre-operative symptoms are presented in Table 1. RMM and ARM were performed pre-operatively to 64% and 9.8% of the patients respectively. Post-operatively, the measurements were done in 15% and 4.8% of the cases.

Ninety-two percentage of the septoplasties were done under local anaesthesia supplemented with intravenous

sedation. Altogether 24 doctors performed the septoplasties; 13 specialists and 11 residents. 77% of the operations were done by a specialist, 13% by a resident and in 9.1% operations by a resident under the supervision of a specialist. In two operations, a resident-assisted a specialist. The mean duration of the operations were 39, 67, 109 and 60 min respectively. In 24% of the operations the main surgeon was female.

The average number of post-operative follow-up visits was 2.3 (median: 2). The average time of the follow-up was 82 days (range: 0–643; median: 43). Seventy-five percentage of the patients had their final post-operative follow-up visit before the 81st post-operative day.

Nasal packing, sheeting splints and antibiotics

Post-operative nasal packing was used in 98% of the cases. The nasal packings and the packing period data is presented in the Table 2. In day-case septoplasties, the patient came to a follow-up visit next morning for the removal of the nasal packing. If the patient stayed overnight at the hospital the packings were removed before the patient was discharged.

Curvedly cut 6 × 2.5 cm Silatone™ silicone sheeting splints (Atos Medical AB, Hörby, Sweden) onto one or both sides of the septum fixed with transeptal sutures were used on average 6.5 days (range: 1–14) in 24% of the cases.

In 68 cases (41%) prophylactic antibiotic was used. If the operation was performed by a resident, antibiotics were used in 29% of the operations, and if a specialist was present at the operation the percentage of prophylactic antibiotic was 47% ($P = 0.02$). The mean use of antibiotics was 7.0 days (range: 1–10). The most commonly used were kefalexin 500 or 750 mg twice per day, amoxicillin 500 or 750 mg twice per day, and penicillin 1 million IU twice per day orally.

Table 1. Main and the second symptoms of the 167 consecutive septoplasty patients

Symptom	Main (%)	Second (%)
Blockage of the nose	70	29
Snoring	15	26
Sinusitis	6.7	15
Facial pain	3.1	2.3
Sleep apnea	3.1	9.3
Pharyngalgia	1.2	4.7
Headache	0.6	1.2
Rhinitis vasomotorica		5.8
Epistaxis		3.5
Crusting		3.5

Table 2. Nasal packing in 167 consecutive septoplasty patients

	No. of patients	%
Post-operative packing	164	98
Packing period known [$n = 160$ (days)]		
1	142	89
2	14	8.6
3	3	1.8
4	1	0.6
Nasal packing		
Merocel 2000 8 cm	97	59
Ivalon ThinPack	31	19
Telfa	29	17
Other	7	5

Haemorrhage and infections

At the recovery room, one patient had nasal bleeding that was electrocauterized. In the evening of the operation day, 2 day-case surgery patients had post-operative haemorrhage that was treated at the out-patient department. In the first follow-up visit, one patient had a septal haematoma that was drained.

There were altogether seven infections (4.2%) after septoplasty (Table 3). Three of these patients had been operated on as day-case surgery patients. The operation times of the non-infectious patients and infectious patients did not differ significantly. Those patients, who got a post-operative infection, were younger than those who did not, 35.7 *versus* 44.7 years ($P = 0.047$). All had had a nasal packing for 1 day, and one patient had silicone splints. Four patients had been on antibiotics post-operatively. Three patients were operated on by a resident and four patients by a senior doctor. The infection risk was higher in operations done by a resident ($P = 0.039$).

Questionnaire

The septoplasty relieved the symptoms well or excellently in 55% and moderately in 27% of the cases. The relief of the symptoms was considered very poor or poor by 18% of the patients. The satisfaction to the whole treatment process was 75.4%, 20.9% and 3.7% respectively. The effectiveness of the septoplasty on different symptoms did not differ between the symptom groups. The mean relief of the symptoms was the same whether the surgeon was a resident or a specialist (3.52 *versus* 3.44), and the satisfaction to the whole treatment process was also on the same level, the means were 3.81 and 3.92. There was no difference in the relief of the symptoms between the groups in which RMM or ARM had been used pre-operatively in the diagnostics compared with a group without measurements. In the sheeting splint-group, the mean relief of the symptoms was somewhat higher (3.70), compared with the non-splint group (3.42). However, the difference was not significant ($P = 0.21$).

Table 3. Post-operative infections of 167 consecutive septoplasty patients and infections treated at the ward

Infection	No. of patients	Hospital treatment
Abscess	3	3
Haematoma and fever	2	1
Submucosal swelling and flush	2	
Total	7	4

The pain medication during the operation was good or excellent in 87% and bad or very bad in 3.6% of the operations. The patients rated the skill of the surgeon as excellent in 61%, good in 29%, moderate in 6.1%, poor in 2.4% and very poor in 1.2% of the cases. The gender of the surgeon did not have an effect on how skilful the surgeon was experienced by the patient ($P = 0.96$) or on the relief of the symptoms after septoplasty ($P = 0.56$).

Respondents (155) had answered to the question 'I would come to a same kind of operation again'. Seventy-eight percentage answered 'Yes' and 22% answered 'No'. Those patients, who answered 'no', were younger (mean: 40.1 *versus* 45.6 years, $P = 0.035$) and answered that their satisfaction to the treatment of pain during the operation ($P = 0.009$), symptom relief $P = 0.037$), skill of the surgeon ($P = 0.036$) and overall satisfaction to the whole treatment procedure (0.004) were significantly worse compared with those that would come again to the septoplasty operation. During the 2 year follow-up, five re-septoplasties were done.

Discussion

In this study, we investigated the clinical outcome of septoplasty patients operated on at a tertiary care academic ENT hospital. A questionnaire was sent to consecutive 219 patients 2 years after the operation and replies from 76% percentage were received.

Comparison with other studies

In the present study, septoplasty had relieved the symptoms well or excellently in 55% of the patients. The relief was moderate in 27%, and 18% of the patients considered it poor or very poor. These figures are similar to those published by Bitzer *et al.*² In our study the low dissatisfaction percentage (3.7%) to the whole treatment process shows that the poor symptom relief does not necessarily mean dissatisfaction to the whole treatment process. There was no difference in the clinical outcome or satisfaction whether the operation was performed by a specialist or a resident. One reason might be that the specialists operate on the most difficult septal deformities. In those cases, however, more relief in the symptoms and thus more satisfaction could have been expected.

Ninety percentage of the patients rated the skill of the surgeon as good or excellent. The factors that affect how the patients assess the professionalism and the skills of the physicians are not well known. In a study by Rowland *et al.*⁹ different age groups gave the highest scores on professionalism, as regards the appearance, to conservatively dressed male physicians. Based on the present study, the

gender of the surgeon had no effect on the clinical outcome of the septoplasty or on the patient satisfaction.

Nasal packing is inconvenient for the patient and some studies have considered it unnecessary.¹⁰ However, nasal packing is often used, especially in day-case surgery patients.¹¹ When patients are discharged 2–4 h post-operatively, the vasoconstrictive effect of the local anaesthesia has vanished. If no nasal packing is used some minor bleeding is common as the patient gets up and goes home. In this study, nearly all the patients had nasal packing and the number of post-operative haemorrhages was low. In our earlier study, the post-operative nasal packs were used for 3 days.¹² We have, however, shortened the period of time for nasal packs as data on the use of nasal packs for a shorter post-operative period has been published.¹¹ In this study, the period for the nasal packing was short, for 89% <24 h and for 8.2% <48 h. In septum surgery, the use of sheeting splints is also controversial. In this study, the mean relief of the symptoms was somewhat higher in the sheeting splint-group, but the difference was not statistically significant.

The post-operative infection rate was 4.2% in this study. We have earlier published our post-operative infection rate after septoplasty.¹² In that study, 12 of 100 consecutive septoplasty patients suffered from post-operative infection. During that study period (year 1991), the common practice was to discharge the patients on the third post-operative day. Since then we have changed our septoplasty protocol as reports on day-case septal surgery have been published.^{11,13} In this study, two-thirds of the patients were discharged the same day and the rest of patients stayed only one night at the hospital. Probable causes to the decreased infection rate are the remarkably shortened nasal packing- and hospitalization times.

Clinical applicability of the study

The availability of RMM and ARM is very good at our hospital. However, RMM and ARM were used only in 64% and 9.8% pre- and in 15% and 4.8% of cases post-operatively. RMM is considered to be a more functional test than ARM. This may explain why RMM was preferred to ARM in the diagnostics of septal deviations. In this study, the patients in whose diagnostics RMM or ARM was used were not more satisfied than those patients without RMM measurements. This does not necessarily mean that nasal measurements would give no additional value to the diagnostics of nasal diseases. In the diagnostics of those patients whose septal deformity was severe and easily seen nasal pre-operative measurements were probably not considered necessary. This study does not either show those patients whose nasal blockage

was caused by mucous membrane swelling and by whom the unnecessary septoplasty was avoided because RMM or ARM were done in the diagnostics.

In septum operations at our hospital, most surgeons prefer to use local anaesthesia because of its vasoconstrictive effect and as the patients also avoid unpleasant side effects sometimes connected to general anaesthesia. In this study, nine of 10 operations were done under local anaesthesia. The prevention or the treatment of the pain was not sufficient for 3.6% of the patients. The pain experienced during the septoplasty was also connected to the overall dissatisfaction to the whole treatment process. The percentage of dissatisfaction to pain treatment is low but as it still exists, it is important that the surgeon, in addition to adequate local anaesthesia, uses a technique with minimal probability of pain.

In this study, the total number of the post-operative infections was low. However, in the operations performed by the residents the infection rate was significantly higher. One reason might be the longer total operation time of the residents compared with specialists. Another reason could be that the residents' operative technique is more traumatic causing more tissue damage prone to infections. However, in the operations where a specialist was present significantly more prophylactic antibiotics were prescribed (47% versus 28%). Some of the reasons may be that: (i) specialists treat more complicated cases, and (ii) as the number of septoplasties is increasing, a specialist sees an increasing total amount of infections, even if the proportional amount of infections would decrease. Thus to minimize the individual infection risk of the patient a specialist could be prone to order antibiotics.

The septoplasty patients had on average 2.3 (median: 2) post-operative follow-up visits. Seventy-five per cent had their last follow-up visit 81 days or earlier post-operatively. However, it was also shown that 2 years after the operation only 53% of the patients considered that the relief achieved by the operation was good or excellent. As few predictive factors for the outcome of the septoplasty exist, at least one follow-up visit 1–2 years post-operatively should be included in the routine septoplasty protocol.

References

- 1 Arunachalam P.S., Kitcher E., Gray J. *et al.* (2001) Nasal septal surgery: evaluation of symptomatic and general health outcomes. *Clin. Otolaryngol.* **26**, 367–370
- 2 Bitzer E.M. (2004) Nasal surgery: evidence of efficacy. The patient's view on outcomes of septal surgery. *Rhinology* **42**, 250–252
- 3 Pirila T. & Tikanto J. (2001) Unilateral and bilateral effects of nasal septum surgery demonstrated with acoustic rhinometry,

- rhinomanometry, and subjective assessment. *Am. J. Rhinol.* **15**, 127–133
- 4 Shemen L. & Hamburg R. (1997) Preoperative and postoperative nasal septal surgery assessment with acoustic rhinometry. *Otolaryngol. Head Neck Surg.* **117**, 338–342
 - 5 Sipila J. & Suonpaa J. (1997) A prospective study using rhinomanometry and patient clinical satisfaction to determine if objective measurements of nasal airway resistance can improve the quality of septoplasty. *Eur. Arch. Otorhinol.* **254**, 387–390
 - 6 Reber M., Rahm F. & Monnier P. (1998) The role of acoustic rhinometry in the pre- and postoperative evaluation of surgery for nasal obstruction. *Rhinology* **36**, 184–187
 - 7 Kaygusuz I., Kizirgil A., Karlidag T. *et al.* (2003) Bacteriemia in septoplasty and septorhinoplasty surgery. *Rhinology* **41**, 76–79
 - 8 Weber R., Hochapfel F. & Draf W. (2000) Packing and stents in endonasal surgery. *Rhinology* **38**, 49–62
 - 9 Rowland P.A., Coe N.P., Burchard K.W. *et al.* (2005) Factors affecting the professional image of physicians. *Curr. Surg.* **62**, 214–219
 - 10 Samad I., Stevens H.E. & Maloney A. (1992) The efficacy of nasal septal surgery. *J. Otolaryngol.* **21**, 88–91
 - 11 Nieminen P., Silvola J., Aust R. *et al.* (1997) Nasal septal surgery as an out-patient procedure. *J. Laryngol. Otol.* **111**, 1034–1037
 - 12 Mäkitie A., Aaltonen L.M., Hytönen M. *et al.* (2000) Postoperative infection following nasal septoplasty. *Acta. Otolaryngol. Suppl.* **543**, 165–166
 - 13 Hogg R.P., Prior M.J. & Johnson A.P. (1999) Admission rates, early readmission rates and patient acceptability of 142 cases of day case septoplasty. *Clin. Otolaryngol.* **24**, 213–215