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A Comparative Study of Trans-Septal Suturing Technique and Nasal Packing in Septoplasty

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A B S T R A C T

Nasal obstruction is one of the most common complaints in patients attending Otorhinolaryngology outdoor. The most common cause of nasal obstruction is deviated nasal septum [1]. Apart from nasal obstruction, a significantly deviated nasal septum has been implicated in epistaxis, sinusitis, obstructive sleep apnea headache and otitis media [1-3]. Septoplasty is a surgical procedure used to correct a deviated nasal septum and its one of the commonly performed. Nasal packing after nasal septal surgery has been practiced for decades to prevent post-operative bleeding, septal hematoma pain and discomfort likes epiphora, sleep disturbance, headache and dryness of mouth that the patient has to undergo in the 48 hours post operatively. ***Aim & Objectives*:** To compare the intra-operative and post-operative outcome of trans-septal suture and nasal packing performed during Septoplasty. ***Materials and Methods***: A Cross sectional observational study was taken up in the Department of Otorhinolaryngology, Head & Neck Surgery, Agartala Government Medical College & GBP Hospital in 78 patients with DNS underwent septoplasty surgery. ***Results*:** Amongst the patients who underwent Trans-septal suturing none of the patients reported Epiphora, Headache or dryness of mouth. Only 1 (2.6%) patient each reported sleep disturbance, post operative bleeding or synechia. Whereas All the patients who underwent Nasal packing reported Epiphora and Headache, 31 (79.5%) patients reported sleep disturbance whereas 38 (97.4%) reported dryness of mouth, 28 (71.8%) reported pain on pack removal, 2 (5.1%) reported post operative bleeding whereas synechia was seen in 1 (2.6%) patient.
Keywords: Deviated Nasal Septum, Septoplasty, Trans-septal suture, Nasal Packing.

INTRODUCTION

Nasal obstruction is one of the most common complaints in patients attending Otorhinolaryngology outdoor. The most common cause of nasal obstruction is deviated nasal septum (DNS) [1]. Apart from nasal obstruction; a significantly deviated nasal septum has been implicated in epistaxis, sinusitis, obstructive sleep apnea headache and otitis media [1, 2]. Septal deviations are extremely common, but are not usually severe enough to affect nasal function [1-3]. Many septal deviations are due to direct trauma [4-6]. In the absence of any clear history of trauma, birth moulding and nasal allergies are considered to be the cause [6, 7]. Racial and hereditary factors also consider for prevalence of DNS [8, 9]. Deformity of the nasal septum can be classified as spurs, deviations and dislocations [2]. Only the more severe deviations affect nasal functions and therefore require treatment [3].

Septoplasty is a surgical procedure used to correct a DNS and its one of the commonly performed surgery by the ENT Surgeons [1-3]. This surgery can induce serious complications such as bleeding, septal perforation, synaechia or nasal deformities [4].Nasal packing after nasal septal surgery has been practiced for decades to prevent post-operative bleeding, septal hematoma and abscess formation. The post-operative nasal packing achieved good flap opposition with a snugly fitting pack that would exert a sustained, continuous and equal pressure from either side of the nasal septum. Comparative studies between the different packing material have been conducted from time to time.

In spite of all the advantages discussed of nasal packing the disadvantages of a pack in situ especially with respect to patient comfort is seldom considered. The agony of pain and discomfort likes epiphora, sleep disturbance, headache and dryness of mouth that the patient has to undergo in the 48 hours post operatively should be primarily taken into consideration specially as there is no fixed parameters regarding the size, length and amount of nasal pack to be introduced into the nasal cavities a little over jealous packing done by the surgeon would only add to the patient's misery.

Trans-septal suture using vicryl is good alternative and a viable option for nasal packing. It reduces the chances of septal hematoma formation and also provides good flap approximation. The post-operative pain associated with quilting sutures are much lesser as compared to nasal packing. Therefore, this study is undertaken to find out the better option between the nasal packing ortransseptal suturing technique to manage intra operative and post-operative complications following septoplasty.

Review of Literature

Beckhuis in the year 1973 opined that "As the septum goes, so goes the nose". Nasal septal deviation is quite common and approximately 80% of the population have some degree of septal deviation.

Sinha and Maheshwari (1970) conducted a similar study on 525 cases, out of which 340 (64.75%) were suffering from deviated nasal septum. In their study, highest incidence was seen in the age group of 16 – 25 years, and noted 82.66% males against 17.33% females [3].

Becker *et al*., (1951) stated that trauma in early childhood, (before six or seven years) play an important role in development of deviated nasal septum as maxillary crest and vomer are not completely ossified in that period [4].

Fischer *et al*., (1957) divided the trauma into major and minor groups. Minor trauma is such injuries that stimulate the growth of the cartilage and bone and may result in change that can produce pathological findings in later life [5]. Major traumas are such injuries that include fractures of the nasal bone and/or fractures and dislocation of the septum.

Tepan*et al*., (1970) stated that most of the cases with deviated nasal septum are due to trauma, either in early childhood or later on. In his series, out of 30 cases, 17 had definite history of trauma and in 6 cases; there was history of difficult labour [6].

Gray *et al*., (1972) explained the cause of the deviated nasal septum by birth moulding theory. It states that abnormal intrauterine pressure may lead to compression forces acting on the widest part of the face, that the nose and the jaw. Thus, the displacement of the septum may result from the torsional forces during parturition [7].

Thomson and Negus (1948) observed high incidence of deviated nasal septum amongst Mongols and Africans [8]. Hasan*et al*., (1986) found deviated nasal septum in 64% Indians [9].According to Hasan*et al*., the variation in finding may be due to racial difference [9].

Graymer and Melsen (1989) compared the nasal septum of 41 pairs of the identical twins and found that deformities of the anterior nasal septum (cartilaginous septum) were 22% of all individuals and in the posterior nasal septum (bony septum), some deformities were present in 74% of the persons studied [10].

Nasal packing was first described in the otorhinolaryngolic literature in 1951 and the use of absorbable biomaterials since 1969. Different types of nasal packing have been used like ribbon gauge soaked in bismuth iodoform paraffin paste, liquid paraffin, antibiotic ointments and others.

The disadvantages of anterior nasal packing are compromised nasal breathing, dryness of mouth, nasal pain, nasal valve narrowing, vestibulitis, crusting, synechiae, headache, watering from eyes, ear blocking, irritation of throat, difficulty in swallowing, hypoxia, hypoxemia, and secondary infection. It also increases hospital stay. In addition to these, severe pain is experienced by the patient during pack removal.

The studies by Schoenberg *et al.*, [11], Nunez DA *et al*., [12] and Illum P *et al*., suggested that nasal packing is not necessary after nasal septoplasty as it causes discomfort when it is being removed.

Von Schoenberg and colleagues studied 95 patients undergoing routine nasal surgery and reported that pain was significantly higher in the group that were packed after surgery; and the removal of packing proved to be the most painful

event in the postoperative period. They found a higher rate of complications (including hemorrhage, vestibulitis and septal perforation) in the packed group, though it is not clear if this difference reached statistical significance.

Walikar*et al*., deduced from their study that there was significant reduction in frequency of post-operative pain, headache, discomfort and duration of hospital stay in patients who have undergone septoplasty without nasal packing [13].

S. A. Majeed and B. M. Saeed carried out a prospective non-randomized comparative interventional study at two teaching hospitals in Mosul city from January 2020 to January 2021 [14]. In their study of 60 patients 30 patients had placement of septal quilting sutures (group A), and in the other 30 patients nasal packing was performed (group B). The postoperative morbidity and early outcome in the first 24 h, 1 week and 1 month was assessed. They had found that group B had significantly higher levels of nasal/facial pain, headache, sleep disturbance, breathing difficulties and swallowing difficulties compared to group A ($p < 0.001$).

In a similar study by MA Khan *et al*., 105 patients who underwent septoplasty, they have found that on the operation day 7.6% patients of Group A (Trans septal Suturing) had nasal bleeding while only 1.8% patients in group B (Nasal Packing group) [15]. However, Group A patients had significantly less pain on the evening of operation day as compared to Group B, and also on day 7. There were 11.5% cases of group A, who developed synechiae/ adhesions as compared to 1.8% of Group B.

V Tewari*et al*., (2022) in their study found that none of the patient in transseptal suturing group underwent nasal bleeding and thus none of them required add on nasal packing.100% patients in medicated gauze nasal packing group presented with epiphora, headache, sleep disturbances, and dryness of mouth in 48 hours observation period, whereas none of the patient in trans-septal suturing group presented with such symptom [16].

Aim & Objectives

To compare the intra-operative and post-operative outcome of trans-septal suture and nasal packing performed during Septoplasty.

Materials and Methods

A Cross sectional observational study was taken up in the Department of Otorhinolaryngology, Head & Neck Surgery, Agartala Government Medical College & GBP Hospital for 1 year 6 months (Sept,'2020 to Feb,'2022). In this study 78 patients with DNS were registered. Census Sampling was done for the present study to select the eligible cases. Approval from the Institutional Ethical Committee has been taken.

Inclusion Criteria

- All patients with clinically significant Deviated nasal septum who require to undergoSeptoplasty based on their clinical and radiological features.
- Patients age above 18 years irrespective sex.

Exclusion Criteria

- Patient of DNS with para nasal sinus diseases requiring both septoplasty and endoscopic sinus surgery.
- Patients with bleeding disorder.
- Patient undergoing Septo-rhinoplasty for correction of external deformity and DNS in same setting.

Methodology

All patients with DNS fulfilling the inclusion criteria were thoroughly evaluated by detailed history and thorough clinical examination, diagnostic nasal endoscopy and radiological investigations. Further investigation including haematological, serology for viral markers, Bleeding Time and Clotting Time, Urine for Routine Examination, Chest X ray and ECG were done. Pre anaesthetic check-up was done. Details of the procedure and possible complications were explained. Written and Informed consent was taken. The patient were divided into two groups without nasal packing (Trans septal suturing) (Group A) and Nasal packing (group-B)

General anaesthesia with endotracheal intubation was done for all the patients.

The septum is infiltrated with 1% lignocaine with adrenaline, 1:100,000. All the patient has undergone septoplasty surgery either by conventional or endoscopic method irrespective of groups. Accordingly, Trans-septal suturing done with Vicryl 3-0 round bodies (Group-A) and Merocele nasal packingis applied to support mucoperichondrial flaps (Group-B) patients. Post operative care has been taken for both the groups and nasal packing has

been removed after 48 hr (Post operative day 2) for group B. the following post operative parameters (Pain, Bleeding, septal haematoma, epiphora, sleep disturbance and dryness of mouth) were recorded for both groups.

The patients were typically discharged 3 days after the procedure. Post-operative follows up for the first 7, 15 days, 1month and 3months respectively and assessment of the post-operative nasal cavity were made at every follow up visit. The data were analyzed using IBM SPSS version 29.

RESULTS

In this study majority of patients were in the age group of 20-39 years. The youngest patient was an18-year-old boy and the oldest patient was 64 years, 52 (66.67%) were male and 26 (33.33%) are female.

In this study, 13 (16.7%) patients gave history of antecedental trauma and 65 (83.3%) patients were classified as developmental error or unknown causes.

In this study, pre- operative clinical presentation (Nasal Obstruction, Nasal Obstruction +Discharge, Epistaxis +/- Nasal obstruction, Nasal obstruction +Post nasal drip and Nasal obstruction +Headache) of both the groups are shown in Table 1.

In this study, 51 (65.38%) patients presented with Right sided deviated nasal septum, 24 (30.77%) patients presented with Left sided deviated nasal septum and 3 (3.85%) patients presented with S shaped deviated nasal septum.

In this study, amongst the patients who underwent Trans-septal suturing, none of the patients reported Epiphora, Headache or dryness of mouth. Only 1 (2.6%) patient each reported sleep disturbance, post operative bleeding or synechia.

All the patients who underwent Nasal packingreportedEpiphora and Headache, 31 (79.5%) patients reported sleep disturbance whereas 38 (97.4%) reported dryness of mouth, 28 (71.8%) reported pain on pack removal, 2 (5.1%) reported post operative bleeding whereas synechia was seen in only 1 (2.6%) patient.The p value of this study is <0.05, which is statistically significant.

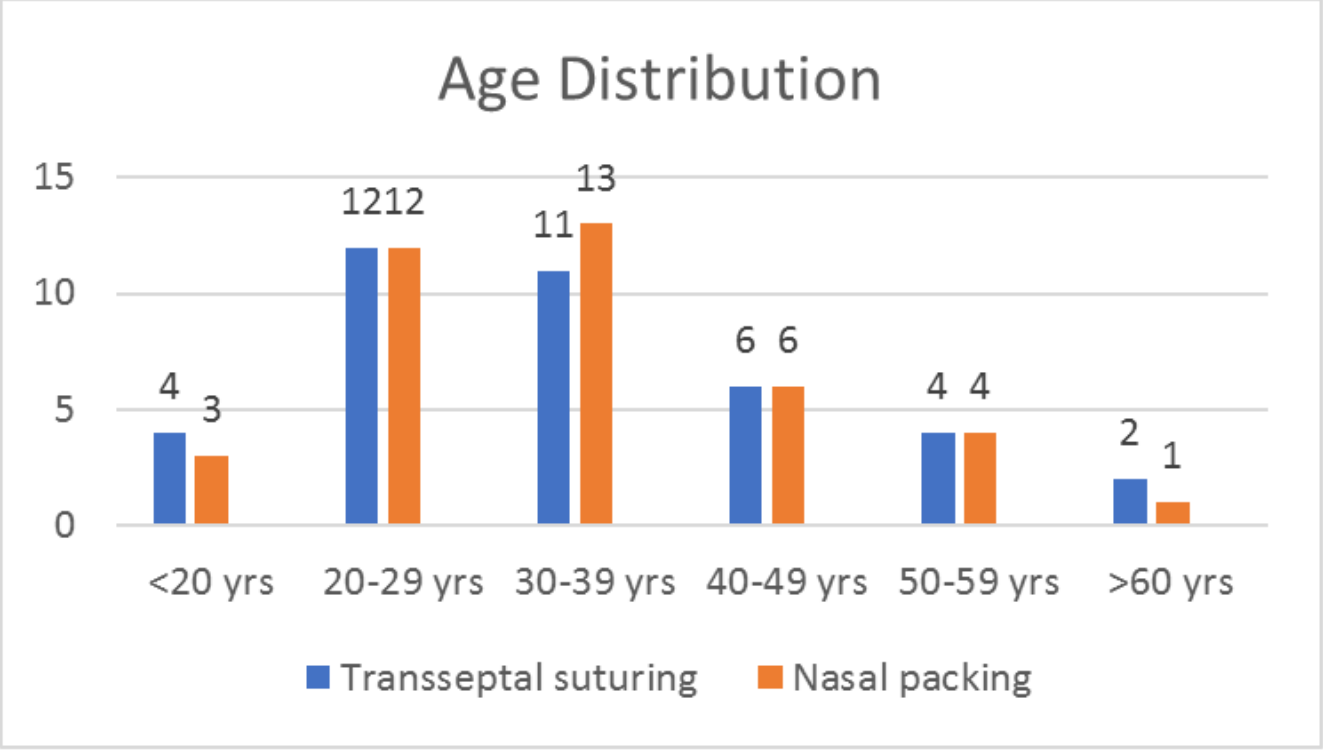

Fig 1: Bar Chart Showing Age Distribution

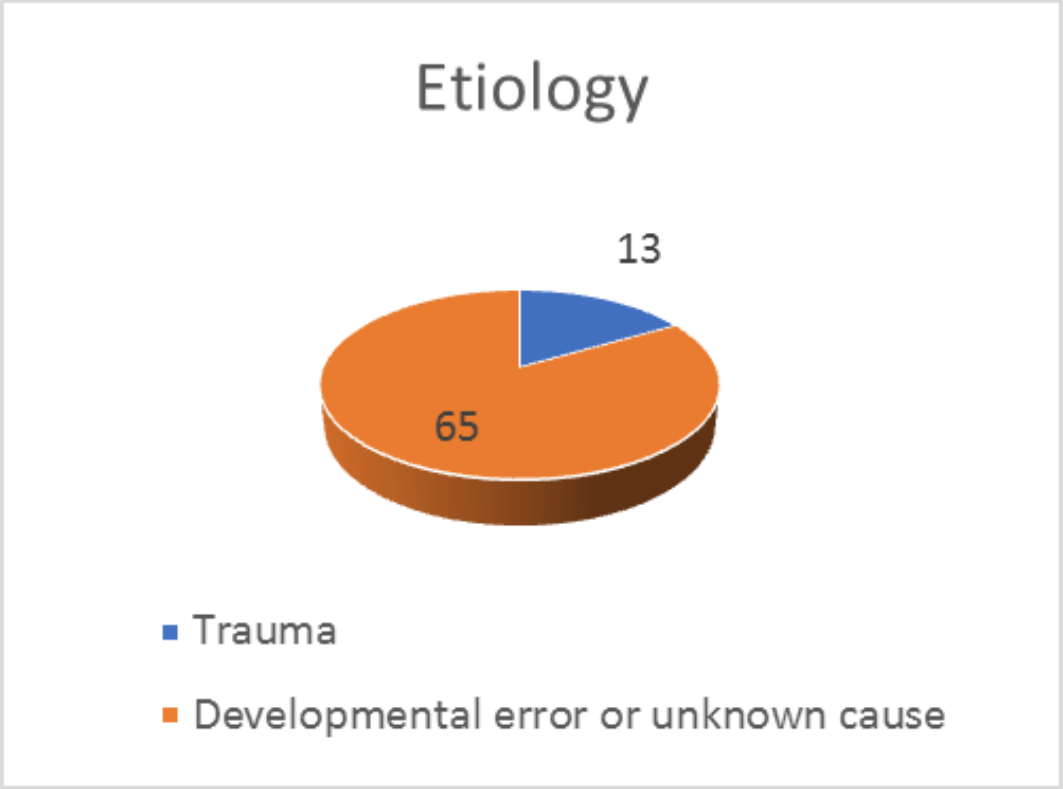

Fig 2: Etiology of DNS

Table 1: Pre operative clinical presentation of the patients

Clinical presentation	Transeptal suturing group (n= 39)	Nasal packing group (n= 39)
Nasal Obstruction	36 (92.3%)	35 (89.7%)
Nasal Obstruction +Discharge	14 (35.9%)	13 (33.3%)
Epistaxis +/- Nasal obstruction	4 (10.2%)	8 (20.5%)
Nasal obstruction +Post nasal drip	1 (2.6%)	1 (2.6%)
Nasal obstruction +Headache	2 (5.1%)	2 (5.1%)

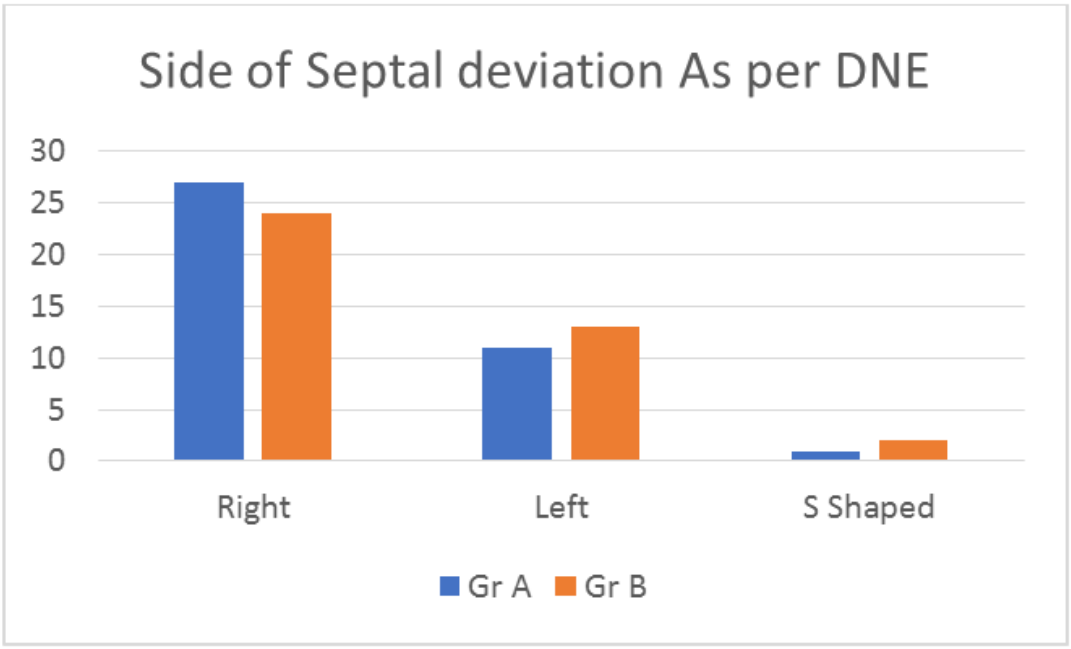

Fig 3: Bar Chart showing side of septal deviation as per DNE

Table-2: Post operative Observation of both groups

Post-operative period		Pain	Bleeding	Headache	Epiphora	Sleep Disturbance	Pain on Pack Removal
		No. of case (%)	No. of case (%)	No. of case (%)	No. of case (%)	No. of case (%)	
Post-operative day1	Group A	2	1	0	00	1	0
	Group B	12	0	34	32	31	0
Post-operative day2	Group A	0	0	0	0	1	0
	Group B	6	2	39	39	31	28
Post-operative day3	Group A	0	0	0	0	1	0
	Group B	0	0	26	20	27	0

DISCUSSION

In this study, 78 patients presenting with different symptoms related to deviated nasal septum were selected by census sampling and they were studied based on the inclusion and exclusion criteria described earlier. All the cases were treated by septoplasty followed by Transseptal suturing or Nasal packing.

In this study, majority of patients were in the age group of 20-39 years. The youngest patient was a 18 year boy and the oldest patient was aged 64 years. The average age of the cases of the series was 29.25 years. There were 52 male and 26 femalewith male to female ratio being 2:1. It was also seen that the incidence had decreasing tendency with increasing age.

Sinha and Maheshwari (1970) in their study found that highest incidence was seen in the age group of 16 – 25 years [7]. Gray *et al*., (1965) studied the incidence and etiology of septal deviation and reported an incidence of 27% in infants and 37% in adults [9].

The predominance of male over female has been observed by Thompson and Negus (1948) [8], Gray *et al*., (1965) [7] &Sinha and Maheshwari (1970) [3].

In this study, 13 (16.7%) patients gave history of antecedent trauma and 65 (83.3%) patients were classified under developmental error or unknown cause.Sood*et al*., (1985) divided traumatic cases of septal deviation in childhood into prenatal, natal and postnatal or early childhood trauma. According to his study, the incidence is more in adult than children apparently due to increased effects of developmental and traumatic factors [8]. Developmental errors are also a common cause of septal deviation. Disproportionate growth of different constituents of nasal septum may lead to deviation. Matzenbaum*et al.*, (1929) addressed the effect of birth trauma to the nose. He stated that the nose of a child delivered by caesarean section is in a perfect contour when compared with a child born naturally. Gray *et al*., (1972) explained the cause of the deviated nasal septum by birth molding theory. But according to Thompson and Negus (1948) [8], Becker *et al*., (1951) [4], Tepan*et al*., (1970) [6] local trauma plays a major role in the causation of DNS.

In this study, amongst the patients who underwent Trans-Septal suturing, none of the patients reported Epiphora, Headache or dryness of mouth. Only 1 (2.6%) patient each reported sleep disturbance, post operative bleeding or synaechia.

Patients who underwent Nasal packing, all (100%) reported Epiphora and Headache. 31 (79.5%) patients reported sleep disturbance whereas 38 (97.4%) reported dryness of mouth. 28 (71.8%) reported pain on pack removal. 2 (5.1%) reported post operative bleeding whereas synaechia was seen in only 1 (2.6%) patient.

Postoperative pain, headache and sleep disturbance was significantly more in the nasal packing group. It was also found that the crusting is commonly seen in patients in the nasal packing group. Quilting the nasal septum and leaving the nasal cavity unpacked increases the comfort level of the patient in the postoperative period. The resultant

pain, headache and sleep disturbance caused by nasal packing can be significantly avoided by using quilting the septum without nasal packing.

The findings are similar to studies by S. A. Majeed and B. M. Saeed (2021) [14], MA Khan *et al.,* (2017) [15], S Ali *et al*., and Ramalingam V *et al*.,

Summary

A study titled **"**A Comparative Study of trans-septal suturing technique and nasal packing in septoplasty" has been undertaken with an aim tocompare the intra-operative and post-operative outcome of trans-septal suturing and nasal packing performed during Septoplasty. The study was initiated after obtaining approval from the Institutional Ethical Committee.

In our study, 78 patients presenting with different symptoms related to DNS were thoroughly evaluated by detailed history, thorough clinical examination, diagnostic nasal endoscopy and radiological investigations. All the cases were treated by septoplasty followed by Transseptal suturing or Nasal packing as per simple random sampling.

In this study majority of patients were in the age group of 20-39 years. The youngest patient was 18 years boy and the oldest patient was 64 years. The average age of the cases of the series was 29.25 years. There were 52 males and 26 females with male to female ratio being 2:1. 13 (16.7%) patients with history of antecedent trauma and 65 (83.3%) patients were classified as developmental error or unknown causes.

The patients who underwent Trans septal suturing none of the patients reported Epiphora, Headache or dryness of mouth. Only 1 (2.6%) patient each reported sleep disturbance, post operative bleeding or synechia. All the patients who underwent Nasal packing reported Epiphora and Headache, 31 (79.5%) patients reported sleep disturbance whereas 38 (97.4%) reported dryness of mouth. 28 (71.8%) reported pain on pack removal. 2 (5.1%) reported post operative bleeding and synechia was seen in only 1 (2.6%) patient. None of the patient reported any late surgical complication.

CONCLUSION

In our present study, Postoperative pain, headache and sleep disturbance was significantly more in the nasal packing group. Application of trans-septal sutures on the nasal septum after septoplasty and leaving the nasal cavity unpacked increases the comfort level of the patient in the postoperative period. Although, a slightly longer time duration is taken for trans-septal suturing, the resultant pain, headache and sleep disturbance caused by nasal packing can be significantly avoided by using quilting the septum without nasal packing.

Conflict of Interest: Nil

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