COMPARISON OF POLYVINYL ACETATE SPONGE AND MEDICATED RIBBON GAUGE NASAL PACK FOLLOWING NASAL SURGERY

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ABSTRACT

Nasal occlusive dressings are routine after nasal surgeries to arrest hemorrhage, to prevent septal hematoma, and to prevent postoperative adhesions. However, patients describe nasal packing and its removal as their worst experience. Various types of nasal packs are available. Medicated ribbon gauge is the traditional form of nasal pack which consists of an open-mesh cotton as a carrier whereas "Polyvinyl Acetate' sponge is a compressed dehydrated material, an improvised one which increases in size and compresses blood vessels when rehydrated with normal saline. As Polyvinyl acetate sponge is smooth and spongy, it causes less pain and abrasion while in-situ and removal. This was a prospective comparative study done in tertiary hospital of Nepal. Patients were subjected to either polyvinyl acetate sponge or ribbon gauge nasal pack following nasal surgery. Comparisons were made in terms of pain score, maintenance of hemostasis and wound healing. There were 154 patients in the study with 104 males and 50 females. The pain score when nasal pack was in-situ was similar in both groups whereas it was lesser in the polyvinyl acetate group on its removal. However, bleeding and adhesion were found to be similar. Crust formation was less in polyvinyl acetate group. Six synaechia were noted in ribbon gauge group only. Pain was significantly less during removal of polyvinyl acetate pack.

KEYWORDS

bleeding, nasal packing, nasal pain, polyvinyl acetate, ribbon gauze

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INTRODUCTION

Nasal occlusive dressings are used following nasal surgery to arrest hemorrhage, prevent septal hematoma and to prevent postoperative adhesion and synaechia formation by medialising the middle turbinate and apposing the septal flap.[1,2] An ideal dressing should be easy to insert and remove without causing discomfort. Patient often complains that the removal of nasal packs after nasal surgery is the worst part of their surgical experience.[3,4] This has led to the search for a better pack from removable nasal pack, absorbable nasal pack to no packing at all. Despite the new improvised materials like hydroxylated polyvinyl acetate (PVA) sponge and various balloon tamponade devices, use of Vaseline or antibiotic-soaked ribbon gauze (RG) is still in practice. A foam polymer of hydroxylated polyvinyl acetate is supposed to be less abrasive and hence associated with lesser pain than medicated ribbon gauze. The aim of this study was to compare PVA and RG nasal packs in terms of discomfort, hemostasis and its usefulness in preventing complications.

MATERIALS AND METHODS

This study was a prospective and comparative study. Ethical clearance was taken from Institutional Review Committee (IRC) of Nepal Medical College Teaching Hospital. Sample size was calculated to be 154. The same number of sample was considered for the study.[5] Informed and verbal consent was taken from the patient before enrollment into the study. Sample was randomized by computer generated number in the beginning of the study which was allocated to the patient at the end of the surgery and the nose was packed accordingly. The pain score was recorded on the first postoperative day and at the time of pack removal on second post-operative day. The Numerical Rating Scale (NRS) was used as a tool to measure pain where patient was asked to rate from 1 to 10; '1' being no pain and '10', the worst pain. Comparisons were made with Mann-Whitney rank U test for the pain scale. Secondary outcomes like hemostasis with pack in-situ and on removal, post-surgical crusts and synaechia formation were compared using the chi-square test. Nasal endoscopy was done on 3rd post-operative day(POD) to compare the crust formation and again on 3rd and 6th post-operative weeks to compare synaechia formation between the two groups.

RESULTS

There were 154 patients in total, 77 in ribbon gauge and 77 in polyvinyl acetate group. The mean age of the study population was 31.27 years; ranging from 9 to 78 years. Characteristics of two groups were shown in Table-1.

The pain score was compared using Mann Whitney Rank U test. The pain score on 1st day in both groups was not significant using independent sample median test (p= 0.254) as well as independent sample Mann-Whitney U test (p = 0.327). However, the pain score on removal was statistically significant which showed less pain with polyvinyl acetate (Independent sample median test p=0.002 and independent sample Mann-Whitney U-test p =0.014). (Table-2 and Fig. A and B)

Table-1: Characteristics of two groups

	Group PVA	Group RG	P value
Age (mean yrs +/- SD)	32.71 +/- 14.353	29.83 +/- 15.84	0.239
Gender	Male 47	Male 57	0.085
	Female 30	Female 20	
Diagnosis (most common)	DNS 26	DNS 30	0.278
	Sinonasal polyposis 16	Sinonasal polyposis 16	
Surgery (most common)	Septoplasty 22	Septoplasty 32	0.096
	FESS 27	FESS 29	

PVA-Polyvinyl acetate, RG-Ribbon Gauge, DNS-Deviated Nasal Septum, FESS-Functional Endoscopic Sinus Surgery

Table-2: Comparison of Pain score between PVA and RG group

Pain Score on	Group	Mean+/-SD	Median	Minimum	Maximum	P value*
1ST POD	RG	3.13+/-1.80	2	1	8	0.327
	PVA	2.97 +/-2.09	2	1	10	
On removal	RG	5.03+/-2.63	6	1	10	0.014
	PVA	3.99+/-2.02	4	1	8	

PVA-Polyvinyl acetate, RG-Ribbon Gauge, POD-Post-operative Day, *Mann-Whitney U test

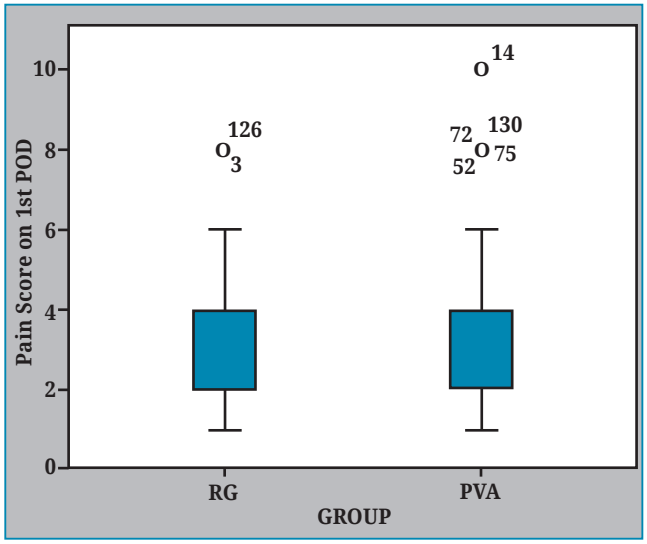

Fig. 1: Pain score on 1st Post-operative Day (POD); RG: Ribbon Gauge, PVA: Polyvinyl acetate

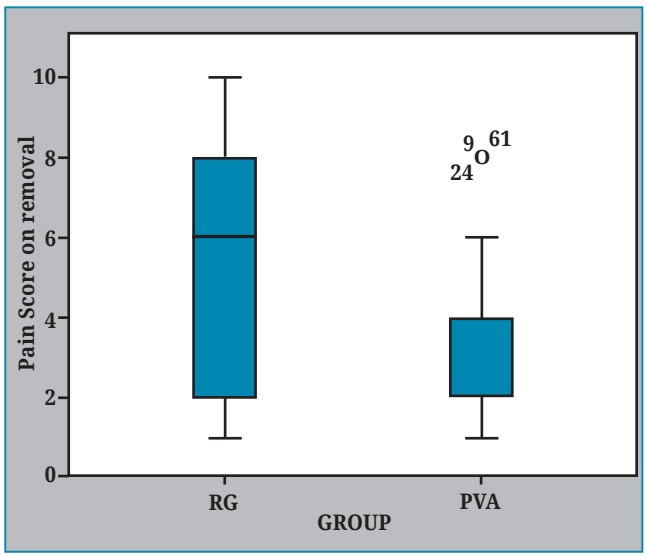

Fig. 2: Pain score on pack removal; RG: Ribbon Gauge, PVA: Polyvinyl acetate

Secondary outcomes between two groups were similar in terms of nasal bleeding when in-situ, with chi square value of 2.567, difference 4 and 2-sided asymptomatic significance p value of 0.633. Similar result was obtained when bleeding was compared between the groups on pack removal (chi square= 1.785, df =3, p value = 0.618)

Endoscopic evaluation showed less crust formation on 3rd post-operative day in PVA group (p value=0.054) but was satistically insignificant. However, adhesion was indifferent between two groups (p value = 0.262). Six synaechia were observed in ribbon gauge group. Septal hematoma was observed in 2 cases in each group.

DISCUSSION

Nasal occlusive dressing is considered as a vital tool to control nasal bleeding. It confers stability to nasal framework. It serves to prevent septal hematoma and synaechia formation following any endonasal surgery. However, the nasal pack can cause pain and discomfort to the patients while in–situ and on removal. There can be post-operative incidences of re-bleeding, and crusts and synaechia formations. Incidence of such consequences varies between the uses of different nasal packs. Therefore, various nasal packs have been studied to improve the experience by the patients and to control hemostasis and to prevent crusts and synaechia formation.

Packing materials with pore sizes greater than 50um, in principle, carry the risk of ingrowth of granulation tissue. The smaller the pore, the less likely new skin on a healing wound will migrate into the foam.[2] Gauge and uncoated large pore foam packing materials do not meet this requirement. The mesh structure present in ribbon gauge has propensity of tissue ingrowth during wound healing which causes pain and bleeding on removal.[3,4,6-9] In spite of this, medicated ribbon gauge is regularly used following endonasal surgery in our practice because it is easily available and cost effective in our part of the world.

Our study has found out that the pain score between the two groups with packs in-situ were not significant. This was similar to the study done by Garth *et al.*[6] However, the pain score in-situ was more with RG group in the study done by Joshi *et al.*[10]

On pack removal, the pain score was significantly less in PVA group in our study which was similar to the study done by Joshi *et al.*[10] However, it was more in other studies.[6,11-14]

This study showed no difference in control of bleeding between the two packs while the pack was in-situ which was similar to other studies.[6,10,15,16] However, Dutta *et al* have found out that bleeding episodes was more common with polyvinyl acetate than with ribbon gauge in-situ.[17]

Though our study found no difference in bleeding on pack removal, some studies have reported brisk bleeding with PVA during removal.[6,10] Dutta *et al*, however, have stated that bleeding on pack removal was rather associated with RG pack.[17]

When wound healing was compared between the packs, crust formation was statistically non significant but slightly higher in RG pack in our study. Similarly, adhesion and synaechia formation were seen more frequently in RG. Some other studies comparing RG and PVA packs with different other packs have concluded that there was no significant difference in any of these parameters in terms of wound healing.[16,18-22] Dutta *et al* have found more synaechia formation with RG pack in his study.[17] Sirimanna *et al* have showed that the overall complications were less with RG pack.[23]

This study has showed that PVA pack is better than RG pack in terms of pain score on its removal.

Nasal bleeding was similar in two groups. Although statistically insignificant crust and synaechia formation was more with ribbon gauge group. Therefore, polyvinyl acetate packs can be preferred following nasal surgeries.

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