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Patient satisfaction and quality of life after septoplasty in adults: literature review

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Abstract:

Background: Septoplasty is a common surgical procedure designed to correct a deviated nasal septum and relieve symptoms of nasal obstruction. While the primary goal of the surgery is to improve nasal airflow, patient satisfaction and quality of life (QoL) have become important measures of surgical success. Understanding the impact of septoplasty on QoL is essential to optimise patients' outcomes and refine treatment approaches. Despite its widespread use, number of high-quality studies have been limited. However, in recent years

there have been a growing interest in assessing its effectiveness using objective and patient-reported outcomes.

Objective: The aim of this literature review is to analyse the effectiveness of septoplasty, including the impact of septoplasty on patient satisfaction and quality of life, and to assess predictors of surgical success.

State of knowledge: Septoplasty is a surgical procedure aimed at correcting a deviated nasal septum to improve nasal airflow and relieve obstruction. Recent studies show, that septoplasty leads to significant improvement in nasal breathing, sleep quality, daily functioning, mental state and olfactory function. Psychological factors, preoperative expectations and degree of nasal deviation have been identified as key determinants of surgical outcome.

Conclusion: Septoplasty is an effective procedure that leads to significant improvements in quality of life and general satisfaction from surgery. Several factors have been identified that influence surgical outcome including patient mental state, patient expectation, severity of septal deviation and surgical technique. To optimise results, surgeons should focus on refining surgical techniques, patient selection and management of patients' expectations.

Keywords: septoplasty; quality of life; surgery; deviated nasal septum; nasal obstruction; satisfaction.

Introduction:

Deviated nasal septum is one of the most common nose deformities. Approximately 75% of people exhibit some level of nasal septum deviation (NSD) [1]. This condition can result in significant challenges for individuals, impacting their quality of life [2]. NSD impairs the airflow and prevents from breathing comfortably through the nose, which results in crusting and bleeding, mucosal damage, compensatory turbinate hypertrophy and altered olfactory function [3].

Septoplasty is a common surgical procedure performed by otolaryngologists to correct NSD. Epidemiological data show that in some European countries, 40 to 75 septoplasties are performed per 100,000 inhabitants [4]. It is a widely recognised procedure in the field of otolaryngology and is commonly performed in clinical practice [3]. The indications for septoplasty are not explicitly outlined in international guidelines but are determined based on rhinoscopy findings and symptoms such as nasal obstruction, recurrent sinusitis, pharyngitis, nosebleeds and breathing difficulties. Additionally, it is used in plastic surgery to improve aesthetic outcomes.

The efficacy of septoplasty is well-documented by physical data [5, 6]. The impact of this procedure on quality of life and patient satisfaction has been a subject of debate for a long time. While these data are subjective, they are critical measures of surgical success.

This literature review explores the current evidence about patients' satisfaction and quality of life after septoplasty procedure, underlining factors that contribute to better outcomes and areas where improvements can be made.

Methods:

Relevant literature on septoplasty was identified using a comprehensive search of PubMed, Scopus, Springer Link, Web of Science, and Embase. Preference was given to articles published between 2010 and February 2025 to ensure relevance to modern-day practise. Priority was assigned to meta-analyses, systematic reviews and randomized controlled trials (RCT). Key terms such as 'septoplasty', 'deviated septum', 'nasal obstruction', 'NOSE score', 'nasal septum deviation', 'nasal surgery', 'SNOT22', 'Septoplasty satisfaction' were utilized during the search process to optimize article retrieval. This approach identified the most relevant literature on patient satisfaction and quality of life after septoplasty. The exclusion criteria involved articles centred around paediatric population.

This review employs a mixed-methods approach to analyse patient satisfaction and quality of life following septoplasty. The selection of articles assessing patient satisfaction was conducted based on satisfaction measurement scales, such as the Visual Analogue Scale (VAS) and the Overall Satisfaction Score (OSS), or indirect proven determinants of patient satisfaction, such as the presence of complications and pain post-surgery [7]. The selection of articles measuring patient quality of life was based on disease-specific tools, including the Nasal Obstruction Symptom Evaluation (NOSE) scale and the Sino-Nasal Outcome Test (SNOT22), as well as general quality of life tools, such as the Short From (SF-36) and the Glasgow Benefit Inventory (GBI).

Results:

A comprehensive search yielded 57 articles for assessment, out of which 44 were included in the systemic review. The selection criteria prioritized recent publications and those with robust evidence, including meta-analyses, systematic reviews and RCTs. It is important to note that although most of the selected articles met these criteria, not all publications met these standards.

Literature review:

1. Impact of septoplasty on patient satisfaction.

The impact of septoplasty on patient satisfaction has traditionally been underestimated, but recent research has reassessed its importance. A Randomized Clinical Trial published in 2021 assessed the difference between impact of non surgical management and impact of septoplasty on patients satisfaction after surgery by usage of the Visual Analogue Scale 1, 3 and 6 months post-treatment [8]. The study concluded that both the nonsurgical management and undergoing a septoplasty resulted in a significant improvement in Visual Analogue Scale (VAS) satisfaction results. Furthermore, the results of the septoplasty were superior to those of the nonsurgical treatment. While the satisfaction of non-surgical management began to decrease after 3 months of therapy, this effect was not observed in the case of patients after septoplasty procedure [8].

Symptom relief on patient satisfaction

Surgical outcomes significantly impact patient satisfaction. Studies show a correlation between subjective and objective septoplasty outcomes [9, 10]. The evaluation of symptom improvement is challenging due to the subjective nature of the condition, which is known to vary throughout the day. Objective measurements, such as acoustic rhinometry and rhinomanometry, do not always align with patient perception [9]. However, patients who have undergone septoplasty and have an increased objective nasal outcome have been reported to be more satisfied with the procedure. Furthermore, patients experiencing more severe degrees of nasal obstruction have been shown to benefit to a greater extent from septoplasty than those with milder obstruction [9]. This effect has been shown to be long lasting with a minimum of 24 months of follow-up. The debate surrounding the potential worsening of outcomes over time remains unresolved, as the available evidence remain inconclusive [10].

Type of septoplasty on patient satisfaction

Patient satisfaction varied depending on the type of septoplasty performed. Most common septoplasty techniques used are either an endoscopic or conventional approach. Endoscopic assistance yielded higher satisfaction scores in comparison to conventional septoplasty [11]. Additionally, endoscopic assistance was associated with reduced incidence of complications, more rapid reduction in VAS scores for nasal obstruction, and diminished level of discomfort [11, 12]. In recent studies other techniques have been reviewed – bony or septal cartilage

batten grafting. These techniques yielded satisfactory long-term results of 92,3 % and 91,1 % meriting further investigation and direct comparison to other techniques [10]. Modified extracorporeal septoplasty and marionette septoplasty have also been shown to be highly effective in the treatment of severe septal deformities [13]. However, due to the extensive nature of these techniques and the severity of septal deviation in patients, the results are not directly comparable to other approaches. It is important to note that alternative septoplasty techniques generally demonstrate higher success rates in comparison to standard endonasal septoplasty. This is primarily because they are frequently more appropriate for the treatment of more severe septal deformations, which result in more noticeable improvement in nasal obstruction and accordingly higher patient satisfaction from surgery.

The procedure of septoplasty can be performed concurrently with other nasal surgeries when indicated and has been demonstrated to result in patient satisfaction. The mean VAS satisfaction score was found to be higher in patients who underwent inferior turbinate reduction with septoplasty than in those who underwent only septoplasty [14, 15]. However, the difference was only found to be statistically significant six months after surgery [14]. No significant difference has been found in outcomes between different surgical techniques to address inferior turbinate hypertrophy [16] and all were proven effective [17]. These techniques included turbinectomy, radiofrequency ablation and conventional turbinoplasty techniques.

Interestingly, no significant difference in satisfaction was found between patients with allergic rhinitis who underwent septoplasty or septoplasty with inferior turbinate reduction [18].

Haemostasis and nasal stabilization on patient satisfaction

Nasal packing is a technique commonly used to prevent or treat complications like bleeding adhesions, hematoma and others. Its primary functions include stabilising the residual cartilaginous septum, supporting septal flap apposition and minimising the recurrence of septal deviation [19]. However, this method has also been associated with a number of undesirable complications, including nausea, discomfort, pain, sleep disturbances, postoperative infection, and numerous others. A metanalysis was published in 2017, which compared nasal packing with trans-septal suturing technology [19]. The conclusion of the article was that, in comparison to nasal packing, trans-septal suturing was associated with a lower occurrence of patient pain, headaches and adhesion after septoplasty, which relates to a higher level of patient satisfaction. The difference in other complication occurrence was deemed not to be statistically significant.

Anaesthesia in septoplasty on patient satisfaction

The perioperative period plays a crucial role in patient satisfaction, with a significant part of satisfaction being attributed to effective pain management during and after surgery. A meta-analysis conducted in 2015 sought to evaluate the differences in local and general anaesthesia in nasal surgeries. The study revealed that, in cases of septoplasty, general anaesthesia resulted in superior outcomes in terms of patient satisfaction, with patients expressing greater satisfaction with nasal function, appearance and pain management [20]. Furthermore, another research has demonstrated that the sphenopalatine ganglion block for pain control following septoplasty has been found to result in a greater degree of patient satisfaction when compared to the use of anaesthetic local agents [21].

Complications from surgery

The presence of surgical complications is associated with lower patient satisfaction [7]. A 2024 meta-analysis revealed that septoplasty consists of a relatively low rate of adverse effects. The most common of which included bleeding and infection with prevalence of 4,12 %. Septal perforation was observed in 2.6 % of patients. Revision surgery was needed in only 0,31 % of cases, indicating that most patients did not require further surgical intervention. Despite the encouraging nature of these results it is still expected that surgeons should consider all complications into account, especially bleeding [6].

Mental state of patients on patient satisfaction

The psychological well-being of patients scheduled to undergo septoplasty has been demonstrated to have a significant impact on their postoperative satisfaction levels [22]. A higher incidence of psychological symptoms has been demonstrated to be associated with diminished postoperative satisfaction. Furthermore, it has been determined that specific personality traits may also influence patients' postoperative satisfaction [23]. It is essential that these features be thoroughly investigated and given due consideration during the diagnostic and therapeutic processes. This will ensure enhanced patient satisfaction and quality of life while also providing legal protection for physicians [24].

Patient expectations before surgery

Patient expectations have been shown to affect satisfaction from surgery. Strong relationships were found with high expectations preoperatively and low satisfaction postoperatively [25, 26]. Doctors should manage and rationalize patient expectations and align it with the

characteristics of the patient. Moreover, surgeons must be aware of the potential outcomes and the limits of their capabilities. These considerations should be discussed with patients.

2. Impact of septoplasty on quality of life

Evaluating the efficacy of septoplasty is a complex task. One approach to addressing this challenge involves assessing the patient's quality of life before and after the surgical procedure. Various instruments have been developed for the purpose of evaluating quality of life, and these can be categorised into two main types: specifically designed for nasal-oriented symptoms and those that are intended for general quality of life evaluation.

Nasal-specific Quality of Life Tools

The NOSE (Nasal Obstruction Symptom Evaluation) score is very reliable and frequently used QoL instrument specific to nasal obstruction in surgical patients [27]. It consists of a questionnaire that asks patients to rate their feelings on five separate questions on a 0-4 scale. The questions address nasal congestion, nasal blockage, trouble breathing through the nose, problems with sleep and the ability to get air through the nose during exercise. The score is then summarised and multiplied by five, resulting in a maximum score of 100. A score of 0 indicates no symptoms, while 100 represents the worst possible case of nasal-related problems. The second tool is SNOT22 (Sino-nasal outcome test). It is a much more detailed questionnaire used to assess sinus and nasal related quality of life [6]. It is mostly used to assess the quality of life of patients with chronic sinonasal diseases like allergic rhinitis and sinusitis. It consists of 22 symptoms that patients rate on a 0-5 scale.

General quality of life Tools

The Glasgow Benefit Inventory (GBI) is a validated, generic patient-recorded outcome tool that has been extensively used in otolaryngology. It has been demonstrated to serve as a proper instrument for the assessment of patients' quality of life following intervention [28]. The GBI is distinguished by its capacity to differentiate the benefits of surgical and medical interventions from the perspective of the patient. It is comprised of 18 items, which are evaluated using a 5-point Likert scale.

The SF-36 (Short Form Health Survey) is a questionnaire used to measure overall health-related quality of life, incorporating aspects such as physical functioning, emotional well-being and vitality. In certain instances, it is also used to provide additional insight into septoplasty outcomes, going beyond just nasal symptoms to assess overall quality of life.

The application of disease-specific and general QoL questionnaires allows for a more comprehensive evaluation of patient outcomes following septoplasty [29]. This approach helps to assess how septoplasty impacts specific aspects of life like sleep, breathing and physical activity as well as broader factors like mental health.

Septoplasty influence on quality of life

Up until 2019 the evidence for the effectiveness of septoplasty was based on lower quality studies with high risk of bias. One of the first high-quality studies, a randomized controlled trial published in 2019 by Van Egmond, showed that septoplasty was more effective than non-surgical management for nasal obstruction in adults with a deviated septum [30]. Patients who underwent septoplasty exhibited superior outcomes on the Glashow health status inventory, NOSE scale and SNOT22 at 6 months, and this effect was maintained up to 24 months of follow-up.

Mental health

Recent findings have indicated that patients diagnosed with nasal septal deviation exhibit elevated scores on both the self-rating anxiety scale (SAS) and the self-rating depression scale (SDS), surpassing the national standards. However, these levels of anxiety and depression diminished postoperatively in patients with mild to moderate SAS/SDS scores. Notably, patients with severe anxiety and depressive symptoms demonstrated a suboptimal response to treatment and exhibited only marginal improvements [24]. This study highlights the importance of SAS/SDS in selecting suitable patients for surgery**.**

Nasal Obstruction

A meta-analysis conducted in 2023 demonstrated a significant enhancement in obstructive symptoms relief and QoL as measured by the NOSE score, in patients who underwent functional septoplasty, either with or without turbinate surgery [3]. However, the validity of these outcomes remains uncertain, as the existing literature provide conflicting results [31].

Nose congestion and rhinitis

Allergic rhinitis is the most frequently associated comorbidity with deviated nasal septum (DNS) [32]. In patients diagnosed with DNS and allergic rhinitis that underwent endoscopic nasal surgery, a significant improvement in symptoms was observed, as indicated by a substantial decrease in Total Nasal Symptom Score (TNSS) [32]. This improvement was more pronounced in comparison to patients who received conservative treatment, specifically the use of nasal sprays. The symptoms that demonstrated the most significant improvement following surgery included rhinorrhoea, nasal obstruction, nasal itching, and sneezing [32]. A further systematic review has documented that the treatment of chronic rhinogenic headaches

can be achieved through septoplasty, in conjunction or in isolation with turbinate reaction. However, the selection of appropriate patients is emphasised as a pivotal consideration [33].

Sleep Quality

Sleep impairment is strongly related to level of nasal obstruction [26]. A 2018 prospective cohort study found that undergoing septoplasty resulted in a significant improvement in the score on the Pittsburgh Sleep Quality Index (PSQI) [34]. The patients recorded better sleep quality, lesser disturbance and better intensity of sleep during the previous month.

It has been demonstrated that the procedure significantly improves obstructive sleep apnoea (OSA) in patients with concomitant nasal obstruction symptoms [35]. Patients who undergo septoplasty for DNS and OSA may experience a greater improvement in snoring and daytime sleepiness than other generic health parameters. However, isolated nasal surgery does not critically modify the evolution of OSA and the use of continuous positive airway pressure (CPAP) therapy is still recommended.

Daily activities

A 2019 observational cohort study, conducted by the Swedish National Septoplasty Register, established a significant correlation between activity limitation and the severity of nasal obstruction [26]. Furthermore, patients with moderate to severe nasal obstruction prior to surgery who experienced a reduction to mild or none nasal obstruction following the procedure, reported a moderate to severe impact on their daily activities [26]. This correlation and outcomes was also proven in a meta-analysis [6].

Olfactory function

A 2021 Meta-analysis has examined the effect of septoplasty on olfactory function [36]. In general, patients with septal deviation have reduced olfactory function compared to the general population, which affect their quality of life [37]. The study found that this procedure improves olfactory function, but the results are discrete and vary from patient to patient. The most important factor is the selection of the right patients. Patients with more severe NSD benefited more from the surgery than those with mild obstruction. The study concluded that further randomised trials are needed to confirm the results.

3. Factors influencing surgical outcome

Degree and type of nasal septum deviation

As demonstrated in observational cohort study undertaken by the Swedish National Septoplasty Register, patients diagnosed with more severe nasal obstruction prior to surgery

demonstrated a greater degree of improvement following the septoplasty procedure [26]. The most significant improvements were observed in the areas of their daily living, activities, and sleep-related impairment, with a notable decrease in the proportion of patients experiencing these issues from 76 % prior to surgery to 7 % 12 months post-surgery [10, 26].

Patients with caudal or dorsal deflections of nasal septum are considered more difficult for surgeons to operate on [38, 39]. These operations had the highest percentage of complications including tip ptosis, persistent nasal obstruction and severe valve collapse [38]. Additionally, nasal valve abnormalities could result more frequently in primary septoplasty failure [39].

Patient demographics

The septoplasty procedure shows a notable over-representation of male patients. The prevailing literature suggests that the majority of these procedures are performed on male patients, primarily due to the association of nasal septum deviation with physical exertion, sports, and trauma. However, the impact of gender on the outcomes of septoplasty remains inconclusive [9, 26, 40].

The impact of age on the outcomes of septoplasty has also given inconclusive results [8].

Type of septoplasty

A systematic review and meta-analysis of randomised clinical trials has revealed that endoscopic septoplasty is superior to conventional septoplasty in relief of postoperative nasal obstruction, the duration of surgery and the reduction of the risk of intraoperative and postoperative haemorrhage and other complications, including mucosal adhesion, synechiae, persistent septal deviation and septal tear [41]. Long term benefits of nasal obstruction were likely similar in the two techniques [42]. It is hypothesised that patients exhibiting specific symptoms, such as hyposmia and PND, may benefit more from the endoscopic approach [42].

Co-existing conditions

As demonstrated in the relevant literature, patients with nasal septum deviation have been shown to exhibit elevated levels of stress, anxiety and depression. They have been found to experience diminished improvement in quality of life and satisfaction levels following septoplasty. Moreover, their recovery period is prolonged [10, 24, 43].

Allergic patients have been shown to be more prone to experiencing adverse effects following surgical procedures. Nevertheless, it must be acknowledged that septoplasty has been demonstrated to result in a substantial improvement in nasal symptoms and overall quality of life in population of allergic patients. A metanalysis conducted in 2024 revealed that there was no statistically significant difference in postoperative symptom improvement between asthma and non-asthma patients [32]. Furthermore patients exhibiting inflammatory components of

nasal obstruction (allergic rhinitis and chronic rhinosinusitis) did not demonstrate divergent outcomes in comparison to patients without these components [10]. These findings suggest that these patients can achieve a comparable improvement of quality of life post-surgery.

No evidence was found to suggest that smoking, diabetes mellitus, or allergic rhinitis influenced the complication rate of septoplasty [44].

Conclusion

Septoplasty has been shown to be a satisfactory operation for patients. Patient satisfaction after septoplasty is influenced by a number of factors, including surgical outcome, surgical technique, postoperative pain management, complications, patient psychological state and expectations. Further research is needed to determine how these findings can be used to improve patient satisfaction. Septoplasty surgery has been shown to have a positive effect on patients' nose-specific and general quality of life. It has been shown to improve nasal symptoms, sleep quality, daily functioning, olfactory function and mental health. Surgical outcomes depend on the type and degree of nasal obstruction, the surgical technique chosen and the mental status of the patient. These findings highlight the importance of proper patient selection, management of expectations and appropriate technique of septoplasty.

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