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Day-case septoplasty and unexpected re-admissions at a dedicated day-case unit: a 4-year audit

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ABSTRACT

INTRODUCTION Septal surgery has been identified as suitable for day-surgery, but is not widely performed as such. Guidelines for day-surgery state that the unexpected admission rate should be 2–3%. Previous audits have not achieved this figure and septoplasty is not universally considered suitable for day-surgery. We have reviewed practice over 4 years in our institution to identify surgical and patient factors associated with unexpected admission following septoplasty.

PATIENTS AND METHODS A retrospective case note based audit of day-case septoplasty procedures reviewed at the end of each year between October 1998 and October 2002.

RESULTS A total of 432 septal surgery procedures were performed, comprising 378 septoplasties and 54 submucous resections. Thirty-eight patients were admitted, overwhelmingly because of haemorrhage in the immediate postoperative period, giving an overall admission rate of 8.8% within the first 24 h. Factors associated strongly with re-admission were the use of intranasal splints, the performance of revision surgery, submucous resection (as opposed to septoplasty) and, less so, the performance of additional procedures and the peri-operative administration of diclofenac. There was no correlation between unexpected admission and grade of surgeon, surgical technique or any of the patient factors analysed.

CONCLUSIONS The unexpected admission rate of septal surgery performed at our unit is above that recommended for day-case procedures, but is within the range previously published. Patient satisfaction with day-case septoplasty has been shown to be high. We believe that septoplasty should be performed in this setting but there is a significant chance that patients may need admission, and a pathway should be in place for this to occur with minimal disruption to the patient.

KEYWORDS
Septal surgery – Audit – Day-case

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Day-case surgery offers significant advantages to the patient, including less disruption to routine, reduced risk of nosocomial infection and shorter waiting times, while it is also associated with reduced hospital costs. Where the patients and cases have been carefully selected, there is no difference in outcome from surgery performed in in-patient basis. The Royal College of Surgeons of England in 1992 stated: 'day surgery is now considered the best option for 50% of all patients undergoing elective surgical procedures though the proportion will vary between specialties'.[1] The target, however, has not been met, and prominent among those specialities failing to achieve the expected target is ENT.

Although there is a consensus that young, healthy patients undergoing myringotomy and tympanostomy tube insertion, direct endoscopies and operations under local anaesthetic can be discharged the same day, nasal surgery is more controversial. A multicentre study showed as early as 1996 that septoplasty can be safely performed as day-case surgery.[2] In the Day Surgery Unit of the Royal National Throat, Nose and Ear Hospital (RNTNE), London septal and turbinate procedures are carried out routinely as day-cases. Although an audit of 1642 day-case operations performed in RNTNE published in 2000[3] showed that, overall, the unexpected admission rate in our unit was 1.8% and well below the recommended standards by The Royal College of Surgeons of England,[1] septoplasty was highlighted as a procedure associated with unusually high re-admission rates (13.4%), forming thus the bulk of most re-admissions. Several factors have been thought to be involved in this high admission rate. After the use of strict guidelines for selecting patients for day-case septal surgery and following recommendations to quilt the nasal septum, the practice was re-evaluated from October 1998 to September 2002. As

part of attempt to reduce re-admissions, we assessed factors associated with the patient, the surgeon and the anaesthetist that could be linked with unexpected re-admission.

Patients and Methods

At the end of each year between October 1998 and October 2002, a retrospective audit of day-case septoplasty procedures was performed. All day-case septoplasties are performed on morning lists in a dedicated unit within the hospital with its own theatre, a 6-bay recovery area and a six 'reclining-chair' pre-discharge area. Patients must meet day-case suitability criteria based on the guidelines of The Royal College of Surgeons of England and are interviewed by a day-care nurse, usually on the day of their out-patient appointment.

Data on the surgical technique (including type of incision, flap[s] elevation, resected areas, closure technique, use of splints and packs), the grade of surgeon, and anaesthesia used (general, local infiltration and topical), as well as details of the patient's concurrent medical conditions and drug therapy were collected from the case notes. Time to discharge, unexpected admissions and complications were also recorded. All data were entered in a Microsoft Access database and subsequently transferred to SPSS v10 for statistical analysis. Univariate analysis was initially performed to assess for factors associated with re-admission. The factors identified in this way were then entered in a logistic regression model.

Results

Patients

A total of 432 cases of septal surgery were analysed. There were 38 unexpected re-admissions within the first 24 h (8.8% of all patients). In the vast majority (22/38 or 58% of all re-admissions), that was because of bleeding. In 9 cases (24%), it was for medical reasons, while in the few remaining cases it was for DVT prophylaxis or at the patient's request (Fig. 1).

Patients mean age was 34.8 years (SD 11.2 years; range, 12–76 years). Of the patients, 78% were male and 22% were female. Of male patients, 9% were re-admitted compared with 6% of female patients; however, the difference was not statistically significant ($P = 0.350$). Of all patients, 16% had some recorded medical history; in the majority (17 patients), it included mild asthma. Of patients with past medical history, 14% were re-admitted compared with 8% of those without such history although the difference did not reach statistical significance ($P = 0.09$). The average age of patients re-admitted was slightly higher than the age of those discharged the same day (36.1 years compared to 34.7 years), without this difference being statistically significant ($t = 0.7$; $P = 0.460$).

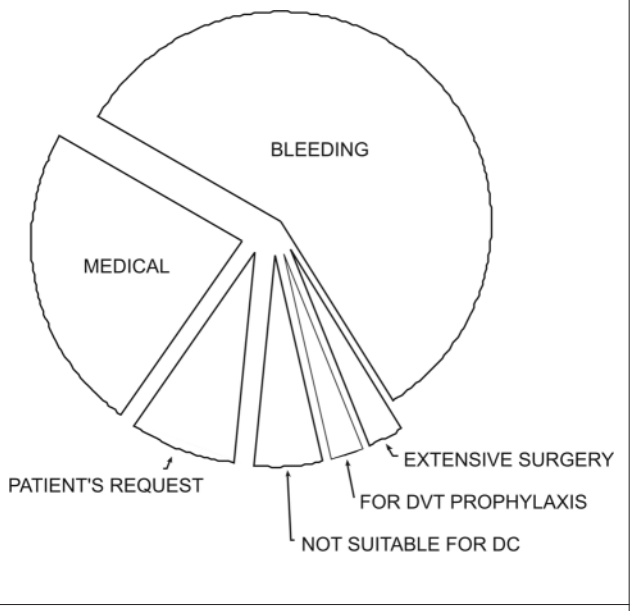

Figure 1 Reasons for unexpected admission after septal surgery.

Surgeon

Year 1 specialist registrars performed 40% of all operations, while non-training grades performed 22% and consultants 20%. Senior house officers performed only 2% of all procedures, while the remaining procedures were performed by year 2–6 specialist registrars. Trainees had re-admission rates of 10% compared to 7% of non-training grades/consultants, although the difference was not significant.

Operation

The operating time ranged from a minimum of 10 min to a maximum of 1 h 55 min, the median being 30 min. There was no correlation between the operation duration and re-admission ($P = 0.88$). The operation was defined as 'limited septoplasty' in 3 cases and as a revision in 7 cases. In 66% of all cases, an additional procedure was performed, which usually was a turbinate procedure, while in 35 cases other procedures performed included sleep nasendoscopy (23), sinus surgery,(15), biopsies (5), myringotomy (1) and sphenopalatine ligation (1). Technical details of the operation are given in Table 1.

It is obvious from Table 1 that revision procedures, submucous resection, additional procedures excluding operations on the turbinate and, most importantly, the insertion of splints were all associated with significantly higher rates of re-admission. Three out of seven revision septoplasties

Table 1 Technical characteristics of the operation and re-admission rates (RR)

	Type (% of procedures)	RR (%)	Type (% of procedures)	RR (%)		RR (%)	*P*-value
Difficulty of operation	Limited (1)	0	Standard (97)	8	Revision (2)	43	0.003
Type of operation	Septoplasty (88)	8	SMR (12)	17			0.039
Additional procedure (excluding turbinate)	Yes (5)	8	No (95)	18			0.029
Type of turbinate procedure	Outfracture (18)	7	Outfracture + SMD (12)	10	Surface cautery (9)	10	0.432
	SMD (23)	8	Trimming (1)	50	None (37)	9	
Incision	Hemitransfixion (59)	11	Killian (16)	11	Other (24)	3	0.204
Flaps raised	Unilateral (86)	10	Bilateral (14)	5			0.201
Vomer excision	Yes (67)	11	No (33)	8			0.204
Maxillary crest excision	Yes (43)	10	No (57)	8			0.574
Perpendicular plate excision	Yes (38)	9	No (62)	9			0.881
Extensive bony dissection	Yes (12)	12	No (88)	8			0.267
Quilting	Yes (68)	8	No (32)	11			0.251
Closure of incision	Yes (63)	9	No (37)	9			0.634
Type of packing	None (42)	6	Merocel (39)	12	Jelonet (4)	12	0.361
	Telfa (7)	7	Other (8)	6			
Splints	Unilateral (2)	12	Bilateral (6)	33	None (92)	7	< 0.001

were re-admitted, as were 8 out 16 patients who had bilateral splints. It is also important to note that the one patient who had sphenopalatine ligation was re-admitted, as was one of two patients who had trimming of the inferior turbinates.

Anaesthetic issues

The type (lignocaine 1% or 2% and adrenaline 1:80,000 or 1:200,000) and amount (range, 2–10 ml; median 4 ml) of local anaesthetic infiltrated pre-operatively was not associated with re-admission (P = 0.647 and P = 0.960, respectively). Data on anaesthetic agent used for induction were available for 111 patients: almost all were induced with alfentanyl and propofol, while 2 patients underwent the operation with local anaesthesia under sedation. Two patients were induced with midazolam/propofol and one with alfentanyl and one propofol only. Anaesthesia was maintained with nitric oxide and sevofluorane in the vast majority of patients, while in 21 patients it was maintained with sevofluorane only and in 3 patients with nitric oxide and isofluorane. There was no correlation with re-admission (P = 0.761). Moffet's solution was used in 275 of 361 patients, while no preparation was specified in 85 patients; cocaine was used in one case and cophenylcaine in 2 cases. Although the re-admission rate was 8% for patients who had Moffet's solution pre-operatively compared with 11% for those who did not have any preparation, the difference was not statistically significant (P = 0.401). Data on analgesia used were available for 294 patients: Interestingly, a strong association was found between the use of voltarol and re-admission because of bleeding: co-codamol was used in 204 patients, codeine alone was used in 14 patients, paracetamol alone in 43 patients, while 8 had tramadol and 46 received voltarol. The use of voltarol was associated with increased bleeding, clinically significant enough to warrant re-admission in 13% of cases (P = 0.02).

A model incorporating the four factors found to be independently associated with unexpected admission was created – namely use of diclofenac, revision and submucous resection surgery, use of intranasal splints and performance of an additional procedure. Logistic regression was performed – the factors associated strongly and independently with re-admission were revision surgery (odds ratio [OR], 11.2; 95% confidence intervals [CI], 1.3– 93.5; P = 0.02) and the use of splints (OR 2.2; 95% CI, 1.1–4.32; P = 0.02; log likelihood,

0.01; pseudo R^2, 0.09). However, a classification model produced in this way, showed quite poor sensitivity, with poor ROC curve characteristics – accurately predicting re-admission in 93% of cases, but actually (when the level of probability was set at 0.2 preventing 2 out of 20 re-admissions – at a cost of 4 in-patient stays, while in order to prevent 5 re-admissions one had to re-schedule 27 patients for in-patient surgery). Analysis was performed also, after excluding medical and other reasons for re-admission, between the above mentioned factors and re-admission because of bleeding only; no change was found in the factors discussed.

Discussion

Otolaryngology is one of the specialties that have embraced day surgery. A significant number of ear, nose and throat operations such as rigid endoscopies, minor ear procedures, adenoidectomy are perfectly suited for day surgery. However, there is still considerable controversy regarding the suitability of septal surgery for day surgery: A number of studies have reached contradictory conclusions. This is directly related to the re-admission rates associated with day-case septoplasty, ranging in studies from 2%[4] to 5%[5] to 11.4%.[6] In the vast majority of cases, re-admission was due to postoperative bleeding. This uncertainty has led different departments in various trusts to adopt different policies, some performing all septoplasties in the day-surgery setting, while others perform all septoplasties on an in-patient basis. At the Royal National Throat Nose and Ear Hospital, septal surgery has been routinely performed as a day-case procedure, in view of the Audit Commission's report in 1992 that identified a target rate of 50% for septal operation in adults.[7] The results of an audit of 1642 patients who underwent day-case surgery in our hospital were published in 2000.[5] These indicated that, overall, the unexpected admission rates were quite low (1.8%) and well within the recommended 2–3% national standards as published by The Royal College of Surgeons of England. However, in that study, an analysis per procedure identified that the vast majority of re-admissions were related to immediate postoperative haemorrhage following septal surgery, which occurred in a rate of 13.4%. Following the completion of that first cycle of audit, various safeguards were implemented, while the selection guidelines of patients for day surgery were changed. These included advocating quilting for almost all septoplasties as well as stricter criteria for day-case surgery in general. These included specific questioning on arrangements at home as well as a greater emphasis on social and communication factors. The current study, performed on 432 septoplasties over the last 4 years, monitors the effects of these changes, and represents the next circle of the audit spiral. Following the focus on septoplasties that was the result of the previous audit, we attempted to assess the factors within day-case septoplasty that could be associated with re-admission.

First, it is encouraging that, following the changes implemented and instigated by our previous audit, the re-admission rate within the first 24 h has been reduced by more than a third, from 13.4% to 8.8%. In an attempt to find a way to predict patients who may be unexpectedly admitted, we studied more than 35 factors associated with the surgery. These included patients factors (co-morbidity, medication, age, sex) surgical factors (grade of surgeon, technical aspects of the operation and postoperative management) and anaesthetic factors (including type and quantity of anaesthetic agent, premedication, local anaesthetic and analgesia used). The use of splints and revision surgery were highly associated with bleeding and re-admission; less so, the use of diclofenac, the performance of additional procedures such as ESS and biopsies (but excluding turbinate procedures) and more extensive surgery in the form of submucous resection.

Nevertheless, we feel that simple measures, such as the avoidance of splints (more so since other studies have demonstrated their poor risk/benefit ratio[8,9]), the avoidance of booking revision procedures and septoplasties associated with additional procedures as day cases could reduce re-admission rates. The effect of diclofenac on increased bleeding has not been studied in relation with septal surgery. Although significant controversy still exists, a recent meta-analysis showed that aspirin is associated with increased incidence of postoperative haemorrhage following tonsillectomy,[10] while a study of diclofenac showed that it was associated with increased intra-operative blood loss.[11] Although more studies are necessary in order to confirm the link between diclofenac and postoperative bleeding in septoplasty, the use of alternative analgesics should perhaps be considered.

However, logistic regression analysis showed that although these factors are associated strongly with re-admission, *per se* they explain only 9% of all re-admissions. That is reflected in the fact that when these factors were inserted in a predictive model, the ROC characteristics were quite poor resulting in inadequate predictive power. In other words, even after dealing with these factors, we could only reduce re-admission rates by a small percentage, and it is unlikely that we would meet The Royal College of Surgeons of England standard of 3%.

Conclusions

We used the audit spiral to monitor and improve our results for day-case septal surgery. As a result of stricter criteria and the use of quilting, the unexpected admission rate following septal surgery performed at our unit has been reduced by 34% since our previous study. However, it is still

above that recommended for day-case procedures, but well within the range previously published. Revision surgery, additional nasal procedures and the use of intranasal splints were significantly associated with re-admission and are being discouraged. Patient satisfaction with day-case septoplasty has been shown to be high. Our study identified some factors that have been shown to be independently associated with re-admission within the first 24 h. We feel that a prospective study where these factors are addressed is warranted and may well record further reduced re-admission rates. However, clinicians must be aware that there is always a significant chance that patients may need admission, and a pathway should be in place for this to occur with minimal disruption to the patient.

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