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Efficacy of septoplasty with endoscopic osteomeatal clearance in the management of headaches due to chronic sinusitis secondary to deviated nasal septum

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ABSTRACT

Background: Deviated nasal septum (DNS) is a common condition which affects most children and adults. Several surgical procedures are available for DNS. Endoscopic septoplasty is a minimally invasive surgical technique which can minimise trauma to the nasal septum and decrease post-operative morbidity. The present study was aimed to study the efficacy of septoplasty with endoscopic osteomeatal clearance, on headache due to sinusitis secondary to DNS.

Methods: The study was longitudinal in nature and involved patients undergoing septoplasty with endoscopic osteomeatal clearance at Government Medical College Hospital, Kottayam, Kerala, India. Patients with significant nasal obstruction due to DNS, and having recurrent sinusitis causing headache, were included into the study. Patients were discharged after 3 days and were called up for review at 2 weeks, 6 weeks, 3 months, 6 months, and 1 year and evaluated for change in headache as assessed by visual analogue score (VAS).

Results: A total of 50 participants were enrolled into the study over a period of 2 years. Maxillary sinus was involved in almost 96% of the cases while frontal sinus was affected in 46% and ethmoid sinus in 50% of participants. Seventy four percent participants had subjective symptomatic improvement at 2 weeks after surgery. The mean (SD) VAS score pre-operatively was 6.54 (1.5) and it improved to 4.18 (1.8) at 2 weeks following surgery ($p < 0.05$).

Conclusions: Septoplasty with endoscopic osteomeatal clearance is a procedure which is highly efficacious and well tolerated in treating headache due to sinusitis secondary to DNS.

Keywords: Nasal septum, Rhinoplasty, Endoscopy, Nasal obstruction

INTRODUCTION

Deviated nasal septum (DNS) is a common condition which affects most children and adults. Some studies have shown that almost 30% of all neonates are affected by this condition, and the numbers rise during the course of childhood.¹ Septal deformity can occur due to two major reasons. It can be due to anterior cartilage deformity affecting the anterior quadrilateral cartilage as a result of direct trauma or pressure at any age. The other

main mechanism involves compression of all septal components, mainly occurring due to the longitudinal and rotating forces in the process of parturition.² There has been hypotheses previously, which stated that DNS is a congenital etiology and that most of the people who suffer from this problem are born with it. But those issues have been conclusively laid to rest with extensive studies using magnetic resonance imaging (MRI) methods, which showed a higher prevalence of DNS among older children and adults.³

Most of the patients with DNS are either asymptomatic or has mild symptoms which does not warrant medical attention. A study from Iran reported that among the patients with DNS, almost 42% suffered from headache, 30% had nasal congestion or obstruction and around 25% has running nose or smelling disorders.⁴ Other studies have shown that DNS is a cause for mouth breathing in children, and it can result in excessive snoring, drooling on pillows, nocturnal sleep problems and irritability during the day time.⁵ Also, DNS is a condition which makes the patient susceptible to chronic rhinosinusitis. Studies have shown that those patients with postero-inferior and antero-inferior septal deviations are more likely to develop chronic rhinosinusitis.⁶

The diagnosis of the condition used to be based on clinical symptoms and examination findings alone, before the advent of modern diagnostic equipment like scopes and imaging modalities. Anterior rhinoscopy, nasal endoscopy, computerised tomography (CT) scan and MRI scan are the diagnostic techniques used routinely in diagnosis these days. Techniques like acoustic rhinometry, rhinomanometry and nasal spectral sound analysis are also used, but their sensitivity and specificity are on the lower side.⁷

Several surgical procedures are available for DNS. Submucous resection (SMR) is a surgical technique which used to be very popular before the advent of other newer procedures. High incidence of complications, especially septal perforations, is cited as the main reason for the relative obscurity of SMR nowadays. But certain studies have shown that SMR has very low incidence of complications in case of experienced surgeons and the risk is higher in unskilled hands only.⁸ Septoplasty is a relatively newer technique and has been adopted across the world for correction of DNS.

Septoplasty offers low rate of complications and helps in accurate assessment of the whole nasal problem along with precise correction of primary and secondary obstructive factors. Septoplasty is the procedure of choice in most developing countries where facilities for endoscopy are not available.⁹ Endoscopic septoplasty is a minimally invasive surgical technique which can minimise trauma to the nasal septum and decrease post-operative morbidity. Endoscopic septoplasty also offers good surgical access to perform other procedures like dacrocysto rhinostomy (DCR) or functional endoscopic sinus surgery (FESS). Studies have shown that complications of septoplasty like dental pain, septal perforation and saddle nose deformity occur very rarely with endoscopic septoplasty.⁹

The present study was aimed to study the efficacy of septoplasty with endoscopic osteomeatal clearance, on headache due to sinusitis secondary to DNS.

METHODS

The study was longitudinal in nature and involved patients undergoing septoplasty with endoscopic osteomeatal clearance at Government Medical College Hospital, Kottayam, Kerala, India. Patients with significant nasal obstruction due to DNS, and having recurrent sinusitis causing headache, were included into the study. Patients with vascular headache, posterior ethmoid or sphenoid sinusitis on CT scan and those undergoing functional endoscopic sinus surgeries (FESS) were excluded from the study.

X-ray of the para nasal sinuses (PNS) and screening sinus coronal CT of PNS supplemented by axial cuts, of sections 5mm and bone width of 1000-3000 HU, were taken in all cases. Septoplasty together with endoscopic osteomeatal clearance was done in all cases except those with gross septal deviations. Surgery was done mostly under local anaesthesia except in children and apprehensive adults when general anaesthesia was chosen. Patients were discharged after 3 days and was called up for review at 2 weeks, 6 weeks, 3 months, 6 months, and 1 year and evaluated for change in headache as assessed by visual analogue score (VAS). Follow up endoscopy was done at 2 weeks, 3 months and 1 year post operatively.

The data was digitised using Microsoft Excel and was analysed using SPSS 12.0, a statistical package brought out by IBM Inc. The study was approved by the institutional ethics committee and care was taken to obtain written informed consent from the participants before being enrolled into the study.

RESULTS

A total of 50 participants were enrolled into the study over a period of 2 years. A vast majority (60%) of the participants were aged below 30 years, with 38% between 31 to 60 years and only 2% aged above 60 years. 68% of the participants were males and 32% were females. On clinical examination, 42% has s-shaped deviation, 16% had c-shaped deviation, 28% had a spur and 14% had high deviation as given in Table 1.

All the participants had headache secondary to chronic sinusitis. Among the other symptoms, almost 90% had complained of persistent nasal discharge, 64% of participants had facial pain and 50% had purulent discharge from the nose. Only less than 10% of the participants complained of facial congestion and hyposmia as presented in Table 2.

All the participants had chronic sinusitis secondary to DNS. Maxillary sinus was involved in almost 96% of the cases while frontal sinus was affected in 46% and ethmoid sinus in 50% of participants. Only maxillary

sinus was involved in 20% of the participants and only frontal sinus affected in 4% of the people studied. No participant had solitary involvement of ethmoid sinus, but maxillary and ethmoid sinus were involved together in 34% of the cases. All three sinuses under consideration was involved in 16% of the participants as shown in Table 3.

Table 1: Baseline clinic-demographic characteristics.

Characteristic	Frequency (n=50)	Percentage
Age		
Upto 30 years	30	60%
31 to 60 years	19	38%
61 and above	1	2%
Sex		
Male	34	68%
Female	16	32%
Type of deviation		
S shaped	21	42%
C shaped	8	16%
Spur	14	28%
High	7	14%

Table 2: Presenting symptoms among participants.

Symptoms	Frequency (n=50)	Percentage
Facial pain/ pressure	32	64%
Facial congestion/fullness	4	8%
Nasal discharge	45	90%
Hyposmia/ anosmia	2	4%
Purulent discharge in the nose	25	50%

Table 3: Sinus involvement in CT and X-ray studies.

Sinuses involved	Frequency	Percentage
Maxillary only	10	20%
Ethmoid only	0	0
Frontal only	2	4%
Maxillary and ethmoid	17	34%
Ethmoid and frontal	0	0
Frontal and maxillary	13	26%
Maxillary, ethmoid and frontal	8	16%

All the participants were symptomatic before surgery. 74% participants had subjective symptomatic improvement at 2 weeks after surgery, while 10% reported worsening and 16% has no change in symptoms. At one year after surgery, 74% of the participants had improved symptomatically while 16% reported worsening of symptoms as given in Table 4.

Table 4: Improvement in symptoms following surgery.

Time	Improvement	Worsening	No change
Preoperative	50 (100%)	NA	NA
2 weeks	37 (74%)	5 (10%)	8 (16%)
6 weeks	39 (78%)	6 (12%)	5 (10%)
3 months	36 (72%)	6 (12%)	8 (16%)
6 months	40 (80%)	3 (6%)	7 (14%)
1 year	37 (74%)	8 (16%)	5 (10%)

The severity of headache was assessed using a Visual Analogue Scale which had scores from 1 to 10, depending on the perceived severity of pain. The mean (SD) VAS score pre-operatively was 6.54 (1.5) and it improved to 4.18 (1.8) at 2 weeks following surgery. The mean (SD) VAS score improved serially over time and was 2.80 (2.4) at 1 year after surgery. This improvement over time was statistically significant ($p < 0.05$) on Friedman's test as shown in Table 5.

Table 5: Headache assessed by VAS following surgery.

Time	Mean VAS (SD)	Mean Rank	P value
Preoperative	6.54 (1.5)	5.28	<0.001 [#]
2 weeks	4.18 (1.8)	4.18	
6 weeks	3.34 (1.6)	3.14	
3 months	3.46 (1.6)	3.27	
6 months	3.10 (2.1)	2.68	
1 year	2.80 (2.4)	2.45	

[#]- Friedman test

DISCUSSION

In this study, patients with headache as a result of chronic sinusitis secondary to DNS showed significant improvement in symptoms following surgical intervention. The improvement was evident in the proportion of participants who had subjective decrease in symptoms and also in reduction of VAS score following surgery. A similar trend has been observed in other studies also. A study done in Iran showed that almost 82% of the participants reported improvement in their headache at 2 years of follow-up period, following any type of septoplasty surgery.¹⁰

Another study from United Kingdom showed that almost 63% of the participants said they have fewer headaches at the end of a 18 month follow-up period. Those participants with frontal headache and pressure-like symptoms over their forehead were more likely to report improvement in headache after septoplasty.¹¹ Overall, endoscopic septoplasty with osteomeatal clearance is a well-tolerated procedure and is considered superior to traditional approach for DNS.

A study from London reports that those who underwent endoscopic septoplasty showed better improvement when assessed in terms of nasal obstruction symptom evaluation (NOSE) scores and subjective change in symptoms.¹³ Another study from New Delhi showed that complications of septoplasty like haemorrhage, infraorbital edema and nasal pain were lower in patients who underwent endoscopic septoplasty than patients who had conventional procedures.¹⁴

Studies done in other developing nations also showed similar efficacy for endoscopic septoplasty. A study from Nepal showed that the procedure is effective in reduction of symptoms associated with DNS such as rhinorrhoea, nasal obstruction and headache. Also, the complication rates very minimal even with a shorter training period for the surgeons.¹⁵

In conclusion, septoplasty with endoscopic osteomeatal clearance is a procedure which is highly efficacious and well tolerated in treating headache due to sinusitis secondary to DNS.

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