

Outcomes of septal surgery

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Abstract

Objective: To assess the change in health-related quality of life following septal surgery.

Study design: Post-intervention, health-related quality of life questionnaire.

Participants: Adult patients undergoing septal surgery, recruited from two sources (the Scottish ENT outcomes study and the North Glasgow National Health Service Trust) over an 18-month period.

Main outcome measure: Glasgow benefit inventory score.

Results: A total of 149 Glasgow benefit inventories were returned. Of these, 13 were incomplete and were thus excluded, leaving 136 to be analysed. The response rate from the Scottish ENT outcomes study patients was 55 per cent and the response rate from the North Glasgow National Health Service Trust patients was 41 per cent, giving an overall response rate of 49 per cent. The mean Glasgow benefit inventory score was 11.3 (standard deviation 20, 95 per cent confidence interval 7.8 to 14.7). This result was similar to those of other studies using the Glasgow benefit inventory to assess septal surgery outcomes.

Conclusion: Patients reported minimal improvement in their health-related quality of life following septal surgery.

Key words: Outcome Assessments; Nasal Septum; Surgical Techniques

Introduction

Septoplasty and submucous resection of the septum are common ENT surgical procedures. In Scotland, a total of 2202 septoplasties or submucous resections was performed in 2003.¹ Septal surgery is performed to improve nasal airways by correcting deviations in the nasal septum. Submucous diathermy to the inferior turbinates, or other turbinate surgery, is occasionally performed as part of the procedure.

There are many articles in the medical literature on the outcomes of septal surgery, using a variety of patient-based outcome measures. These can be divided into: disease- or condition-specific outcome measures, which assess nasal symptoms; and general health status outcome measures (such as the Glasgow benefit inventory), which are generic and assess a broad range of health status indicators and effects of illness.

Disease-specific outcome measures which have been used previously include the nasal obstruction septoplasty effectiveness study,² the sino-nasal outcome test,³ the Fairley nasal symptom score⁴ and the nasal health survey.⁵ The nasal obstruction septoplasty effectiveness study was a multicentre study using a validated questionnaire; it showed a

significant improvement in scores three and six months after septal surgery.² The sino-nasal outcome test was originally designed as a rhinosinusitis questionnaire; however, Buckland *et al.* used it as an outcome measure for septal surgery, and showed an improvement in nasal obstruction scores at three months.³ Arunachalam *et al.* measured the Fairley nasal symptom score and showed a post-operative improvement after septoplasty.⁴ Seigel *et al.* also measured nasal specific outcomes (using the nasal health survey) and found an improvement in scores after septoplasty.⁵ Tools such as acoustic rhinometry, rhinomanometry and nasal peak flow have also been used. Improvement in these scores correlates weakly with improved patient symptom scores.⁶ The major disadvantage of disease-specific instruments is that they do not allow comparison with other patient groups suffering other diseases or conditions.

General health status questionnaires which have been used previously in the literature include the Nottingham health profile (assessing general health status), the Nottingham general health questionnaire (GHQ-28) (assessing occult psychological distress in patients with physical symptoms)⁴ and the short form 12.⁵ None of these questionnaires show any significant

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benefit arising from septal surgery. As generic questionnaires cover a broad range of health status indicators, many items may be irrelevant to a particular condition. These items result in a wide range of scores which are not relevant to the condition being studied. As there are few questions relevant to a specific condition, the instrument may be insensitive to changes that might occur as a result of treatment for that condition.

The Glasgow benefit inventory is a validated quality of life measurement which was developed at the Medical Research Council Institute of Hearing Research in Glasgow. It has been widely used in otolaryngology to measure benefit following interventions.⁷ It is not disease-specific but measures change in health status following interventions. It allows comparison between different interventions. The Glasgow benefit inventory is a post-intervention questionnaire containing 18 questions which can be completed by the patient or an interviewer. The scores range from +100 (maximum positive change) to -100 (maximum negative change).⁸

Materials and methods

The aim of this study was to measure the change in patients' overall health status following septal surgery with or without turbinate surgery.

Glasgow benefit inventory questionnaires were sent to patients throughout Scotland as part of the Scottish ENT outcomes study. This was a multicentre trial aiming to assess health-related quality of life in otorhinolaryngology patients. The patients in the Scottish ENT outcomes study were recruited as follows: 82 patients (82.8 per cent) from Aberdeen Royal Infirmary; 15 patients (15.2 per cent) from the North Glasgow National Health Service (NHS) Trust (i.e. Glasgow Royal Infirmary and Gartnavel General and Stobhill Hospitals); and two patients (2 per cent) from Crosshouse Hospital, Kilmarnock.

Patients undergoing septal surgery in the North Glasgow NHS Trust (i.e. Glasgow Royal Infirmary and Gartnavel General and Stobhill Hospitals) between 1 September 2003 and 29 February 2005 were identified from theatre books and the discharge coding system. Any of these patients who had not completed a Glasgow benefit inventory as part of the Scottish ENT outcomes study were sent a copy of the inventory to complete, so no patient would be included twice. Questionnaires were sent out six to 12 months after surgery.

The inclusion criteria were all adult elective patients undergoing septoplasty or submucous resection with or without turbinate surgery (including revision surgery). The exclusion criteria were: age under 16 years, emergency surgery (e.g. for epistaxis or trauma) and additional surgery (e.g. functional endoscopic sinus surgery or rhinoplasty). The inclusion and exclusion criteria are the same for both groups of patients.

The outcome measure was the Glasgow Benefit Inventory Score.

The Glasgow benefit inventory score was recorded, giving a measure of change in health status. Statistical

analysis was performed using the StatistXL for Microsoft Excel software.

Results and analysis

A total of 149 Glasgow benefit inventories were returned: 99 from Scottish ENT outcomes study patients and 50 from North Glasgow NHS Trust patients. Thirteen inventories were incomplete and were thus excluded, leaving 136 to be analysed. The response rate of the Scottish ENT outcomes study patients was 55 per cent and that of the North Glasgow NHS Trust patients was 41 per cent, giving an overall response rate of 49 per cent.

The mean Glasgow benefit inventory score was 11.3 (standard deviation 20; 95 per cent confidence interval 7.8 to 14.7; range +64.7 to -55.6). The results of all the questionnaires are shown in Figure 1.

The Glasgow benefit inventory scores from the two groups were similar, with mean scores of 11.9 for the Scottish ENT outcomes study patients and 10.1 for the North Glasgow NHS Trust patients.

Discussion

The overall mean Glasgow benefit inventory score was 11.3. This is a positive score, which suggests that the patients perceived benefit from the procedure.

This study relied on patients completing and returning a questionnaire. This introduced a bias, as patients who did not respond may have perceived either a greater or lesser degree of benefit than those who did respond. In this study, only 49 per cent of questionnaires were returned. We have no record of the degree of success of the surgical procedure in the opinion of the surgeon.

The low mean Glasgow benefit inventory score obtained is similar to the findings of the other two studies to use the Glasgow benefit inventory as a measure of septal surgery outcome (i.e. Uppal *et al.* and Konstantinidis *et al.*).^{9,10} These authors found Glasgow benefit inventory scores of +5 and +15.5, respectively, with patient numbers of 75 and 51, respectively. Although no other authors have used the Glasgow benefit inventory as an outcome

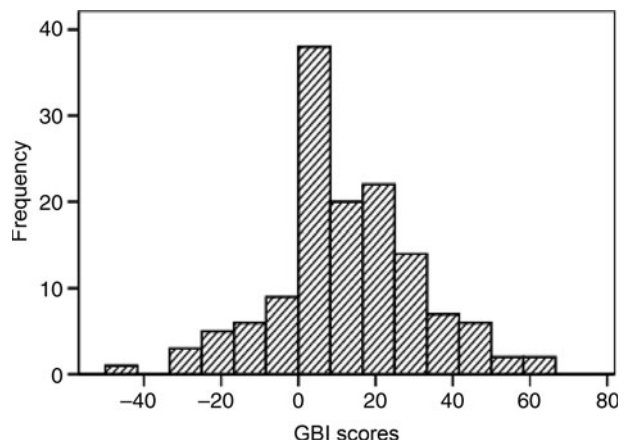


FIG. 1

Range of Glasgow benefit inventory (GBI) scores.

TABLE I
GLASGOW BENEFIT INVENTORY SCORES FOR OTOLARYNGOLOGY
INTERVENTIONS

Procedure	GBI score	95% CI
Septal surgery*	11.3	7.8–14.7
Septal surgery ⁹	5	
Septal surgery ¹⁰	15.5	
Septorhinoplasty ⁷	24	
Functional rhinoplasty ¹¹	27.7	
Functional & cosmetic rhinoplasty ¹¹	58.3	
FESS ¹²	23	
BAHA ¹³	31	22–41
Adult tonsillectomy ¹⁴	27.5	22.9–32.1
Laser palatoplasty ¹⁵	13.3	
Laser DCR ¹⁶	16.8	
Acoustic neuroma surgery ¹⁷	–6.6	

*Present study. GBI = Glasgow benefit inventory; CI = confidence intervals; FESS = functional endoscopic sinus surgery; BAHA = bone-anchored hearing aid insertion; DCR = dacryocystorhinostomy

measure for septoplasty, some have used it as an outcome measure for rhinoplasty. McKeirnan *et al.* found a mean Glasgow benefit inventory score of +27.7 following 'functional' rhinoplasty.¹¹ The same study found a Glasgow benefit inventory score of +58.3 following 'functional and cosmetic rhinoplasty'. This compares with a figure of +24 for septorhinoplasty in the original Glasgow benefit inventory paper (Table I).⁷

Other studies which used general quality of life measures, such as the Nottingham health profile⁴ and the short form 12,⁵ found no significant improvement following septal surgery.

The Glasgow benefit inventory has been used as an outcome measure for many other otolaryngology interventions. The published figures for mean Glasgow benefit inventory score include +23 for endoscopic sinus surgery,¹² +31 for bone-anchored hearing aid implantation,¹³ +27.5 for adult tonsillectomy,¹⁴ +13.3 for laser palatoplasty for snoring (after 12 months)¹⁵ and +16.8 for endoscopic laser dacryocystorhinostomy (Table I).¹⁶

Negative Glasgow benefit inventory scores have been published, for example, following acoustic neuroma surgery.¹⁷

- **The Glasgow benefit inventory can be used to compare different ENT interventions**
- **Patients reported minimal improvement in overall health-related quality of life following septal surgery**
- **This large, multicentre study confirms that septal surgery has minimal effect on health-related quality of life**

It has been shown that septal surgery leads to an improvement in nasal symptom scores. However, the present study found that septal surgery resulted

in only a small change in general health status, as measured by the Glasgow benefit inventory. There are four possible explanations for this finding.

The first is that the indications for septal surgery were incorrect. Septal surgery is best performed for anterior septal deflections causing obstruction in the nasal valve area, and patients with coexisting rhinitis will not derive as much benefit from surgery.^{18,19} In patients with incorrect indications, the outcomes of surgery will not be as good as those with the correct indications, even if the surgery is performed well.²⁰

The second possible explanation is the technical quality of the surgery. If septal deflections are over- or under-corrected, or if complications result, then general health status scores are unlikely to improve.

The third possible reason is that the Glasgow benefit inventory questions do not target those aspects of health-related quality of life affected by septal surgery.

The fourth and most likely explanation is that septal deviations cause minimal morbidity and that general health status questionnaires are therefore not the best tools with which to measure the morbidity caused. This would also explain why other general health status measures (such as the Nottingham health profile and the short form 12) have failed to show any significant health improvement after septal surgery.

Conclusion

Following septal surgery, patients reported minimal improvement in their overall health-related quality of life.

References

- 1 ISD Scotland. <http://www.isdscotland.org> [10 January 2006]
- 2 Stewart MG, Smith TL, Weaver EM, Witsell DL, Yueh B, Hannley MT *et al.* Outcomes after nasal septoplasty: results from the Nasal Obstruction Septoplasty Effectiveness (NOSE) study. *Otolaryngol Head Neck Surg* 2004;**130**: 283–90
- 3 Buckland JR, Thomas S, Harries PG. Can the Sino-nasal Outcome Test (SNOT-22) be used as a reliable outcome measure for successful septal surgery? *Clin Otolaryngol* 2003;**28**:43–7
- 4 Arunachalam PS, Kitcher E, Gray J, Wilson JA. Nasal septal surgery: evaluation of symptomatic and general health outcomes. *Clin Otolaryngol* 2001;**26**:367–70
- 5 Siegel NS, Gliklich RE, Taghizadeh F, Chang Y. Outcomes of septoplasty. *Otolaryngol Head Neck Surg* 2000;**122**: 228–32
- 6 Pirila T, Tikanto J. Unilateral and bilateral effects of nasal septum surgery demonstrated with acoustic rhinometry, rhinomanometry, and subjective assessment. *Am J Rhinol* 2001;**15**:127–33
- 7 Robinson K, Gatehouse S, Browning GG. Measuring patient benefit from otorhinolaryngological surgery and therapy. *Ann Otol Rhinol Laryngol* 1996;**105**:415–42
- 8 MRC Institute of Hearing Research. <http://www.ihr.mrc.ac.uk/scottish/products/> [30 October 2004]
- 9 Uppal S, Mistry H, Nadiq S, Back G, Coatesworth A. Evaluation of patient benefit from nasal septal surgery for nasal obstruction. *Auris Nasus Larynx* 2005;**32**:129–37
- 10 Konstantinidis I, Triaridis S, Triaridis A, Karagiannidis K, Kontzoglou G. Long term results following nasal septal surgery: focus on patients' satisfaction. *Auris Nasus Larynx* 2005;**32**:369–74

- 11 McKiernan DC, Banfield G, Kumar R, Hinton AE. Patient benefit from functional and cosmetic rhinoplasty. *Clin Otolaryngol* 2001;**26**:50–2
- 12 Mehanna H, Mills J, Kelly B, McGarry GW. Benefit from endoscopic sinus surgery. *Clin Otolaryngol* 2002;**27**:464–71
- 13 Arunachalam PS, Kilby D, Meikle D, Davidson T, Johnson IJ. Bone-anchored hearing aid quality of life assessed by Glasgow Benefit Inventory. *Laryngoscope* 2001;**111**:1260–3
- 14 Bhattacharya N, Kepnes LJ. Economic benefit of tonsillectomy in adults with chronic tonsillitis. *Ann Otol Rhinol Laryngol* 2002;**111**:983–8
- 15 Banerjee A, Dempster JH. Laser palatoplasty evaluation of patient benefit using the Glasgow benefit inventory. *J Laryngol Otol* 2000;**114**:601–4
- 16 Bakri SJ, Carney AS, Robinson K, Jones NS, Downes RN. Quality of life outcomes following dacryocystorhinostomy: external and endonasal laser techniques compared. *Orbit* 1999;**18**:83–8
- 17 Santarius T, D'Sousa AR, Zeitoun HM, Cruickshank G, Morgan DW. Audit of headache following resection of acoustic neuroma using three different techniques of suboccipital approach. *Rev Laryngol Otol Rhinol (Bord)* [in French] 2000;**121**:75–8
- 18 Dinis PB, Haider H. Septoplasty: long term evaluation of results. *Am J Otolaryngol* 2002;**23**:85–90
- 19 Samad I, Stevens HE, Maloney A. The efficacy of nasal septal surgery. *J Otolaryngol* 1992;**21**:88–91
- 20 Ridenour BD. The nasal septum. In: Cummings CW ed. *Otolaryngology Head and Neck Surgery*, 3rd edn. St Louis, Missouri: Mosby-Year Book, 1998;**2**:940

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