

A Comparative Study between Septal Quilting Sutures, Nasal Packing and Internal Nasal Splint in Septoplasty

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ABSTRACT

Background: Septal deviation is a prevalent cause of nasal obstruction, affecting up to eighty percent of the general population.

Aim: To compare the influence of septal quilting sutures against nasal packing versus internal nasal splint in septoplasty as regard headache, pain following the operation, sleep disturbance, bleeding, hematoma, epiphora, synechia and crustation.

Patients and methods: This randomized prospective comparative clinical trial has been conducted on 60 cases with deviated nasal septum causing persistent complaint of nasal obstruction. Patients were recruited from Otorhinolaryngology outpatient clinic, Mansoura University Hospital from November 2021 to November 2022.

Results: A statistically significant variance has been observed between the three groups with regard to the median VAS score of pain, bleeding, headache, epiphora and sleep disturbances at 2nd Post-Operative Day (POD). A statistically significant variance has been observed between the three groups regarding the median VAS score of Pain, bleeding and Sleep disturbances at 7th POD. A statistically insignificant variance has been observed between the three groups regarding the median VAS score of headaches and epiphora at 7th POD.

Conclusion: Quilting sutures at the end of septal surgery are preferred because the cases experienced minimal unpleasant symptoms compared to nasal packing or internal nasal splints, and also it is not time consuming to us and is available all the time. On the contrary, nasal packing (Merocel) and silicone internal nasal splints may be unavailable sometimes in addition they cause many unpleasant symptoms to the patients.

Keywords: Septal Quilting Sutures, Internal Nasal Splint, Septoplasty

INTRODUCTION

Septal deviation is a prevalent etiology of nasal obstruction, occurring in up to eighty percent of the general population. Several cases of septal deviation are asymptomatic, and the extent or severity of the deviation shows little to no association with the degree of obstruction. This paradox establishes a diagnostic dilemma for certain cases and surgeons. Not all cases exhibit enhancement, as the satisfaction of cases following septoplasty varies between sixty-five percent and eighty percent ⁽¹⁾. Septoplasty is among the most commonly performed treatments by rhinologists and face plastic surgeons. It is carried out primarily to decrease obstruction of the nose, but it may additionally give a superior surgical approach in endoscopic sinus and skull base operation and an easier access for therapy following the operation. A deviated septum may be bony, cartilaginous, or both. The septum may be angulated, twisted, tilted, curved, present with a spur's formation, or a combination of these. Consequently, there is no single "standard" or "routine" procedure that might satisfy all parameters and complexities of cases ⁽²⁾.

Septoplasty might be related to several complications, such as nasal hemorrhage following the operation, septal perforation, nasal adhesions and septal hematoma ⁽³⁾. It was thought that nasal packing after septoplasty could reduce postoperative complications; many surgeons still believe it to be true ⁽⁴⁾. Intra-nasal packing has been proposed to

reduce nasal hemorrhage following the operation and to avoid septal hematoma and nasal adhesion development ⁽³⁾. There are different packing materials identified in the literature, like numerous gauzes types with or without drugs, foam and cellulose, absorbable gelatin sponges, Merocel, internal nasal splint and polyethylene oxide gel ⁽⁵⁾. In spite of these theoretical benefits, proofs the utilization of packing following the operations is insufficient. The discomfort experienced during pack removal is a significant factor for cases. Consequently, it has been recommended that nasal packs be avoided wherever possible. To avoid these difficulties, the suturing of septal mucosal flaps has been established ⁽⁶⁾.

A substitute to nasal packing is the application of silicone septal splints, with or without an airway, to avoid synechia following the operation and ensure septal stability ⁽⁷⁾.

This research aimed to compare the influence of septal quilting sutures against nasal packing versus internal nasal splint in septoplasty as regard headache, pain following the operation, sleep disturbance, bleeding, hematoma, epiphora, synechia and crustation.

PATIENTS AND METHODS

This randomized prospective comparative clinical trial has been carried out on sixty cases with deviated nasal septum causing persistent complaint of nasal obstruction. Patients were recruited from Otorhinolaryngology outpatient clinic, Mansoura University Hospital. The

research was carried out within one year, from November 2021 to November 2022.

Inclusion criteria: Patients with persistent nasal obstruction either unilateral or bilateral due to deviated nasal septum and in need for septoplasty and age over 16 years

Exclusion criteria: patients with age under 16 years, previous history of nasal surgery, associated pathology in the nasal cavity or nasal sinuses: nasal polyposis, inferior turbinate hypertrophy, benign tumors, comorbid illness like diabetes, systemic hypertension, cardiac disease, craniofacial anomalies, immunodeficiency diseases, and unable to give consent.

Study procedure: Sixty cases with deviated nasal septum attending at the otorhinolaryngology outpatient clinic of Mansoura University Hospital needing surgical intervention. The investigation has been conducted over a duration of one year.

The cases were randomly separated into three groups; group A, group B and group C .

All cases had septoplasty as a standard procedure then after finishing the procedure we did the following: in group- A internal nasal packing “Merocel” has been done. In group - B nasal septal quilting sutures has been performed. In group – C internal nasal splint has been done.

Surgical procedure

The operation has been conducted under general anesthesia. Submucosal infiltration of 1/100000 epinephrine has been carried out on both sides of nasal septum; subsequently caudal septal incision has been carried out on left side. The septal bones have been reached by raising the mucoperiosteum and mucoperichondrium on both sides. The cartilaginous septal parts have been dissected free and mobilized by chondrotomies as needed.

In the nasal packing group; The hemitransfixion incision was close by interrupted sutures by 5/0 Vicryl on 16 mm round needle, then the cases nose has been packed with standard 10 or 8 centimeters Merocel pack (UNIPORE Merocel) on both sides of the nasal cavity. Pack was removed following 48 hours.

In the quilting sutures group; As prescribed, septal incision was closed, then the septal flaps were mattressed by 4-0 Vicryl on 19 mm round body needle, which has been utilized to quilt septal flaps from posterior to anterior and knot fixed on the side opposite to the incision.

In the internal nasal splint group; As prescribed, septal incision was closed then silicone internal nasal splint was placed on both sides of nasal cavity and fixed by single suture. Splint was removed after 1 week.

Postoperative follow-up

Postoperative follow-up for all patients was planned for the same day of surgery, with discharge occurring after receiving parenteral antibiotics (Ceftriaxone 1g) and analgesics based on pain severity, assessed via a visual analogue scale (VAS) directly following full anesthesia recovery. If there was no nasal bleeding, patients were discharged with oral antibiotics (Augmentin 1g twice daily for 8 days) and saline nasal irrigation. Follow-up visits occurred on the 3rd, 7th, and 21st postoperative days (POD). On the first follow-up (48 hours’ post-surgery), patients with nasal packs had them removed, pain was reassessed, and nasal bleeding was evaluated. In patients without nasal packs, local examination was done to remove any blood clots or crusts. During this visit, patients were also questioned about symptoms such as headache, epistaxis, swallowing difficulties, sleep disturbances and excessive lacrimation. The second follow-up (7 days’ post-surgery) involved removal of the silicone splint and endoscopic nasal examination to check for infection, septal hematoma, edema, crusts, and granulation. The final evaluation took place on the 21st POD, with another endoscopic examination to assess infection, septal hematoma, synechia, and granulation.

Ethical Consideration

The study protocol has been approved from the Institutional Review Board (IRB) of the Faculty of Medicine, Mansoura University. Informed written consent has been gathered from each participant in the research and caregiver of each patient younger than 18 years with the assurance of confidentiality. The Helsinki Declaration was followed throughout the study's conduct.

Statistical analysis

The data were analyzed by IBM SPSS Statistics for Windows, Version 25.0. (IBM Corp, 2017). Quantitative data were expressed as mean \pm SD or median (IQR) in normally and non-normally distributed data respectively. Qualitative data were presented as numbers and percentage of total. One-way ANNOVA was used to compare normally distributed data between the three groups. To compare non-normally distributed data between the three studied groups and each two groups, Kruskal-Wallis test and Mann-Whitney test were used. The Wilcoxon test was used to compare pain, bleeding, headache, epiphora and sleep disturbance by VAS at 2nd and 7th POD within each group. Qualitative data between the three groups were compared using Monte Carlo test. P value \leq 0.05 is considered statistically significant.

RESULTS

A statistically insignificant variance has been detected between the three groups according to age and sex (Table 1).

Table (1): Demographic characters of the studied groups.

Variable	Group A (number= 20)	Group B (number = 20)	Group C (n=20)	P value
Age (Mean \pm SD)	27.4 \pm 6.2	29.7 \pm 6.8	27.8 \pm 5.8	0.5
Sex N (%)				0.8
Male	9(45)	11(55)	11(55)	
Female	11(5)	9(45)	9(42.9)	

A statistically significant variance has been observed between the three groups according the median VAS score of pain, bleeding, headache, epiphora and sleep disturbances at 2nd POD (Table 2).

Table (2): Pain, bleeding, headache, epiphora and sleep disturbance by VAS at 2nd POD among the three groups.

Variable	Group A	Group B	Group C	P value
	(number = 20)	(number = 20)	(number =20)	
	Median (IQR)			
2 nd POD				
Pain	1(0.25-1.75)	4(3-4)*	1(1-2)#	<0.001
Bleeding	1(1-1)	3(3-4)*	2(1-2)*#	0.001
Headache	1(0.25-1.75)	3(3-4)*	1(1-2)#	<0.001
Epiphora	0(0-1)	3(3-4)*	0(0-1)#	<0.001
Sleep disturbances	1(1-1)	4(4-5)*	3(1.25-3)*#	<0.001

*: Significant difference compared to group A, #: Significant difference compared to group B

A statistically significant variance has been observed between the three groups according to the median VAS score of pain, bleeding and sleep disturbances at 7th POD. A statistically insignificant variance between the three groups with regard to the median VAS score of headaches and epiphora at 7th POD (Table 3).

Table (3): Pain, bleeding, headache, epiphora and sleep disturbance by VAS at 7th POD among the three groups.

Variable	Group A	Group B	Group C	P value
	(number = 20)	(number = 20)	(number =20)	
	Median (IQR)			
7 th POD				
Pain	0(0-0.75)	1(1-1)*	0(0-0)#	<0.001
Bleeding	0(0-0)	0(0-1)	1(0-1)*	<0.001
Headache	0(0-0)	0(0-1)	0(0-1)	0.3
Epiphora	0(0-0)	0(0-0)	0(0-0)	0.9
Sleep disturbances	0(0-1)	1(0-2)	1.5(0-2)*	0.02

*: Significant difference compared to group A, #: Significant difference compared to group B

At 7th POD, crustation was statistically significant more frequently in group B and C in comparison with group A. At 21st POD, synechia was statistically significant more frequently in group B than group A and C (Table 4).

Table (4): Hematoma, crustation and synechia by endoscopic examination at 7th and 21st POD among the three groups.

Variable	Group A (number = 20)	Group B (number = 20)	Group C (number =20)	P value
	N (%)			
7 th POD				
Crustation	0 (0%)	10(50)	10(50)	0.001
Synechia	-	-	-	
Hematoma	-	-	-	
21 st POD				
Crustation	-	-	-	
Synechia	1(5)	8(40)	1(5)	0.003
Hematoma	-	-	-	

DISCUSSION

A statistically insignificant variance was found between the three groups according to age and sex (P value equal 0.5 and 0.8; correspondingly A statistically significant variance has been observed between the three groups according the median VAS score of pain, bleeding, headache, epiphora and sleep disturbances at 2nd POD. But A statistically significant variance has been observed between the three groups according to the median VAS score of pain, bleeding and sleep disturbances at 7th POD. A statistically insignificant variance between the three groups with regard to the median VAS score of headaches epiphora and sleep disturbances at 7th POD, the median VAS score was statistically significantly greater in group B 4(4-5) then group C 3(1.25-3) then group A 1(1-1) at 2nd POD. It was also higher in group C 1.5(0-2) compared to group A 0(0-1) at 7th POD. In all studied groups; the median VAS score of pain, bleeding, headache, epiphora and sleep disturbances was statistically significantly greater at 2nd POD compared to 7th POD in group A (P value <0.05).

Our findings were corroborated by the research conducted by **Arora et al.** ⁽⁸⁾, which indicated that all 20 cases (100%) who underwent anterior nasal packing experienced severe discomfort manifested as pain, necessitating the administration of parenteral analgesics (I/M Voveran). Numerous of them weren't able to sleep comfortably throughout night because of pain. They had mouth dryness, odour, profuse rhinorrhea, headache, watering eyes. There was absolutely no discomfort in cases in whom quilt stitching has been carried out whereas four cases (ten percent) with intranasal splints had mild discomfort in the form of pain, in which two cases had to be given one or two tablets of analgesics daily.

Our results showed that at 7th POD, crustation was statistically significant higher in group B and C in comparison with group A (P value = 0.001). At 21st POD, synechia was statistically significant higher in group B than group A and C (P value = 0.003).

Our findings were corroborated by the research conducted by **Arora et al.** ⁽⁸⁾, which indicated that six cases (30%) who had anterior nasal packing experienced formation of the crust. No case with quilt stitching and splint had formation of crust. Two (10%) cases with anterior nasal packing had the emergence of synechiae following the operation. No patients using nasal splints or quilt stitching had the development of synechiae following the operation.

Ramalingam et al. ⁽⁹⁾ reported same findings, noting that seventy to seventy-five percent of cases in nasal packing group developed crusts on the 5th and 14th postoperative days. The probability of crusting was lower in quilting group of cases (seven percent -5th postoperative days: two percent- 14th postoperative days). It has

been recorded that none of the cases in quilting group developed synechiae by the 14th postoperative days, but forty-one percent of cases in nasal packing group exhibited some degree of synechiae at the end of 14th postoperative days.

This agreed with the findings of **Thapa et al.** ⁽¹⁰⁾ who observed a significantly greater amount of crusting in nasal packing. However, their investigation utilized medicated gauze packing rather than Merocel. However, nasal packing leads to some degree of mucosal trauma leading to formation of crust which in turn may result in formation of the synechiae.

Furthermore, **Krishna Prakash et al.** ⁽¹¹⁾ detected that crusting was more prevalent in the nasal packing group, lasting for an average of nearly two weeks throughout the interval following the operation. Quilting the nasal septum has significantly prevented these complications and problems following the operation.

Moreover, in the research conducted by **Joshi et al.** ⁽¹²⁾ the rate of synechiae has been elevated with nasal packing (twenty percent versus eight percent). Dry mouth and sore throat (seventy-two percent) and vestibulitis (twelve percent) were only related to nasal packing. None of the cases in either group had significant bleeding or septal hematoma.

Whereas, in the research of **Majeed and Saeed** ⁽¹³⁾, with regard to the early complications following the operation, no major hemorrhage has been observed among the cases of both groups. In group A, three cases (ten percent) in the surgical ward experienced minor hemorrhage but none (zero percent) in group B did (p-value equal 0.237). There was no demand for admission and they have been discharged on the same day. At the end of the 1st week, no cases had intranasal infection or septal hematoma in the two groups. In group B, seven cases (twenty-three percent) developed intranasal crusts, while in group A, five patients (16.7 percent) did so; this variance was statistically insignificant (p-value equal 0.748). Upon additional monitoring following one month, no cases in either group had adhesions following the operation. One case in group A exhibited septal perforation, whereas none were observed in group B. The variance was statistically insignificant (p-value equal 1.0).

CONCLUSION

We prefer to use quilting sutures at the end of septal operation, because our patients experienced minimal unpleasant symptoms compared to nasal packing or internal nasal splints and also it is not time consuming to us and is available all the time. On the contrary, nasal packing (Merocel) and silicone internal nasal splints may be unavailable sometimes in addition they cause many unpleasant symptoms to the patients.

DECLARATIONS

- **Consent for publication:** I certify that each author has granted permission for the work to be submitted.
- **Funding:** No fund.
- **Availability of data and material:** Available.
- **Conflicts of interest:** None.
- **Competing interests:** None.

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