Original Research Article

Use of PVAC sponge in anterior nasal packing: Analysis of two hundred cases

Minutha R[1], Sriram Nathan[2*]

[1]Associate Professor, Department of ENT, MVJ Medical College, Bangalore, Karnataka, INDIA.
[2]Senior Consultant, Department of ENT, Narayana Hospital, Whitefield, Bangalore, Karnataka, INDIA.
Email: drsriramnathan@gmail.com

Abstract

Background: Anterior Nasal Packs have evolved over the years. Although some centres still use the conventional Gauze or glove packs, most of the modern centres have shifted to Sponge packing. Surgical Products are constructed of a unique hydroxylated polyvinyl acetal (PVAc) sponge. O**bjectives:** We analysed the uses of PVAc sponges over a period of three years in around two hundred cases. Their common indications, methodology and complications if any. **Methods:** Over a course of three years, two hundred randomly selected patients on whom anterior nasal packing was done with PVAc sponge were analysed. **Results:** The most common indication was post operative packing (78%) followed by various other indications such as hypertensive bleed, traumatic epistaxis, and post cauterization. **Conclusions:** The PVAc sponge is an ideal agent for anterior nasal packing and is tolerated well.
Key Words: Anterior nasal packing, PVAc sponge, Epistaxis.

[*]**Address for Correspondence:**
Dr. Sriram Nathan, Senior Consultant, Department of ENT, Narayana Hospital, Whitefield, Bangalore, Karnataka, INDIA.
Email: drsriramnathan@gmail.com
Received Date: 23/09/2017 Revised Date: 16/10/2017 Accepted Date: 10/11/2017
DOI: https://doi.org/10.26611/1016423

Access this article online	
Quick Response Code:	Website: www.medpulse.in
	Accessed Date: 12 November 2017

INTRODUCTION

Anterior Nasal Packing is the commonest and the most important modality of Haemostasis control in any situation. Previously an antibiotic ribbon gauze or gloves inserted packs have been used though some centres still use them. Recently there has been a shift to the use of a derived modified sponge in nasal packing. These are constructed of a unique hydroxylated polyvinyl acetal (PVAc) sponge. PVAc sponge has been used around the world in a variety of medical applications for over forty years. PVAc packings are lint and fiber free. They provide a unique combination of exceptional liquid absorption and wicking characteristics with high tensile strength. We analyze the use, methodology and complications of PVAc sponge in anterior nasal packing done in Two hundred patients done over a period of three years. These patients were encountered in both the authors clinical practice. Functional endoscopic sinus surgery (FESS) is currently the most effective treatment for chronic sinusitis refractory to medical therapy, with symptomatic improvements reported by approximately 90% of patients. In addition to meticulous and careful surgical technique, the management of the postsurgical patient is instrumental to optimizing success following FESS. The reported complications following FESS can be classified broadly into immediate postoperative complications such as bleeding and crusting; short-term complications such as infection, synechiae formation, and turbinate lateralization; and long-term complications such as ostial stenosis, refractory disease, and disease recurrence.[1] Epistaxis, or nasal bleeding, has been reported to occur in up to 60 percent of the general population. The condition has a bimodal distribution, with incidence peaks at ages younger than 10 years and older than 50 years. In rare cases, this condition may lead to massive bleeding and even death. Although epistaxis can have an anterior or posterior source, it most often originates in the anterior nasal cavity. Nasal bleeding usually responds to first-aid measures such as compression. When epistaxis does not respond to simple

measures, the source of the bleeding should be located and treated appropriately. Treatments to be considered include topical vasoconstriction, chemical cautery, electrocautery, nasal packing (nasal tampon or gauze impregnated with petroleum jelly), posterior gauze packing, use of a balloon system (including a modified Foley catheter), and arterial ligation or embolization. Topical or systemic antibiotics should be used in selected patients. Hospital admission should be considered for patients with significant comorbid conditions or complications of blood loss.[6]

MATERIAL AND METHODS

We analyzed Two Hundred cases of Anterior Nasal Packing done with PVAc Sponge done over a period of three years with the following objectives:

- Enumerate the common presenting Indications of Anterior Nasal Packing
- Enumerate the Procedure involved
- Enumerate the common precautions involved
- Enumerate the common post packing complications if any

Study Design

This was a case series done to analyze the uses and methodology of PVAc sponge in anterior nasal packing done over a period of three years during the practice of the authors. A total of two hundred cases were selected for study. All these had the presenting indication of anterior nasal packing. All were managed with the standard recommended treatment protocol and were under follow up of at least six months post packing and subsequent removal.

Inclusion Criteria

1. Post operative after nose surgeries commonly Functional endoscopic sinus surgery
2. Patients with hypertensive bleed and bleed due to other causes
3. Patients amenable for follow up for a minimum period of six months

Exclusion Criteria

1. Patients who had nasal packing with conventional methods
2. Patients with posterior nasal packing
3. Patients not amenable for follow up

MATERIALS AND METHODS

All the cases had undergone anterior nasal packing. Anterior nasal packing is a routine procedure after most of the surgery of the nose such as Septoplasty, Turbinoplasty and Functional Endoscopic Sinus Surgery including others. Epistaxis or nasal bleed was usually managed in the emergency ward and most of the time the pack was placed only after the conservative measures such as blood pressure control, local ice pack and topical medication application were unable to control the bleed. In cases of bleed due to trauma the packing was done in major bleed and uncontrollable bleeds. Only the patients who had agreed for anterior nasal packing with PVAc were included in this analysis. In the post operative patients, the insertion of the pack is done under anaesthesia and one size fits all adult size is used. The pack is initially coated with a layer of antibiotic ointment such as the Povidone Iodine and then around 5-10ml of Saline or Distilled water is injected into the pack to facilitate the swelling. The removal is done by just pulling the attached thread.

Figure 1: PVAc Nasal pack

In patients with epistaxis due to any cause, the pack is done with minimum or no sedation with just a spray of 10% local anaesthetic agent and the pack may be cut and resized as convenience. The pack is similarly coated with antibiotic ointment and removed by pulling the thread in 24-48 hours. In either of the two above situations, a broad spectrum antibiotic either injectable or oral was given to all patients. Post packing, the removal was done in most of the cases after 24-48 hours without any local anaesthesia or sedation. The patients were then closely monitored for period of minimum two hours for any change in vital signs indicative of bleeding. They were subsequently discharged and asked for regular follow up of varying intervals. This period was uneventful in most of the patients with nominal complaints of pain and mild swelling which was managed with oral medications only.

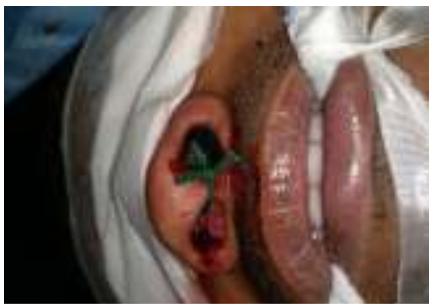

Figure 2: Pack in situ after FESS

A minimum Post packing followup of around three months was done in all the cases.

OBSERVATIONS AND RESULT

The study had the following results and observations as enumerated in the figures

- The most common indication of anterior nasal packing was after nasal surgery of post surgical nasal packing (78%)
- The most common surgery done was Functional endoscopic Sinus surgery

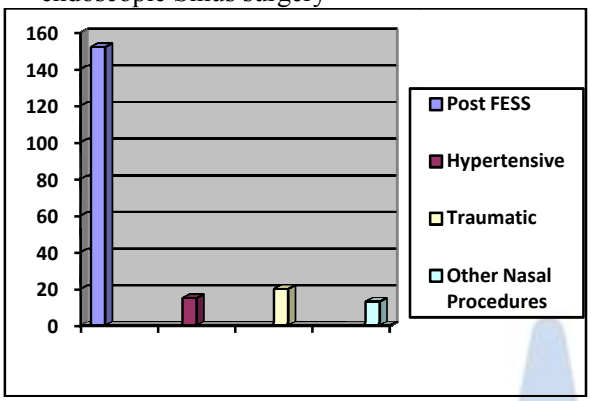

Figure 3: Indications for packing

- (76%) with or without Turbinoplasy (90 percent of 76%) with or without Septoplasty (99% of 76%)
- Other surgical interventions included Excision of nasal and other tumors such as the capillary hemangioma (5%)
- The most common cause of Epistaxis requiring packing was the Hypertensive bleed (7.5%)
- Other indications included bleeding secondary to trauma, foreign body removal (10%) post local cauterisation and other nasal procedures (6.5 %)
- In all the cases of Post operative packing the packing was done bilaterally that while in many cases of Hypertensive bleed the packing required was only unilateral. All in all there were around 175 bilateral packing while there were 25 unilateral packing done.

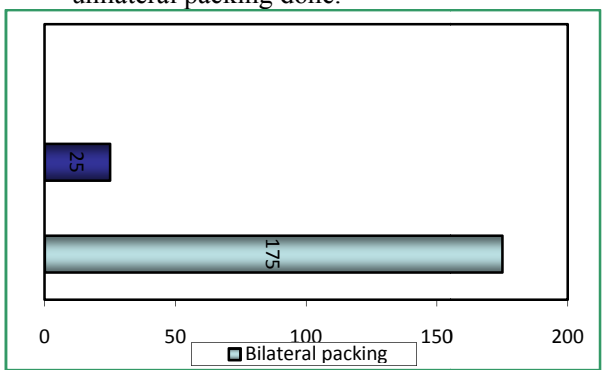

Figure 4: Unilateral/ Bilateral packing

Most of the packing was removed in 24 hours (98%) while some were removed after 48 hours (2%)

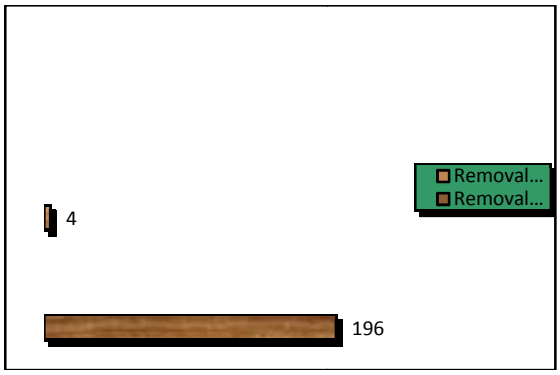

Figure 5: Removal of pack

Bleeding, slight numbness and pain were the common post pack removal symptoms seen in most of the cases.

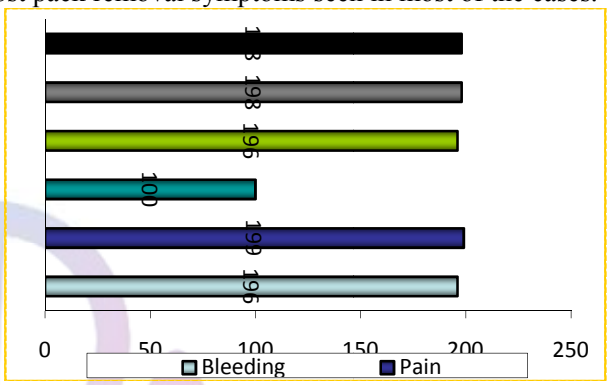

Figure 6: Post Removal Symptoms

Follow up

The first follow up was usually after one week of the packing and the subsequent follow up was after one and three months. During follow up special care was done to asses whether the patient has any old or new symptoms. A diagnostic nasal endoscopy was done in all cases to asses the nasal cavity and to rule out Synechia. The following findings were seen as summarized below: All the patients had responded well to the nasal pack in terms of bleeding control with none of them requiring re packing (200 of 200). Almost all the patients had mild pain (98%), mild swelling (99% and nose irritation (99%) during the first follow up.

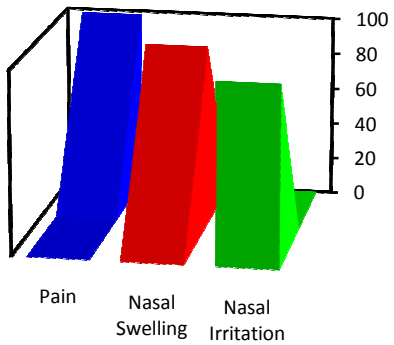

Figure 7: First Follow up

Copyright © 2017, Medpulse Publishing Corporation, MedPulse International Journal of ENT, Volume 4, Issue 2 November 2017

During the second follow up, the only common complaint was occasional nose irritation (70%) and mild swelling (10%). This was exclusively seen in the nasal surgery group of patients. Three patients who had undergone extensive nasal surgery rather than routine, that is extensive spur resection and or Turbinoplasy had developed Synechia which was removed or released by a simple local anaesthetic in the outpatient department itself.

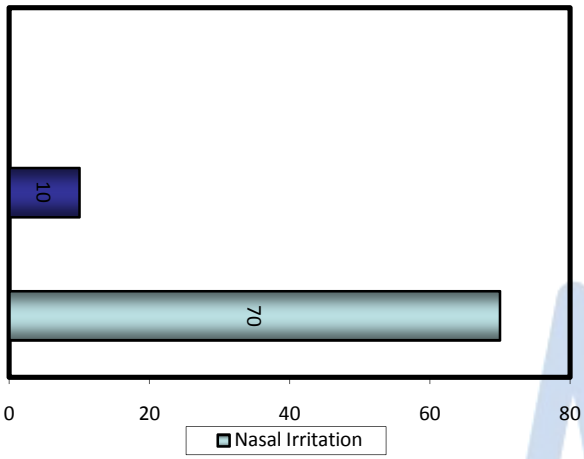

Figure 8: Second Follow up

During the third and final follow up, only two patients in which extensive surgery was done complained of mild nasal irritation which was managed which just Saline wash and spray. None of the patients had nose bleed. None of the patients had nose swelling.

DISCUSSION

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 this 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%. Their study 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.[2] Miller *et al* sought to determine the efficacy of MeroGel, an absorbable hyaluronic acid nasal dressing (HA) in reducing synechia after functional endoscopic sinus surgery (FESS) compared with Merocel, a nonabsorbable packing (NAP) requiring removal. They conducted a blinded, randomized, controlled trial of 37 patients requiring bilateral FESS for chronic sinusitis. Patients were randomized to placement of HA within the right or left middle meatus and NAP on the other side. Patients were evaluated at 2, 4, 6, and 8 weeks postoperatively. The results revealed 5 patients (14%) with synechia at last follow-up: 3 sides (8%) with HA and 3 (8%) with NAP. Thirteen patients (35%) had synechia at any visit, 10 sides (27%) with HA and 9 (24%) with NAP. Seven patients (19%) required lysis of synechia, 5 sides (14%) with HA and 3 (8%) with NAP. The authors concluded that there was no statistically significant difference between HA and NAP dressings. The Merocel dressing being similar to the PVAc sponge as used in our study is thus an effective nasal packing agent.[3] The material we used in our study was a modified Sponge. Other materials such as fibrin seal can also be used for pot operative bleeding control though it is a costlier option. The safety and efficacy of a new hemostatic sealant, based on a gel with collagen derived particles and topical thrombin (FloSeal, Fusion Medical Technologies, Inc. Fremont, CA) were assessed as an alternative to nasal packing for hemostasis in functional endoscopic sinus surgery. In a prospective clinical study of 50 patients undergoing bilateral endoscopic anterior ethmoidectomy, 2 ml FloSeal was used after surgery to stop bleeding. The results were compared to a control group of 50 patients with Merocel packing and showed that intraoperative hemostasis was rapid and equal in both groups. The main advantages of the new hemostatic sealant included a higher degree of comfort during postoperative nasal breathing and absence of complaints due to pressure or pain. There was only one case of postoperative bleeding

on the 6th day, which required nasal packing. There were no more cases of stenoses or synechia in the ostiomeatal complex than were found in the Merocel group. No systemic side effects due to FloSeal were observed. This specific hemostatic sealant was shown to be a safe and efficacious alternative method for hemostasis in endoscopic sinus surgery with high patient satisfaction and an easy and fast mode of application.[4] Shoman N *et al* conducted a study to compare NasoPore (Stryker Canada, Hamilton, ON, Canada) and a traditional middle meatal spacer (MMS) composed of Merocel ((Medtronic Xomed, Mississauga, ON, Canada) placed in a vinyl glove finger in functional endoscopic sinus surgery (FESS) with regard to postoperative bleeding, wound healing, and patient comfort. The study design was a prospective, double-blind, randomized trial of 30 consecutive adults (age > 16 years) with chronic or recurrent acute rhinosinusitis undergoing bilateral FESS, excluding patients with significant difference in their sinus disease bilaterally using preoperative computed tomographic scan assessment (Lund-McKay scores > 2). Preoperatively, all patients were randomized and blinded to receive NasoPore (Stryker Canada) on one side and Merocel on the other. Patients completed a questionnaire during their first postoperative week relating to their subjective assessment of pain, pressure, nasal blockage, swelling, and bleeding. Patients were evaluated 1 week postoperatively for packing removal and debridement, and associated discomfort and bleeding with the removal, as well as overall preference for either pack. A clinician blinded to the randomization process objectively assessed the healing status of the nasal cavities at 4 and 12 weeks postoperatively. The main outcome measures were Patient satisfaction, bleeding, and wound healing postoperatively. They observed the following; Thirty patients were enrolled. There was no significant difference between the Lund-Mackay scores in both groups preoperatively (p =. 80). Postoperatively, there was no significant difference between both groups with regard to patients' pain, pressure, blockage, swelling, bleeding, or discomfort on packing removal (p >. 05). There was no statistical difference in the amount of bleeding associated with packing removal (p =. 32). Mucosal grading at 4 weeks was significantly better for the traditional MMS (p =. 03), but this difference disappeared at the 12-week visit (p = 1.00). It was concluded that the absorbable pack did not significantly reduce the risk of bleeding or patient discomfort compared with a traditional nonabsorbable MMS and was associated with significantly slower mucosal healing initially, an effect that disappeared after 3 months postoperatively. There was no significant patient preference for either pack.[5] The pack used in our present study was of a non absorbable variety and as found below gave a similar picture on follow up. Corbridge RJI *et al* performed a prospective study was undertaken to compare the efficacy of Merocel nasal tampons to BIPP (Bismuth Subnitrate and Iodoform Paste) impregnated ribbon gauze in the control of acute epistaxis requiring hospital admission. A total of 50 patients presenting with severe epistaxis was treated with either merocel nasal tampons, or BIPP. The groups did not differ significantly in terms of age, sex distribution, aetiology or severity of the bleed. There was no significant difference in efficacy or patient tolerance of either treatment. It was concluded that Merocel nasal tampons should be considered effective in the first line treatment of severe epistaxis uncontrolled by simple measures. Their ease of insertion makes them suitable for use in the accident and emergency department or in general practice. In the present study also we have found a similar finding that is ease of use and effectiveness in the use of PVAc sponge.[7] Villwock *et al* opined that the treatment of epistaxis is variable. It is important to analyze the effect of the available interventions on patient outcomes. They attempted to determine demographic, management, and outcome trends in patients admitted with a primary diagnosis of epistaxis and treated with conservative management, nasal packing, arterial ligation, or embolization. A review of the data reported by hospitals to the 2008-2010 Nationwide Inpatient Sample for patients admitted with a primary diagnosis of epistaxis was conducted. Conservative management, nasal packing, arterial ligation, or embolization for epistaxis control were the interventions examined. The main outcomes and measures were descriptive statistics for hospital and patient demographic data. Multivariate models were constructed to compare treatment modalities, controlling for patient- and hospital-level variation while reporting the treatment outcomes of mortality, stroke, blindness, length of stay, and total cost. Comparisons were made between patients undergoing embolization, surgical ligation, or nasal packing. Descriptive statistics for patients treated conservatively were reported. They found that a total of 57 039 cases of primary epistaxis were identified. Of these, 21 872 patients (38.3%) were treated conservatively, 30 389 (53.3%) received nasal packing or cauterization, 2706 (4.7%) underwent arterial ligation, and 1956 (3.4%) underwent embolization The odds of stroke in patients following embolization were significantly higher than in patients who underwent nasal packing (odds ratio, 4.660; P = .003), with no significant difference seen compared with surgical ligation (P = .70). There were no significant differences in the odds of mortality or blindness between any of the study groups. Patients undergoing embolization incurred the highest

total hospital costs, nearly doubling the cost of ligation (P andlt; .001), without a corresponding increase in the length of hospital stay (P = .20). It was concluded that treatment for epistaxis is highly variable. No significant differences in clinical outcomes were noted between arterial ligation and embolization in the population studied, although embolization resulted in significantly higher costs. They advised that further prospective studies are needed to elucidate variables affecting outcomes of the various treatment options for epistaxis.[8] Douglas R and Wormald P J have observed that the treatment of epistaxis has undergone significant changes in recent years. Gone are the days when patients had an uncomfortable posterior nasal pack inserted then spent several days on the ward only to bleed again on its removal. New packing devices, ingenious haemostatic agents and endoscopic surgical approaches have been developed to provide a variety of effective and well-tolerated treatment options. They stated that modern packing devices are much easier to insert than traditional gauze packs and are no less effective.[9] In this study by Pringle MBI *et al*, over the period of a year, Merocel nasal packs were used routinely as the primary form of packing in patients referred to the hospital with epistaxis that had not resolved with simple measures, and in whom packing was thought to be required. Their effectiveness was assessed. The packing was usually performed by inexperienced senior house officers. The Merocel packs successfully controlled bleeding in 91.5 per cent of the patients in whom they were used. Use of the correct insertion technique is very important but is very easy to learn and perform. The actual insertion takes only a couple of seconds. Discomfort during insertion, whilst in situ and on removal was assessed. They concluded that Merocel nasal packing is an effective form of first line treatment in patients with epistaxis.[10] In confirmation of this our study also found similar findings in that there is mild discomfort while applying in absence of anaesthesia and while removal though Patients usually tolerate the procedure well.

CONCLUSION

Our study revealed the following conclusions

- PVAc sponge is an ideal material for anterior nasal packing
- PVAc sponge is tolerated well in patients who have undergone nasal surgery such as Septoplasty, Turbinoplasty and/ or Functional Endoscopic sinus surgery or FESS
- PVAc Sponge is effective in controlling bleed in post op patients and gives good haemostasis
- PVAc is an effective Haemostatic agent for control of epistaxis or nasal bleed due to various aetiology
- The pack is usually removed after 24-48 hours and requires antibiotic coverage to prevent secondary infection
- Nose block and a foreign body sensation immediately after packing and mild transient pain during removal are the few problems faced with the PVAc sponge.

REFERENCES

1. Tan BK, Chandra RK. Postoperative prevention and treatment of complications after sinus surgery. Otolaryngologic Clinics of North America. 2010;43:769-779
2. Sirshak Dutta et al. Modified Technique of Anterior Nasal Packing: A Comparative Study Report. Indian J Otolaryngol Head Neck Surg. 2012 Dec; 64(4): 341–345.
3. Miller RS, Steward DL, Tami TA, Sillars MJ, Seiden AM, Shete M, Paskowski C, Welge J. The clinical effects of hyaluronic acid ester nasal dressing (Merogel) on intranasal wound healing after functional endoscopic sinus surgery. Otolaryngology–Head and Neck Surgery. 2003;128:862-869
4. Baumann A, Caversaccio M. Hemostasis in endoscopic sinus surgery using a specific gelatin-thrombin based agent (FloSeal). Rhinology. 2003;41:244-249
5. Shoman N, Gheriani H, Flamer D, Javer A. Prospective, double-blind, randomized trial evaluating patient satisfaction, bleeding, and wound healing using biodegradable syn- thetic polyurethane foam (NasoPore) as a middle meatal spacer in functional endoscopic sinus surgery. Journal of Otolaryngology—Head and Neck Surgery. 2009;38:112-118
6. CORRY J. KUCIK, LT, MC, USN, and TIMOTHY CLENNEY, CDR, MC, USN. Management of Epistaxis. Am Fam Physician. 2005 Jan 15;71(2):305-311.
7. Corbridge RJ1, Djazaeri B, Hellier WP, Hadley J. A prospective randomized controlled trial comparing the use of merocel nasal tampons and BIPP in the control of acute epistaxis. Clin Otolaryngol Allied Sci. 1995 Aug;20(4):305-7
8. Villwock JA, Jones K. Recent trends in epistaxis management in the United States: 2008-2010. JAMA Otolaryngol Head Neck Surg 2013; 139:1279.
9. Douglas R, Wormald PJ. Update on epistaxis. Curr Opin Otolaryngol Head Neck Surg. 2007 Jun. 15(3):180-3.
10. Pringle MB1, Beasley P, Brightwell AP. The use of Merocel nasal packs in the treatment of epistaxis. J Laryngol Otol. 1996 Jun; 110(6):543-6.

Source of Support: None Declared
Conflict of Interest: None Declared