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A Comparison of Conventional Nasal Pack with Merocel Nasal Pack in the Management of Epistaxis

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Abstract
Nasal bleeding is extremely common and affects all age group.5 to 10% of population experiences every year. Most of the epistaxis ceases spontaneously and only a few would require nasal packing. Nasal Packs had been used routinely for refractory epistaxis. Conventional gauze pack and Merocel nasal pack are the common pack used in refractory anterior epistaxis.
Aim: *To study the effectiveness of conventional nasal pack with merocel nasal pack in terms of discomfort experienced by the patient during pack insertion and pack removal, blood pressure changes, need for repacking after removal of pack and nasal mucosal injury.*
Methods: *Study is based on analysis of 32 patients who had severe epistaxis which was refractory to digital pressure and medical management in the period from October 2017 to October 2019 at Rajah Muthiah Medical College, Chidambaram.32 patients were divided into group A and group B containing 16 patients in each group. Group A was packed with conventional gauze pack soaked in Vaseline or Bismuth Iodoform Paraffin Paste. Group B was packed with Merocel Nasal Tampon pack.*
Results: *The mean discomfort score during pack insertion using visual analog score was higher 7.1 with group A than 3.5 with group B. Similarly, the mean discomfort score during pack removal was more with conventional nasal gauze (3.75) than merocel nasal pack (1.25). Blood Pressure was found to be increased after pack insertion with 12 mmhg in group A and 4mm Hg in group B. However, it was not statistically significant. Incidence of repacking was more with merocel pack. 1 patient required repacking in conventional nasal pack and three patient with merocel pack. The mean mucosal scoring was more with conventional nasal pack than merocel which was statistically significant on day 1. There was no significant mucosal injury between 2 group on day 7 and 14.*
Conclusion: *Merocel nasal pack is a favourable technique in view of ease of insertion, lesser insertion time and short learning curve. However, Conventional nasal pack is the time tested technique with less incidence of repacking, hence more acceptable to the patient.*
Keywords: *Conventional gauze pack, Merocal Nasal Tampon pack, Epistaxis.*

Introduction

Epistaxis (Greek for nosebleed) is a problem, which has been a part of the human experience from earliest times. Epistaxis is extremely common and affects all age groups. 5 to 10 % of the population experiences an episode of epistaxis

each year. 10 % of those will see a physician. 1 % of those seeking medical care will need aspecialist. Most nosebleeds stop without treatment or with no more than the treatment administered by the patient, who may compress his nose or hold his head over a basin until bleeding ceases.[1]

Nasal packs have been used routinely used for refractory epistaxis. Classic anterior packing is performed with Vaseline impregnated narrow gauze placed in nose until sufficient pressure exists to tamponade the bleeding. As the discomfort at the removal of the pack is maximum at removal, nasal packing is avoided whenever it is possible. This has led to search for a better nasal pack.[2,3]

Our purpose in this study is to offer a comparative evaluation of effectiveness with conventional nasal pack and merocel nasal pack

Materials and Methods

Interventional study of anterior nasal packing done at Rajah Muthiah Medical College & Hospital, Chidambaram. Study was conducted among patients who had refractory epistaxis and underwent anterior nasal packing during the period from October 2017 to October 2019.

Inclusion Criteria

1) Patients of any age
2) Both sexes
3) Anterior epistaxis not controlled by digital pressure

Exclusion Criteria

1) Posterior Epistaxis
2) Post Operative nasal surgery patients

Method of Study

After obtaining the clearance from ethical committee, study was started in Rajah Muthiah Medical College and Hospital. 32 cases of anterior epistaxis refractory to digital pressure were enrolled and were randomly divided into two groups with 16 patient in group A (Conventional nasal Pack) and 16 Patient in group B (Merocel Nasal pack). Blood pressure was placed before placing the pack. In Group B, 16 patients were taken for study, in which nasal tampons (Merocel) was used. Merocel is a non-absorbable pack made from polymer of hydroxylated polyvinyl acetal. Discomfort experienced by the patient during pack insertion was assessed using visual analog scale (Annexure I). Blood pressure was measured 5 minutes after nasal pack insertion. The pack was left in situ for 48hours.

During pack removal, the discomfort felt by the patient, was reassessed using visual analog scale (Annexure I). On removal of pack after 48 hours in both group A and B, incidence of repacking was observed. The nasal mucosal changes like mucosal congestion, edema, crusting and synechia formation was analyzed using Diagnostic Nasal Endoscopy on 1st day, 7th day and 14th day following pack removal. Mucosal Scoring using Diagnostic Nasal Endoscopy is assessed as below: Mucosal Congestion & Edema:0- No congestion and edema, 1- Mild Congestion and edema, 2- Severe Congestion with gross edema. Crusting: 0 – No crusting,1 – Mild crusting, 2- Gross crusting. Synechiae Formation: 0- No adhesion,1- Adhesion Band, 2- Closed Cavity.[4]

Observations and Results

Table 1: Gender distribution

Gender	Group A	Group B	%
Female	4	1	15.65
Male	12	15	84.375
Total	16	16	32

Our study showed male predominance in both groups with 75% in group A and 93% in group B. Overall 84% of male predominance was seen.

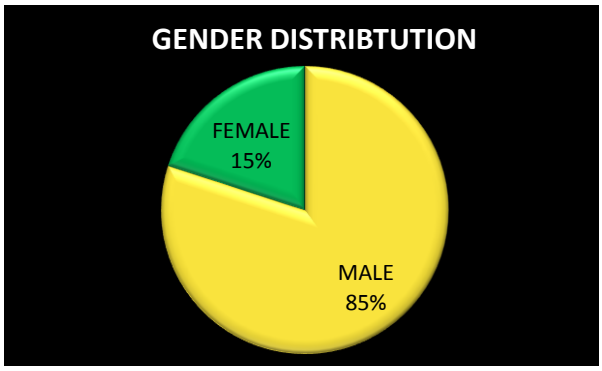


Table 2: Age Group distribution

Age in Year	Group A	Group B
0-10	0	0
11-20	0	1
21-30	5	1
31-40	1	3
41-50	6	6
51-60	4	5
Mean	42.87	44.68

In Our study, the majority of our patients belonged to age group 41-50 years (37.5%).The mean age was 42.8 in group A and 44.6 in Group B.

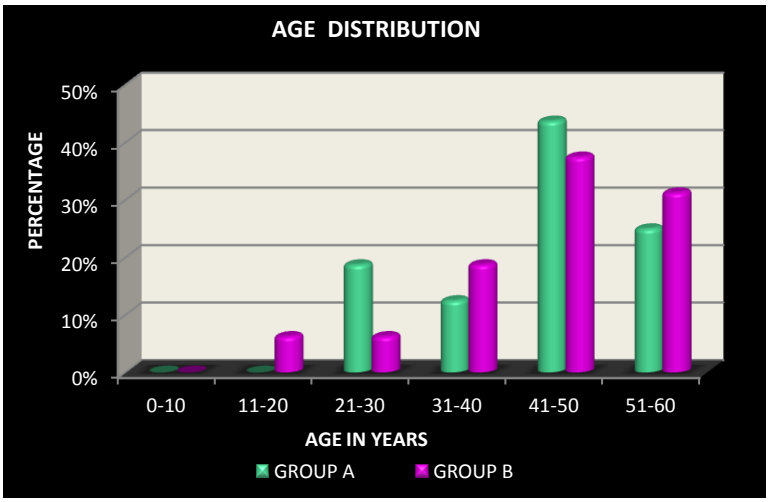


Table 3: Etiology distribution

Etiology	Group A	Group B	Total	%
Trauma	7	5	12	37.5
DNS	2	0	2	6.25
Hypertension	5	9	15	46.88
Acute rhinosinusitis	1	1	2	6.25
Bleeding diasthesis	0	1	1	3.125
Total	16	16	32	100%

In our study, the most common cause of epistaxis was hypertension (46.875%) followed by trauma (37.5%).

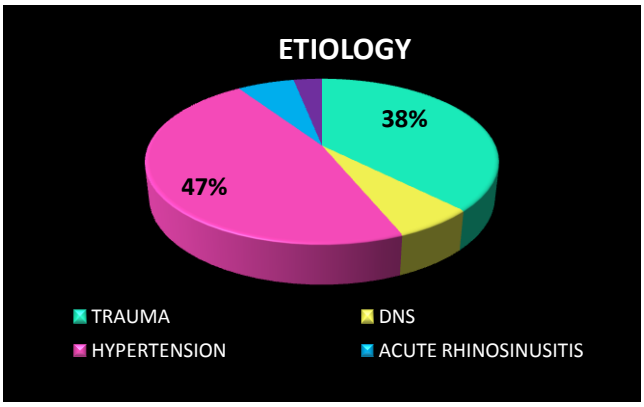


Table 4: Discomfort Score during pack insertion

Group	N	Mean	SD	P Value
A	16	7.1875	1.0468	**0.002**
B	16	3.5625	1.0935	

The discomfort Score during pack insertion in group A and group B was 7.18 and 3.5 respectively. These result shows a statistically significance difference (P =0.002).

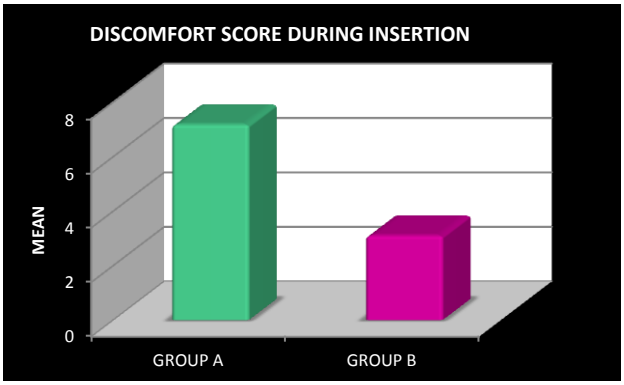


Table 5: Discomfort Score during Pack removal

Group	N	Mean	SD	P Value
A	16	3.75	1.06	**0.000**
B	16	1.25	0.09	

The discomfort score during pack removal in group A and group B was 3.75 and 1.25 respectively. The result showed statistically significance of p value 0.00 between both group.

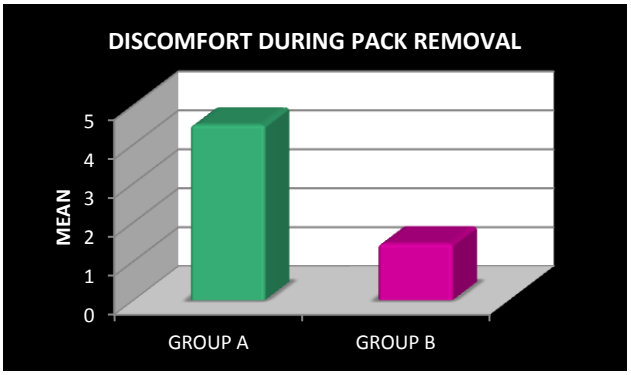


Table 6: Blood Pressure changes

	Group	Pre insertion	Post insertion	P Value
Systolic Bp Mean	A	140	152.25	0.065
	B	161.8	165	0.081
Diastolic Bp Mean	A	86.87	96.87	0.083
	B	92.5	95.75	0.13

Rise of Blood pressure was seen in systolic blood pressure (11mmHg) and diastolic blood pressure (4mm Hg) with both conventional gauze pack and merocel nasal pack. However, the result was not statistically significant.

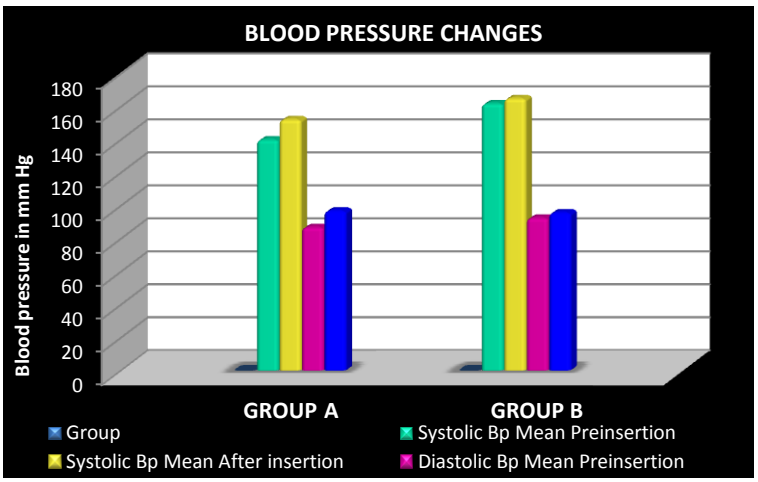


Table 7: Need for Repacking

Repacking	Group A		Group B		Total	
	N	%	N	%	N	%
Required	1	6.25	3	18.75	4	12.5
Not required	15	93.75	13	81.25	28	87.5

Incidence of bleeding was more following merocel nasal pack when compared to conventional nasal pack. Out of 16 patients, 1 patients required repacking in group A and 3 patient in group B.

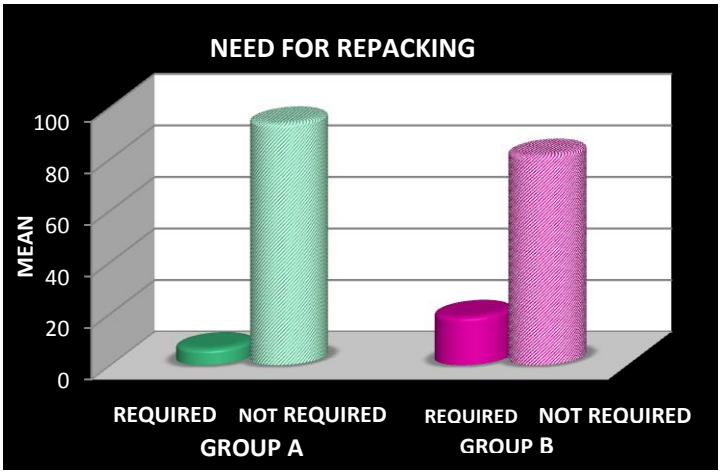
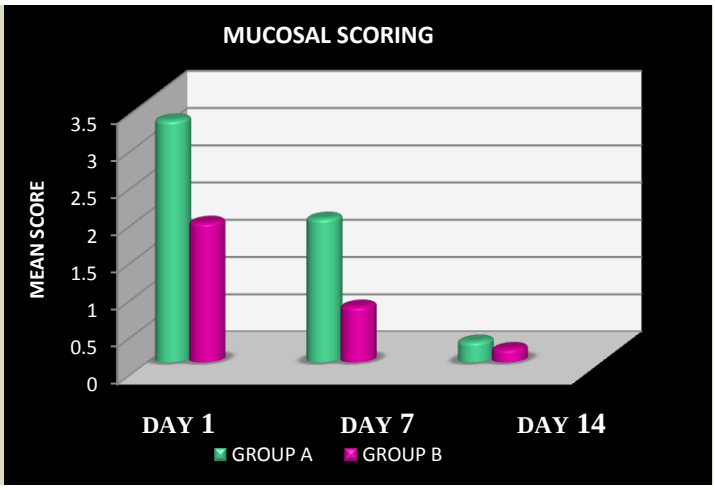


Table 8: Mucosal Scoring

Post pack removal	Group	N	Sum of score	Mean	P Value
Day 1	A	16	52	3.25	
	B	16	23	1.875	**0.02**
Day 7	A	16	30	1.93	
	B	16	15	0.75	**0.34**
Day 14	A	16	4	0.68	**1.00**
	B	16	1	0.18	

The mucosal injury was more with conventional gauze pack than merocel, was clinically and statistically significance on day 1, but showed no statistical significance between the two groups on day 7 and 14 post pack removal.



Discussion

Gender distribution

Table 9: Gender distribution in comparison with other studies

Study Series	Males %	Females %
Amusa et al	77	23
Varshney et al	58	42
Hussain et al	67.4	36.4
Present Study	84	16

In our present study of 32 patients, 84% were males and 16% female. Male predominance was seen in this study which is similar to above mentioned studies.

Age Distribution

Table 10: Age distribution in comparison with other studies

Studied series	1st decade	2nd decade	3rd decade	4th decade	5th decade
Jueslius et al (N=1724)	1.7%	2.4%	7.6%	34.6%	56.7%
Varshney et al (N=88)	4.5%	12.5%	10%	45.3%	27.7%
Amusa et al (N=106)	6.6%	6.6%	28.3%	23.1%	35.3%
Present study	0	3%	18%	12.5%	37.5%

The present study shows that epistaxis is more common in fifth decade (37.5%) which is comparable with above studies.

Etiology

Table 11: Etiology distribution in comparison with other studies

Study series	Trauma	Hypertension	Idiopathic
Sharma et al	16.4%	59.25%	2.4%
Ozgur A et al	25.4%	21.7%	16.9%
Vikram VJ et al	3.33%	5%	44.67%
Present Study	37.5%	46.88%	0

In our study, the most common cause of epistaxis was Hypertension (46.88%) followed by trauma (37.5%). Unlike above mentioned studies, we did not observe any epistaxis which was idiopathic in nature.

Discomfort Score during Pack insertion

Shivakumar.L et al (2014) compared conventional nasal pack and merocel nasal pack in the management of epistaxis. He divided 60 patients in two groups with 30 in group A (conventional nasal pack) and group B (merocel nasal pack). Results showed mean discomfort score during packing was 7.63 with conventional nasal pack and 5.53 with merocel nasal pack. The pain score during insertion was significantly less with merocel. While the pack insitu, there was no statistically significant difference in the discomfort cause by the packs. Both the packs were well tolerated although 60% of patients did complain of headache.[5]

In the study by ***Dutta, Mukherjee*** et al (2012), a total of 240 patients were taken for study to compare the modified anterior nasal packing. 132 patients were packed for epistaxis with merocel (N-30), gauze pack with sisomycin cream (N-60) and Gauze pack with sisomycin cream with septal splint (N-42). 22 patients of merocel pack had moderate pain, 92 patient of Gauze pack had severe pain. This difference was statistically significant.[6]

In the study by ***Mamta, Raman Wadhera*** et al (2017) who compared the effects of conventional nasal packing and packing with merocel and merocel with ventilation tube. 60 patients were divided into three groups: Group A underwent septoplasty with insertion of merocel packs with ventilation tube, Group B underwent septoplasty with insertion of merocel packs without ventilation tube and Group C underwent septoplasty with insertion of antibiotic soaked conventional nasal packs. Means pain score was significantly less in group A (0.3) as compared to Group B and C (0.7).[7]

In our present study, the mean score for discomfort during pack insertion was 7.1 with conventional gauze pack twice than that of merocel pack 3.5. This result showed statistical significance of P Value 0.002 which is similar to above mentioned studies.

Discomfort Score During pack removal

In the study by ***Mamta, Raman Wadhera*** et al (2017), Mean pain score was 3.75 for group A, 3.6 and 4.65 for group B and C respectively. There was statistical difference between three groups.[7]

In the study by ***Shivakumar .L*** et al (2014), The difference in discomfort on removal of packs were significant, ranging 6.17 with conventional nasal pack and 3.67 with merocel (P <0.001).[6]

In the study done by ***Sudhir M Naik*** et al (2014), the mean pain score was 4.85 and 4.65 for ribbon gauze and merocel respectively. Visual Analog Scores were significantly higher in ribbon gauze compared to tampon packs during the pack removal.

In present study, the mean discomfort score during pack removal was more for conventional pack 3.75 than merocel 1.25 with statistically difference (P value = 0.00) which is similar to above mentioned studies.

Blood Pressure Changes:

Nasal packing can cause systemic effects which may be due to poor sleep quality, respiratory difficulty, decreased oxygen saturation ,circulatory problems and toxic shock syndrome which can threaten life of a person. Bilateral nasal packing can lead to significant rise in systolic and diastolic blood pressure and a dip in blood oxygen saturation.

In the study by ***Dutta*** *and* ***Mukherjee*** et al (2012)., It was observed that with conventional pack and with foil splint there were significant rise of systolic blood pressure recorded after 5min, 15.79 and 14.93 mm Hg on average respectively. With nasal tampon, it was only 6.56 mm Hg.[6]

In present study, blood pressure was analyzed before pack insertion and after 5minutes with pack in situ. The Systolic blood pressure showed a significant rise of 12mm Hg after 5minutes of pack insertion in group A and 4 mm Hg in Group B. However, this was not statistically significant. There was difference of 10 mm hg diastolic blood pressure in group A and 3mm Hg in group B. The results were not statistically significant.

Need for Repacking

In the study by ***Mamta, Raman Wadhera*** et al (2017), 60 patients were taken for study60% patients in group A, 87.5% patients in group B and C had repacking. There were statistical significance between group A and Group B and C during pack removal.[7]

In the study done by ***Sudhir M Naik*** et al (2014), 136 patients were taken for study, out of 83 were packed for epistaxis. The incidence of repacking was more with gauze pack (13%) than merocel (0.8%).[8]

In the study by ***Shivakumar. L*** et al (2014), divided 60 patients in two groups with 30 in group A (conventional nasal pack) and group B (merocel nasal pack). In group A, 2 patients experienced bleeding. Among them one required repacking, which was done using merocel. In group B, 1 patient had bleeding which was mild in nature. There were no statistically significant difference in the repacking after pack removal between two groups.[5]

In the study by ***Dutta*** *and* ***Mukherjee*** et al (2012), episode of bleeding was more in group A (12.5%) and group B and C (2.3%) and was observed to be statistically significant.[6]

In present study, the need for repacking was observed. In group A, 1 patient had bleeding on pack removal and required repacking. In group B, 3 patients required repacking. 1 patient required posterior nasal pack as there was bleeding with pack insitu and 2 patients required repacking with conventional nasal gauze pack. However this was not statistically significant (P - 0.36). Incidence of bleeding was more with merocel which is similar to above mentioned studies.

Mucosal scoring

In the study by ***Dutta, Mukherjee*** et al (2012) , Mucosal injury was found to be lower with merocel (3.7) than Group B and C gauze pack (14.6). The results were statistically significant.[6]

In the study conducted ***Naiket. M*** et al who evaluated mucosal adhesions and crusting in patients packed with gauze pack and nasal tampon. The mean mucosal score was 12.6 in group A and 7.9 in group B. They concluded that there was no significant difference in mucosal injury between the two groups.[9]

In the study done by ***Sudhir M Naik*** et al (2014), 136 patients were taken for study, out of 83 were packed for epistaxis. Total crusting score at 2 weeks was 27.3 in ribbon pack and 13.1 in nasal tampon. Total Adhesion score was 14.2 at 2 weeks in ribbon gauze pack and 9.5 in nasal tampon pack. No statistical significance was seen between both group.[8]

In our study, we have analyzed the mucosa using the ***Valerie J.Lund MS, David W.Kennedy*** mucosal scoring system on day 1,7 and 14 after pack removal.[48.] The mucosal injuries were more with ribbon gauze packing than merocel which was clinically and statistically significant on day 1 after pack removal. There were no statistical significant difference in day 7 and day 14 after pack removal. There were more congestion and crusting on day one following pack removal with conventional gauze pack.[4]

Conclusion

Anterior nasal packing is the most common procedure done for refractory epistaxis. Merocel nasal pack produces significantly less discomfort during pack insertion and during removal. Both nasal pack did not cause siginificant blood pressure changes after insertion. Conventional

nasal pack and merocel pack are equally effective in controlling the bleeding. However incidence of bleeding was more with merocel. Merocel nasal Pack causes fewer nasal mucosal injury. Conventional nasal pack have good safety profile. And requires trained professionals for effective packing. On the other hand, Merocel pack is easy to insert and requires a short duration of time and even a beginner can do the procedure. Conventional Nasal pack is less expensive than merocel. Although, Conventional nasal pack is the time tested method for effective control of nasal bleeding, judicious choice has to be made between Conventional nasal pack and Merocel nasal pack by the treating doctor.

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