Comparison between Foley's catheter and ribbon gauze packs in posterior epistaxis

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Backgorund: Epistaxis is one of the commonest emergency conditions in Otorhinolaryngology. It is classified anatomically into anterior and posterior nasal bleeding. Different materials had been used to stop posterior nasal bleeding.

Aim of work: Comparison between Foley's catheter and ribbon gauze impregnated with antibiotic in nasal packing for posterior nasal bleeding.

Patients and Methods: A prospective study on one hundred patients presented to the emergency room with posterior nasal bleeding from July 2015 till December 2017. They were randomly classified on alternate patient basis into two equal groups where a Foley's catheter was used as a nasal pack in group (1) and a ribbon gauze was used in group (2). Pain during insertion of the pack, while the pack was in situ and during removal was compared between both groups using a visual analogue scale. Incidence of re bleeding after pack removal, the incidence of mucosal tears and synechia formation were compared between both groups.

Results: Pain showed a highly significant difference between both groups being less in Foley's catheter group. Re bleeding was more in the second group with a significant difference. Mucosal tears and synechia formation were less in the first group with a highly significant and significant difference respectively than in the second group.

Conclusion: Foley's catheter packing is advisable in controlling posterior epistaxis as it showed less pain levels, less re bleeding rates and less complication incidence.

Keywords: Epistaxis, Foley's catheter, visual analogue scale.

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Introduction

Epistaxis is the most common emergency in Otorhinolaryngology all over the world along with pharyngitis. [1] Approximately 7–14% of adults experience epistaxis at some certain point in their whole lives. [2] Although, most of epistaxis episodes resolve spontaneously yet, some cases need admission and further management. According to the site of epistaxis, Ear, nose and throat (ENT) doctors had classified this condition into anterior epistaxis (90%) and posterior epistaxis (6-10%) according to pyriform aperture. [3] Posterior nasal bleeding is most commonly arterial and presents with more difficulty in control and consequently aspiration and airway compromise. [4] Posterior epistaxis might need posterior nasal packing with different methods as ribbon gauze with antibiotic, nasal sponge tampons, double-balloon nasal catheters or anterior gauze pack with posterior Foley's catheter which is an available choice for posterior nasal packing. [3]

Selection of the type of posterior packing technique depends largely on effectivness, low rate of complications and, tolerability of patients who are basically from the older age group.

In this study, a comparison had been done between two of the most commonly used techniques to stop posterior nasal bleeding namely; ribbon gauze impregnated with antibiotic and Foley's catheter. We compared these two techniques regarding pain, efficacy, including rate of re bleeding after pack removal, mucosal tears and incidence of synechia formation.

Patients and Methods

This is a prospective study done on patients presented to the emergency room of Sultan Qaboos hospital, Salalah, Oman, with posterior nasal bleeding from July 2015 till December 2017. All patients with epistaxis where no anterior bleeding point had been seen or presented initially with posterior nasal bleeding had been included in the study, regardless the age group, after local hospital ethical committee approval and informed consent had been taken from patients.

Exclusion criteria:

1. Congenital bleeding disorders.
2. Extensive heart disease.
3. Refusal to be included in the study.
4. Anterior source of bleeding.

A total number of 100 patients with different ages and different causes of bleeding were included and randomly divided on alternate patient basis into two equal groups; group (1) included patients controlled by Foley's catheter as a posterior nasal pack with small bilateral anterior merocel packs and group (2) included patients controlled by ribbon gauze impregnated with antibiotic.

Latex made Foley's catheters of size 16 or 18 with topical anesthetic gel and filled with 20-30 cc of distilled water was used. They were kept in place using the umbilical cord clamp with a small gauze piece between the clamp and the

collumella to prevent collumellar damage. The ribbon gauze was inserted in layers in the nose after application of topical anesthetic gel and pushed tightly backwards tightly to control the bleeding.

The two groups were compared as regards age, gender. Pain during insertion of the pack, while the pack was in the nose, and during removal of the pack was compared between the two groups using a visual analogue scale (VAS) from 1-10 where one presented the least pain and ten presented the worst degree of pain as described by patients.

The rate of re bleeding after removal of the pack was compared between both groups. Mucosal tears and synechia formation over a time period of six weeks post pack removal were compared between the two groups.

Both types of packs were kept in situ for 72 hours. Insertion of both types was done in the minor operating theatre (OT) or the emergency room and removal was done in the ward or the minor OT according to suspicion of re bleeding demonstrated by presented amount of ooze while packs were in situ.

Statistical analysis

Qualitative data were presented as number and percentage. Quantitative data were presented as mean, standard deviation. Comparison between the two groups was done using chi square test for qualitative data and independent t test for quantitative data. Pearson test was used to assess the correlation between age and pain. Statistical significance was determined as $P < 0.05$ while a highly significant difference was calculated as $P< 0.001$ using SPSS, version 21 (SPSS Inc., Chicago, USA).

Results

This is a prospective study which had been done in 100 cases of posterior nasal epistaxis where no anterior bleeding source was identified and presented to the hospital emergency room from July 2015 till December 2017.

Patients were randomly divided into two groups wherein group (1), we used Foley's catheter as a posterior nasal pack to control bleeding, we used bilateral small merocel anterior pack for support of the catheter while in group (2) we used ribbon gauze impregnated with antibiotic to control epistaxis. Group (1) patients' mean age was 54.12±10 years old while group (2) patients' mean age was 49.64±8.3 years old. The mean age for all patients was 51.88±9.45. In group (1), 20 females (40%) and 30 males (60%) were included. In group (2), ten females (20%) and 40 males (80%) were included **(Fig. 1)**.

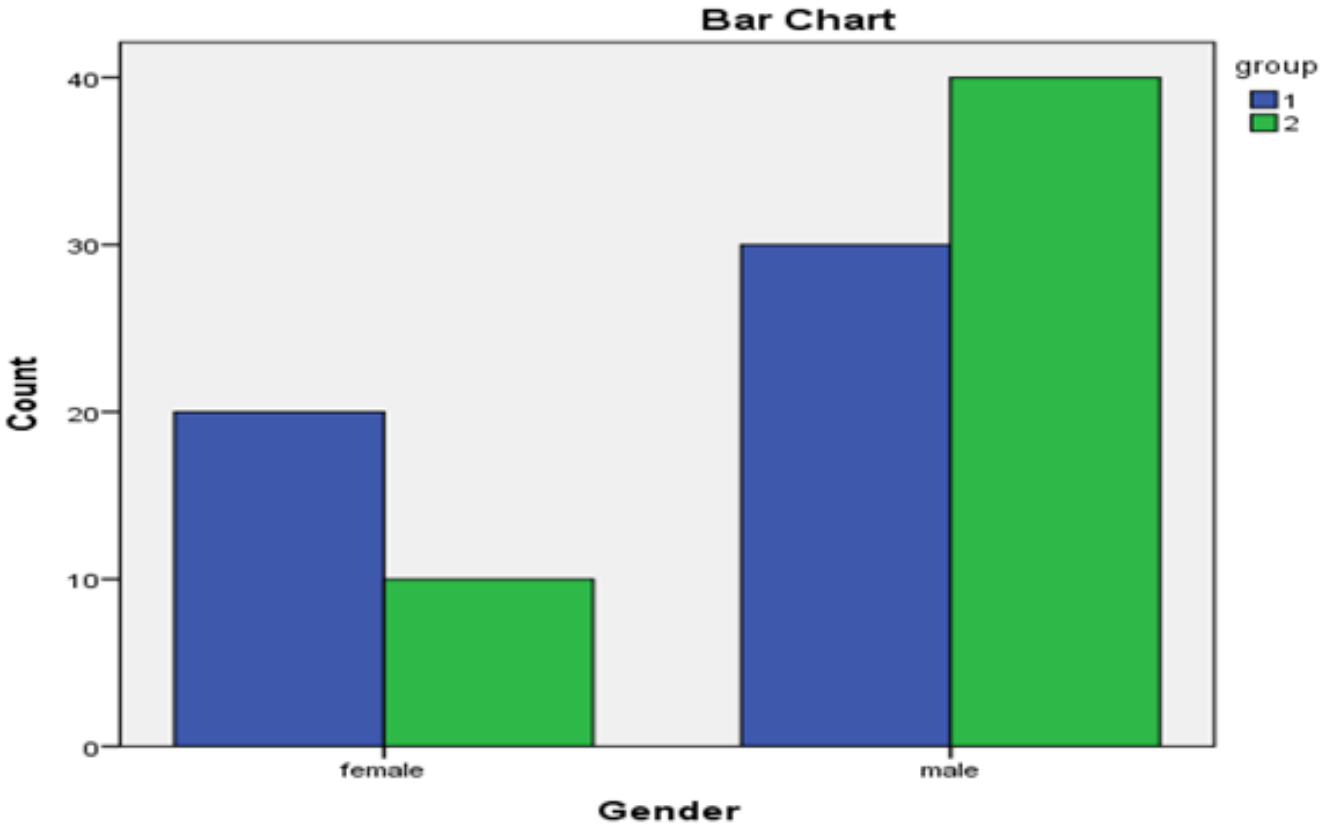

Fig 1. Gender distribution in both groups.

A visual analogue score with a scale 1-10 was used to describe pain associated with packs in both groups where number 1 presented the least pain and discomfort while number 10 presented the worst degree of pain and discomfort.

Pain during insertion of the pack, while the pack was in situ and, during pack removal in group (1) was 4.72±1.03, 4.02±0.82 and 4.48±1.035 respectively, while in group (2), pain was 6.16±0.77, 5.78±0.764 and, 6.4±0.606 respectively with a highly significant difference in all measures between both groups in favor of the first group where Foley's catheter had been inserted **(Table 1)**.

Table 1. Comparison between both groups regards pain during insertion, while in situ, and during removal of nasal pack.

Pain	Group 1	Group 2	P value
During insertion	4.72±1.03	6.16±0.77	0.000
While in situ	4.02±0.82	5.78±0.764	0.000
During removal	4.48±1.035	6.4±0.606	0.000

Data are presented as mean±standard deviation.

There was no significant correlation between age in both groups and degree of pain perceived by patients **(Table 2)**.

Table 2. Correlation between pain and age in both groups.

		Pain during pack insertion	Pain while pack in situ	Pain during pack removal
Group 1	Pearson Correlation	.136	-.020	.083
	Sig. (2-tailed)	.348	.890	.567
Group 2	Pearson Correlation	.041	.074	-.068
	Sig. (2-tailed)	.777	.611	.640

The rate of re bleeding after immediate removal of the pack had been used. In group (1), five (10%) of cases showed mild re bleeding anteriorly from the nose after removal of the packs where no post nasal bleeding had been seen. Bleeding stopped with small anterior gauze pack with topical decongestant. In group (2), 18 (36%) of cases showed mild anterior nasal bleeding, which seemed due to consistency and rough surface of the ribbon packs while the removal process itself. This was also stopped with a small repeated gauze pack with topical decongestant. The comparison between both groups as regards re bleeding showed a significant difference of p value 0.002 in favor of the first group **(Table 3)**.

Table 3. Comparison between both groups regarding rate of re bleeding.

Variables	Group 1	Group 2	P value
Rebleeding	5 (10)	18 (36)	0.002

Data presented as number and percentage, comparison with chi square test.

Observation for mucosal tears and synechia formation due to possible injury by the pack itself had been done in this study. Mucosal tears had been observed in only two cases of nasal packing with Foley's catheter while near half of the cases (23 out 50) of nasal packing with ribbon gauze showed mucosal tears with a highly significant difference of p value 0.000.

Nasal synechia as a result of injury in the nose probably due to the type of contact between the nasal mucosa and different type of nasal packs had not been seen in cases with Foley's catheter while in group (2) where ribbon gauze had been used, eight cases had showed synechia by the sixth week post epistaxis control during routine follow up visits. This showed a significant difference in favor of the first group (p value of 0.003) **(Table 4)**.

Table 4. Comparison between both groups regarding mucosal tears an synechia.

Variables	Group 1	Group 2	P value
Mucosal tears	2 (4)	23 (46)	0.000
Synechia	0 (0)	8 (16)	0.003

Data presented as number and percentage, comparison with chi square test.

Discussion

Epistaxis is a very common complaint in the field of Otorhinolaryngology that is thought to affect about 10-12% of population, about 10% of them might need medical follow up and care. [5]

Epistaxis had been anatomically classified into anterior and posterior nasal bleeding, according to the site of origin of bleeding in relation to the pyriform aperture. Anterior nasal bleeding is usually easy to control in comparison to the posterior epistaxis which is usually profuse because of larger vessels in posterior location as sphenopalatine artery. [6]

Conservative and surgical methods to stop and manage epistaxis are implemented according to every case. In cases of posterior nasal bleeding, which is common in elderly, many methods of posterior nasal packing had been mentioned in literature. [3]

In this study, the mean age of patients in both groups was 51.88±9.45 years old with a mean age of 54.12±10 years old in group (1) and 49.64±8.3 years old in group (2). This matched with the peak age of incidence of epistaxis in adults in the sixth decade as stated by McGarry [7] and khan et al. [8]. Age of incidence was found in adult patients as early as fourth decade onwards as documented by Basheer et al. in 2017, where most of them were having hypertension, deranged coagulation profile or atherosclerotic disease. [6]

Both groups in this study showed more male incidence and this result is matching with other studies. [6-8] This might be attributed to the more likely incidence of trauma or other injuries and atherosclerotic disease in males and the protective function of oestrogen on the nasal mucosa in pre menopausal females. [6]

In our study, according to visual analogue scale for pain and discomfort levels, patients in group (1) with Foley's catheter showed less pain and discomfort levels with a highly significant difference in all conditions of pack insertion, while in situ and, during removal than in group (2) with ribbon gauze. This matched with Khan et al. study [8] where they compared pain levels between BIPP (Bismuth Iodoform Paraffin Paste) and Foley's catheter as nasal packs for posterior nasal bleeding. They found that pain levels during insertion of Foley's catheter, while in situ, and during removal was significantly less than in the same conditions in case of BIPP packs. Callejo et al. [9] found less pain levels when they used pneumatic nasal packs during both insertion and removal when compared to gauze packs.

In our study, pain levels were not affected by age of patients in both groups where there was no significant difference between different ages of both groups and pain or discomfort caused by the two types of nasal packing.

Khan et al. [8] stated that re bleeding was more common in Foley's catheter group than in BIPP group with no significant difference and attributed that to loosing of pressure caused by the pneumatic pack with time. This came in contrast with our study where the rate of re bleeding when the pack was removed was significantly higher in the ribbon gauze group than in the Foley's catheter group and in our opinion, this might be caused by the extremely dry surface of the gauze with time due to clotted blood on its surface and the previous resistance of the patient due to discomfort during insertion of the pack which might cause more injuries to the nasal mucosa.

Pack itself might be traumatic to the nasal mucosa and might cause cause bleeding in areas different from the main cause of the initial bleeding. [10]

In our study, we compared the mucosal tears after removal of the nasal packs in both groups and it had been found that they are more likely to occur in ribbon gauze packs with a highly significant difference than in the Foley's catheter group.

Researchers in literature did not encounter any significant differences in the incidence formation of synechia at 2 weeks, 4 weeks, and 6–8 weeks observation after nasal surgery. [11] In our study, a higher incidence of synechia occurred in the second group with ribbon gauze which is mostly attributed to the more injurious effect of this type of pack compared to Foley's catheter as a posterior nasal pack.

Conclusion

Posterior nasal epistaxis usually needs immediate management due to its bad sequelae. Posterior nasal packs usually succeed to control posterior epistaxis. Foley's catheter with anterior nasal merocel packs are effective in controlling such a condition with less pain levels and more patients' tolerability than tightly packed ribbon gauze. Foley's catheter has a very small incidence of re bleeding chances after pack removal and has less complications as well. It is a recommended technique to manage posterior nasal bleeding.

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Conflicts of interest

The authors declare no conflicts of interest.

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