

A Comparative Study between Conventional Neosporin Impregnated Ribbon Gauze and Merocel Nasal Packing following Septoplasty: A Cross-Sectional Analytical Study

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ABSTRACT

Introduction: Nasal packing is one of the common procedures performed after septoplasty to prevent postoperative hemorrhage, septal hematoma, and synechia formation and to stabilize the remaining cartilaginous septum. A variety of nasal packs like conventional neosporin impregnated ribbon gauze (NIRG) and Merocel are used after septal surgeries. The aim of this study was to compare between conventional NIRG and Merocel nasal packing following septoplasty.

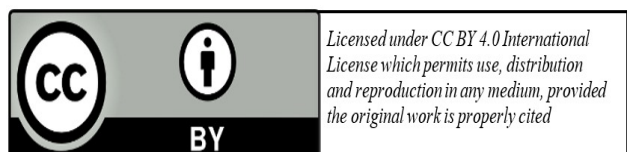
Methods: A cross-sectional analytical study was conducted among patients with conventional neosporin impregnated ribbon gauze (NIRG; Group A) and Merocel (Group B) nasal packing following septoplasty. Comparison was made in regards to post-operative pain levels, ability to prevent hemorrhage and synechia formation in two groups.

Results: The mean pain score while pack in situ was 3.71 for Group A and 3.08 for Group B whereas 4.05 for Group A and 3.34 for Group B during removal of pack. Average number of bolster changed was 3, 2 and 2 in Group A and 5, 3 and 3 in Group B on operation day, first postoperative day and second postoperative day respectively. At 4 weeks postoperatively, the number of patients who developed synechia were 4 (11%) in Group A and none (0 %) in Group B.

Conclusions: The morbidity associated with postoperative pain was minimal with Merocel packing. Hemostatic effects were best observed with NIRG packing, though the difference was not statistically significant. Synechia formation which is one of the most important determinants of successful septoplasty was best prevented by Merocel packing. Hence, Merocel is superior to NIRG packing after septoplasty.

Key words: Merocel; Neosporin impregnated ribbon gauze; Pain; Septoplasty; Synechia.

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INTRODUCTION

Deviated nasal septum is one of the most common disorders in human beings, which may lead to symptoms of nasal obstruction, headache, epistaxis, hyposmia, and post nasal drip. Nasal obstruction, the most common symptom of DNS is often described as fullness, congestion, or decreased airflow. [1,2] The prevalence of DNS was found to be 30.9% to 53% as shown by different research studies. [3,4] Septoplasty is routinely performed more conservative and precise surgery for symptomatic deviated nasal septum in ENT theatres. [5] Nasal packing is done after septoplasty to prevent postoperative hemorrhage, septal hematoma and synechia formation. [6,7,8] The ideal packs should be easy to insert and remove without causing discomfort. They should be comfortable when in place and should prevent postoperative bleeding.[9] A variety of nasal packs like conventional Neosporine ([neomycin](#), [bacitracin](#) and [polymyxin antibiotics](#)) Impregnated Ribbon Gauze (NIRG) and Merocelel are used after septal surgeries. Merocelel, one of the most common nonabsorbable nasal packing materials, is a compressed, dehydrated sponge composed of hydroxylated polyvinyl acetate that can increase in size within the nasal cavity

and compress a bleeding vessel through rehydration with normal saline.[10]

The objective of this study was to compare conventional NIRG and Merocelel nasal packing following septoplasty in regards to post-operative pain levels, ability to prevent hemorrhage and synechia formation.

METHODS

This was a prospective analytical study conducted among patients with Deviated Nasal Septum (DNS) who underwent septoplasty in the Department of Otorhinolaryngology, Head and Neck Surgery, Manipal College of Medical Sciences from December 2021 to June 2023 under general anesthesia after taking ethical approval from Institutional Review Committee (MEMG/498/IRC). All the patients meeting the inclusion criteria during the study period were included in the study. A total of 70 patients above 18 years of age, belonging to either gender with symptomatic DNS were enrolled in the study Patients with repacking cases after septoplasty, septoplasty combined with other nasal surgeries like Functional Endoscopic Sinus Surgery (FESS), turbinoplasty and patient lost to follow up were excluded from the study.

The randomization numbers were concealed in a sealed envelope and the patients were arbitrarily divided into two groups - Group A (35 patients) underwent nasal packing using

NIRG and Group B (35 patients) with Merocelel after septoplasty.

After completion of septoplasty surgery, all patients were prescribed Inj. Ceftriaxone 1 gm IV 12 hourly, Injection Paracetamol 1 gm IV 8 hourly on the day of surgery. Then, from first post-operative day, Inj. Ceftriaxone was continued till third post-operative day and Tab Paracetamol 500 mg TDS/QDS was prescribed. Packing was removed on third post-operative day.

The comparison between conventional NIRG and Merocelel nasal packing following septoplasty was done in regards to control of bleeding, pain during pack in situ and removal and synechia formation.

Bleeding was assessed by number of bolsters changed when pack was in situ, whereas after the removal of pack it was graded as Grade 0- no bleeding, Grade 1- minimal-confined to nose, Grade 2- moderate-bleeds out of nose, Grade 3- severe-requires repacking. [11]

Patient was educated about Visual analog scale (VAS) for pain on the day of admission. It was used to determine pain score during pack in-situ (first and second post-operative day) and removal (third post-operative day) by resident doctor who was involved in the study on every morning and evening round. The pain score was divided into three groups: Mild 1-3, Moderate 4-6, Severe 7-10. Patient was followed up for four weeks and diagnostic nasal endoscopic assessment for adhesions was

done. Grading was done as, Grade 0-No synechia and Grade 1-Presence of synechia. Collected data was entered in Excel sheet. Statistical analysis of the study was carried out for various parameters with appropriate statistical method using Statistical Package for the Social Sciences (SPSS) program version 25.0.

RESULTS

Out of total 450 patients with DNS, 70 patients with symptomatic nasal obstruction were undergone septoplasty surgery. Among them 55(78.57%) were males and 15(21.43%) were females. Common age group undergone septoplasty surgery was 21-30 years of age (Figure 1). The minimum age was 18 years and maximum age was 65 years with a mean age of 43 years.

The total number of bolsters changed during pack in situ was 7 in Group A and 11 in Group B ($p=0.99$) (Table 1).

Table 1. Total number of bolsters changed (n=70)

Day	Group A	Group B	p value
OT day	3	5	0.99
1 st post-op day	2	3	
2 nd post-op day	2	3	
Total	7	11	

Total of 14(40%) patient in Group A and 27(77%) in Group B required Tablet Paracetamol 500 mg three times a day while 21(60%) patients in Group A and 8(23%) in

Group B required Tablet Paracetamol 500 mg four times a day for pain management. (p= 0.001) (Table 2).

Table 2. Frequency of Tab. Paracetamol 500mg consumed per day (n=70)

Frequency→	TDS	QDS	p value
Group A	14 (40%)	21 (60%)	0.001
Group B	27 (77%)	8 (23%)	

Total of 33(91.55%) patients in Group A and 26(74%) in Group B develop minimal to

moderate bleeding after removal of nasal pack (Table 3).

Table 3. Grading Scale for bleeding after removal of nasal pack (n=70)

Grade	Bleeding	Group A	Group B
0	No bleeding	3 (8.5%)	9 (26.0%)
1	Minimal-confined to nose	25 (71.5)	22 (63.0%)
2	Moderate-bleeds out of nose	7 (20.0%)	4 (11.0%)
3	Severe-requires repacking	0 (0.0%)	0 (0.0%)
Total		35 (100%)	35 (100%)

The mean pain score while pack in situ was 3.71±0.76 for Group A and 3.08±0.60 for Group B (p=0.71) whereas 4.05± 0.97 for

Group A and 3.34± 0.67 for Group B during removal of pack (p=0.73) (Table 4).

Table 4. Pain Score

Group	No.	Min.	Max.	Mean	SD	p value
When pack in situ (n=70)						
A	35	3	5	3.71	0.76	0.71
B	35	2	5	3.08	0.60	
During removal of pack(n=70)						
A	35	3	7	4.05	0.97	0.73
B	35	3	5	3.34	0.67	

When pack in situ, 17 (48.60%), 18 (51.40%) patients in Group A and 29 (82.85%), 6

(17.15%) patients in Group B develop mild and moderate pain respectively. Similarly, during

pack removal, 10 (28.57%), 19 (54.29%), 35 (100%) patients in Group A and 27 (77.14%), 8 (22.86%), 0 (0.00%) patients in Group B

develop mild, moderate and severe pain respectively (Table 5).

Table 5. Pain Severity

Pain Severity	Pack in situ		During removal	
	Group A	Group B	Group A	Group B
Mild	17 (48.60%)	29 (82.85%)	10 (28.57%)	27 (77.14%)
Moderate	18 (51.40%)	6 (17.15%)	19 (54.29%)	8 (22.86%)
Severe	0 (0.00%)	0 (0.00%)	6 (17.14%)	0 (0.00%)
Total	35 (100%)	35 (100%)	35 (100%)	35 (100%)

There were no synechiae in Group B but 4(11%) patients developed the synechiae on 4 weeks post -operative follow up in Group A (p=0.04).

DISCUSSION

There is no generalized consensus to define an ideal nasal packing material. An ideal nasal pack should minimize discomfort, achieve good control of bleeding and easy to insert and remove. Both Neosporine Impregnated Ribbon Gauze and Merocel pack appear to fulfill these criteria. But still there are some differences in their effectiveness. In this study, common age group who underwent septoplasty surgery was 21-30 years followed by 31-40 years. The minimum age was 18 years and maximum age was 65 years with a mean age 43 of years. In most of the studies, the predominant population undergoing septal surgery was seen in the age

group of 21-30 years which was highlighted in similar studies in the past. [9,12] The reason for the predominance of the younger patient is that the younger are more aware and concerned about the symptomatology of deviated nasal septum and are more likely to seek treatment.

As is evident, the difference is not statistically significant (p=0.99) even though NIRG appeared to be better in controlling bleeding from nose. Similar studies concluded that hemostatic effects were best observed with medicated conventional gauze packing, though the difference was not statistically significant (p<0.20). [13,14]

In a past study, two patients with conventional nasal pack and seven patients with Merocel nasal pack developed bleeding during pack removal and concluded that there was a statistically significant difference between the two group of patients with respect to bleeding

during pack removal. [15] But, another similar study concluded that there was no statistically significant difference between the two packing materials in terms of bleeding on removal. [12] In our study, 33(91.55%) patients in Group A and 26(74%) in Group B develop minimal to moderate bleeding after removal of nasal pack showing that NIGR pack have more tendency of bleeding on removal. The reason might be rough surface of NIGR pack compared to Merocel that might cause trauma to nasal mucosa.

As is evident from Table 4, the difference is not statistically significant even though Group A pack cause more pain both when pack in situ and on removal. When pack in situ, 18 (51.40%) patients in Group A and 6 (17.15%) patients in Group B develop moderate pain respectively. Similarly, during pack removal, 25 (71.43%) patients in Group A and 8 (22.86%) patients in Group B develop moderate to severe pain. That's why 21(60%) patients in Group A and 8(23%) in Group B required Tablet Paracetamol 500 mg four times a day for pain management ($p=0.001$). Similar studies showed significantly higher pain levels in the gauze packing group as indicated by more paracetamol 500 mg consumed by gauze packing group for pain management. [13] Similarly, a past study concluded that the Merocel pack had lesser pain scores compared to conventional method while pack removal, which was assessed using visual analog scores ($P = 0.0001$). [14] An ideal NIGR pack exert

more pressure in the nasal cavity and might cause trauma to nasal mucosa on removal leading to more pain as experienced by the patient.

In our study, there were no synechiae in Group B but 4(11%) patients in Group A developed synechiae on 4 weeks post-operative follow up ($p=0.04$). Most of the literatures concluded that conventional pack had more synechiae formation than the Merocel pack. [9,14,15] This is in contrast to other similar studies in which there were no differences between different packing materials with respect to synechiae formation. [12,16] The less chance of synechiae formation with Merocel nasal pack might be due to its smooth surface causing less trauma to nasal mucosa.

The limitation of this study was it is a single center study. Thus, the conclusion may not be generalized. Also, this study didn't compare the effect of different packing materials in different sinonasal surgeries apart from septoplasty.

CONCLUSIONS

The morbidity associated with postoperative pain was minimal with Merocel packing. Hemostatic effects were best observed with Neosporin Impregnated Ribbon Gauze packing, though the difference was not statistically significant. Adhesion formation which is one of the most important determinants of success of septoplasty is best prevented by Merocel packing. Hence, we can

conclude that MeroceI is superior to NIRG packing after septoplasty.

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