

Postoperative Intranasal Adhesions and Morbidity Following Septoplasty with and Without Splints; A Comparative Study

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ABSTRACT

Background:One of the principal nasal operations often carried out by ENT specialist is septoplasty. A variety of materials have been tested as nasal splint; however, the efficacy of all is still questionable. The current study was aiming at evaluating the efficacy and safety of using intranasal splints in overcoming formation of adhesion.

Aim of the study:is to evaluate the possible role of intranasal splint in reducing the rate of intranasal adhesions and to figure out possible complications associated with their use in patients undergoing septoplasty.

Patients and methods:This is a prospective comparative study of 80 adult patients underwent septoplasty by the same surgical team, in Ad-Diwaniyah teaching Hospital, from October 2018 to August 2019. Patients were selected randomly and divided into two equal groups, each group included 40 patients. In one group, nasal splint was used and in the second group no nasal splint was used. Pain, sleep disturbance and dysphagia during the first 7 post-operative days were evaluated based on visual analogue scale. Other outcomes such as crusting, perforation and adhesions were searched for during the fourth week post-operatively.

Results:Regarding pain and sleep disturbances, there was significant difference between the two included groups ($p < 0.05$) in that suffering was more linked to group with intranasal splint. However, there was no significant variation with respect to crusting and adhesion ($p > 0.05$) between both study groups.

Conclusion:the use of intranasal splint should be tailored based on certain selection criteria since it is associated with more patient suffering and negligible protection against adhesions and crusting if used routinely.

Key words:Postoperative, intranasal adhesions, morbidity, septoplasty splints

Introduction

When the nasal septum is not in the midline and is associated with patients' manifestations such as chronic nasal congestion, nasal obstruction, headache, repeated ear infections, nose bleed and sinusitis, the condition is known as "deviated nasal septum (DNS)" (1-4).

The operation that is indicated to correct symptoms in association with septal deviation is known as septoplasty (5). Morbidity accompanying this kind of operation is rarely recorded; however, bleeding, septal perforation, adhesions inside nose and infection has been previously described (6). One of the main adverse outcomes in association with nasal operation is the occurrence of adhesions between the lateral nasal walls and the septum (7,8). The reported rate of adhesions in association with septoplasty is around 6 to 11 % and this rate becomes even higher when the operation includes resection of turbinate reaching 31 % (9). In order to prevent this complication of adhesion formation, ENT specialists have been practicing intranasal splint

globally (10). The material used in synthesis of nasal splints is silicon and the use of such material has been described to be accompanied by significantly less rate of adhesions; however, complications such as septal perforation, vestibule inflammation and nasal discomfort (11). The exact mechanism by which such splint prevents adhesions is not well understood and substantial controversy is reported in available published articles with respect to recommendation of using such splints in preventing adhesions (12-14). The rarity of Iraqi literatures dealing with recommendations pertaining to the use of such trend in preventing nasal adhesions and the possible mechanism and outcome and existence of significant controversy worldwide, justified the planning and carriage out of the current study. The aim of this study was to evaluate the possible role of intranasal splint in reducing the rate of intranasal adhesions and to figure out possible complications associated with their use in patients undergoing septoplasty.

Patients and methods

This is a prospective comparative study of 80 adult patients underwent septoplasty by the same surgical team, in Ad-Diwaniyah teaching Hospital, from October 2018 to August 2019. Patients were selected randomly and divided into two equal groups, each group of (40). First group with nasal splint (group A) and the second group without nasal splint (group B). Visual analogue scale was used to evaluate the pain, dysphagia and sleep disturbance for the 1st 7 days. As well as adhesion, perforation and crustation were recorded at 4th postoperative week.

The study was approved by ethical approval committee of College of Medicine/ University of Al-Qadisiyah. Formal agreements were issued by the health directorate of Ad-Diwaniyah province, the formal representative of Iraqi ministry of health. Verbal consent was obtained from every participant.

Data analysis was based on the well known statistical package (SPSS version 25) in addition to Microsoft Office Excel 2010. The presentation of numeric quantitative variables was in the form of range, standard deviation and mean, whereas qualitative non-numeric variables were expressed in the form of proportions and percentages. The association among qualitative variables was based on Chi-square test; however, Fischer exact test and Yates correction were used instead if Chi-square test would be proved invalid. Independent samples *t*-test was used to compare mean age between the two study groups. The level of significance was selected at *p*-value of 0.05 or less (27-32).

Results

Eighty patients fulfilled the inclusion criteria enrolled in this study: 28 males (35%) and 52 females (65 %). Their ages ranged from 17 to 50 years with a mean (\pm SD) of age of the participants was 28.6 ± 7.7 (17-48) years for group (A) 29.0 ± 8.9 (18-49) for group (B) as shown in table (1).

Postoperative pain according to VAS five patients (12.5%) from group (A) reported mild pain while 11 patients (27.5%) from group (B) reported mild pain which is statistically significant (*P* 0.008). Twenty-five patients (62.5%) from group A and 28 (70%) reported pain to be moderate. Ten patients, (25%) from group A while only one (2.5%) recalled pain to be severe see table (2).

Two (5%) and one (2.5%) patients from group (A) and (B) respectively reported mild sleep disturbance and this is statistically significant ($p = 0.0001$).

While 29 (72.5%) of patients from group B reported moderate sleep disturbance.

Thirty-three (82.5%) of splinted patients reported severe sleep disturbance see table (2). Five (12.5%) and seven (17.5%) patients from group A and B respectively reported mild dysphagia while 32 (80%) and 30 (75%) patients from group A and B respectively reported moderate dysphagia and three (7.5%) patients from each group reported severe dysphagia. these results reflect no significant difference in dysphagia between the 2 groups ($p = 0.820$). As shown in table (2). Adhesions was observed only in three (7.5%) patients in Group B and no patient (0.00%) in Group A. (p value is 0.077) which is not statistically significant as shown in table (3). Two (5%) from group A and four (10%) from group B have a crustation. as shown in table (3). There were no septal perforations in both groups. as shown in table (3).

Table 1: Demographic characteristics of patients subjected to septoplasty

Characteristic	Group with intranasal splint <i>n</i> = 40	Group without splint <i>n</i> = 40	<i>p</i>
Age (years)			
< 20, <i>n</i> (%)	5 (12.5 %)	5 (12.5 %)	
20-29, <i>n</i> (%)	19 (47.5 %)	20 (50.0 %)	
30-39, <i>n</i> (%)	12 (30.0 %)	9 (22.5 %)	
≥ 40, <i>n</i> (%)	4 (10.0 %)	6 (15.0 %)	
Mean ±SD	28.6 ±7.7	29.0 ±8.9	> 0.05 I
Range	17-48	18-49	NS
Gender			
Male, <i>n</i> (%)	15 (37.5 %)	13 (32.5 %)	> 0.05 C
Female, <i>n</i> (%)	25 (62.5 %)	27 (67.5 %)	NS

n: number of cases; **I:** independent samples t-test; **C:** Chi-square test; **NS:** not significant at $p > 0.01$

Table 2: Early post-operative outcomes contrasted between the two included study groups

Characteristic	Group with intranasal splint <i>n</i> = 40	Group without splint <i>n</i> = 40	<i>p</i>
Post-operative pain			
Mild (1-3)	5 (12.5 %)	11 (27.5 %)	
Moderate (4-7)	25 (62.5 %)	28 (70.0 %)	< 0.05 C
Severe (8-10)	10 (25.0 %)	1 (2.5 %)	NS
Sleep disturbances			
Mild (1-3)	2 (5.0 %)	1 (2.5 %)	
Moderate (4-7)	5 (12.5 %)	29 (72.5 %)	< 0.05 C
Severe (8-10)	33 (82.5 %)	10 (25.0 %)	NS

Difficulty with food intake

Mild (1-3)	5 (12.5 %)	7 (17.5 %)	> 0.05 C NS
Moderate (4-7)	32 (80.0 %)	30 (75.0 %)	
Severe (8-10)	3 (7.5 %)	3 (7.5 %)	

n: number of cases; **C**: Chi-square test; **NS**: not significant at $p > 0.01$; **S**: significant at $p \leq 0.05$

Table 3: Late post operative outcomes (4th week post-operatively)

Characteristic	Group with intranasal splint <i>n</i> = 40	Group without splint <i>n</i> = 40	<i>p</i>
Adhesions			
<i>n</i> (%)	0 (0.0 %)	3 (7.5 %)	> 0.05 F NS
Crustation			
<i>n</i> (%)	2 (5.0 %)	4 (10.0 %)	> 0.05 Y NS
Perforation			
<i>n</i> (%)	0 (0.0 %)	0 (0.0 %)	---

n: number of cases; **C**: Chi-square test; **NS**: not significant at $p > 0.01$; **S**: significant at $p \leq 0.05$

Discussion

Formation of adhesions between nasal septum and turbinates, middle or lower, is a well known complications encountered following nasal surgeries and it has been in the range of 10 to 36 (15, 16). One of the common approaches to avoid such adhesions is the use of nasal splints which are by the present time commercially available in various shapes and sizes (17). In the current study we observed only 3 cases of adhesions in the non-splinted group which is 7.5 %. The adhesions were released in the outpatient clinic under local anesthesia and none of the splinted group formed adhesion but this is not statistically significant. In accordance with our findings, several previous reports highlighted the insignificant contribution of splinting in the prevention of post-operative adhesions (9, 18, 19). However, our results disagree with findings of Schoenberg et al who reported significantly lower incidence of adhesions following intranasal splinting (20).

In their study on 106 patients, undergoing a variety of nasal operations, Campbell et al, recommended the use of intranasal splints in cases of bilateral procedures as this was associated with significantly less adhesions and to avoid this approach in cases of unilateral procedures due to high rate of adverse outcomes (21). In one previous study, there was significantly more pain in association with splint whereas adhesions were not reduced significantly in the splinted group (22). Our observations are therefore in line with the results of the later study (22).

In our study, nasal discomfort and sleep disturbances were reported more with splinted approach and these findings are supported by previous observations (18, 21, 26). However, our results are different from the

observations of Abdulkhaliq et al (23) and Jung et al (24), as the later two studies reported no significant variation in post-operative pain score and sleep disturbances between splinted and non-splinted groups.

In the current study, also, there was no significant difference in the incidence rate of crustation between the study groups. In significant low rate of crustation has been reported by previous studies (7, 25). In addition, in the present study, we did not found septal perforation and this finding was in line with the observation of previous authors (9, 19, 22, 27). It is worth to mention that in the current study splints were prepared from X-ray films as previously described by several authors (23, 28).

Based on the previous discussion, it appears that prevention is the best method to avoid this complication, thus, otolaryngologists or nasal surgeons need to be a very careful of their dissection during septoplasty.

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References

1. Gray LP. Deviated nasal septum. Incidence and etiology. Ann Otol Rhino Laryngol 1978; 87: 3-20.
2. Cole P, Chaban R, Naito K, Oprysk D. The obstructive nasal septum. Arch Otolaryngol 1988; 114: 410-2.
3. Brain D. The Nasal Septum. In: Kerr AG. Scott-Brown's Otolaryngology. 6th ed, London; Butterworths 1997: 11/01-11/27.
4. Min Y, Jung H W, Kim CS. Prevalence study of nasal septal deformities in Korea: Results of a nation-wide survey. Rhinology 1995; 33: 61-5.
5. Gray LP. The deviated nasal septum. Etiology. J Laryngol Otol 1965; 79: 567-75.
6. Muhammad IA, Rahman NU. Complications of the surgery for deviated nasal septum. J Coll Physicians Surg Pak. 2003 Oct; 13: 565-8.
7. Shone GR, Clerg RT. Nasal adhesions. J Laryngol Otol 1987; 101: 555-7
8. White A, Murray JA. Intranasal adhesion formation following surgery for chronic nasal obstruction. Clin Otolaryngol 1988; 13: 139-43.
9. Al-Mazrou KA, Zakzouk SM. The impact of using intranasal splints on morbidity and prevalence of adhesions. Saudi Medical Journal 2001; 22 (7): 616-8.
10. Ajmal M, Tirmizey MA, Rehman AU, Ahmed N. Role of nasal splints. The Professional 1998; 5: 255-8.
11. Ahn MS, Maas CS, Monhian N. A novel, conformable, rapidly setting nasal splint material: results of a prospective study. Arch Facial Plast Surg. 2003; 5:189-92.
12. Fischer ND, Biggars WP, MacDonald HJ. The bookend nasal septal splint. Otolaryngol Head Neck Surg 1981; 89: 104-6.
13. Watson MG, Marshall HF. Intranasal adhesions which recur despite splinting: an ominous sign? J Laryngol Otol 1990; 104: 426-7.
14. Kriukov AI, Turovskii AB, Tsarapkin Glu. Use of intranasal splints in acute septoplasty in the treatment of composite nasoseptal fractures. Vestn Otorinolaringol. 2007; 2: 51-3.
- 15 White A, Murray JA. Intranasal adhesions formation following surgery for chronic nasal obstruction. Clinical Otolaryngology 1988; 13:139-43.
- 16 Eliopoulos PN, Phillippakis C. Prevention of post-operative intra-nasal adhesions. J Laryngol Otol 1989; 103:664-6.
- 17 M.B.Pringle. The use of intra-nasal splints: a consultant survey. Clin. Otolaryngol. 1992, 17, 535-539
- 18 Malki D, Quine SM, Pfleiderer AG. Nasal splints revisited. Cambridge J Laryngol Otol 1999; 113: 725-7.
- 19 Almoflehi MS. The impact of using intranasal splints on morbidity and prevalence of adhesions. J Sc Tech 2009; 10:1-6.
- 20 Von Schoenberg M, Robinson P. (1992). The morbidity from nasal splints in 105 patients. Clin. Oto. Laryngol. Vol. 17: [528-530].

- 21 JCampbell, J. B., Watson, M. G., Shenoi, P. M. (1987) The role of intranasal splints in the prevention of post-operative nasal adhesions. *Journal of Laryngology and Otology*, 101: 1140-1143.
- 22 Cook JA, Murrant NJ, Evans KL, Lavelle RJ. (1992). Intanasal splints and their effects on intranasal adhesions and septal stability. *Clin. Oto. laryngol.* Vol. 17: [24-27].
- 23 Abdulkhaliq K. Amin, D. A. Hasan, A. M. S. trans-septal suture method versus intranasal silicone splint in septoplasty. *International Journal of Technical Research and Applications* e-ISSN: 2320-8163, Volume 3, Issue 3 (May-June 2015), PP. 159-165
- 24 Jung YG, Hong JW, Eun YG, Kim MG (2011) Objective usefulness of thin silastic septal splints after septal surgery. *Am JRhinol Allergy* 25(3):182–185.
- 25 Asaka D, Yoshikawa M, Okushi T, Nakayama T, Matsuwaki Y, Otori N, et al. Nasal splinting using silicone plates without gauze packing following Septoplasty combined with inferior turbinate surgery. *Auris Nasus Larynx*. 2012; 39:53–58.
- 26 Jawaaid A,Tahir M, Abdullah A, Akbar F, Jamalullah M. Intranasal pressure splints - a reliable alternative to nasal packing in septal surgery. *Bangladesh J Otorhinolaryngol*. 2012; 18(2): 124-12.
- 27 Gunaydin RO, Aygenc E, Karakullukcu S, Fidan F, Celkkanat S. Nasal packing and transseptal suturing techniques: Surgical and anaesthetic perspectives. *Eur Arch of Otorhinolaryngol*. 2011; 268: 1151-1156.
- 28 CAMPBEJL.BL., WATSONM.G. & SH~NPO.MI. (1987) The role of intranasal splints in the prevention of postoperative nasal adhesions. *J. Laryngol. Otol.* 101, 1140-1 143