

Original Article



Efficacy of Trans-nasal Endoscopic Sphenopalatine Artery Ligation in the Management of Recurrent Posterior Epistaxis

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Abstract

Background: Recurrent posterior epistaxis is a challenging problem for most otolaryngologists. Of the several proposed treatment modalities, endoscopic ligation of SPA (Sphenopalatine artery) provides a simple and effective solution with relatively minor complications. **Objectives:** Aim of this study was to find out the success rate and complications of endoscopic ligation of SPA in the management of recurrent posterior epistaxis. **Materials and Methods:** This was an observational study conducted from Jan 2019 to Jan 2021. Total 60 patients were included in this study. Inclusion criteria were - recurrent epistaxis (at least 4 episodes in last 2 months) with bleeding point not seen in anterior rhinoscopy, Failure of previous conservative management with medications and nasal packing, age between 18–60 years of both sexes. All the patients underwent trans-nasal endoscopic Sphenopalatine artery ligation, and patients were followed up for 12 weeks to identify repeated bleeding and to evaluate complications. **Results:** In this study male to female ratio was 1.5:1. Mean age of study group was 44.66 (± 8.62) years. No recurrent bleeding occurred in 51 (85%) and in 9 (15%) nasal bleeding occurred in the 2 months postoperative period. Anesthesia of incisor teeth occurred in 18 patients (30%), 22 patients (37%) complained about increased nasal crusting. **Conclusion:** Endoscopic ligation of Sphenopalatine artery shows good outcome in prevention of further episodes of epistaxis in most patients. Although some minor complications can occur, these are manageable.

Key words: Epistaxis, Nasal Endoscopy, Sphenopalatine artery, Sphenopalatine foramen, Endoscopic ligation, Nasal packing

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Introduction

Epistaxis is a common disease. It is estimated that 60% of the population has at least one episode of epistaxis in their lifetime and of this group, 6% seek medical treatment.¹ It is also the commonest emergency in ENT, which accounts for 1 in 3 of all ENT emergency admissions. Although common, the management of epistaxis can be challenging due to its varying severity.² Up to 90% of cases of epistaxis originate anteriorly in the Little's area of the nose and generally it does not require medical treatment. In cases where intervention is indicated, epistaxis can easily be controlled with a first-line treatment, like chemical cautery or Anterior Nasal Space (ANS) packing.³ About 10% of cases originate from posterior nasal area and require interven-

tions like – balloon tamponade, and Posterior Nasal Space (PNS) packing. These methods are costly, time consuming, increase the hospital stay, uncomfortable for the patients, and has high failure rates. After initial control of epistaxis in the hospital, patients are discharged to their homes when asymptomatic. But recurrence is common, and these patients frequently re-visits either with inactive or active bleeding episodes. Although the amount of bleeding in these episodes are usually minor to moderate, they can be a major source for apprehension for the patients and their family, and can impose with a cumulative financial burden of multiple visitations and interventions. Sphenopalatine artery is known as the artery of epistaxis, as it provides majority of the blood supply to the nasal mucosa. In situations where the source of nasal bleeding is poorly localized,

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ligation of Sphenopalatine artery can provide a good solution. With the widespread popularization of endoscopic sinus surgery and the deeper understanding of local regional anatomy, Trans-nasal endoscopic sphenopalatine artery ligation (TESPAL) has been advocated as an effective alternative for the control of posterior epistaxis.³

As the Sphenopalatine Results from TESPAL are certainly more impressive and lucrative than repeated nasal packing. It is simpler, less invasive and a more effective than other alternatives like – ligation of IMA (Internal Maxillary Artery), Ligation of ECA (External Carotid Artery), or arterial embolization.⁴ TESPAL is traditionally considered when anterior or anterior-posterior nasal packing fails to control the bleeding. But it is also effective in preventing further episodes (96%) of epistaxis after achieving initial control.⁵ Aim for this study is to assess the efficacy of TESPAL in preventing recurrent episodes of epistaxis and evaluate any potential side-effects of this procedure.

Materials and Methods

This was an observational study to assess the efficacy of TESPAL in preventing recurrent episodes of epistaxis and evaluate any potential side-effects of this procedure. The study was conducted at the department of otolaryngology and Head-Neck surgery, Khwaja Yunus Ali Medical College Hospital, Enayetpur, Shirajganj from January 2019 to January 2021. Total 60 patients were included in this study. Inclusion criteria were - recurrent epistaxis (more than 4 episodes in last 2 months) with bleeding point not seen in anterior rhinoscopy, Failure of previous conservative management with medications and nasal packing, age between 15–60 years of both sexes. Exclusion Criteria were – Epistaxis resulting from sinonasal tumors, Patients with vascular diseases/vasculitis. All the patient volunteered and informed written consent was taken from all patients. This study involved interviewing all patients (an/or his/her attendant) who underwent this procedure. After admission, detailed history was taken and intra-nasal examination was done using nasal speculum. Relevant investigations including complete blood count, blood coagulation profile and Liver function tests were done. Patients were screened multiple times with evaluation of blood pressure and blood glucose level. Pre-operative informed written consent was taken. Per-operative endoscopic nasal examination was done. All the patients underwent either unilateral or bilateral endoscopic ligation of the Sphenopalatine artery and a piece of Gelfoam was kept in the middle meatus, no packing was done. Patients were discharged after overnight hospital stay. After operation first follow up was on 7th Post-operative day, second follow up was done 1 month and 3rd follow up was done 2 months after the operation. During follow up visits, nasal cavity was examined and patients were inquired for recurrent episodes of epistaxis or any other side effects. All the information was recorded and analysed using SPSS (Statistical Package for Social Sciences) version 21. The Chi-Square test was used to analyse the significance level of p<0.05. Continuous data was presented as mean standard deviation and categorical data was presented in number percentage. The summarized date was presented in the tables and charts.

Result

In this study 36(60%) of the study population were male and 24(40%) were female. Male: Female ration was 1.5:1

Table I – Sex distribution of the study group (n=60)

Sex	Number of Patients	Percentage(%)
Male	36	60
Female	24	40

10(17%) of the study population were in the age group of 18–30 years, 18(30%) in 31–45 years and 32 (53%) between 46–65 years. Majority of the study population were in the age group of 46–65 years. Mean age was 44.66 (±8.62) years.

Table II – Age distribution of the study group (n=60)

Age range	Number of Patients	Percentage (%)
18 – 30	10	17
31 – 45	18	30
46 – 65	32	53
Total	60	60
Mean ±SD	44.66 (± 8.62)	-

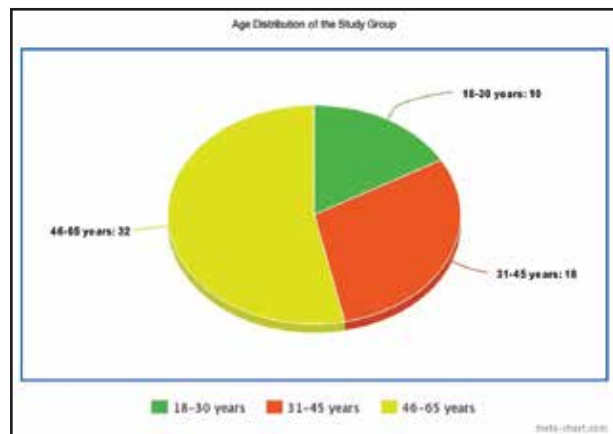


Fig: 1

In this study, 10 (17%) patients had ≤ 4 episodes, 34 (57%) patients had 5–10 episodes, and 16 (27%) patients had > 10 episodes of epistaxis in 2 months before hospital admission.

Table III – Severity of symptoms (number of episodes in last 2 months) among the study group (n=60)

Number of Episodes	Number of Patients	Percentage (%)
4 episodes	10	17
5–10 episodes	34	57
> 10 episodes	16	27

Among the study group 30 (50%) was suffering from hypertension, 12 (20%) had Ischemic heart diseases, 26 (43%) had DM, 8 (13%) had Chronic renal disease and 4 (7%) had coagulation abnormalities. Most patients presented with more than one symptom.

Table IV – Distribution of Co-morbidities among the study group (n=60)

Symptoms	Number of Patients	Percentage (%)
Hypertension	30	50
IHD	12	20
DM	26	43
Chronic Renal Disease	8	13
Coagulopathy	4	7

Recurrent episodes of epistaxis occurred mostly in the 46–65 years age group (6 patients), 3 patients in the 31–45 years age group and no recurrence was found in the 18–30 years age group.

Table V– Incidence of recurrent epistaxis in the study group (n=60)

Age range	Number of patients	Percentage (%)
18– 30	0	0
31– 45	3	5
46 – 65	6	10

Recurrent bleeding occurred in 9 (15%) and Nasal crusting was found in 22 (37%) patients. Anesthesia of Palate and Incisor teeth occurred in 18 (30%) case.

Table VI– Post Operative Complications (n=60)

Complications	Number of Patients	Percentage (%)
Recurrent bleeding	09	15
Nasal crusting	22	37
Anesthesia of Palate and Incisor teeth	18	30

Table VII– Comparison between pre and post-operative status (n=60)

Age Range	Patients with Epistaxis before TESPAL	Patients with Epistaxis after TESPAL	P value
18– 30	10	0	0.005614
31– 45	18	3	
46– 65	32	6	

Discussion

Recurrent epistaxis is a common problem in both sexes of the middle aged and elderly. Some patients may have some underlying co-morbidities like IHD, DM, CKD, but in most cases no apparent etiological factors are found. Majority of these cases present with unilateral nasal bleeding, where the source of bleeding can't be identified on anterior rhinoscopy. These cases are termed posterior epistaxis, and they pose a management dilemma for the otolaryngology specialist. For active bleeding usually ANS with PNS packing is used commonly, alternatively balloon catheter tamponade or endoscopic targeted packing or diathermy of the bleeding point is done. Nasal packing is hazardous as it is very uncomfortable or painful for the patient, carries risk of infection and toxic shock syndrome and failure rate for controlling posterior epistaxis is 26–52% with nasal packing. Moreover, nasal packing causes severe mucosal trauma which can later lead to nasal adhesion and stenosis. Additionally, middle aged and elderly patients with posterior epistaxis have high rates for further episodes, once control of a single epistaxis episode is achieved. This leads to multiple visitations, hospital admissions, and nasal packing procedures – ultimately causing severe mental and physical distress to the patient, along with a large cumulative financial burden. So, in the otolaryngology community, specialists are looking out for a procedure that is cost-effective in long term and less burdensome for the patient.

The procedure we worked with in this study of ours, is the trans-nasal endoscopic sphenopalatine artery ligation or TESPAL. It is a novel procedure which is commonly used for managing intractable epistaxis. One of the most advantageous point of this procedure is its high success rate of controlling active bleeding and prevention of any further episodes of epistaxis.

Although TESPAL is not under widespread use for non-life-threatening epistaxis, we believe it can be a fitting alternative to the hassle of repeated hospital admission and interventions to control recurrent episodes of nasal bleeding. Aim for this study is to assess the efficacy of TESPAL in preventing recurrent episodes of epistaxis and evaluate any potential side-effects of this procedure.

In our study mean age was 44.66 (± 8.62) years. Majority 32 (53%) of the study population were in this age group. We evaluated the age range of the patients included in similar studies and found – Odat et al² mean age 45 years, Gandomi et al³ mean age 45.3 years, Gede et al⁴ mean age 61.2 years, O'flynn et al⁵ mean age 59.9 \pm 16.2 years, Nouraei et al⁶ mean age 55.7 \pm 18.4 years, Hey et al⁷ mean age 58.2 years. Although our finding was similar to some studies, most of the studies showed a higher range for mean age of the patients. This may be due to a high threshold of inclusion criteria in those studies where TESPAL was opted as a last resort in a life-threatening situation. On the other hand, we had a low threshold for opting patients for a TESPAL procedure.

In our current study we found among 60 patients, 30 patients (50%) had a history of hypertension, 12 patients (20%) were on aspirin for IHD and 26 patients (43%) were diabetic. This type of pattern of co-morbidities were found on other similar studies also. Odat et al² showed that among 15 patients 6 patients had hypertension and 3 were on anticoagulation. In the study of Gede et al⁴, among 78 patients, 20 patients (25%) had a known history of hypertension, 24 (30%) patients took small doses of aspirin for prevention of heart attacks, 10 patients (13%) used either clopidogrel or warfarin to prevent blood clots after primary attacks, 2 patients (3%) had diabetes, 2 patients (3%) had other heart diseases. O'flynn et al⁵ had 6 patients were hypertensive among 12 patients of his study group. Nouraei et al⁶ showed that among 67 patients 30% had hypertension, 19% were taking aspirin, and 11% were anticoagulated with warfarin.

We found that, the success rate of prevention of further episodes of epistaxis in 2 months after surgery was 85% in our study. Among 60 patients in the study group only 9 patients (15%) suffered from recurrent bleeds during the follow up period. Odat et al² showed that among 15 patients undergoing none of the patient had a re-bleed, which indicates a success rate of 100%. Gandomi et al³ performed this procedure in 27 patients, with 4 patients having recurrent episodes during follow up period – his study had an 85% success rate in preventing further epistaxis. Gede et al⁴ performed a study in Denmark, where he showed a 78% success rate. O'flynn et al⁵ performed a smaller study of 12 patients in the United Kingdom, where 1 patient showed persistent re-bleed, making his success rate 92%. Nouraei et al⁶ from United Kingdom published a series of 67 cases of TESPAL, where his success rate was 88%. Hervochon et al⁸ published a review of TESPAL procedures performed by multiple surgeons in France, which showed an 84% success rate. Kumar et al⁹ published a review of 11 case series with 127 patients, where the success rate was 98%. Kitamura et al¹⁰ published a systematic review of 896 cases of TESPAL, where pooled failure rate with re-bleeding was only 13.4%. Voegels et al¹¹, in his study of 31 patients undergoing TESPAL, found no

cases of post op rebleeding. Here we can see most of the studies shows similar success and failure rates. The minor discrepancy that was found was probably due to the small sample size of each individual study.

In our study, Nasal crusting occurred in 22 (37%) of the patients, and anesthesia of palate was found in 18 patients (30%). Odat et al² had 1 patient develop minor intra-nasal adhesion. In the study done by Gede et al⁴, 9 patients had chronic nasal crusting. None of the patients had palatal numbness. Evaluating similar studies, we can say TESPAL has overall low complication rate. Our patients who had nasal crusting responded well to regular alkaline nasal douching. But palatal anesthesia did not recover during the 2 months follow up period.

Conclusion

After considering all the variables related to this study and comparing them to other contemporary studies, we can conclude that – failure of prevention of recurrence of posterior epistaxis can be aptly dealt with the TESPAL procedure. Very few patients experience re-bleeds after this procedure. Overall hospital stays and patient suffering is much less compared to the alternative of repeated nasal packing or electrocautery. Although complications like nasal crusting or palatal anesthesia can occur, it's within an acceptable range.

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