

How to Cite:

Acharya, S., Dash, A., & Satpute, S. (2022). Septoplasty in peadiatric population: A systematic review of quality of life outcome. *International Journal of Health Sciences*, 6(S8), 6361–6366. <https://doi.org/10.53730/ijhs.v6nS8.13785>

Septoplasty in peadiatric population: A systematic review of quality of life outcome

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Abstract---Septoplasty in children is controversial due to concerns over an adverse effect on nasal and facial growth. Recent evidence has confirmed that septoplasty can be safely performed without affecting nasofacial development in properly selected pediatric patient. The purpose of this article is to establish the impact of pediatric septoplasty on nasal and facial growth and review the clinical indications and evidence for timing of surgery according to the most recent literature. A structured review of the PubMed, Ovid Medline and Cochrane Collaboration databases (Cochrane Central Register of Controlled Trials, Cochrane Database of Systemic Reviews) was undertaken, using the terms: pediatric, childhood, septoplasty, nasal septum, indications, nasal growth and facial growth. A further similar study concluded that external septoplasty does not affect most aspects of nasal and facial growth, but may negatively influence growth of the nasal dorsum. Furthermore, one study demonstrated that a group of children with symptomatic uncorrected deviated nasal septum had a statistically significant increased occurrence of facial and dental anomalies compared with age and sex matched controls, therefore supporting a role for septoplasty. Conclusions: Evidence exists to support that pediatric septoplasty can be performed without affecting most aspects of nasal and facial growth. Furthermore, not performing or delaying septoplasty when indicated may adversely affect nasal and facial growth with compounding adverse effects in terms of deformity and asymmetry. Despite the majority advocating the timing of septal surgery to be 6 years and older, more clinical studies are required that may provide further evidence for correction of septal deviations in younger children, perhaps even at birth.

Keywords---septoplasty, paediatric population, systematic review.

Introduction

Septoplasty and other nasal corrective surgeries are commonly done in adult population. They are not routinely done in children because of the fear of abnormality of nasofacial growth¹. Other argument against septoplasty is that it can cause dorsal under projection of nose². The incidence of septal deformity in children is around 12.4% in age group 2.5- to 6- years³ and 13.6% in age group 6- to 9-years old.^{4,5} Exact timing of septoplasty in children is debatable because nasal vault growth completes by age 16 years in male and 14 years in female. However many surgeons prefer to do it early considering the benefit versus the risk⁶.

Objective assessment of septoplasty surgery can be examiner biased. It may not always depict patient satisfaction. Quality of life assessment tools are latest addition to measure patient's satisfaction by employing multiple questionnaires. They subjectively assess the outcome measures in terms physical social and psychological benefit. Our current review aims to determine the quality of life outcome in children following septal surgery.

Methodology

A thorough review of literature was done in English language which were published in databases either in pubmed, embase, scopus, central science citation index. All relevant articles between January 2000 to January 2022 were included. The keywords which were used either individually or in combination were- septoplasty, paediatric nasal deformity, Quality of life, patient satisfaction, deviated septum, congenital nasal obstruction etc. Some routine cross checks were made between article information with standard text books to have more clarity on the subject. Only studies with nasal septal surgery below 18 years were selected when the outcome were measured via various Quality of life assessment tools. Articles with no clear follow of patients and without clear information were excluded from studies. The success of the intervention was defined based on the subjective outcome of patient's nasal obstructive symptoms. A good outcome is defined as significant improvement and a fair outcome as average improvement and bad outcome as no improvement in QOL scores.

A total of 109 articles were retrieved from the electronic databases. Five articles concerned with pediatric septoplasty with short term and longterm quality of life outcomes were selected and summarized in table 1. Various subjective assessment tools used in these studies were Visual Analogous Scale(VAS)^{7,8,9}, 5 item sinus and nasal QoL(SN-5)⁸, Nasal Obstruction Symptoms Evaluation(NOSE)¹⁰ questionnaire. Visual analogue score is a 10 point subjective scale with score of 1 indicating least satisfied and score of 10 depicting maximum satisfaction. SN-5 is a sinus and nasal specific assessment system wherein 5 items are scored on a scale from 1 to 7. Mean of all 5 items determines the score with higher score indicating severe symptoms. Stewart et al¹¹ devised NOSE scale, a simple QOL assessment score based on nasal obstruction. In NOSE scale

patients score five symptom specific questions with 0 to 4 meaning no problem and severe problem respectively.

We got 385 number of patients who were operated either with septoplasty alone or septorhinoplasty. Two studies were retrospective and three studies were prospective in nature. Pediatric septoplasty was shown to have a positive impact on the quality of life outcome in most patients. Some of the noted complication seen were post operative synechia formation residual septal deviation.

Summary of studies

Table 1

Study/year	Nature of study	Assessment tool	Total patients	surgery	outcome	complication
Victoria S ¹²	Retrospective study	SN -5 and VAS	28	septoplasty	Good	N/A
Yilmaz m ¹³ 2014	prospective	NOSE and VAS	35	septoplasty	Effective and satisfactory	N/A
H c Hsu ¹⁴	retrospective	NOSE and VAS	50	septoplasty	Significant improvement in score	N/A
M Alexander ¹⁵	prospective	NOSE	136	Functional septorhinoplasty	Improvement in QOL	N/A
Hena din ¹⁶ 2019	Prospective	NOSE	136	Septoplasty/septorhinoplasty	improvement	N/A

Discussion

The nasal dorsum consists of nasal bone, nasal process of frontal bone. And nasal process of maxilla. Growth of nose continues till 17-18 years of life. Some studies report growth to continue till 36 years of age¹⁷ Nasal surgery in children requires dedicated understanding of anatomical as well as physiological aspect of growth to have an optimal outcome. This can prevent excessive correction which can be devastating. Shape of nose changes from childhood to adult. There are two growth zones described in children viz, sphenospinal and sphenodorsal region.¹⁸ the sphenospinal region contributes to outward growth whereas sphenodorsal region is responsible for normal increase in height and length of septum. Trauma and injury affects the type of growth depending upon region injured. Basic understanding of this aesthetic concept can avoid facial deformity and thereby the requirement of revision surgery.

Nasal deformity can present as cosmetic defect or nasal obstruction or both. Nasal obstruction can lead to open mouth breathing and chronicity leads to abnormal facial tone. This can affect the midface growth resulting in micrognathia retrognathia and maxillary hypoplasia. Recent anthropometric studies have revealed that pediatric patients have normal nasal and facial growth following nasal plastic surgery¹⁹. On the contrary delayed corrective procedure can result in nasal and facial growth arrest²⁰. Negative results have been shown to occur like sleep disturbances and abnormal psychomotor development^{21,22}. Conservative

approach while correcting nasal deformity in children has been found to be useful with no facial growth deformity.

Quality of Life Outcome

Outcome measures have been extensively studied for adult population but there is paucity of literature where post surgical outcomes have been measured in pediatric population²³. Numerous objective methods have been classically employed like angle measurements, anthropometric assessment to evaluate the post operative outcomes²⁴. But they may not always depict patient satisfaction. Subjective assessment like Quality of life has been extensively used by facial plastic surgeon now a days to characterize patient outcome in a better and impartial manner. All studies taken for our review have reported significant improvement in patient satisfaction after septal correction surgery in children. Few reported complication which are less morbid and are always correctable. Gross external nasal deformity alone or with septal deviation may lead to low social self esteem and social embarrassment which can lead to social isolation and other mental abnormality.

The appropriate age for septoplasty remains debatable. But literature review reveals no major adverse events in children post operatively. Nasal surgeries have been performed by ENT surgeons as part of approach to skull base. Transnasal transseptal surgery in children as old as 4 years have been reported to be safe by previous study²⁵. Children with deviated septum are prone to develop dental malocclusion ear diseases and recurrent respiratory illnesses. Lee et al²⁶ demonstrated females have more satisfaction as compared to males. So another factor contributing to outcome can be patient characteristics. There is no significant differences between the level of satisfaction between toddlers and older children. Type of surgery like open or closed have also less impact on children as far as level of satisfaction is concerned.

Septal surgery has to be done early when indicated. Care must be taken to avoid unnecessary radical correction which can have impact on the support and further growth of the midface. When performed in a properly selected patient with appropriate necessary precaution, it can contribute significantly to improvement in quality of life.

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