

Original Research Article

Comparative study of nasal packs, quilts and splints in septal surgery

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ABSTRACT

Background: Nasal packing, quilting and splinting are utilized in septal surgery to have a patent airway. The effects on the patient have been studied.

Methods: 60 subjects with deviated nasal septum requiring septal surgery were selected from the Rhinology division of otorhinolaryngology services of Dayanand Medical College and Hospital, Ludhiana. Comparison between nasal packing, nasal splints and quilt suturing was carried out in a period of one and a half years.

Results: All the 20 patients (100%) of anterior nasal packing had severe local discomfort but no postoperative hematoma. 1 patient (5%) of quilt stitching showed septal swelling and 1 patient (5%) of anterior nasal packing suffered from moderate degree of fever. There was no such episode in any of the patients in whom quilt stitching and splints were used. 6 patients (30%) of anterior nasal packing had crust formation which was not seen in quilt stitching and splint patients. 7 patients (35%) of nasal packing had ulceration of nasal mucosa on removal of pack, while none had in the quilt stitching or nasal splint group. 2 (10%) patients with anterior nasal packing had postoperative synechiae formation.

Conclusion: Quilting and splinting are the ideal tamponade post septal intervention As except for mild discomfort they do not experience the unpleasant sequel of accordion nasal packs. Moreover, it makes the procedure a day care surgery.

Keywords: Nasal packs, Quilting and splinting, Septal surgery

INTRODUCTION

A deviated nasal septum with consequent nasal obstruction and a facial deformity, is one of the common conditions encountered in the clinical practice of rhinology.

The incidence of deviated nasal septum is quite high. Thiele found septal deviation in 22% of normal population & these deviations were often left than right.¹ Hassen et al in their study found nasal septal deviation in 64% cases. Majority showed deviation toward left side (46%) while deviation towards the right side was only in 18% cases.¹

The entity, septal deviation necessitates surgical intervention to attain, internally, adequate nasal airways and facilitate bilateral equal lower alveolar ventilation. Externally facial symmetry and pleasing aesthetics can be achieved

Nasal haemostasis and patency postoperatively are obtained utilizing ribbon gauze roller packs, splints and quilting sutures by opposing the septal flaps to the residual chondro-osseous skeleton.

Aim of the study was to study effect of nasal packs, quilting sutures and nasal splints on the nasal cavity following surgical intervention on the septum.

METHODS

60 patients of deviated nasal septum attending the department of otorhinolaryngology of Dayanand Medical College and Hospital, Ludhiana and requiring surgery were irrespective of age and sex. The study was undertaken in a period of one year.

The study cohort was divided in three groups.

Group I: 20 patients in whom anterior nasal packing with cotton gauze impregnated with antibiotic ointment was done. Pack was removed after 48 hours.

Group II: 20 patients in whom quilt stitching (Figure 3) without nasal packing was done.

Group III: consisted of 20 patients in whom nasal splints (Figure 1) without nasal packing was applied.

Procedure of quilt stitching

- 4-0 plain catgut suture, on a small 1cm long cutting needle was employed.
- A bulky knot was placed in the distal end of the suture material.
- The initial placement of the suture was begun as far posterior in the nasal cavity as was technically practical. In this regard, a straight haemostat served as an appropriate needle holder.
- A randomly positioned series of “through and through” sutures were made, gradually advancing the pattern forward, until the caudal end of the septum was reached.
- At the caudal septum, the suture was used to carry across and close the transfixation or hemitransfixation incision or it was stopped short of the same and secured. In the latter circumstances, the incision was then closed separately.
- While care was taken to pull the slack out of the suture between each needle placement, excessive tightening was avoided lest the blood supply to the membranes be compromised.

Procedure of applying nasal splints

Teflon splints of appropriate size were used. After lubricating the splints with oil-based ointment like Neosporin, the two splints were introduced with ridges facing down and laterally. Using the nasal dressing forceps, the splints were manipulated to pass medial to middle turbinate. If the splints were too large for the alar opening, using a sharp instrument the splints were cut across the dotted lines to curl the splints and introduce. A thread was passed into the holes and tied loosely. Holding the thread loop, the septal clip held open in the nasal

speculum was introduced. A gauze piece was placed over the columella under the thread to avoid columellar notching. On final inspection, it was made certain that metal clip did not come in direct contact with the septal mucosa and the splints were placed at a higher level than nasal floor. The splints and the clips were removed after 48 hours.

When the clips were to be used, it was taken care not to use high concentration adrenaline local packs for septal surgery lest the ischemic necrosis of septum might occur.

All the cases were followed up to 6 weeks to check

- Discomfort
- Haemorrhage
- Infection
- Haematoma formation
- Synechia formation
- Crusting
- Ulceration
- Residual obstruction.

Inclusion criteria

Only septoplasty patients were included for the study.

Exclusion criteria

Inferior turbinectomy patients came under exclusion criteria.

Statistics

All statistical calculations were done using Statistical Package of Social Sciences (SPSS) 17 Version statistical program for Microsoft windows (SPSS Inc. released 2008. SPSS statistic for windows, version 17.0, Chicago). Ethical approval of the study was taken from the Institutional Ethics Committee.

RESULTS

The observations were analysed as mentioned below.

Table 1: Surgical intervention undertaken.

SMR/Septoplasty	No. of cases	Percentage (%)
Septoplasty	52	86.66
SMR	8	13.33

In 52 cases (86.66%) septoplasty and in 8 cases (13.33%) sub mucous resection was done.

Out of total of 60 patient, 20 patient received anterior nasal packing, 20 patients had quilt stitching done and in 20 patient nasal splints were applied.

Table 2: Method of achieving postoperative haemostasis.

Method	No. of cases
Anterior nasal packing	20
Quilt stitching	20
Splints	20

Table 3: Number of patients with post-operative discomfort and degree of discomfort.

Method used	Discomfort degree	No. of cases	Percentage (%)
Anterior nasal packing	severe	20	100
Quilt stitching	Nil	0	0
Splints	Mild	4	10

All the 20 patients (100%) in whom anterior nasal packing was done suffered from severe discomfort in the form of pain for which even analgesics via parenteral route (I/M Voveran) had to be given. Many of them were not able to sleep comfortably during night due to pain. They suffered from watering eyes, dryness of mouth, headache, odour, profuse rhinnohea. There was absolutely no discomfort in patients in whom quilt stitching was done while 4 patients (10%) with intranasal splints had mild discomfort in the form of pain, in which 2 patients had to be given one or two tablets of analgesics per day. There was no vomiting in any of the patient.

Table 4: Number of patients with haemorrhage (before removal of cotton gauze packs and splints).

Method used	No. of cases with hemorrhage	Percentage (%)
Anterior nasal packing	0	0
Quilt stitching	0	0
Splints	0	0

No patient showed postoperative haemorrhage with any of the methods used.

Table 5: Number of patients with haemorrhage (on removal of cotton gauze packs and splints).

Method used	No. of cases with hemorrhage	Percentage (%)
Anterior nasal packing	8	40
Quilt stitching	0	0
Splints	0	0

Out of 20 patients in whom anterior nasal packing was done, 8 patients (40%) had bleeding on removal of packs but bleeding was mild and did not require repacking. Stopped by pinching nose.

There was no such episode of bleeding in any of the cases in whom quilt stitching was done or nasal splints applied.

Table 6: Number of patients with postoperative hematoma formation.

Method used	No. of cases with hemorrhage	Percentage (%)
Anterior nasal packing	0	0
Quilt stitching	1	5
Splints	0	0

There was no postoperative hematoma in any of the patients in whom anterior nasal packing was done or nasal splints were applied while 1 patient (5%) of quilt stitching showed septal swelling.

Table 7: Number of patients with infection.

Method used	No. of cases with hemorrhage	Percentage (%)
Anterior nasal packing	1	5
Quilt stitching	0	0
Splints	0	0

1 patient (5%) of anterior nasal packing suffered from moderate degree of fever. But there was no rash formation, hypotension, mucosal hyperaemia, vomiting, diarrhoea or any evidence of multisystem organ dysfunction. There was no such episode in any of the patients in whom quilt stitching and splints were used.

Table 8: Number of patients with crust formation.

Method used	No. of cases with hemorrhage	Percentage (%)
Anterior nasal packing	6	30
Quilt stitching	0	0
Splints	0	0

6 patients (30%) in whom anterior nasal packing was done had crust formation. No patient with quilt stitching and splint had crust formation.

Table 9. Number of patients with ulcer formation.

Method used	No. of cases with hemorrhage	Percentage (%)
Anterior nasal Packing	7	35
Quilt stitching	0	0
Splints	0	0

7 patients (35%) with anterior nasal packing had ulceration of nasal mucosa on removal of pack, while no

patient with either quilt stitching or nasal splints had ulceration of nasal mucosa.

Table 10: Number of patients with synechiae formation.

Method used	No. of cases with hemorrhage	Percentage (%)
Anterior nasal packing	2	10
Quilt stitching	0	0
Splints	0	0

2 (10%) patients with anterior nasal packing had postoperative synechiae formation. No patient with quilt stitching or nasal splints had postoperative synechiae formation.

DISCUSSION

All the 20 patients (100%) of anterior nasal packing had severe local discomfort but no postoperative hematoma. 1 patient (5%) of quilt stitching showed septal swelling. 1 patient (5%) of anterior nasal packing suffered from moderate degree of fever. There was no such episode in any of the patients in whom quilt stitching and splints were used. 6 patients (30%) of anterior nasal packing had crust formation which was not seen in quilt stitching and splint patients. 7 patients (35%) of nasal packing had ulceration of nasal mucosa on removal of pack, while none had in the quilt stitching or nasal splint group. 2 (10%) patients with anterior nasal packing had postoperative synechiae formation.

The most common reasons cited for post septoplasty nasal packing are bleeding, internal support, increased tissue apposition, decreased oedema and closure of dead space. Each of these indications for nasal packing can be easily managed in ways that are much less uncomfortable to the patient with pleasing results.

Toxic shock syndrome as reported in literature is very serious and sometimes fatal conditions complicating operations where intranasal splints and/or packs have been used. Toxic shock syndrome is a multisystem disorder was first reported by Todd et al in 1978.¹

Cotton gauze pack is not biocompatible and may lead to foreign body reaction. and there is bleeding on pack removal. Moreover, crusting is another frequent complication after nasal packing², it was found in 10% cases of nasal packing in the Fjermedal, et al study.³

Paraffinoma as a complication of nasal packing was described by Becker 1983⁴. Nasal packs become adherent to the surrounding mucosa and when removed leave some shreds and raw areas which later result in synechia formation. Aspiration of pack if loose can occur post-surgery.

The prompted pain in the nose and the forehead in the postoperative phase with a full nasal pack, is the primary cause of reluctance and hesitancy in the patient to come forward for nasal surgery. The Schoenberg, et al study reported, the MPS in nasal packing patients as 4.2 and while in the pack free as 2.8.⁵ The Nunez et al study found a significantly higher threshold of post-operative pain in the those with a nasal pack.⁶

Dysphagia due to the Toynbee phenomenon was too significantly more in packed patients (p<0.001). On swallowing with obstructed nasal passages, air doesn't pass anteriorly and is insufflate into the middle ear cleft. Moreover, the uneasiness is consequent to poor oral intake with packs in situ.

Headache, discomfort in swallowing, dryness of mouth, disturbed sleep and oozing of nasal secretions, had a significantly higher incidence in the packing with the splinted group in the Nayak, et al study.⁷ Awan, et al⁸ in addition noted that dysphagia, intermittent watering from the eyes and dryness of mouth exclusively seen in patients with packs are not the causes of real concern, but add to the patient's woes.

Nasal obstruction causes sleep-disordered breathing which may be due to a direct mechanical effect, so that the pressure in an obstructed upper airway becomes negative if there is no gas flow and results in tendency to airway closure. Also, there is evidence of a reflex mechanism, by which interruption of normal sensory input can cause abnormal breathing patterns and a decrease in genioglossus and diaphragm muscle activity which normally act to preserve airway patency. Zwillich, et and Suratt, et al demonstrated an increase in the frequency and duration of apnoeic episodes when the nose is occluded. Hady et al also suggested that nasal packing for 24 h may cause arterial oxygen desaturation. 70% of the patients in our study had average SpO₂ less than 95%. Although, this temporary drop in oxygen saturation in packed group may not be clinically relevant in many patients but the nasal packing can induce or worsen OSA particularly in older patients with cardiac or pulmonary problems.

A utilized tympanometry to evaluate the nasal packing effects on pressure dynamics of the middle ear function.⁹ Their results corroborated to those of Egelund et al.¹⁰ The eustachian tube is affected consequently with a feeling of mild uneasiness to full discomfort. The immediate complications such as bleeding on removal of pack/clip and late ones such as synechiae were encountered more in packing group but were not statistically significant and the resolution of nose block was also comparable in both the groups.

Vis a vis the complications of post- operative packing, alternative modalities like the nasal splints (Figure1), trans septal quilting sutures (Figure 3) and nasal clips (Figure 2) many have been the indigenous advancements

in the field of rhinology. Intranasal splints were first described by Salinger and Cohen in 1955. The splints were initially fashioned from any suitable material such as strips of X-ray film or even the polythene tops of coffee-cans. The magnetic nasal splints were originally described by Seltzer, however the magnets available at the time were too weak for the splints to be effective in the usual case. The much stronger samarium cobalt magnets described by Goode solved this problem.

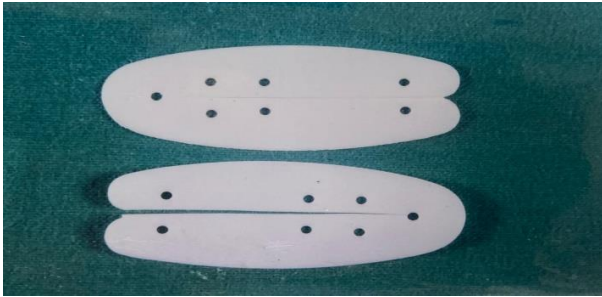


Figure 1: Nasal splint.



Figure 2: Nasal clip.

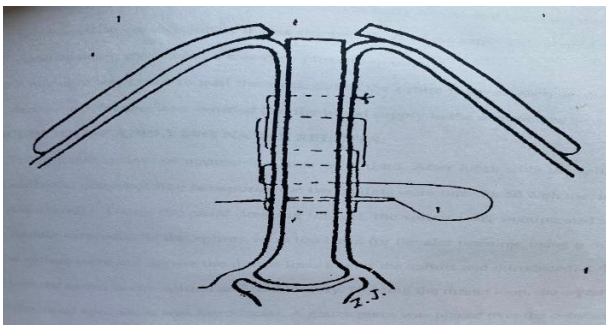


Figure 3: Trans-septal quilt stitching.

Splints were initially introduced to support the reconstructed septum but since then have been used as a means of securing haemostatic packs in place in the treatment of anterior epistaxis. They have also been advocated as a means of holding septal grafts in place following dermoplasty or grafting of septal perforations. Intranasal splints are very effective in prevention of post-operative nasal adhesions.¹¹

Recently, the advisability of using these splints has been challenged. There is a uniform agreement that

postoperative pain is increased by their use¹¹. There is a very slight but definite risk of developing TSS. In a controlled study by Cook et al splints were shown to offer no additional help in stabilizing the septum postoperatively. Malki et al randomized patients undergoing septal and inferior turbinate surgery to splints or no splints.^{12,13} They found increased pain at 1 week post-operatively in splinted group and no difference in adhesions at 6 weeks.

Sessions suggested the application of multiple continuous through and through 4-0 plain catgut stitches with 1 cm straight needle to keep the mucoperichondrium, near septal cartilage. Bahman Guyron did a randomised study to evaluate the role of nasal packing following septoplasty.^{14,15} He suggested that patients with nasal packing are less likely to have improvement in nasal airway as compared to the patient with quilt stitching. The need for a pack was challenged by Reiter et al who used quilting technique instead of packing to prevent swelling and hematoma postoperatively.¹⁶

The trans-septal quilting suture avoids post-operative haemorrhage and septal haematoma while avoiding the morbidity of packing or splints. Lemmens, et al evaluated post-operative stability using this technique.¹⁷ Out of 226 subjects, only a single persistent septal deviation was noted.

Wadhwa et al compared intranasal septal splints and to compare the results of this type of support with those of conventional nasal packing.¹⁶ At the 6-week follow-up, only 2 patients (6.7%) in the splint group exhibited a residual deformity, compared with 8 patients (26.7%) in the packing group. No patient in the splint group had an intranasal adhesion at follow-up, while 4 (13.3%) in the packing group did so.

Veluswamy reported a late septal stitch abscess with this quilting technique and emphasised that it was time consuming and needed surgical dexterity. Alternatively, some authors have had success with intraseptal application of fibrin glue.¹⁹ The use of fibrin glue in septal surgery has been advocated by Hayward and Mackay.²⁰ In addition to their adhesive properties, they are also haemostatic agents and can be used to stick the septal flaps together and thus reduce the risk of haematoma formation. A commercial preparation is available (Tisseel by Immune Ltd.) which incorporates the use of bovine thrombin. Allergic reactions can occur to the bovine thrombin and there is also the theoretical risk of transmitting such viral infections as hepatitis and HIV. For this reason, the use of an autologous fibrin glue is undoubtedly safer but is less convenient as it entails obtaining 100 ml of whole blood from the patient about a week before the operation.¹²

Veluswamy et al compared packs with septal clips and observed that nasal packing caused significant postoperative uneasiness as compared to septal clips and

did not give any added advantage over the latter as far as the final outcome is concerned which appears to be operator and technique dependent.

CONCLUSION

Quilting and splinting are the ideal tamponade post septal intervention. As except for mild discomfort they do not experience the unpleasant sequel of accordion nasal packs. Moreover, it makes the procedure a “day care surgery”.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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