



Trans-septal Suturing Versus Merocel Nasal Packing: A Post Septoplasty Comparison

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Received: 14 June 2020 / Accepted: 27 July 2020
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Abstract It has been observed that nasal packing following septoplasty contributes to co-morbidities like post-operative pain, bleeding and increased duration of hospital stay. Trans-septal suturing has been suggested as a safe and effective alternative with a view to obviate the need for nasal packing and the hence avoid the discomfort associated with it. To compare the outcome of trans-septal suturing technique with merocel nasal packing after septoplasty. This was a prospective comparative study done on 60 patients who underwent septoplasty. The patients were divided randomly into 2 groups, while Group A comprised of patients undergoing Post-operative nasal packing with poly vinyl alcohol sponge (also commercially called Merocel), Group B included patients who underwent nasal septal suturing after surgery. The postoperative pain, hemorrhage and duration of hospital stay were the main parameters that were assessed and a comparison was drawn between the post-operative outcome of two techniques. Post-operative global pain score was 62.18 ± 4.75 in the group A (patients with nasal packing) and 24.73 ± 4.29 (patients with trans-septal suturing) in group B ('p' value was < 0.0001). Post-operative bleeding was noticed in 19 patients (out of 30) in group A, and in 2 patients of group B

('p' value was < 0.0001). 27 out of 30 patients of Group A were discharged on day 2 whereas 24 out of 30 patients of Group B required only 1 day of hospital stay after the surgery ('p' value was < 0.0001). Trans-septal suturing technique reduces the duration of hospital stay, causes lesser post-operative bleeding and pain and is a relatively less painful technique than merocel nasal packing.

Keywords Septoplasty · Trans-septal suturing · Nasal packing · Pain · Bleeding

Introduction

Septoplasty is a commonly performed surgery for the correction of a symptomatic deviated nasal septum and as an additional procedure in endoscopic surgeries to approach the lateral nasal wall. Nasal packing is routinely done as a last step of this surgery with the purpose of preventing post-operative bleeding, formation of synechiae or septal hematoma, reducing edema, optimizing the position of the septal flaps and closing the dead space between cartilage and subperichondrial flaps [1].

Despite numerous benefits of this procedure, nasal packing is found to be associated with co-morbidities such as post-operative pain and discomfort [2]. Moreover, there are reports suggestive of disadvantages like compromised nasal breathing, dryness of mouth, nasal pain, headache and watering from eyes in addition to irritation of throat, difficulty in swallowing, hypoxia, hypoxemia-in patients with Obstructive sleep apnea syndrome and Toxic shock syndrome associated with nasal packing [3]. In recent times, different forms of nasal packing materials can be used [4–6] with the poly vinyl alcohol sponge (which is also commonly called merocel) being the commonest

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choice. Merocel being a non-dissolvable object carries with it the inherent risk of infection and sepsis if left in situ for long.

The need for an alternate technique that avoids post-operative complications of Septoplasty along with obviating the need for nasal packing following the surgery was hence warranted. Trans-septal suturing was undertaken with the idea of providing benefits of reduced post-operative pain, bleeding, discomfort and a shorter duration of hospital stay as compared to nasal packing.

The present study was carried out to compare the outcome of Trans-septal suturing technique with poly vinyl alcohol sponge nasal packing after septoplasty with post-operative pain, hemorrhage and duration of indoor stay in hospital taken as main assessment parameters.

Materials and Methods

This was a prospective randomized study conducted in the Department of Otorhinolaryngology at Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi during the 18-month period between September 2017 and March 2019.

All patients in the age group of 18–65 years undergoing septoplasty, for the correction of a symptomatic nasal septum, were included in the study. The patients selected for surgery were those who remained symptomatic after three months of medical management. Patients with a psychiatric disorder, concha bullosa, nasal polyposis, medical contraindications for surgery, acute nasal trauma, adenoid hypertrophy, uncontrolled asthma and nasal allergies were excluded from the study. Institutional ethical committee approval was taken for the study and a detailed consent was obtained from all patients both for surgery and the study.

A detailed relevant history was taken followed by a thorough general physical and ENT examination in all patients undergoing surgery. A complete examination of nose was done by anterior rhinoscopy and diagnostic nasal Endoscopy. All patients underwent routine investigations including coagulation profile to rule out any contraindication for surgery.

Patients were randomly divided in two groups A and B. Classic septoplasty was performed in all patients. Post-operative nasal packing was done with merocel in 30 patients who were included in group A. Nasal pack was kept in situ for 48 h. Pack removal was done by gentle withdrawal, using Tilley's nasal dressing forceps after adequate hydration with 20 ml saline. In patients of group B, no nasal packing was done and instead septal suturing technique was used to closely appose mucoperichondrial flaps.

Post-operative antibiotics were prescribed to all patients. Decongestant nasal drops were also advised immediately or after removal of nasal packs in group A. Patients were assessed for post-operative hemorrhage at the time of discharge and after a follow up period of 15 days. On the first post-operative day each patient was provided an appropriate pain score on the basis of Global Pain Scale to document his/her pain following the entire procedure. Indoor stay in the hospital following the surgery was noted with each technique and the data was compared.

Results

A total of 60 patients with symptomatic deviated nasal septum were included in the study. At the end of the surgery, the patients were randomly selected to either undergo nasal packing with merocel or Trans-septal suturing after surgery and were included in group A and group B respectively. Both the groups comprised of 30 patients each. The mean age group in Group A was found to be 25.37 ± 5.48 years and in Group B was 27.07 ± 9.88 years. Out of the 60 patients in the study 16 were females and 44 were males. No significant variation was noted in coagulation profile of patients in both the groups. All patients in both the groups had some form of nasal septal deviation as found on nasal endoscopy.

Merocel or Poly vinyl alcohol sponge nasal pack was removed after 48 h of surgery in the patients of Group A. Bleeding was looked for at this point in these patients and findings were documented. For the patients of group B, bleeding was assessed on the day of discharge which in most cases was on the post-operative day 1 (24 h post-surgery). Both of these were compared it was found that only 2 patients in Group B had mild bleeding on post-operative day 1 and needed to be observed for 1 more day. Their duration of hospital stay thus became same as that for patients in Group A.

In patients of Group A it was observed that 19 patients out of 30, had mild to moderately severe nasal bleeding at time of pack removal, out of which bleeding in 14 patients had to be controlled by nose pinching and intravenous infusion of injection tranexamic acid(500 mg stat) at the time of pack removal. However, about 11 patients of this group had no bleeding at the time of pack removal i.e. 48 h after surgery. In 5 of the patients of the packing group bleeding was profuse, enough to warrant repacking of the nasal cavities as it was not controlled by pinching. These 5 patients were subsequently discharged with nasal packs and called at appropriate dates for the pack removal. As 19 patients bled at the time of pack removal in the Group A and only 2 patients of group B bled at time of discharge

statistical analysis was done and the results revealed a 'p' value of < 0.0001, which was significant.

Thus, it was concluded that patients with Trans-septal suturing after septoplasty bleed significantly less than the group of patients undergoing nasal packing time at the time of pack removal. No bleeding was noted in patients of either group when observed on during the follow up visit, 15 days after surgery.

Figure 1 depicts the comparison of post-operative hemorrhage at the time of pack removal in both the groups.

For the assessment of post-operative pain, Global pain scale was used for both the groups. It was computed by summing up separate scores of 4 broad parameters and dividing the total value by 2. These parameters were pain, mood, clinical outcome and activities following surgery. Pain score measured the amount of pain experienced by the patient subjectively. It was computed by allocating points according to the intensity of pain (mild, moderate or severe) experienced by a patient during the week after the surgery and was again reviewed 3 months post operatively.

Mood score measured the feelings of the patient subjectively. It was computed by taking into consideration, the feelings of being afraid, depressed, tired, anxious or stressed after surgery. These feelings were numerically rated on a scale of 1 to 10, and summed up to get the total mood score. It is worthwhile to note that the mood score evaluated the patient mood during the week of the surgery.

In order to measure the patient's clinical performance following surgery, the clinical outcome score was calculated. The score considered factors such as patient independence, ability to work, ability to sleep and comfort level in the week following the surgery and points were given on a scale of 1 to 10.

Activity score measured the ability of the patient to perform his day to day activities in the week following the

surgery. It took into account the patients' ability to carry out tasks such as household chores, going to the nearby store, enjoying with friends and family and performing non strenuous exercise such as walking.

On computing all the 4 scores and getting the total pain score for the patients in both of these groups a statistical analysis comparing the total global pain scores was done.

It was found that in the group A the mean total score was 62.18 ± 4.75 and in group B mean total pain score was 24.73 ± 4.29 . The minimum and maximum score in the in-group A was 53 and 77 whereas group B was 16.5 and 38 respectively. On comparing total pain scores in all patients of both the groups the statistical analysis revealed that the 'p' value was < 0.0001, which was significant. Table 1 depicts a comparison of global pain score between both the groups.

Thus, it was concluded that global pain score was significantly lower in patients of Group B when compared with patients of group A. Thus, we can safely infer that patients undergoing septoplasty with Trans-septal suturing technique experienced lesser pain compared to their counter parts undergoing septoplasty with merocel nasal packing.

Most patients of group B were discharged 24 h after surgery i.e., on post op day 1. However, 5 patients of the same group were discharged on post op day 2 due to post-operative bleeding which was controlled by intravenous infusion of injection tranexamic acid (500 mg stat). One patient had his discharge delayed to day 2 due to 1 episode of fever which was resolved the following day (post op day 2).

Among patients of group A, 27 patients were discharged on post op day 2 and two patients had to be discharged on request, one of whom had bleeding during pack removal the next day and needed repacking while the other one had

Fig. 1 Bleeding at the time of pack removal

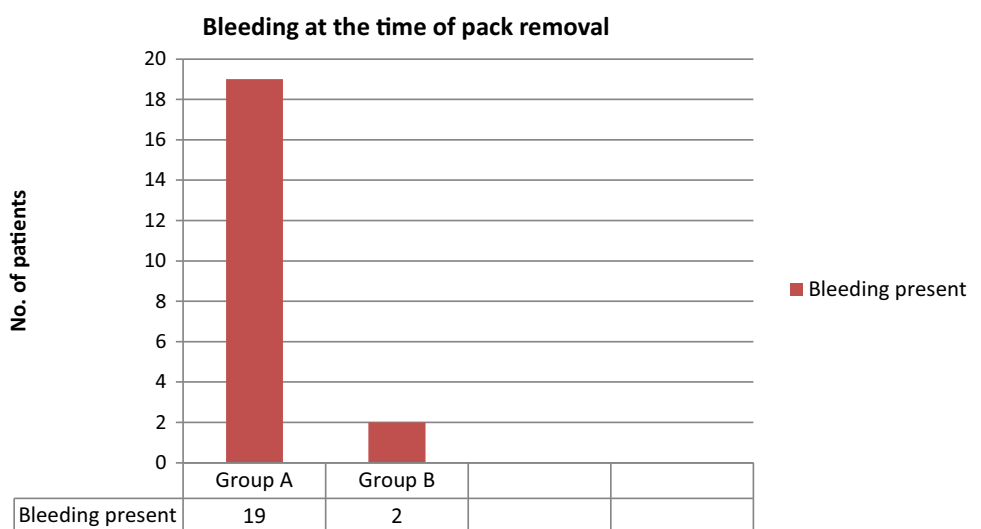
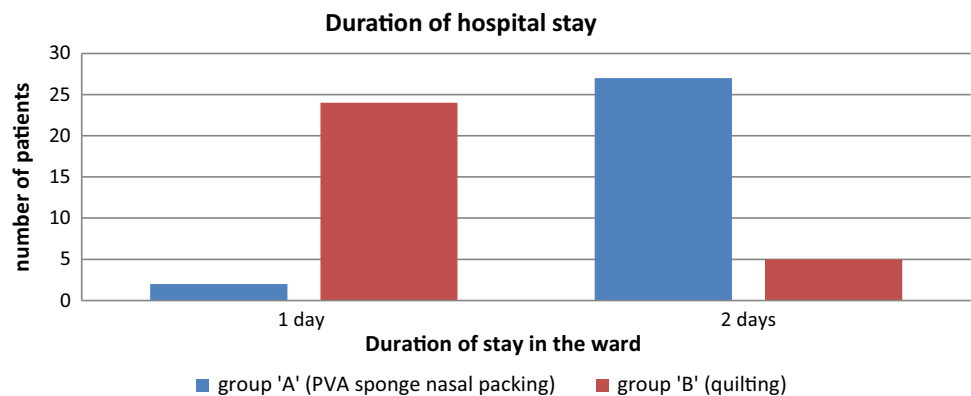


Table 1 Comparison of global pain score between both the groups

Total	Operative procedure		p value
	Septoplasty with Merocel nasal packing (Group A)	Septoplasty with trans-septal suturing (Group B)	
Sample size	30	30	< 0.0001
Mean \pm SD	62.18 \pm 4.75	24.73 \pm 4.29	
Median	61.25	24	
Min–Max	53–77	16.5–38	
Inter quartile Range	59–65.500	21.500–27.500	

Fig. 2 Duration of hospital stay of patients belonging to Group A and Group B

no bleeding. One of the patients in this group developed septal hematoma on pack removal (post op day 2) so he was repacked and discharge was further delayed by 2 days (post op day 4).

Since 24 patients in Group B required only 1 day of hospital stay and 27 of the patients of group A were discharged on post op day 2, the data was subjected to statistical analysis and it was found out that the 'p' value was < 0.0001, which was statistically significant. Figure 2 depicts the comparison of duration of hospital stay of patients belonging to Group A and Group B.

Thus, it could be concluded that patients with trans-septal suturing required lesser duration of hospital stay and thus could be discharged earlier than the patients who had undergone nasal packing with merocel.

While carrying out the study, a note was made of synechiae formation in the follow up visits. Synechiae formation was found higher in patients of Group A (11 patients) as compared to the patients of group B (2 patients). The data was subjected to statistical analysis the 'p' value was found to be < 0.01 which was significant. Thus, we could safely conclude that trans-septal suturing after septoplasty resulted in significantly lesser synechiae in the post-operative period as compared to patients undergoing nasal packing with merocel post septoplasty.

Discussion

Nasal packing following septal surgery was started by Gustav Killian of Germany in the year 1847 [7] and has been practiced since then by otolaryngologists around the world with the hope to reduce post-operative complications in patients undergoing septoplasty. However, it was observed that the process of pack removal resulted in a lot of patient discomfort and pain [8]. It was also seen to be associated with episodes of bleeding which in some cases was significant enough to warrant repacking, which subjected the patient to repeated trauma and anxiety. The poly vinyl alcohol sponge also called merocel is the most commonly used commercially available nasal pack throughout the world [9].

It has proved to be an effective method to arrest post-operative or traumatic nasal bleeding. Suturing the septum in septoplasty is suggested as a safe procedure that can replace nasal packing, with a view to completely avoid the painful process of pack removal [10, 11]

In our study, we drew a comparison between nasal packing with merocel and Trans-septal suturing after septoplasty using bleeding, post-operative pain and duration of hospital stay as the main parameters.

After assessment of hemorrhage in all patients and comparing both the techniques, we found that bleeding as a post-operative complication was significantly lower in the group of patients undergoing Trans-septal suturing. The results were comparable to a similar study conducted by Hogg et al. who concluded that a bleeding rate of less than 1% was seen in post-operative patients of septoplasty who had undergone Trans-septal suturing in their study [12].

We used the global pain scale to measure the amount of pain experienced by patients during the 7-day period after surgery and on the follow up visit 3 months later. When the pain score was calculated on the basis of this scale for patients of the both groups and compared, it was found that patients with trans-septal suturing experienced much less pain post operatively as compared to patients undergoing nasal packing with the statistical analysis revealing a highly significant p value of < 0.0001 . Our findings were similar to those in studies by Schoenberg et al. [13], Bajaj et al. [14] and Samad et al. [15] who concluded that pain was a significant complaint in patients undergoing nasal packing following septoplasty.

Our study also documented and compared the difference in duration of post-operative stay in patients of both the groups. Most patients in the group B required only one day of hospital stay. Whereas majority of the patients in group A needed to be kept in ward overnight for two consecutive days, for the administration of IV antibiotics to avoid the risk of septicemia with nasal packing. Statistical analysis of data revealed that the 'p' value was < 0.0001 which was highly significant. Therefore, we concluded that the duration of hospital stay was lesser in the group of patients undergoing Trans-septal suturing. These findings were consistent with those of Mane et al. [16] who conducted a similar study comparing Trans-septal suturing and nasal packing post septoplasty and concluded that patients with Trans-septal suturing have a comparatively shorter duration of hospital stay. Their study also concluded that pain and discomfort was lesser with Trans-septal suturing following septoplasty.

An additional statistically significant finding noted in our study was that synechia formation was observed in 11 patients undergoing nasal packing. This finding was only seen in 2 patients undergoing trans-septal suturing. A 'p' value of 0.01 proved this finding to be statistically significant. A study by Awan and Iqbal [17] reported that synechia formation was observed in 8 patients of their patients undergoing nasal packing but none of their patients undergoing trans-septal suturing presented with this finding. However, the statistical analysis did not prove this finding to be statistically significant in their study.

Conclusion

A comparative analysis of trans-septal suturing and mero-cel nasal packing following Septoplasty could help us conclude that the trans-septal suturing technique is much a better, safer and effective alternate to nasal packing following septoplasty. It is not only seen to significantly reduce the post-operative pain, bleeding and discomfort associated with nasal packing, but also decrease the duration of hospital stay, thereby minimizing the risk of nosocomial infections to patients and reducing the burden on the health care system. Another significant finding noted in our study was that trans-septal suturing resulted in lesser incidence of post-operative synechia than nasal packing.

Hence, we recommend the practice of trans-septal suturing as a standard procedure after septoplasty. Nasal packing should only be reserved for cases in which there is an extensive flap tear.

Funding No Funding was received

Compliance with Ethical Standards

Conflict of interest The authors declare that there was no conflict of interest

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