

# Refractory Epistaxis: Role of Endoscopic Cauterisation of Sphenopalatine Artery

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**Abstract:** Epistaxis is defined as bleeding from the nose. It is one of the most common rhinological emergencies, making the management of posterior epistaxis a challenging problem for ENT surgeons. Conventional management options in form of chemical cauterisation, anterior nasal packing and posterior nasal packing, are not so much effective and satisfactory. **Objective:** The objective of this study was to assess the effectiveness of endoscopic sphenopalatine artery (SPA) cauterization in patients with refractory epistaxis. **Materials and Method:** The experience of endoscopic sphenopalatine artery cauterisation under general anaesthesia in 3 patients has been described. All patients had undergone anterior nasal packing, posterior nasal packing, endoscopic cauterisation of visible bleeding points but all of them failed to control bleeding. **Results:** Epistaxis was controlled in all the 3 patients after endoscopic sphenopalatine artery cauterisation. **Discussion:** Endoscopic sphenopalatine artery cauterisation is a safe and effective method of managing refractory posterior nasal bleeding which is not responding to all other conservative measures.

**Keywords:** Sphenopalatine artery, endoscopic cauterization, epistaxis.

## 1. Introduction

Epistaxis is one of the most common emergencies in ENT department. There is a bimodal distribution with peaks in children and young adults and the older adult (45–65 years).<sup>1</sup> Sometimes it may be intractable and challenging for ENT surgeon. It may be life threatening because of associated complications like aspiration, hypotension and anaemia.<sup>2</sup> Most cases of epistaxis can be managed with conservative measures like nasal packings and chemical cautery. Upto 15% of patients require hospital admission for some surgical intervention.

Previously ligation of internal maxillary artery was considered through trans-antral route. However it may be associated with many major complications like facial swelling, facial numbness, oro-antral fistula and failure rate of 10-15 percent.<sup>3</sup> More recently cauterisation or clipping has been adopted which is safe and not associated with any major complication.

In this study, we have tried to control refractory epistaxis via cauterizing the sphenopalatine artery endoscopically.

## 2. Materials and Methods

A yearlong prospective study was carried out in our institution. All patients had persistent epistaxis despite several episodes of anterior and posterior nasal packing in form of conservative management. Patients underwent Sphenopalatine artery cauterization following an informed consent. Mean time of patient follow up was 6 months.

## 3. Procedure

Sphenopalatine artery cauterisation was done under general anaesthesia. Initially, nostril packed with nasal packings soaked in solution {saline (30ml) + 1:100,000 adrenaline(2ml)}.

Local anaesthesia xylocaine 2% (1ml) with 1:100,000adrenaline was injected into the pterygopalatine

fossa through the greater palatine foramen in the roof of the hard palate. Greater palatine foramen identified between second and third molar teeth 1 cm medial to this area. After this nasal packs removed, decongested and middle meatus antrostomy done. Mucoperiosteal flap elevated from posterior lip of antrum. Sphenopalatine artery identified running vertically approximately 1 cm behind the ostium.

Location of sphenopalatine foramen can be identified by the help of crista ethmoidalis. After identification of sphenopalatine artery, it was cauterised with endoscopic bipolar diathermy. Muco-periosteal flap repositioned and nasal packing done. Packing removed 72 hours after surgery.

Details of the patient who underwent SPA cauterisation-

Age / Sex	Presentation	Side	Associated disease
75 / F	Recurrent epistaxis for 2 months	B/L	Acquired haemophilia
21/M	Recurrent epistaxis for 4 months	Rt.	Trauma
35/M	Recurrent epistaxis for 2 months	Rt.	Idiopathic

## 4. Results

The procedure took around average 40 minutes. No immediate post-op complication was noted in any patient due to the procedure. Major bleeding was controlled except mild oozing from the mucosa. One patient who was diagnosed as acquired haemophilia expired ten days after the procedure due to hypovolaemic shock due to repeated haemorrhage from mucosal sites & internal bleeding other than nose. It is to be noted that in this patient also SPA cauterization worked excellent and major nasal bleeding stopped just after the arterial cauterization. Other 2 patients didn't present with any active epistaxis episode in their 6 months follow-up.

## 5. Discussion

In recent years, with advances in surgical technology, the advent of endoscopic sinus surgery has brought change in the treatment of sinus disease and has increased our knowledge of the anatomy of the lateral nasal wall.

The invention of the Hopkins rod in 1960s has revolutionised nasal surgery. Only recently has this new technology been adapted for the treatment of epistaxis.<sup>4-6</sup>

Traditionally the treatment options have included one or more of the following: nasal packing, septoplasty and arterial ligation of internal maxillary artery and external carotid artery or anterior ethmoidal artery. Apart from a high failure rate ranging from 26 to 52% and posterior nasal packing is associated with considerable discomfort and mucosal trauma, morbidity due to hypoxia.<sup>7</sup>

Repeated nasal packing has a high rate of complications (69%), including synechia, sinusitis, lesions in the nasal mucosa, local infections, septal perforation, orbital cellulitis, necrosis of the nasal ala, fracture of the lamina papyracea, perforation of the palate, and alterations in the middle ear. Other possible complications, although very rare, include pyogenic granuloma, allergy, toxic shock syndrome, obstructive sleep apnea syndrome (OSAS), hypoventilation, chest pain, hypoxia, aspiration (if the tamponade is moved), altered arterial blood gases, bradycardia, hypotension, and infectious endocarditis.<sup>8-12</sup>

Traditional arterial ligation methods are also associated with significant morbidity and failure rates. The transantral approach to the maxillary artery may cause damage to the nasolacrimal duct or infraorbital nerve and thus cheek anaesthesia. External carotid artery ligation is associated with risk of damage to hypoglossal nerve and vagus nerve. Moreover there is a high failure rate due to extensive anastomosis distal to the site of ligation.<sup>13</sup>

Sokoloff first undertook angiographic embolisation for epistaxis in 1972.<sup>14</sup> Embolisation is routinely performed in some centres as a means of treating intractable epistaxis. The technique entails cannulation of the external carotid artery and location of the bleeding point by water soluble contrast. Coils, gel foam, and polyvinyl alcohol can then embolise the causative artery. The success rate has been reported to be as high as 87%, which is similar to arterial ligation.<sup>15</sup> The technique's limiting factors include; lack of specialist radiologists and equipment, the inability to embolise ethmoidal arteries because of the risk of blindness, false aneurysm development at the insertion site, cerebrovascular accidents, and imaging difficulties after nasal packing. Studies have reported a complication rate of 17%–27%.<sup>16</sup>

The microscopic surgical approach to the sphenopalatine foramen was first described by Prades (1978),<sup>17</sup> as an approach for Vidian neurectomy. Subsequently, advances in techniques of nasal endoscopy, led to the sphenopalatine artery being accessed in the management of posterior epistaxis. This has resulted in the popularization of endoscopic cauterization of sphenopalatine artery in the management of refractory epistaxis.

One of the reasons that Sphenopalatine artery cauterization has become popular is that it is the terminal branch of the Internal Maxillary artery and is sufficiently distal to make retrograde and anastomotic blood flow from other vessels unlikely. This fact has led surgeons to consider how to better approach this artery in an attempt to minimize both morbidity and failure rates, despite the description of transantral routes to the sphenopalatine artery.<sup>18</sup>

Buchwald and Jensen (2006) showed that this is a minimally invasive technique which is effective and significantly reduces the discomfort for the patient.<sup>19</sup>

Srinivasan et al(2000) had compared trans-nasal endoscopic sphenopalatine artery diathermy with conventional approaches and including septoplasty and nasal packing and external carotid artery ligation<sup>20</sup>. They found that the sphenopalatine artery diathermy group experienced a shorter hospital stay on average and they experienced no surgery-related complications. Prepageran and Krishnan (2003) showed that endo-nasal endoscopic coagulation of sphenopalatine artery is a safe and efficient method of controlling persistent posterior epistaxis with minimal complication.<sup>21</sup>

In Sharp et al. (1997) elevated a mucosal flap over the sphenopalatine foramen and then used a transnasal endoscopic approach to apply either diathermy or clips to the sphenopalatine vessels in 10 patients with intractable epistaxis; they reported no treatment failures.<sup>22</sup>

Similarly, Pritikin et al. (1998) applied bipolar diathermy and hemostatic clips to the sphenopalatine vessels via a transnasal endoscopic route in 10 patients with intractable epistaxis and they also reported a success rate of 100%.<sup>23</sup>

Our study aimed at determining the advantages of SPA cauterization over other methods and assessing the immediate and late post-operative cessation of epistaxis as well as complications associated with the procedure.

The cauterization of the Sphenopalatine artery leads to considerable complications. In some studies, 33% of cases had increased nasal crusting following this procedure. Also palatal numbness was reported in 13 % of cases. However, in our study, no patient reported any of these complications. Sphenopalatine artery cauterization has been shown to be associated with a shorter hospital stay and cost effectiveness compared with other surgical modalities. There are no contraindications for sphenopalatine cauterization. Thus we recommend the use of this procedure for the control of posterior epistaxis as an immediate second-line management when conservative treatment as first line fails.

## 6. Conclusion

Endoscopic cauterization of SPA is technically straightforward to perform and allows direct cauterization of the major vessel supplying the posterior nasal cavity. The procedure appears to be safe, simple, fast, and effective for the management of refractory posterior epistaxis with low rates of morbidity and complications, and should be considered as an immediate second-line management when

conservative treatment as first line fails. Some experts even recommend its use as a first option, without waiting for the failure of posterior packing.

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