

The Impact of Septoplasty on The Quality of Life

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ABSTRACT

Purpose of Study: The principal aim of this study was to evaluate the patient reported outcome of septoplasty alone. While there are various objective investigations available to assess the post operative affects of septoplasty as well as subjective outcome reports of septoplasty in combination with various additional nasal procedures, there is a lack of necessary standanderized subjective parameters to assess the outcome of septoplasty on its own merit.

Study Design: It's a Cross-sectional retrospective medical outcome study.

Materials and Methods: Sixty (60) patients who underwent septoplasty alone over a two year period were included in this study at Sligo General Hospital, Sligo, Republic of Ireland from 1st January 2005 to 31st December 2006. Patients who had any additional nasal surgical procedure at the same time as septoplasty such as submucous diathermy, turbenectomy or functional endoscopic sinus surgery were excluded. This was done so as to exclude the bias of other nasal surgical procedures which may also have an additional impact on the improvement in the quality of life of the patients.

A questionnaire was created to answer specific pre operative and post operative questions. A comprehensive chart review was done and patients were contacted for a phone interview for any information that was found to be deficient in the chart. These included relief of nasal obstruction, improvement in mouth breathing, headaches, anterior nasal secretions, post nasal drip and any alterations in the sense of smell. Scoring of the nasal symptoms was done using the validated Fairley nasal scoring scheme. All post operative information was compared to pre operative status.

Results: Our study revealed that there was an improvement of 95.8 % in nasal obstruction, 85.4 % in mouth breathing, 56.9 % in improvement of sense of smell, 75.2 % in headaches, 56.6 % in post nasal drip and 71.4 % in anterior nasal discharge. Overall improvement was 79.2%.

Conclusion: Our study concluded that septoplasty alone has shown 79.2% improvement in the quality of life. Unfortunately, it was revealed from literature search that no such study has been conducted on the effects of septoplasty alone on the quality of life. Therefore

It is required to do more studies on septoplasty alone to see its effects on quality of life as there is a gap in research for such study.

INTRODUCTION

In the present health climate and due to increased consumerism in healthcare, policy makers are increasingly concerned with regards to attaining a balance between cost and quality of health care. It is therefore not surprising that there are pressures to first quantify various procedure outcomes and then to transform these results into sound clinical practice guidelines. Patient reported outcome (PRO) measures the results of various treatments at end points of health care interventions. In order to contain spiralling health care costs, data from these PRO's is being used to examine surgical care and recognize ineffective or less affective procedures¹. In addition, patients living in the present day of information, are comparatively better informed and may possibly enquire for

variety of information about their treatment including the generally accepted outcome results.

Nasal obstruction is one of the commonest presenting problems at most otolaryngological departments around the world. While the causes of this problem can be varied, the commonest reason is a septal deviation. As it is a mechanical and structural obstruction, the best course of action to alleviate the symptoms is to recommend a septoplasty. Nearly 20,000 septal surgical procedures were carried out in the United Kingdom in 2009-2010². With such a common clinical problem and one of the commonest surgical procedures, it is imperative that standardized, validated and comprehensive protocols are available to assess the quality of life following septoplasty to assess surgical outcomes.

Septal surgery to relieve nasal obstruction has been in use for nearly a hundred and fifty years ever since Adams³ in 1875 first used a technique of blunt fracturing and splinting. Freer⁴ and Killian⁵ laid down the foundations of septal surgery with the classical sub mucous resection (SMR) early in the twentieth century. The pioneer of the modern septoplasty is however Cottle⁶, who in 1958 first published the conservative approach to correct septal deviations.

Clinical observation, subjective and objective parameters are three widely accepted method to assess the outcome of septal surgery. Clinical observation of the post operative improvement in septal structural anatomy has a poor correlation with patient's perception of improvement⁷. Objective methods such as rhinometry have produced mixed results^{8,9}. Recently several subjective instruments have been used to assess the improvement after septal surgery. On the whole these instruments make a lot of sense as most commonly it is a subjective problem i.e. nasal obstruction, which first brings the patient to the otolaryngologist and therefore the post operative improvement should also be evaluated by a subjective questionnaire.

METHODS

The study was designed as a medical outcome study. It is the cross-sectional retrospective study. All patients who underwent septoplasty during 1st January 2005 till 31st December 2006, a two year period at Sligo General Hospital, Sligo, Republic of Ireland were included. The sample size was of 73 patients out of which 60 patients had the complete follow up 13 patients were unreachable on phone so were excluded from the study. Patients who underwent an additional procedure such as endoscopic sinus surgery, rhinoplasty, submucous diathermy or turbinate surgery were excluded. Any patients who in addition to septal deviation had symptoms of allergic rhinitis and were receiving medical treatment were also excluded. This was

done so as to exclude the bias of subjective improvement of other nasal treatment/procedures and concentrate solely on the outcome of septoplasty. 73 patients over a two year period met these criteria.

After obtaining the consent of all attending physicians a comprehensive questionnaire was developed. Nasal symptoms which were thought to have a significant effect on patients were included in this questionnaire. These were nasal obstruction, mouth breathing, runny nose, post nasal drip, smell disturbances and headaches. The medical records of all 73 patients were examined to answer these questions. Fairley nasal scoring system¹⁰, a standardized and validated tool, was used to rate all the symptoms pre and post operatively. The scoring was done as follows; 0 = no problem, 1 = mild problem, 2 = moderate problem, 3 = severe problem. Post operative improvement was defined as decrease of one grade. A detailed telephone interview was held with each patient to fill in the gaps in information which were deficient in the chart and also to assess the overall subjective improvement by septoplasty. Each telephone interview lasted between 15 to 20 minutes and was carried out at home phone numbers obtained from the patient's file either in the evenings or at weekends. 60 patients were contactable and formed the basis of our study. Mean follow up period was thirteen months. After completion of all the questionnaires, data was inserted into SPSS 19.0 Statistics program (IBM Corporation, New York. USA). Wilcoxon signed rank test was used to calculate the statistical significance.

RESULTS

It was not surprising to see all 60 patients (100%) suffering from nasal obstruction as this was the main problem for which they were originally referred. The duration of nasal obstruction was also noted and is given in table 1.

Table 1: Summary of Preoperative symptoms

Preoperative symptoms	Number of patients	Percentage
Nasal Obstruction	60	100 %
Mouth Breathing	40	66.7 %
Headache	36	60 %
Post Nasal Drip	31	51.6 %
Poor sense of smell	28	46.6%
Anterior Nasal Discharge	20	33.3 %

A summary of the results of the questionnaire are shown in Table 2 and 3

Table 2: A Summary of the preoperative symptoms

SYMPTOMS	ASYMPTOMATIC	MILD (1)	MODERATE (2)	SEVERE (3)	Mean
Nasal Obstruction	0	0	36	24	2.4
Mouth Breathing	20	0	25	15	1.58
Poor sense of smell	32	19	7	2	0.65
Anterior Nasal Discharge	40	6	10	4	0.63
Headaches	24	16	15	5	1.01
Post Nasal Drip	29	16	11	4	0.83
Epistaxis	60	0	0	0	0

Table 3: A summary of postoperative symptoms

SYMPTOMS	ASYMPTOMATIC	MILD (1)	MODERATE (2)	SEVERE (3)	Mean
Nasal Obstruction	55	4	1	0	0.1
Mouth Breathing	46	13	1	0	0.23
Poor sense of smell	49	2	3	6	0.28
Anterior Nasal Discharge	50	5	4	1	0.26
Headaches	51	6	0	3	0.25
Post Nasal Drip	49	4	3	4	0.36
Epistaxis	0	0	0	0	0

The mean preoperative and post operative scores and statistical analysis for all six symptoms are given in Table 4.

Table 4: Comparison of the mean pre and post operative scores with statistical analysis using Wilcoxon signed rank test

Symptom	Pre Operative Mean	Post Operative Mean	Improvement	P value
Nasal Obstruction	2.4	0.1	95.8%	.0001
Mouth Breathing	1.01	0.25	85.4%	.02
Poor sense of smell	0.65	0.28	56.9%	.03
Anterior Nasal Discharge	0.83	0.36	71.4%	.01
Headache	1.58	0.23	75.2%	Not Statistically Significant
Post Nasal drip	0.63	0.26	56.9%	Not Statistically Significant

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44 patients (73.3 %) complained of unilateral nasal obstruction while 16 (26.7 %) had bilateral obstruction. Preoperative symptoms of all 60 patients are summarized in Table 1.

The mean total preoperative symptom score was 7.1 and the mean total postoperative score was 1.48. There is a 79.2 % improvement when comparing these two scores. However, when at the end of the telephone interview all patients were asked if they were satisfied with the overall results of the surgery, 55 out of 60 (91.6 %) replied in affirmative.

When the 5 patients (8.4 %), were asked as to reason why they were not satisfied with their surgery, 3 patients (5 %) said that their headaches had increased following surgery and 2 (3.4 %) said that their sense of smell had reduced. All these five patients had chosen "severe" as their post operative symptoms while having scored mild (2 patients) or moderate (1 patient) pre operatively for the headache group and mild (1 patient) and moderate (1 patient) for poor sense of smell group.

DISCUSSION

Increasing health costs, wide variation in clinical practice, and the imprecise indications for many surgical procedures, has understandably, led to increasing demand for the demonstration of the effectiveness of the many established interventions. Due to recent pressures on health care resources, patient orientated outcomes of various surgical procedures are becoming of paramount importance and may eventually lead to a shift in allocation of precious resources. Septoplasty is one of the commonest surgical procedures performed in otolaryngological units and consequently patient orientated benefits following this procedure may eventually affect the departmental budgets and organization. It is therefore imperative that appropriate and widely accepted processes are in place to analyze the outcomes of septal surgery.

Clinical examination, objective rhinometry and subjective quality of life questionnaires are the three main areas by which the success of septal surgery can be judged. Clinical examination of the nasal septal deviation in the preoperative stage has poor correlation with the degree of severity of the patient's symptoms. Similarly in the post operative stage, there are several studies over the years which have conclusively shown that structural improvements in septal deviation are not

always in concurrence with patients symptoms^{11,12,13,14,15}

Objective assessment of nasal airflow by rhinometry has been used with varying success. The main criticisms are the natural variations in air flow between various parts of the nasal cycle as well as test-retest variability.^{16, 17} Furthermore it is a time consuming investigation and as septoplasty is one of the commonest procedures done in otolaryngology departments, the sheer time involved in reviewing all the cases to carry out an objective assessment makes it a challenging tool to assess post septal surgery improvement. A meta analysis by Singh et al¹⁸ found only 3 out of 942 studies applicable to their strict criteria and concluded that only a limited conclusion to the feasibility of rhinometry can be drawn.

Since Cottle first described the septoplasty operation, there have been some early reports to assess its outcome.^{9, 19, 20} While at the time, these reports did provide an assessment of patient satisfaction, they were based on self designed, non standardized and non validated questionnaires. Since then patient reported outcomes (PRO) have evolved to attain a significant role in the assessment of various therapeutic modalities.²¹ A variety of "nose-related" quality of life questionnaires have been used to assess subjective improvement in post septal surgical patients. They are considered to be the optimum method of evaluating the results of surgery.² A rough parallel could also be drawn with the cancer TNM classification. The development and subsequent evolution of a standardized TNM classification has helped in evaluation of the treatment of a particular tumour as well as enabled multi-centre comparisons and collation of the data to determine the most effective treatment modality. Similarly a validated and standardized post septoplasty PRO instrument can facilitate the assessment and comparison of the effectiveness of the procedure in various otolaryngological units.

Fairley nasal questionnaire (FNQ) was one of the first validated PRO instrument to be designed for rhinosinusitis in 1993.²² It was a twelve item questionnaire originally based on the work of Lund²³ on inferior meatal antrostomies. Although designed for rhinosinusitis, Konstantinidis²⁴ using FNQ for post septal surgery patients, reported a significant improvement of post operative nasal score with significant benefit in the nasal obstruction, sore throat and the sense of smell but not for headaches. In order to assess

improvements in general health due to septal surgery, Glasgow Benefit Inventory (GBI) first put forward by Robinson et al²⁵ in 1996 also formed part of this study. GBI consists of 18 questions which measures general, physical and social health of patients especially from otolaryngological procedures. No statistically significant improvement in GBI was found when post operative and preoperative scores were compared. In this study data for only four nasal symptoms is presented, although a full twelve item FNQ was used. We have provided data for six nasal symptoms but have not used any general health outcome questionnaire.

Uppall et al²⁶ in 2005 also employed GBI. Only those patients who picked nasal obstruction as their main complaint (out of possible eight nasal symptoms) were included in the study. The main aim of the study was not to assess alleviation of various nasal symptoms but to measure improvements in general, physical and social health of patients undergoing septoplasty. They concluded a highly significant correlation ($p < 0.001$) between GBI and those patients who had improvement in nasal obstruction following nasal surgery. This was in contrast to Konstantinidis's²⁴ findings which did not show any improvement in GBI after septoplasty. However Uppall's cohort underwent turbinate surgery in addition to septoplasty while Konstantinidis's group only had septal surgery.

A multi otolaryngological procedures PRO study from Edinburgh²⁷ was also published in 1993. Various procedures were studied. Using pre and post operative visual analogue scale for three nasal symptoms, they reported that following septoplasty, there was a 83%, 33% and 32% decrease in nasal obstruction, catarrh and facial pain respectively. Siegel et al²⁸ undertook a wide ranging and comprehensive study in 2000 using a Nasal Health Survey (NHS) which is also known as Chronic Sinusitis Survey based on recommendations by Gliklich and Metson²⁹. They wanted to not only determine the patient based outcome but also any predictors of potential outcome. NHS was divided into a symptom and medication sub score. Along with the NHS they also carried out a pre and post operative general health survey called Short Form 12[®] (Quality Metric Incorporated, Lincoln, RI, USA) which is a generic health survey of clinical care measuring both mental and physical health. There was statistical significant improvement in the symptom-

based ($p < 0.001$), medication-based ($p < 0.018$) and total scores ($p < 0.001$). They further reported that although there was no statistical improvement in the pre and post operative general health survey scores, the preoperative scores were within limits of the normal population. Predictor analysis revealed two groups, namely females and patients with prior nasal procedures to have a worse outcome.

Arunachalam et al⁷ in 2001 used three PRO instruments in his study. Fairley nasal symptom score was used for assessing nasal obstruction, nasal catarrh and facial pain. The whole 12-item FNQ was not used. Their study also utilized Nottingham Health Profile (NHP) (MAPI Research Trust, Lyon, France), a brief indication of a patient's perceived emotional social and physical health problems as well as General Health Questionnaire (GHQ), (MAPI Research Trust, Lyon, France), a measure of psychological health. Both NHP and GHQ had no statistical significant difference pre and postoperatively.

Sino Nasal Outcome Test (SNOT-22) is a validated and standardized tool for assessment of patients with chronic rhinosinusitis. It started as a 16 item questionnaire³⁰ was modified to 20 items³¹ and then increased to 22 items when it formed the basis of the largest national trial in the world for assessment of rhinosinusitis³². Buckland et al³³ utilized the same SNOT-22 questionnaire to assess patients undergoing septoplasty and SMR. 35% of patients also had some form of turbinate surgery. Although there was an overall improvement of 47%, nasal obstruction improved in 87.5 %, Facial pain in 55% and catarrh in 30%.

Stewart et al³⁴ using their own designed and validated NOSE Scale studied 59 patients undergoing septoplasty with a majority of them also having turbenectomy. They found a high statistically significant improvement three months post septoplasty ($p = 0.0001$). Gandomi et al³⁵ also used the NOSE scale to assess the improvement following septoplasty with over 70% of patients also having turbinate "manipulation". They reported a statistical significance of $p = 0.001$ in their patients. Both Stewart et al and Gandomi et al found that these improvements were sustained at six months. Gandomi et al further observed that the fact that they had a better success rate than most studies was probably due to having a younger cohort and postulated that the younger patients have nasal symptoms that are more "anatomically dependent" while older patients may

suffer from nasal obstruction due to more “dynamic causes”.

The debate as to the ideal or most appropriate PRO instrument goes on. The fact is illustrated by the list in Table 5 which shows that in the last two decades the academic otolaryngological community, striving for the best modality to test patient driven septoplasty outcome, has tested various types of instruments with varying results. Apart from the NOSE scale (an instrument designed primarily for testing the outcomes in chronic rhinosinusitis patients) which forms the basis for two reports, none of the instruments have found wide acceptance apart from the initial study. In a review of scoring system for the outcome of endoscopic sinus surgery in patients suffering from chronic rhinosinusitis, Morley and Sharp³⁶ concluded that out of fifteen instruments, SNOT-22 was the most appropriate.

Table 5 clearly shows that, to the best our knowledge, apart from Konstantinidis²⁴, all the studies using various PRO nasal instruments have recruited patients, who have had various other nasal procedures in addition to septoplasty. While the overall aim is to improve the various nasal and associated general health complaints, it cannot be said with absolute certainty as to how many of these patients improved due to septoplasty and how many due to other nasal procedures mainly turbinate surgery. Our study by including patients undergoing only septoplasty, gives a more accurate picture of improvement due to this procedure alone, with no contribution from benefits which could have been acquired from additional lateral nasal wall procedures. This work has only been done by Konstantinidis²⁴ who included only three questions in their review while we have investigated six questions.

Table 5: Summary of all Patient Related Outcome studies after Septoplasty and other nasal procedures

Year	Authors	PRO Utilized	Types of Operations included
1987	Haraldsson ¹¹	Self designed non validated	Septoplasty
1992	Samad et al ³⁷	Self designed non validated	Septoplasty, SMR, Turbinate Surgery
1993	Denholm et al ²⁷	Edinburgh Audit	SMR + Septoplasty
2000	Siegel et al ²⁸	NHS + Short Form 12 [®]	Septoplasty, Rhinoplasty and Fracture Reductions
2001	Arunachalam et al ⁷	Fairley nasal symptom score, NHP, GHQ-28	Septoplasty, SMR, SMD, Inferior Turbinectomy
2003	Buckland et al ³³	SNOT-22	Septoplasty/SMR ± Turbinate Surgery
2004	Stewart et al ¹⁵	NOSE Study	Septoplasty ± Partial Turbinectomy
2005	Uppall et al ²⁶	GBI	Septoplasty±Tu rbinate surgery
2005	Konstantinidis et al ²⁴	FNQ, GBI	Septoplasty
2010	Gandomi et al ³⁵	NOSE Study	Septoplasty ± Turbinectomy

CONCLUSION

We have shown that a validated questionnaire to assess outcome following septoplasty is a useful tool to quantify subjective improvements in patients. More widespread use of such tools may become a necessity in the challenging

environment of present day healthcare management. The practise of the art of medicine is always undergoing constant change. It is not unforeseeable in the near future that in addition to history, clinical examination and relevant investigation, an internationally standardized and

validated questionnaire in used. If the score is below a certain validated number, it would be explained to the patient that the outcomes of that procedure would be less than desirable and an alternate non surgical option may be a better choice.

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