

Competence of Cauterization of Sphenopalatine Artery for Idiopathic Refractory Posterior Epistaxis

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ABSTRACT

Background: Refractory posterior epistaxis requires cautery of sphenopalatine artery.

Objective: This study aimed to estimate the efficiency of cautery the sphenoid artery and to observe postoperative complications.

Patients and methods: This prospective study was conducted on 200 adult patients with posterior epistaxis at a private hospital and clinic in Kirkuk, northern Iraq, from the period from February 2019 to September 2021. The nasal cavity of each participant was carefully examined endoscopically to find out the location of the bleeding, and then determine the necessity of surgical intervention.

Results: A total of 200 cases of epistaxis were included, posterior epistaxis accounted for 12 (6%) of all epistaxis cases, and required cauterization of the sphenoid artery. According to the results, the success rate of all surgical cases was complete, as no serious complications were observed intra and post endoscopic cauterization, except for one case of numbness of the palate, which gradually disappeared during the first three months after the operation. **Conclusions:** Good success can be achieved by cautery of the sphenopalatine artery and it can be considered as the first-line for idiopathic posterior epistaxis.

Keywords: Sphenoid surgery, cauterization, nasal cavity, epistaxis.

INTRODUCTION

Epistaxis represents a great challenge for emergency departments, as it is one of the important post-accident emergency situations ⁽¹⁾. Although it is a common otolaryngological condition ⁽²⁾, nevertheless, posterior epistaxis is an uncommon ⁽³⁾. It can be life-threatening due to aspiration and hypotension as well as comorbidities. A small proportion of up to 15% of them requires hospitalization and will therefore need surgical intervention ^(4,5). The majorities of cases of epistaxis, up to 90%, originate in the Kiesselbach area and are relatively easy to treat using chemical cautery or packing. However the minorities of cases, up to 10%, arise from the posterior nasal region and require more antagonistic closure or other interventions including endoscopic surgery ⁽⁶⁻⁹⁾. Thus, the management of epistaxis ranges from simple self-treatment to critical interventions in emergency departments up to urgent surgeries ^(10,11). Many cases can be treated and achieve hemostasis in outpatient clinics without the need for surgical intervention. However, there are some cases of recurrent epistaxis where the bleeding site is deep and difficult to manage ^(12,13). In line with recent uprising in endoscopic nasality sinus surgery, endoscopic cauterization of the sphenopalatine artery is now used for posterior epistaxis ⁽¹⁴⁾. Therefore, the current study aimed to evaluate the efficacy of this surgical procedure for a group of patients suffering from idiopathic refractory posterior epistaxis.

PATIENTS AND METHODS

In this prospective clinical study, a total of 200 cases of epistaxis were participated, attended the ENT Clinic and Private Hospital in Kirkuk, Northern Iraq, from the period from February 2019 to September 2021. All the

participants underwent a thorough examination of the nasal cavity with endoscopy to find out the location of the bleeding by Consultant Physician (TNF) to determine the necessity of surgical intervention. The official approval has been obtained from the local health directorate in the province. Inclusion criteria were active posterior epistaxis, both genders, aged 18-65 years old, and firmed consent to participate. In contrast, patients under the age of 18 years old, refused to participate, and those suffering from anterior epistaxis were excluded from the current study.

Surgical procedures

Endoscopic sphenopalatine artery cauterization was performed (**Figure 1**) according to the following steps:

- The procedure done under general anesthesia with cuff endotracheal tube and pharyngeal pack.
- Patient should be in supine position with head elevated 15 degree and rotated towards the surgeon.
- Draping must not close the eye.
- Removed all nasal packs and irrigated the nasal cavity by warm normal saline solution.
- Using ribbon gauze soaked in 2 ml of 1/1000 of adrenaline topical anesthesia was applied and inserted between the septum and inferior turbinate and in middle meatus.
- All areas of nasal cavity were inspected to detect any bleeding point and to cauterize it.
- Injected of local adrenaline 1/80000 at the attachment of middle turbinate on the lateral nasal wall.
- Used Endoscope was 0 degree 18 cm ,4 ml diameter.

- The middle turbinate has been gently medialized to open the field and should be gently mediated to prevent cerebrospinal fluid leakage
- The lateral nasal wall was palpated to find the posterior fontanelle, which is a mucosa-covered ostium located behind the uncinate process, under the ethmoid bullae and about 1 cm in front of where the middle turbinate attaches to the lateral nasal wall from behind. This defect must be seen clearly.
- Vertical incision done the mucosa immediately posterior to this fontanelle and sub-mucosal has been dissected for about 1cm towards attachment of middle turbinate.
- First structure to be encounter was crista ethmoidalis, and sphenopalatine artery located just posterior to it, we elevated mucosa to expose the foramen.
- By using Kerrison punches we removed crista ethmoidalis and this step done gently in order not disrupt the artery.
- After the artery was clearly identified, we cauterized the artery either by unipolar or bipolar and then the anterior branch was transect medially and superiorly to cauterize the other branches.
- The mucosal flap was replaced with a surgical piece, so there was no need for anterior packing.
- Each patient was observed for one day and discharged the next day.
- Follow-up of these patients after endoscopic surgery continued for six months.

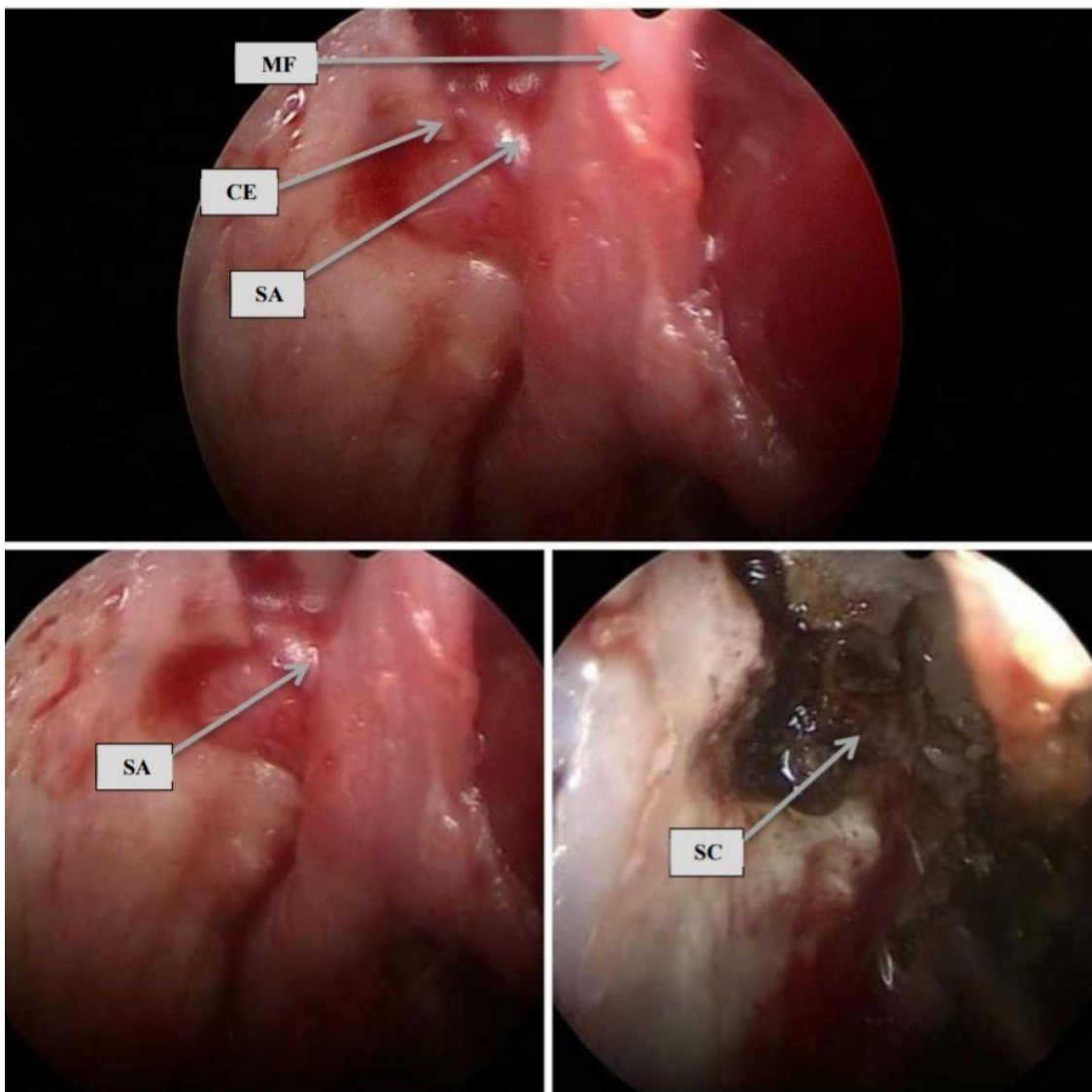


Figure (1): Cauterization process on the sphenopalatine artery. MF: Mucosal flap, CE: Crista ethmoidalis, SA: Sphenopalatine artery, SC: Site of cautery.

Ethical Considerations:

The study was conducted after obtaining the approval of the Ethics Committee of the Directorate of Health of Kirkuk. Written informed consents to accept participation in the study were obtained from all patients. This research has been done in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis

Statistical analysis was done descriptively, using SPSS for Windows version 26. Data were analyzed using chi-square analysis and data were represented as frequencies and percentages.

RESULTS

The 200 participating patients consisted of 80 (40%) men and 120 women (60%) 120 as shown in **Figure 2**, with an average age of 48.4 years old.

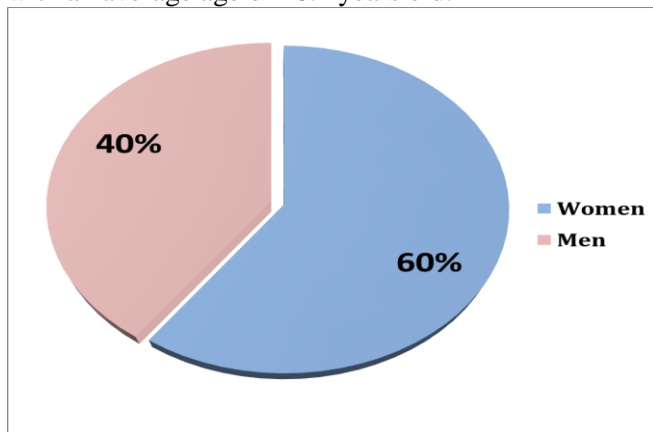


Figure (2): Gender distribution among all epistaxis patients.

Of the total 200 patients with epistaxis participated in the study, 12 (6%) patients with idiopathic posterior epistaxis required surgical intervention as displayed in **Figure 3**.

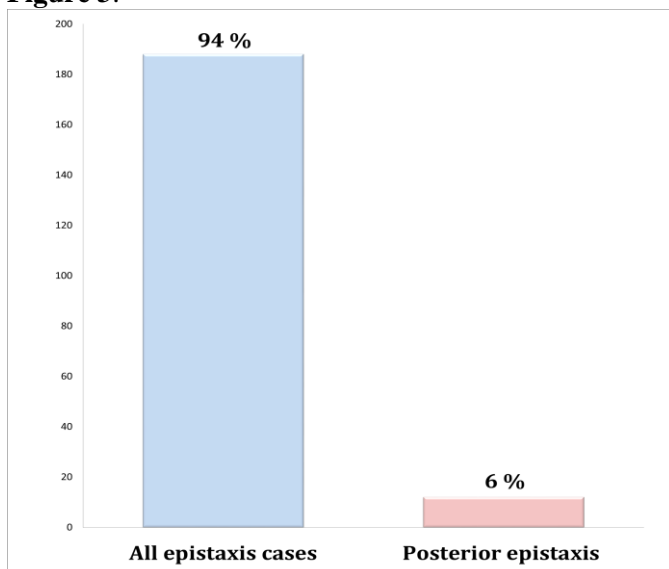


Figure (3): The incidence of posterior idiopathic epistaxis among all participants.

Table 1 summarizes and compares the characteristics and results of the 12 patients who received unipolar and bipolar cautery. All patients had their nose bleeds controlled successfully and without noticeable complications during the six-month follow-up, except for 1 patient in unipolar cautery group had numbness of the palate in the first week after the operation, and it gradually improved spontaneously during the first 3 months after the operation.

Table (1): Comparison of unipolar and bipolar cautery groups of 12 patients.

Variables	Unipolar surgical cautery (N=7)	Bipolar surgical cautery (N=5)
Age (mean)	48.8	48.2
Gender	Men	3
	Women	2
Require a blood transfusion	4	3
Co-morbidities	Hypertension (HT)	0
	Diabetes mellitus (DM)	0
	HT and DM	2
	None	1
Palatal numbness	1	0
Any other post-operative complications	0	0

DISCUSSION

Accompanying the expansion of surgical technology, endoscopic sinus surgery has revolutionized the detection and treatment of sinus diseases^(15,16). Posterior epistaxis is generally difficult to manage, especially when it is recurring. There are non-surgical methods that have proven unsafe, unsuccessful and unsatisfactory results with detrimental complications^(17,18).

Specifically in 1976, an endoscopic intranasal approach was used, in which the artery was ligated while accessing the Vidian nerve. It was found that this approach can freely access the sphenopalatine artery. This artery is the terminal branch of the internal maxillary arteriole which is the predominant exporter of caudal rhino blood equipping^(19,20). However, the sphenopalatine artery ligation approach has proven to lead to major complications, including crusting of the nose⁽²¹⁾.

Endoscopic cauterization of the sphenopalatine artery is a feasible technical surgical procedure that allows direct cauterization of the main vessel that supplies the posterior nasal cavity^(22,23). Our findings were supportive of other similar studies. In a previous study conducted by **Gandomi and Colleagues (2013)** on 27 patients underwent endoscopic cauterization in

Shiraz, Iran. They found that endoscopic cauterization of the sphenopalatine artery can be considered an immediate treatment as a second alternative when conservative treatment is not successful⁽⁵⁾.

In other study conducted by **Kitamura and Colleagues (2019)** through a meta-analysis technique on 896 cases of sphenopalatine artery ligation or cautery for nose bleeding, they concluded that sphenopalatin surgery for refractory epistaxis is an effectiveness approach due to its low failure rates and less complications. The comparison between the two procedures showed that cauterization was more effective than ligation⁽²⁴⁾.

CONCLUSION

Endoscopic cautery of the sphenopalatin artery is a safe, rapid, and effectiveness procedure for the managing of posterior epistaxis without serious complications, thus may be recommended as a first choice for the treatment of idiopathic posterior epistaxis.

Conflict of Interest: There is no conflict of interest.

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Authors' contribution: authors contributed equally in this study.

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