Quilting Suture Versus Silastic Intranasal Septal Splint in Septoplasty

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ABSTRACT

Objectives: This study aims to compare the efficacy of quilting trans-septal suturing with intranasal silastic splint in septoplasty at reducing postoperative complications and pain.

Methods: A total of 100 patients who had elective septoplasty were equally divided into two groups by simple randomization, in group A trans-septal quilting suturing was done and in group B intranasal silastic splint insertion and fixation. Both groups were compared postoperatively on pain scores, adhesions, crust formation, and the incidence of vestibulitis, septal hematoma, and septal perforation.

Results: postoperative pain scores were significant over the three observation time periods (1^{st} day,1^{st} week and 2^{nd} week) for the whole study group with P values <0.05, also postoperative pain scores among the quilting suture group was significantly lower than for the silastic group (P value=0.009). Adhesion occurred in 6% of patients in group A and 2% in group B, neither of which was statistically significant. Also, the rates of crust formation and development of vestibulitis did not differ significantly between groups. Further, no septal hematoma or septal perforation were observed in either group.

Conclusion: Trans-septal quilting suture can be safely applied in septoplasty instead of using nasal silastic splints, without increasing the rate of postoperative complications and yielding lower postoperative pain scores.

Keywords: Intranasal adhesions, pain score, quilting suture, septoplasty, silastic, vestibulitis.

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INTRODUCTION

Nasal obstruction is a common reason for visits to otorhinolaryngology clinics due to its impact on the patient's quality of life(1). Nasal obstruction can arise from a single or multiple causes, which maybe challenging for the treating physician to elaborate(2), and one of the commonest causes is having a deviation of the nasal septum which is managed surgically by elective septoplasty(3).
Septoplasty is a common surgical procedure performed by otorhinolaryngologists to correct or repair nasal septum defects; it can be performed in isolation or in combination with other rhinological procedures(4).

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Septoplasty techniques are continuously being refined in attempts to improve surgical outcomes and reduce post-operative complications(5). A commonly used septoplasty technique in our practice is the insertion of silastic intranasal splints.

Salinger and Cohen began using nasal splints in 1955 with the aim of stabilizing the position of the septum following septal surgery(6,7). The use of intranasal splints in septoplasty surgery has been proposed to reduce the incidence of complications, such as septal hematoma and mucosal adhesions, and to stabilize the septum postoperatively to reduce septal deviation recurrence(8). A variety of materials have been used for such splints, including X-ray films, coffee cup lids made from polyethylene, and dental utility wax. The majority of modern splints are made from silicon rubber material or polytetrafluoroethylene, most commonly Teflon silicon splints(9).

With the improvements in septoplasty techniques, and to yield improved results and decreased pain resulting from intranasal splints, a variety of suturing techniques have been used and described(10). A continuous quilting suture using 4.0 plain catgut had been used to approximate mucosal flaps, which was reported by Sessions(11). Also, a new suturing technique, named nasal septal chain suturing, was described(12). Such techniques also gives the benefit of closing and approximating the mucosal tears and of supporting the cartilage structure postoperatively(13).

In our study we aim to compare the effects associated with quilting trans-septal suture technique on preventing complications and reducing discomfort and pain to the effects associated with silastic intranasal septal splint after septoplasty.

MATERIALS AND METHODS

This prospective comparative study enrolled 100 patients aged 17–42 years who had undergone elective septoplasty surgery in Prince Hashim Bin Al Hussein Hospital between December 2020 and October 2021_to manage their nasal obstruction due to having a deviated nasal septum. Each patient had an American Society of Anesthesiologists (ASA) physical status of I or II. A consent form was obtained from each patient after they were informed of the study's purpose and methods.

The inclusion criteria comprised patients who: were aged between 17–45 years; had a deviated nasal septum as the only cause of nasal obstruction; had no previous nasal surgery; and had a normal clotting profile. All patients had been operated on by the same otorhinology team under identical anesthetic conditions.

All septoplasties were performed using general anesthesia with endotracheal intubation. Infiltration of the septum used 1% lidocaine combined with adrenaline (1:100,000). A hemitransfixion incision was made in order to elevate the mucoperichondrial flap to approach the septum. Deviated septal parts (cartilage or bone) were then identified and removed or reshaped to preserve as much septal cartilage as possible. The incision was closed with 4-0 **vicryl rapide**.

Patients were divided using simple randomization into two groups with each group comprising 50 patients. Quilting trans-septal suture technique using 4-0 **vicryl rapide** was performed in group A, whereas intranasal silastic nasal septal splint fixed with one 2-0 silk stitch was inserted and removed on the day 7 post-operatively in group B. Both groups had no intranasal packing at the end of the operation. All patients were discharged the day following the operation with instructions on nasal hygiene, a 7-day course of 500 mg cephalexin capsules three times daily, and 500 mg paracetamol tablets for analgesia.

For each patient, post-operative complications were recorded, including septal hematoma at the 1st day and 1st week post-operative follow up visit, crust formation at the 1st and 2nd week follow ups, and vestibulitis at the 1st week follow up. Also, a record of septal perforation and adhesions was obtained at the 4th week follow up. Pain and discomfort were also recorded using the visual analogue scale between 0 and 10 (0 = no pain, 10 = severe pain) was obtained at the 1st day post-operation and at the 1- and 2-week follow ups.

IBM SPSS for Windows.; ver 24. Armok. NY :IBM Corp was used for statistical data analysis, with split plot anova, independent samples t-test, Chi-square of independence, continuity correction and

two-tailed tests when appropriate. The data are expressed as mean ± standard deviation (SD). P values < 0.05 were considered statistically significant.

RESULTS

Our study included 100 patients ranging in age from 17 to 42 years who were randomly assigned to one of two groups. Each group comprised 50 patients, and both groups were comparable in age and gender (P value being 0.555, 0.523 respectively). Group A comprised 32 males and 18 females, with a mean age of 25.24 ± 6.641 years, whereas group B comprised 35 males and 15 females, with a mean age of 24.40 ± 7.511 years (**Table I**).

Split plot anova test was done, and according to the results (Wilks' Lambda value 0.957, P value= 0.119 not significant) and (Greenhouse-Geisser value 0.680, P value=0.560 being not significant) the Time*Group interaction is not significant.

The pain mean scores among the observation time periods postoperatively was (4.45, 3.29 and 0.93) for the 1st day, 1st week and 2nd week respectively (**Table II-A**). Mean difference was (1.16) between 1st day and 1st week postoperative pain scores, (3.52) between 1st day and 2nd week postoperative pain scores and (2.36) between 1st week and 2nd week postoperative pain scores, (P value <0.05 for all of them, being significant) **(Table II-B)**. So, pain scores were significant over the three observation time periods for the whole study group.

The mean of post-operative pain for group A was (2.520) while for group B it was (3.260), with a mean difference of (0.74) between group B and group A,(P value= 0.009 being significant) (**Table III)**, showing that post-operative pain scores among the quilting suture group was significantly lower than for the silastic group.

Intranasal crustation at the 1-week follow up was noted in 6 cases (12%) from group A and 3 cases (6%) from group B (P = 0.295; **Table IV**). Crustation was evaluated again at the 2-week follow up, revealing 2 cases (4%) in group A and 1 case (2%) in group B (P = 0.558; **Table V),** P values in both events are not significant. Nasal vestibulitis was observed in 2 patients (4%) of the silastic group, while no vestibulitis was observed in the group who received trans-septal suture (P = 0153; being not significant, **Table VI).**

Intranasal adhesions were evaluated at the 4-week follow up, finding that 3 patients (6%) in group A and 1 patient (2%) in group B showed adhesions (P = 0.307 which is not significant; **Table VII**). Neither septal perforation nor septal hematoma was observed in either group.

Table I. Demographic data of the study groups

Parameter	Group A	Group B	P value	df
Age (mean±SD) in years	25.24 ± 6.641	24.40 ± 7.511	0.555	98
Gender (M/F)	32:18	35:15	0.523	—

SD: standard deviation, df: degree of freedom

Table II. Post-operative pain at various observation times

A.

Pain Observation time	Mean	Standard error
1st day post op	4.45	0.248
1st week post op	3.29	0.173
2nd week post op	0.93	0.090

B.

Pain Observation time	Mean difference	P value
1st day vs 1st week	1.16	0.00
1st day vs 2nd week	3.520	0.00
1st week vs 2nd week	2.360	0.00

Table III Pain among groups

Group	Mean	Standard error
A	2.520	.196
B	3.260	.196

Mean difference=0.74, $P = 0.009$

Table IV. Post-operative nasal crusts, 1st week post-operatively

	Crust formation	
Group	**Yes**	**No**
Group A	6	44
Group B	3	47

χ^2 (1) =1.099, $\boldsymbol{P}$= 0.295

Table V. Post-operative nasal crusts, 2nd week post-operatively

	Crust formation	
Group	**Yes**	**No**
Group A	2	48
Group B	1	49

χ^2 (1) =0.344, ***P*** = 0.558

Table VI Post-operative vestibulitis

Group	Vestibulitis, number and percentage
Group A	n=0, %= 0%
Group B	n=2, %=4%

χ^2 (1) =2.041, ***P*** = 0.153

Table VII Post-operative adhesions

Group	Adhesions, number and percentage
Group A	n=3, %= 6%
Group B	n=1, %=2%

χ^2 (1) =1.042, ***P*** = 0.307

DISCISSION

A variety of studies had been conducted to compare trans-septal suturing to nasal packing in septoplasty, finding more favorable outcomes—especially in pain scores—when using trans-septal sutures(14). Furthermore, another study compared trans-nasal sutures with intranasal silicon splints, finding results in favor of using trans-septal sutures in septoplasty(15).

Postoperative pain scores were significantly lower in group A when compared to group B over the study time interval, which corroborates the results obtained by Hasan et al.(15) for the postoperative pain assessment and those, also with the results of Ramalingam et al.(16) in which suture was compared to nasal packing. The result in our study of significant lower pain scores in group A than B, may be explained by the presence of the silastic sheet and pain produced from its removal.

At the 1-week follow up, intranasal crusts were observed in 6 cases from the trans-septal quilting suture group and in 3 cases from the intranasal silastic group; however, these results are not statistically significant. Although there were fewer cases in both groups at the 2-week follow up, these results were also not statistically significant. Likewise, Kubok et al.(17) and Hasan et al.(15) found no statistically significant differences in the incidence of intranasal crusts between trans-septal sutures and intranasal splints.

Vestibulitis was not observed in any members of group A, while only 2 cases of mild vestibulitis were observed in group B (P = 0.475). This can be attributed to the pressure or irritating effect of the anterior edge of the intranasal splint. Our results were in accordance with those of Cayonu et al., who found no statistically significant differences in infection rate between trans-septal suturing and intranasal splinting and merocele(18). Said et al. also reported no significant differences in rates of infection between trans-septal suture and nasal packing(19).

Cayonu et al. and Kuboki et al. both reported no differences in the rate of post-septoplasty adhesions when trans-septal suture was used vs intranasal silastic splint(17,18). Certal et al. also reported that using conventional packing and trans-septal suturing technique did not differ significantly in postoperative mucosal adhesions(20,21). Neither nasal septal perforation nor hematoma had occurred in either study group, which is in line with results by Amin et al., Kuboki et al., and Cayonu et al.(15,18,22).

CONCLUSION

Patients who received trans-septal quilting sutures had similar rates of postoperative complications compared to those who received splints and better results with respect to postoperative pain, rendering it the more preferred technique. Thus, we recommend using trans-septal quilting technique in septoplasty, as it can be safely used and practiced.

Conflict of interest

None.

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