

# Endoscopic Cauterization of the Sphenopalatine Artery in Persistent Epistaxis

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## SUMMARY

The management of epistaxis remains to be a challenging problem for most ENT surgeon especially posterior epistaxis. Most cases are managed by placement of posterior nasal packs or balloons and failure leads to more invasive techniques, involving ligation of the internal maxillary artery. The above management is associated with significant patient complication and morbidity. Endoscopic ligation or cauterization of the sphenopalatine artery has emerged as a viable and minimally invasive alternative. We have performed endoscopic cauterization of nine sphenopalatine arteries in eight patients with no further episodes of epistaxis and complications, with an average follow-up of 25 months. The mean age of the patients was 52.75 years. Fifty percent of the patients had a history of hypertension.

## KEY WORDS:

*Endoscopic, Epistaxis, Sphenopalatine artery*

## INTRODUCTION

Epistaxis continues to be one of the most common and intriguing emergencies presenting to the ENT surgeon. Usually, the posterior epistaxis provides a challenging management problem as compared to the trivial bleeding from the Little's area. Placement of posterior nasal packs and/or balloons has been the first line of management. These packs often cause considerable discomfort and may cause mucosal trauma and necrosis. In the elderly, there is significant increased risk of obstruction of the nasal airway causing hypoxia, cardiac arrhythmias, or even death<sup>1,2</sup>.

Patients that continue to bleed despite conservative methods are then subjected to more invasive techniques<sup>3</sup>. The internal maxillary artery is usually ligated through the Caldwell-Luc approach<sup>3</sup>. Sometimes ligation of the external carotid artery in the neck is necessary<sup>3</sup>. The Caldwell-Luc approach has also been associated with significant patient morbidity<sup>4</sup>.

With the advent of the rigid endoscopes for the treatment of nasal and sinus disease, the expanded role has developed to encompass cauterization and ligation of the sphenopalatine artery. Endoscopic cauterization of the sphenopalatine artery causes interruption of the nasal vasculature at a point distal enough to prevent direct, retrograde and anastomotic blood flow from ipsilateral and contralateral carotid systems<sup>5</sup>.

## MATERIALS AND METHODS

Between May 2005 and July 2006, eight consecutive patients (5 male and 3 females) with posterior epistaxis have undergone endoscopic cauterization of nine sphenopalatine arteries (4 right, 3 left and one bilateral) under the care of the main author. The mean age of patients was 52.75 years (range 26-73). All patients with suspected posterior epistaxis were initially managed with placement of a 10 mL balloon catheter in the posterior nasal space and a Merocel pack anteriorly. The patient is then admitted to the ward for observation. In the ward, routine blood examination was carried out for platelet count and coagulation profile. The next day, the packs were removed and endoscopy performed to confirm the site of bleeding. Once a posterior bleed is confirmed, endoscopic cauterization of the sphenopalatine artery is performed as an emergency procedure.

## Surgical Technique

Acute haemorrhage in uncontrolled epistaxis is managed initially by injecting the pterygopalatine fossa through the greater palatine foramen in the roof of the hard palate with 1mL of 1:100,000 adrenaline and 2% xylocaine. Once the patient is under general anaesthesia, the initial 10 mL balloon catheter which was placed in the posterior nasal space and a Merocel pack anteriorly is removed. Five neuropathies soaked in 2 mL 5% cocaine are placed in the affected nasal cavity. Once the bleeding is controlled and with adequate nasal decongestion, the area of the sphenopalatine foramen is inspected. A further 0.5 mL of 1:100,000 adrenaline and 2% Xylocaine is then injected in these area.

The important landmark to be identified is the junction between the membranous posterior fontanelle of the maxillary sinus and the lateral nasal wall. An incision is made from the under surface of the horizontal portion of the ground lamella of the middle turbinate to the insertion of the inferior turbinate on the lateral basal wall. The flap is elevated with a suction Freer's. This flap is elevated posteriorly, in the lower half of the mucosal incision until the anterior face of the sphenoid is identified. Once this landmark is identified the dissection is directed superiorly until the mucosa tents around the region of the sphenopalatine foramen. Here the neurovascular bundle will emerge.

Further gentle dissection in this area is done until the artery is identified. This artery is then diathermied with a bipolar cautery. The flap is then returned and a small piece of

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Table I: Indications, Medical History and Follow-up

	Age	Sex	Cause	Medical History	Follow-up (months)	Recurrence
1	52	F	Recurrent Epistaxis	NPC HPT	33	None
2	45	M	Spontaneous Epistaxis	HPT	30	None
3	27	M	Recurrent Epistaxis	Nil	28	None
4	69	F	Spontaneous Epistaxis	Nil	25	None
5	73	F	Spontaneous Epistaxis	HPT/DM	24	None
6	58	M	Spontaneous Epistaxis	Nil	21	None
7	62	M	Spontaneous Epistaxis	HPT/DM	20	None
8	26	M	Spontaneous Epistaxis	Nil	19	None

HPT, hypertension; DM, diabetes mellitus; NPC, nasopharyngeal carcinoma.

surgicel is placed overlying this area. No intranasal packing is inserted. Patients are discharged the next day with antibiotics and oxymethazoline nasal sprays. Further review is done in the out-patient clinics.

## RESULTS

The results are summarized in Table I. In all patients, their platelet counts and coagulation profile was normal. The average length of the procedure was 54.44 minutes. All patients were discharged the next day. In every case, no intra or post-operative complications were recorded in particular intracranial or intraorbital sequelae. Minor complications like numbness of the teeth, palate and upper lip was also absent. All patients have subsequently been followed up on average of 25 months with no further episodes of epistaxis. Four patients (50%) were hypertensives with associated NPC (one) and diabetes (two). The rest of the patients had unremarkable medical history.

## DISCUSSION

Traditional methods of arterial ligation like the trans-antral approach causes significant morbidity. The trans-antral approach to the internal maxillary artery (IMA) via the posterior wall of the maxillary sinus is also known by the Caldwell-Luc approach. Reported morbidity includes dental injury, infraorbital nerve damage, oro-antral fistula, blindness and ophthalmoplegia<sup>6</sup>. This procedure is also associated with a failure rate of as high as 40%<sup>4,5</sup>. The most common cause for the failure to ligate or cauterize the IMA was due to the surgeon's inability to identify the IMA or its terminal branches in the pterygomaxillary fossa. Additionally, surgical clips were not correctly placed in 13% of cases<sup>4</sup>.

The sphenopalatine artery is the terminal branch of the internal maxillary artery. Endoscopic cauterization of the sphenopalatine artery causes interruption of the nasal vasculature at a point distal enough to prevent direct, retrograde and anastomotic blood flow from ipsilateral and contralateral carotid systems<sup>5</sup>. It is due to this fact that endoscopic cauterization of this artery has become a more

popular approach to deal with posterior refractory epistaxis. The transnasal approach is more direct and feasible as compared to the trans-antral approach. It allows direct entry into the sphenopalatine fossa where the sphenopalatine artery can be easily identified.

Sharp *et al*<sup>5</sup> reported a series of ten consecutive patients that had undergone endoscopic ligation of 11 sphenopalatine arteries over a 26 month period. No patient has had further epistaxis requiring medical attention. Wormald *et al*<sup>7</sup> has also reported a high success rate of 92% in patients with refractory posterior epistaxis treated with endoscopic ligation of the sphenopalatine arteries using Ligar clips.

The endoscopic approach is a non-invasive technique, with easy access transnasally to the sphenopalatine foramen. It also offers considerable reduction in surgical and anaesthetic time as compared with the more traditional approaches hence reducing surgical morbidity and failure rates. This also avoids the necessity to pack the nose for several days. This improves patients comfort and need for prolonged hospitalization. As a conclusion, endoscopic cauterization of the sphenopalatine artery is a safe and cost effective technique in the management of posterior epistaxis.

## REFERENCES

1. Elwany S, Kamel T, Mekhamer A. Pneumatic nasal catheters: advantages and drawbacks. *J Laryngol Otol*. 1986; 100: 641-47.
2. Jacobs JR, Dickson CB. Effects of nasal and laryngeal stimulation upon peripheral lung function. *Otol Head Neck Surg*. 1986; 95: 298-303.
3. Pritikin JB, Caldarelli DD, Panke WR. Endoscopic ligation of the internal maxillary artery for treatment of intractable posterior epistaxis. *Ann Otol Rhinol Laryngol*. 1998; 107: 85-91.
4. Metson R, Lane R. Internal maxillary artery ligation for epistaxis: an analysis of failures. *Laryngoscope*. 1988; 98: 760-64.
5. Sharp HR, Rowe-Jones JM, Biring GS, Mackay IS. Endoscopic ligation or diathermy of the sphenopalatine artery in persistent epistaxis. *J Laryngol Otol*. 1997; 111: 1047-50.
6. Strong EB, Bell DA, Johnson LP, Jacobs JM. Intractable epistaxis: Transantral ligation vs. embolization: efficacy review and cost analysis. *Otol Head Neck Surg*. 1995; 113: 674-78.
7. Wormald PJ, Wee DT, van Hasselt CA. Endoscopic ligation of the sphenopalatine artery for refractory posterior epistaxis. *Am J Rhinol*. 2000; 14: 261-64.