Modified Technique of Anterior Nasal Packing: A Comparative Study Report

Sirshak Dutta · Ankur Mukherjee · Jayanta Saha ·
Goutam Biswas · Dibakar Haldar · Indranil Sen ·
Ramanuj Sinha

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Abstract Anterior nasal packing, which is a common procedure in otorhinolaryngology practice, has different complications. Pain during introduction and removal of pack, bleeding after removal due to mucosal damage and synechia formation are common among them. A continuous effort is going on worldwide to combat those by modifying the nature of pack material or inventing new materials for nasal packing. In the present study an effort was made to compare a new

modification of conventional gauze pack by using aluminum foil prepared from the cover of suture materials as septal splint (to reduce the mucosal damage) with conventional gauze pack and another costly material, nasal tampon (merocel). Comparisons were done in terms of cost, efficacy and complications. Prospective hospital based interventional study. Patients were distributed into three groups according to the material used for anterior nasal packing. Comparisons were made in terms of cost of the material used, pain during introduction of pack, rise of systolic blood pressure, incidences of bleeding while pack in situ, incidences of bleeding after removal of pack that required repacking and incidences of synechia formation after pack removal. The episodes of bleeding while pack in situ, within first 48 h and forced for repacking was observed to be significantly more prevalent among nasal tampon groups (12.5%) of patients but only 2.1 and 2.4% with use of conventional gauze pack and our modification respectively. Regarding bleeding after removal of pack, 10.6% patients experienced bleeding with conventional gauze pack, whereas with our modification it was only 2.4%. Synechia formation was found to be highest among the cases with conventional gauze pack (14.9%), but with our modification it is only 2.4%. In this study it is found that use of aluminum foil prepared from the cover of suture materials can be very useful and cost effective method to reduce some of the complications of anterior nasal packing.

S. Dutta (✉)

Department of Otolaryngology, R.G. Kar Medical College & Hospital, 3/1, Bose Para Lane, Baidyabati, Hooghly,
712222 Kolkata, West Bengal, India
e-mail: sirshakdutta@rediffmail.com

A. Mukherjee

Department of Otolaryngology, R.G. Kar Medical College & Hospital, Room No. 07, K.B Hostel; 1, Khudiram Bose Sarani,
Kolkata 700004, India

J. Saha

Department of Otolaryngology, R.G. Kar Medical College & Hospital, Fl. No. 2D, Block 2, Shraichi Village, Jessore Road,
Kolkata 700129, India

G. Biswas

Department of Otolaryngology, R.G. Kar Medical College & Hospital, B 24/3, Kalindi Estate, Kolkata 700089, India

D. Haldar

Department of Community Medicine, R.G. Kar Medical College & Hospital, Ananda-pally, Baruipur, Kolkata 700144, India

I. Sen

Department of Otolaryngology, R.G. Kar Medical College & Hospital, 55/2, Desbandhu Road (East), Kolkata 700035, India

R. Sinha

Department of Otolaryngology, R.G. Kar Medical College & Hospital, 4A, 2/1, Purbachal, Salt Lake, Kolkata 700091, India

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Introduction

Epistaxis is extremely common in otorhinolaryngology practice all over the world. It is written in medical literature

dating back to early times. Hippocrates (fifth century BC) was probably the first to appreciate that pressure on the alae nasi was an effective method to control nasal bleeding [1]. 7–14% of adults have epistaxis at some time or other [2]. Anterior nasal space (ANS) packing is a frequently performed procedure by the otorhinolaryngologist. This procedure has an important role in the management of epistaxis especially when the conservative measures like digital pressure, ice compression or the primary cautery to the bleeding vessels fails. ANS packing is also commonly performed after a variety of septal or other nasal surgeries to control post-operative bleeding. Though some study raised the question of effectiveness of post septal surgery ANS packing over no packing and even advocated for the later [3–5]. There are a variety of materials used for nasal packing, starting from conventional gauze pack (lubricated with paraffin or antiseptic cream) and bismuth iodoform paraffin paste pack. These methods are quite painful, so some less painful alternatives like nasal tampon (i.e. Merocel); Telfa [6, 7] etc. came into use. A highly absorbent and gel forming material—calcium alginate was used by some surgeons as a less painful and better haemostatic alternative than conventional materials. [8, 9] Some absorbable materials like oxycel or surgicel were also used mainly to reduce the pain and apprehension of pack removal [10]. With a view to obtain a picture related to some aspects of two commonly used materials for nasal packing and a modification of conventional procedure, the present study was contemplated.

Objectives

- (1) To find out per-operative and immediate post-operative complications of two commonly used materials for anterior nasal packing in epistaxis/septal surgery
- (2) To assess delayed post-procedure complications of those methods
- (3) To evaluate a new modification of conventional packing in terms of effectiveness and different complications in comparison to those two materials

Materials and Methods

A prospective observational study was conducted from January 2008 to June 2010 in a tertiary care teaching center of eastern India, which included 240 consecutive patients (168 males, 72 females), who needed anterior nasal packing (132 for epistaxis, and 108 as a post-operative measure after septal surgery). The permission from the institutional ethical committee was taken for the study. All the patients

and their close relatives were explained about the different procedure of the nasal packing using different materials, probable pain during the procedure, discomfort and cost of therapy and possible complications. Material for nasal packing for a particular patient was chosen according to the patients' choice. Three methods were included for the ANS packing, nasal tampon-merocel (Group A), gauze pack lubricated by sisomycin ointment (Group B) and the same gauze pack used with a splint made up of sterilized aluminum foil sheet prepared from the cover of the suture materials used over the septum (Group C) carefully using the paper-covered surface of the foil to remain in contact with the mucosa to eliminate any systemic absorption of aluminum. In all the patients given ANS packs for epistaxis were sprayed with 10% lignocaine spray in the nasal cavity before the procedure, and all the post operative cases were under local anesthesia during the procedure. Cases of septal surgeries done under general anesthesia were excluded from the study. All the patients were admitted for 7 days, and given intravenous antibiotics (amoxycillin + clavulenic acid) for 2 days followed by the same antibiotic orally for another 5 days. Routine hematological investigations were done. Packs were removed after 48 h in all the cases. Diagnostic nasal endoscopy was performed after 48 h of pack removal, 1 day prior to discharge and after 3 weeks to investigate to the cause of bleeding and to identify any synechia formation. The cases with bleeding disorder, sinonasal mass and traumatic epistaxis were excluded from the study. Any other nasal surgeries apart from the septoplasty or submucous resection of septum (SMR) were also not included. Following parameters were compared among the cases. (i) Pain perception during the procedure (measured by Behavioral Observational Pain Rating Scale), (ii) change of the systolic blood pressure (measured prior to, just after and after 1 hour of the procedure), (iii) bleeding during 1st 48 h that required repacking, (iv) need for repacking after pack removal on 2nd day, and v) development of nasal synechia (2 or more in number) within first week of packing. Statistical techniques like simple proportion, ANOVA, χ^2 , relative risk (RR), 95% confidence interval (CI) etc. were used during data analysis. SPSS 17 and Epi info 3.4.3 version (CDC, Atlanta, retrieved from WHO website, on 01.11.09) were used for this purpose.

Results

Among the 240 patients, 70% (168) were male and 30% (72) were female (M: F = 2.33:1). Costing of nasal tampon packing (Group A) is about Rs. 750/- (16.65 USD), in case of gauze pack it is only Rs. 30/- (0.67 USD). Use of septal splint with aluminum foil sheet has no extra cost over

conventional gauze pack as the aluminum sheets were collected from the covers of used suture materials.

In 26.7% (64) patients nasal tampon was used (30 for epistaxis and 34 for post operative pack). 39.2% (94) patients was treated with conventional gauze pack with sisomycin cream (60 for epistaxis and 34 for post operative pack) Rest 34.2% (82) patients were treated with the gauze pack with splint as described earlier (42 for epistaxis and 40 for post operative pack) [Table 1].

The ‘Behavioral Observational Pain Rating Scale’ measured perception of pain during the procedure of packing. 56 out of 60 patients (93.33%) with gauze packing for epistaxis experienced severe pain (score 8–10), 36 out of 42 (85.71%) experienced severe pain when aluminum foil splints were used. When nasal tampon were used only 4 patients out of 30 (13.33%) felt severe pain. This difference was statistically significant. But when packing was undertaken under infiltration of anesthesia during septal surgery, pain perceptions were much less in all the groups. With gauze pack 22 patients out of 34 (64.70%) experienced moderate pain, in 6 patients

(17.65%) pain was mild and another 6 patients felt severe pain. With addition of septal splint 10 out of 40 patients (25%) felt mild pain, 28 patients (70%) had moderate and 2 patients (5%) experienced severe pain. Nasal tampon packing was almost a painless method in post operative group as 30 out of 34 patients (88.23%) felt only mild pain (Table 2).

The rise of systolic blood pressure was taken as the indicator of systemic stress during ANS packing. Blood pressure was recorded before the procedure, after 5 min of nasal packing and after 1 h. It was observed that with conventional pack and with foil splint there were significant rise of blood pressure recorded after 5 min, 15.79 and 14.93 mm-Hg on average, respectively. With nasal tampon pack it was only 6.56 mm-Hg. Significantly low rise of blood pressure in nasal tampon group with septal surgery was also evident. But after 1 h, blood pressure returned to almost pre packing value in all the groups (Table 3).

The episodes of bleeding while pack in situ, within first 48 h and forced for repacking was observed to be significantly more prevalent among nasal tampon groups (group

Table 1 Material used for packing ($N = 240$)

Pack material used	Epistaxis ($N_1 = 132$), no. (%)	Post septal surgery ($N_2 = 108$), no. (%)	Total ($N = 240$), no. (%)
Merocel (group A)	30 (22.72)	34 (31.48)	64 (26.67)
Gauge pack with sisomycin cream (group B)	60 (45.45)	34 (31.48)	94 (39.17)
Gauge pack with sisomycin cream with septal splint (group C)	42 (31.81)	40 (37.03)	82 (34.16)
Total	132 (100.0)	108 (100.0)	240 (100.0)

Table 2 Pain during packing (quantified by Behavioral Observational Pain Rating Scale) [$N = 240$]

Grade of pain (score)	Epistaxis group ($N_1 = 132$)			χ^2 as derived from Kruskal–Wallis test	Post septal surgery group ($N_2 = 108$)			χ^2 as derived from Kruskal–Wallis test
	Group A	Group B	Group C		Group A	Group B	Group C	
Mild pain (0–3)	4 (13.33%)	0	0	70.835, $df = 2$, $P = 0.000$	30 (88.23%)	6 (17.65%)	10 (25%)	41.377, $df = 2$, $P = 0.000$
Moderate pain (4–7)	22 (73.33%)	4 (6.67%)	6 (14.29%)		4 (11.77%)	22 (64.70%)	28 (70%)	
Severe pain (8–10)	4 (13.33%)	56 (93.33%)	36 (85.71%)		0	6 (17.65%)	2 (5%)	
Total	30 (100.0)	60 (100.0)	42 (100.0)		34 (100.0)	34 (100.0)	40 (100.0)	

Table 3 Mean rise in systolic blood pressure in mm-Hg ($N = 240$)

Interval (in minutes) after packing	Epistaxis group ($N_1 = 132$)				Post septal surgery group ($N_2 = 108$)			
	Group A ($n = 30$)	Group B ($n = 60$)	Group C ($n = 42$)	F (ANOVA), df , P	Group A ($n = 34$)	Group B ($n = 34$)	Group C ($n = 40$)	F (ANOVA), df , P
5	6.56	15.79	14.93	144.235, 2, 0.000	5.29	12.06	11.64	84.999, 2, 0.000
60	2.26	4.23	4.02	3.893, 2, 0.25	2.05	4.95	4.17	15.269, 2, 0.000

Table 4 No. of patients experienced bleeding within first 48 h and required repacking ($N = 240$)

Treatment group	Bleeding +ve, no. (%)	Bleeding -ve, no. (%)	χ^2 , df , P	RR (95% CI)
A	8 (12.5)	56 (87.5)	10.33, 1,	5.50,
B + C	4 (2.3)	172 (98.7)	0.0013054	1.71–17.64
B	2 (2.1)	92 (97.9)	Fisher exact-	0.87,
C	2 (2.4)	80 (97.6)	1.0000000	0.13–6.06

RR Relative risk, CI confidence interval, df degree of freedom

Table 5 No. of patients experienced bleeding after pack removal and required re-packing ($N = 240$)

Treatment group	Bleeding +ve, no. (%)	Bleeding -ve, no. (%)	χ^2 , df , P	RR, 95% CI
A	2 (3.1)	62 (96.9)	Fisher exact-	0.46,
B + C	12 (6.8)	164 (93.2)	0.3642774	0.11–1.99
B	10 (10.6)	84 (89.4)	4.63, 1,	4.36,
C	2 (2.4)	80 (97.6)	0.0313397	0.98–19.33

A) of patients but as such no difference could be revealed between groups B and C about this fact (Table 4).

Regarding experience of bleeding after removal of pack, no difference could be observed between nasal tampon and gauze packing with or without splint (Table 5). Whereas group B category of treatment showed significantly higher rate of bleeding compared to C type of treatment (Table 5).

Synechia formation was found not to be lower among the group A patients; however, comparison between other two groups showed that the event was revealed to be more common among the subjects who belonged to group B in comparison to group C and the difference was statistically significant (Table 6).

Discussion

Anterior nasal packing is one of the most commonly performed procedures by ENT surgeons worldwide. Different packing materials are used for this purpose, which include

conventional lubricated gauze pack, nasal tampon or some absorbable materials. Intranasal packing is used to prevent nasal hemorrhage, to prevent septal hematoma and to reduce complications after nasal surgeries [11]. Present study compare the three methods of nasal packing in terms of cost of therapy, pain produced during introduction of nasal pack, rise of systolic blood pressure due to the procedure, effectiveness in term of bleeding with pack in situ and complications in terms of bleeding after pack removal and synechia formation. One of the three methods used in this study is a simple modification of conventional gauze pack. We used the aluminum foil, taken from the cover of surgical suture materials, and used it as a cover over the nasal septal mucosa, to protect the septal mucosa from injury commonly occurred during introduction of gauze pack. We used the paper covered side of those foils to be in contact with the septal mucosa to avoid the contact of aluminum with the mucosa. Nasal tampon is too expensive for most of the socio-economically compromised patients of our country. Moreover, apart from the benefit of low pain nasal tampon was found to have more bleeding with pack in situ, among the patients packed with this costly material, needed repacking and it failed to give additional benefits of less/no bleeding and synechia formation after removal of the pack finally. Gauze pack is quite affordable and our modification adds no extra cost to the conventional gauze pack. Pain is the major limiting factor for use of conventional pack even after addition of the septal splint. Ufuk Aydin et al. had reported the use of urinary lubricant anesthetic gel comprised of lidocaine and chlorhexidine for nasal packing [12]. In the present study 10% lignocaine spray was used before introduction of nasal pack in all of the cases of epistaxis. But it did not prove to be very effective during packing with conventional method. But in cases where nasal tampon were used, majority of the patients felt moderate pain after use of the spray. In cases of nasal packing after surgery pain did not emerge as a considerable factor as very few patients felt severe pain in that category. The reason behind this fact was the influence of local anesthetic injection given before the surgery. In addition, only gauze packing was shown to yield more events of bleeding and synechia formation after removal of the pack finally in comparison to the addition of aluminum

Table 6 Incidence of synechia formation (2 or more in number) [$N = 240$]

Treatment group	Synaechia +ve, no. (%)	Synaechia -ve, no. (%)	χ^2 , df , p	RR, 95% CI
A	4 (6.3)	60 (93.7)	0.50, 1, 0.4813214	0.69, 0.24–1.98
B + C	16 (9.1)	160 (90.9)		
B	14 (14.9)	80 (85.1)	8.22, 1, 0.0041430	6.11, 1.43–26.08
C	2 (2.4)	80 (97.6)		

foil as the septal splint (Tables 5 and 6). As in post surgical cases there is very less chance of pain in both gauze packing with aluminum foil and in nasal tampon, the first one shows almost same rate of complication in comparison to nasal tampon without any extra added cost and can be a better alternative in post surgical cases.

Conclusions

Nasal tampon, which is much costlier than conventional gauze pack, has advantages over the later in respect to less pain, less rise in systolic blood pressure (immediately after packing) and low incidences of synechia formation. But it is less effective in controlling severe epistaxis. Addition of aluminum foil as septal splint with the conventional gauze pack can also reduce the incidences of synechia formation and it is quite effective in controlling severe epistaxis, though the pain during the procedure and blood pressure rise cannot be reduced with this modification. Moreover, it is very effective in reducing the mucosal damage and as a result incidences of re-bleeding after pack removal when compared with conventional gauze pack. So mere addition of aluminum foil as septal splint can reduce some complications of conventional gauze pack without adding any extra cost and can be a very cost-effective alternative to much costlier nasal tampon for those people for whom the cost of treatment really matters.

Conflict of Interest The authors declare presence of no conflict of interest.

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