■ *Original Article*

An evaluation of merocel and neosporin impregnated ribbon gauze packs in patients following nasal surgery: a prospective randomised trial

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Abstract

Background: Packs are placed following nasal surgeries to arrest haemorrhage, to prevent septal haematoma and synechie formation. Despite Merocel, a tampon constructed from a foam polymer of *hydroxylated polyvinyl acetate,* which is less abrasive and hence associated with the less pain, we still use Neosporine Impregnated Ribbon Gauze (NIRG). **Objective:** To compare Merocel and the Neosporine Impregnated Ribbon gauze (NIRG) packs in regards to the post-operative pain levels caused by them and their ability to prevent haemorrhage, crusting and synechie. **Methods:** The nose was packed after surgery either with the Merocel pack or Neosporin Impregnated Ribbon Gauze (NIRG) according to the randomisation. The pain score was noted on the Visual analog score while packs were in situ and again immediately after the pack removal. The haemorrhage, crusting and synechie were noted if present. **Results:** Among 106 patients, 61 were male and 45 were female. In Merocel group there were 51 patients and in NIRG group 55. The mean pain score for merocel was 4.15 while in situ and 3.66 immediately after removal where as mean pain score for NIRG was 6 while in situ and 3.78 immediately after removals. Post-operative crusting and synechie were seen relatively more in NIRG pack group. **Conclusion:** Merocel is superior in terms of both patient comfort and pain.

Keywords: nasal packs, merocel, NIRG, pain, hemorrhage

Introduction

The nasal surgeries are the most common in any tertiary level otorhinolaryngology and Head and Neck unit. Septoplasty, Rhinoplasty, Septorhinoplasty and functional endoscopic sinus surgeries are the most common nasal surgeries.

Nasal packs are placed following nasal surgery to arrest hemorrhage, prevent septal hematoma formation and prevent postoperative adhesion formation by medialising the middle turbinate.

The ideal packs should be easy to insert and remove without causing discomfort. Also they should be comfortable when in place, should prevent postoperative bleeding without damaging the mucous membrane of the nose and should provoke minimal tissue reaction.[1]

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Almost all ENT units use nasal packs whether it be for control of primary epistaxis or after nasal surgery. A variety of nasal packs are used but there is a surprising paucity of studies in the literature comparing nasal packs despite their widespread use.

Despite the new improved materials for the nasal packing which are supposed to cause less discomfort and more effective in controlling the bleeding. We, especially third world countries in which patients have to buy the medicines by his own, still forced to use the ancient time Neosporine Impregnated Ribbon Gauze (NIRG).

The Merocel is relatively new material tampon constructed from a foam polymer of hydroxylated polyvinyl acetate is supposed to be less abrasive and hence associated with the less pain.

The Neosporine Impregnated Ribbon Gauze (NIRG), is widely used, until now virtually in almost all cases of the nasal surgeries, despites its roughness that causes the abrasion on the delicate nasal mucosa.

Methods

Participants

All adults undergoing Septoplasty, Rhinoplasty, Rhinoseptoplasty and Functional endoscopic sinus surgery were considered for randomisation before the surgery. Patients were considered unsuitable if they have at least one of the following exclusion criteria: bleeding abnormalities, patients taking anticoagulant including aspirin and any significant co-morbidity and hypertension.

Interventions

All operations were carried out by consultant surgeons either under local or general anesthesia. Patients had both sides of their nose packed after surgery either with the Merocel or Neosporin Impregnated Ribbon Gauze (NIRG) pack according to the randomisation assignment. All patients had their packs removed on the morning of second post operative day.

Study design

This was a prospective single-blinded randomized trial.

Sample size

Total -106 patients
Merocel group -51 patients.
NIRG group -55 patients.

Randomization – sequence generation

The patient in whom the pack was inserted was randomly assigned at the end of the procedure using previously prepared random number table allocation. The data were collected by a second person, who was not involved in the previous day's procedure.

Randomisation – allocation concealment

The randomisation numbers were concealed in a sealed envelope. At the end of surgery, an envelope was opened that contained instructions to pack both the nostrils either with merocel or NIRG pack.

Statistical methods

The levels recorded on the visual analogue scale conformed to a normal distribution therefore results were analyzed using SPSS version 11.5.

Outcome measures

A. Pain assessment

(1) The pain caused by the presence of packs within the nose.
The patient was asked to make a mark on a visual analogue scale to demonstrate the pain they were experiencing as a result of the nasal pack being present. A visual analogue scale was chosen as a measure of pain both for its simplicity and as it has been validated in a wide variety of settings and has been found to be a sensitive and reproducible assessment of pain.

(2) The pain caused by removal of the nasal packs.
The packs were then removed by one of the resident who was not involved in the operation and immediately after the removal of the pack, the patient was asked to make a mark on a visual analogue scale to represent the pain caused on by removal of the pack.

B. Hemorrhage

(1) Control of hemorrhage.
Postoperatively a standard dressing bolster was placed. After the patient returned to the ward, if the bolster needed replacing, removed bolsters were kept and the new bolster applied. The morning after surgery, a different doctor assessed the collected bolsters. He recorded on the data sheet whether there appeared to have been more bleeding or not. The doctor making the assessment varied but was never the doctor who had carried out the operation and they were not aware of which type of pack was kept in the nose.

(2) The amount of bleeding after removal.
After removal, resident doctor or the nursing staff made a note of how long each nostril continued to bleed. If the blood was still trickling even after the nasal pinch, was collected in kidney trey and measured in measuring jar.

C. Crusting and Synechie

1. The patients were examined on the 3rd post-operative day and crusting was noted.

2. The patients received a 3- and 6-week follow-up appointment. The doctor seeing the patient made a rigid endoscopic assessment of crusting and adhesions in each nostril.

Ethical considerations

Approval for the trial was obtained from B.K.I.H.S. Research forum and Ethical committee.

Consent was obtained from the patient before the surgery.

Results

Patient demographics

Total of 106 patients recruited in this study

1. Sex Distribution

Male-61
Female-45

2. Age Distribution

The mean age of the patients was29.92 with standard deviation of 12.88 (range 14–62).

Table 1: Age distribution

Age	Number	Percent
<20	32	30.18
21-30	34	32.08
31-40	20	18.87
41-50	12	11.32
51-60	4	3.73
>60	4	3.73
Total	**106**	**100**

3. Nasal pathology

Clinical assessment of nasal pathologies were as follows:

- Deviated nasal septum (DNS) was seen in 38patients (35.8%).
- Nasal polyposis was seen in 43 patients (40.56%) among them 34 patients (32.07%) had bilateral ethmoidal polyps whereas 9 cases had unilateral disease.
- Isolated Chronic rhino-sinusitis (CRS) was seen in 9 cases (12.26%), whereas it was associated with deviated nasal septum in7cases (6.60%)
- Deviated nasal septum with deviated nasal framework (DNS &DNFW) was seen in 4cases (3.77%)
- Deviated nasal septum with bilateral concha bullosa (DNS & CB) was seen in only one case.

Table 2: Nasal pathology

	Number	Percent (%)
DNS	38	35.84
Only CRS	13	12.26
Nasal Polyposis, B/L	34	32.07
A.C.Polyp	9	8.49
CRS &DNS	7	6.6
DNS &NFWD	4	3.77
DNS &CB	1	0.94
TOTAL	**106**	**100**

4. Surgeries performed

Functional endoscopic sinus surgery was performed in 56 cases (52.83%).Septoplasty was performed in 38 cases (35.84%) Both Septoplasty and Functional endoscopic sinus surgery were performed in7 cases (6.60%) Rhinoseptoplasty was done in 4 cases (3.77%). Bilateral concha bullectomy was performed in one case.

5. Pain and discomfort level

Mean pain score level for merocel, while in situ was 4.2 and after removal was 3.8.Meanwhile pain score for the NIRG while in situ was 6 and after removal was 4.5.

Twenty-eight patients (54.9%) with merocel pack in situ and 29 patients (56.9%) after removal had the pain score of 4. Most, 34 patients (61.8%) had pain score of 6 when NIRG pack was in situ and after removal score decrease to 5 in 29 patients (52.7%).

Table 3: Pain score for merocel

Pain Score	No.of pts.	Minimum	Maximum	Mean	Std. Deviation
In Situ	55	4.00	7.00	6.0000	0.66667
After removal	55	3.00	5.00	3.7818	0.65802

Table 4: Pain score for NIRG

Pain Score	No.of pts.	Minimum	Maximum	Mean	Std. Deviation
In Situ	55	4.00	7.00	6.0000	0.66667
After removal	55	3.00	5.00	3.7818	0.65802

There is significant difference between the pain scores of NIRG, when it was in situ and after removal and it is statistically significant.

But the difference between the pain scores of merocel pack, while in situ and after removal, was not statistically significant

Merocel pack was easy to insert, causes less pain while insertion as well as while it was in situ but causes somewhat slightly more pain during removal due to its stickiness in the nasal mucosa.

The Neosporin impregnated ribbon gauze caused severe pain while insertion, and also when it was in situ but it caused relatively less pain during removal.

Haemorrage

There was no significant difference in bleeding while packs were in situ but on removal it was observed that there was tendency to bleed after the removal of

the Merocel pack. In almost all cases single boster applied till the morning of the second post-operative day. There were no cases that required the other measures for the control of the bleeding.

Crusting

Crusting was minimal with the merocel pack as seen in the 3rd post-operative day.

Synechie

There were no synechie in merocel group, either in the 3rd or 6th post-operative week. Three developed the synechie on 3rd post -operative week, and after release of the synechie on that visit no synechie were observed on the 6th post-operative week.

Discussion

Postoperative care after nasal surgeries is important both to minimize discomfort for the patient and to obtain the best outcome. The first step in this care is the decision as to whether to pack the nose and if so with what. Not packing the nose has the advantage of avoiding the discomfort caused by packs being in the nose and by their removal. Patients often report that removal of the nasal packs was the worst part of their surgical experience.[2]

There is, however, inevitably some bleeding from the nose following surgery even with meticulous nasal preparation and surgical technique. To achieve good control of bleeding and improve the patient experience, packs are being developed that are more comfortable and cause less pain on removal.

An ideal nasal pack should provide an effective control of bleeding, be easy to insert and remove, comfortable when in place with minimum risk of aspiration and promote a minimal amount of tissue sensitivity or infection.[3] Both merocel and NIRG packs appear to conform to these criteria. There is always a potential risk of aspiration of any nasal pack.[4]

There have been many complications of nasal packing described in the literature.[5, 6, 7]

Though the measurement of pain is a complex problem with many pitfalls,[8] the choice of a visual analogue score to measure pain as opposed to any other pain rating scales was based on the following advantages (i) simplicity, high sensitivity and longitudinal reproducibility, (ii) it generates a directly measurable numerical pain score and (iii) there is good correlation between pain scores obtained by visual analogue score techniques and verbal response and numerical scales but the former is thought to reflect best what the patient actually feels.[9,10]

Shinkwin et al. did a randomized control trial comparing Surgicel Nu-knit, Merocel and Vaseline gauze packs and found that while the Surgicel Nu-knit resulted in less pain and bleeding, 12% of them fragmented on removal and one patient required a general anesthesia to remove it.[3]

Garth et al in non-randomized prospective trial found that Telfa and Paraffin caused less discomfort and bleeding than both Merocel and BIPP packs. However, the Paraffin Gauze caused a paraffin granuloma in one patient.[11]

Arya et al did study with Merocel and Rapid Rhino packs and while Rapid Rhino pack was associated with less pain, three of 17 fell out inadvertently.[12]

Cruise et al also looked at Rhino Rapid pack and did not report any events of packs falling out. They found that Rapid Rhino pack caused significantly less pain than Telfa nasal packs on removal. There was, however, a question of an allergic reaction to Rapid Rhino pack in one patient out of 45.[13]

Badran et al compared Merocel and an inflatable Rapid Rhino pack and found lower pain scores with latter. While Rapid Rhino studied by this group was different from Arya et al. in that it was an inflatable pack. They also expressed concerns about the Rapid Rhino packs' propensity for slipping forward or prolapsing backwards which required deflating and repositioning the pack.[14]

Leek described coating a Merocel pack with gel foam as far back a 1985.[15]

Bresnihan et al compared Merocel and Series 5000 nasal pack and concluded that both the packs are effective regarding haemostasis and have equivalent pain levels while in situ. However, the Series 5000 pack was significantly less painful on removal.

While the Merocel pack has given reasonably high pain scores for removal in many studies it appears to be the pack associated with the least complications. However, despite the associated pain the Merocel pack still remains popular as it is easy to use.[16]

Ilium et al found three septal perforations with merocel in 26 patients.[17]

In our study, Neosporin Impregnated ribbon gauze pack was associated with the more pain while the pack was in situ, and decreased significantly after the removal, but for merocel pack, the pain when it was in situ, was comparatively less and the pain was even lesser when the pack was removed but there was more pain during removal of the pack. The haemostasis was adequately maintained by both the pack when they were in situ but it was observed that due to the adhesive nature of the merocel pack there were slight more tendencies to bleed immediately after the removal of the merocel pack.

Conclusion

This trial has demonstrated that both merocel and Neosporin Impregnated Ribbon Gauze (NIRG) packs fulfill their primary purpose of haemostasis and are well tolerated while in the nose. The pain was significantly reduced after removal in case of NIRG pack but there is no significant difference in pain scores for merocel pack though it causes less pain while comparing with the NIRG pack. The merocel causes slightly more bleeding after removal in comparison to NIRG pack but it may prevent adhesion formation, but a larger trial would be required to confirm this. In addition, the merocel pack is slightly costlier than the NIRG pack.

Both the merocel pack and NIRG pack can be recommended as packs that perform well following nasal surgeries, but the merocel pack has the advantage of causing significantly less pain discomfort while the pack is in situ.

References

1. Von Schoenberg M, Robinson P, Ryan R. Nasal packing after routine nasal surgery – is it justified? J Laryngol.Otol. 1993, 107:902–905.
2. Samad I, Stevens H E, Maloney A. The efficacy of nasal septal surgery J Otolaryngol.1992, 21: 88–91.
3. Shinkwin C A, Beasley N, Simo R, Rushton L, Jones NS. Evaluation of Surgicel Nu-Knit, Merocel and Vasolene gauze nasal packs a randomized trial. Rhinology 199 34:41–43.
4. Walton SL Post extubation foreign body aspiration; a case report. AANA J 1997, 65:147–149.
5. Cvetnic Z , Cvetnic S , Rocic B (1976) Disordered gas exchange in the blood caused by nasal tamponade Rhinology 1976, 14: 121-127.
6. De Vries N , Van der Baan S. Toxic shock syndrome after nasal surgery: is prevention possible? Rhinology1989, 27 : 125-128.
7. Fairbanks DNF. Complications of nasal packing. Otolaryngology Head and Neck Surgery 1986; 94: 412—415.
8. Reading A R. Testing pain mechanisms in persons in pain. In: Wall and Melzack, editors. The text book of pain. 2nd ed. London and Edinburgh: Churchill-Livingstone, 1995 p 269–280.
9. Ong KS, Seymour RA. Pain management in humans. Surgeon 2004, 2 . 15–27.
10. Kelly AM. Does the clinically significant difference in visual analogue scale pain scores vary with gender, age, or cause of pain? , Acad Emerg Med1998, 5: 1086–1090.
11. Garth RJN, Brightwell AP A comparison of packing materials used in nasal sugery. J Laryngol Otol. 1994,108 564–566.
12. Arya AK, Butt O, Nigam A. Double-blind randomized controlled trail comparing Merocel and Rapid Rhino nasal packs after routine nasal surgery. Rhinology 2003,41 : 241–243.
13. Cruise AS, Amonoo-Kuofi K, Srouji I, Kanagalingam J, Georgalas C, Patel NN, Badia L, Lund VJ.A randomized trial of Rapid Rhino Riemann and Telfa nasal packs following endoscopic sinus. Clin Otolaryngol 2006, 31 25–32.
14. Badran K, Malik T H, Belloso A, Timms MS. Randomized controlled trial comparing Merocel and Rapid Rhino packing in the management of anterior epistaxis. Clin Otolaryngol 2005 30(4 333–337
15. Leek JH. How I do it: combine Merocel and gel film as a nasal pack. Laryngoscope 1985;95: 99-105.
16. Bresnihan M, Mehigan B, Curran, A. An evaluation of merocel and Series 5000 nasal packs in patients following nasal surgery: a prospective randomized trial. Clinical Otolaryngology 2007 32 :352–355.
17. Ilium P, Grymer L, Hilberg O. Nasal packing after septoplasty. Clinical Otolaryngology 1992 17 158-162.