Main Article

ENDOSCOPIC SPHENOPALATINE ARTERY LIGATION FOR REFRACTORY POSTERIOR EPISTAXIS

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ABSTRACT: *Intractable posterior epistaxis remains a challenging problem for our specialty. Conventional management options in the form of anterior and posterior packing, arterial ligation of the internal maxillary or the external carotid artery and embolization, are not entirely satisfactory because of morbidity, high failure rates, and occasional significant complication. Our experience with endoscopic sphenopalatine artery ligation for four patients with posterior existaxis is described. All patients had epistaxis refractory to anterior and posterior nasal packing, which was rapidly controlled following the procedure. The technique of spheno-palatine artery ligation is described.*

The technique is simple and effective and prevents the morbidity and complications of nasal packing. It is especially useful in systemically compromised individuals who otherwise tolerate nasal packing poorly, and should be one of the treatment options to be considered relatively early in the management of epistaxis refractory to anterior & posterior nasal packing.

Intractable epistaxis continues to remain a difficult management problem for our speciality. On occasions, it can be life threatening because of anemia, aspiration, hypotension and associated co-morbidities. This is especially so when it occurs in elderly or systemically compromised individuals.

Conventional management pathways dictate that the patient be initially resuscitated, and if the bleeding site cannot be identified then anterior and posterior nasal packing be done to arrest the bleeding. Apart from the considerable discomfort that it causes the patient, nasal packing is also known to cause hypoxia (Elwany et al 96[1]) and airway compromise. Moreover it is frequently ineffective as the protrusion of the turbinates prevents direct pressure over bleeding surfaces on the lateral wall of the nose. The mucosal trauma and necrosis it entails can lead to a vicious circle of rebleeding and repacking. The recognition of these problems have led to angiography with embolization and arterial ligation being proposed as alternatives to nasal packing.

Traditional techniques of arterial ligation such as transantral ligation of the internal maxillary artery or ligation of the external carotid artery have been associated with a failure rate of as high as 10-15%.[2] The reasons for failure include cross anastomosis, a dominant contra lateral internal maxillary artery and also failure to identify and ligate all branches. For effective decrease in arterial pressure, ligation is best undertaken as close to the bleeding area as possible. To this end, endoscopic ligation of the sphenopalatine artery -which is at a point distal to all retrograde and anastomotic connections is conceptually an effective and logical site to direct treatment.

MATERIALS AND METHODS

The authors have recently treated four patients with intractable epistaxis by Endoscopic ligation of the Spheno-platine artery. Their salient features are summarized in [Table 1].

All four cases were initially treated with conventional anterior nasal packing, either with ribbon gauze or with Merocel. As bleeding persisted, they then required posterior tamponade with a posterior nasal pack or a Foley's balloon catheter. Two of the patients (Case 1 and 3) presented with a history of recurrent episodes of epistaxis over 2 years, controlled only with anterior and posterior nasal packing on each occasion. The other two patients (Case 2 and 4) presented with the first episode of recalcitrant nasal bleed, which was not adequately controlled by anterior and posterior nasal packing. These two cases additionally had associated co-morbid conditions [Table 1] and tolerated nasal packs poorly. Removal of nasal packs on day 2 led to rebleeding requiring repacking, and they were then offered the option of endoscopic ligation of sphenopalatine artery.

Surgical procedure

All procedures were done under general anaesthesia. At the

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Table 1

Age/Sex	Presentation	Associated Co-orbidities
40 M	Recurrent episodes of epistaxis. episodes in 2 years, each necessitating anterior and posterior nasal packing	None 4
54 M	Profuse epistaxis. Anterior & posterior nasal packing done twice with persistent rebleeding.	Alcoholic with withdrawal symptoms. Agitated with tendency to pull out nasal packs.
42 F	Recurrent episodes of epistaxis. 5 episodes in 2 years, each necessitating anterior and posterior nasal packing	None
44 M	Profuse epistaxis on POD, following surgery for Ca oesophagus. Anterior and posterior nasal packing done twice, with presistent rebleeding on pack removal	Ca oesophagus post op Intubated. with ETCT and on ventilator. Nasal packing contributed to inability to extubate the patient. Normal coagulation profile.

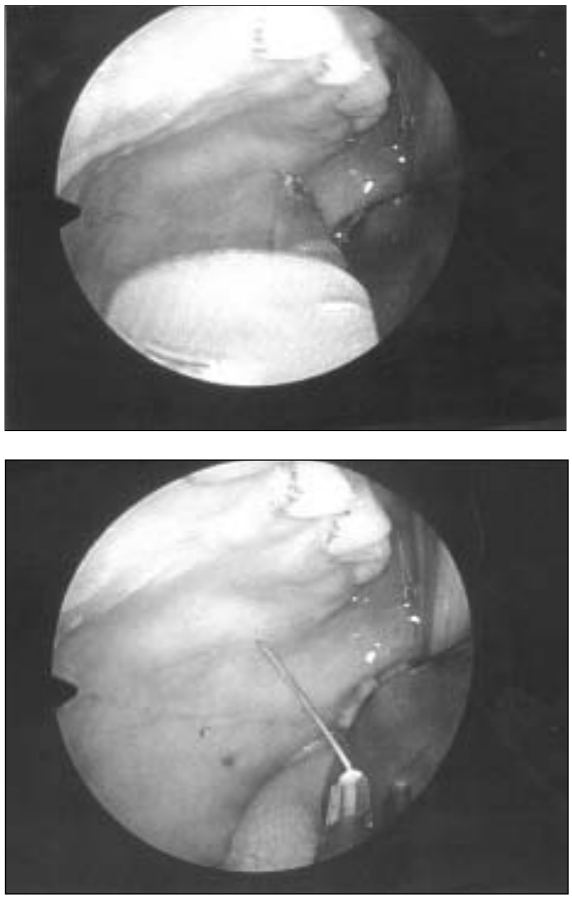

Figure 1: Injection into the palatine foramen prior to starting the procedure and removal of nasal packs

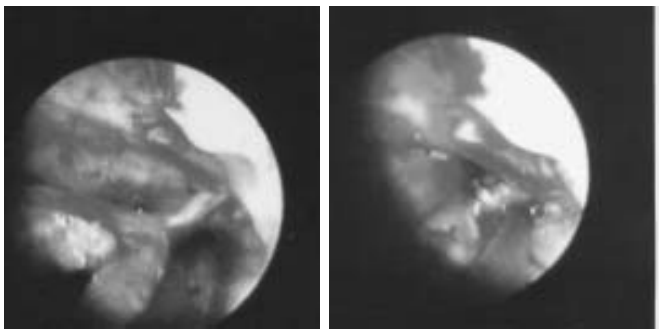

Figure 2: a) the sphenopalatine artery entering the nasal cavity from the sphenopalatine foramen and passing medially, tethering the mucosa to the foramen via a sleeve of fibrous tissue. b) A Ligaclip has been applied on the artery.

start of the procedure, lml of 1% xylocaine with 1 in 1,00,000 adrenaline was injected via a 1 inch needle into the greater palatine foramen. This was intended to reach the terminal tributaries of the internal maxillary artery in the pterygo-palatine fossa and to cause vasoconstriction. In addition, a high volume injection of saline (3ml) was also injected at the same site to pressure tamponade the vessel [Figure 1]. In cases with pre-existing nasal packs (Case 2 and 4), the nasal packs were removed only after this injection.

The surgical field (the lateral wall of the posterior middle meatus, inferior to the horizontal ground lamella of the middle turbinate) was further infiltrated with the solution of xylocaine and adrenaline. The middle turbinate was gently medialized with a Freer's elevator. The spheno-palatine foramen is situated just inferior to the posterior end of the middle turbinate and was accessed by a vertical incision of approximately 1.5cm on the lateral nasal wall. The inferior edge of the vertical incision was sited posteroinferior to the bulla ethmoidalis and it then extended superiorly so as to curve on to the undersurface of the horizontal portion of the middle turbinate (third part of basal lamella). A mucoperiosteal flap was then raised posteriorly so as to develop a pocket between the mucosa and the bone of the middle turbinate/ lateral nasal wall. Further posterior dissection along this pocket exposed the anterior wall of the sphenopalatine foramen, and inferomedial traction on the overlying mucosa led to the

sphenopalatine artery being stretched out and being clearly revealed [Figure 2]. The vessel was then ligated by a metal clip (ligaclip 200) [Figure 2] and was also cauterized just distal to the clip. A loose anterior nasal pack was kept in place at the end of the procedure

RESULTS

The procedure took about 30 minutes. The anterior nasal pack, which was inserted at the end of the procedure, was removed on the second postoperative day. No patient had any complication consequent to the procedure. All patients had successful control of epistaxis. The first three patients were discharged one day after pack removal. In the fourth patient who was intubated and on ventilator, successful control of epistaxis and removal of nasal packs, facilitated the process of extubation.

DISCUSSION

Blood vessels responsible for anterior epistaxis are usually easily identifiable and amenable to management by cauterization, whereas posterior epistaxis can be frustrating for both the surgeon and the patient.

Traditionally the treatment options have included one or more of the following: nasal packing, septoplasty, and arterial ligation of internal maxillary artery, external carotid artery or anterior ethmoidal artery. Apart from a high failure rate ranging from 26 to 52 percent,[3],[4] posterior nasal packing is associated with considerable discomfort, mucosal trauma and morbidity due to hypoxia.

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.[3],[5] 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.

Recently angiography and embolization of the bleeding vessels, and endoscopic clipping or cauterization of sphenopalatine artery have been added to the management options.

Percutaneous embolization of the maxillary artery requires the expertise of an experienced interventional radiologist, which is not uniformly available. It is also. associated with serious neurological complications.[6],[7]

The microscopic surgical approach to the sphenopalatine foramen was first described by Prades[8] 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 ligation of sphenopalatine artery in the management of refractory epistaxis. Multiple studies (Sharp et a[9], Pritkin et al[10], Srinivasan et al[11]) have reported a success rate of over 90% with no significant complications.

The surgical technique has been well described previously. The only additional modification that we have used is the high volume injection of saline via the greater palatine foramen to pressure tamponade the sphenopalatine artery in the pterygo-palatine fossa. This is especially relevant in management of refractory epistaxis as it provides for a transient decrease in sphenopalatine artery blood flow. The transient control so achieved enables the removal of the pack and the time to undertake a formal clipping of the vessel.

We were able to control the epistaxis in all the four patients on whom this procedure was attempted, with no surgical complications, thereby avoiding the morbidity associated with prolonged nasal packing and other external surgical approaches.

Endoscopic ligation of the sphenopalatine artery is a safe, simple and effective procedure in the management of refractory posterior epistaxis. Moreover, in view of minimal morbidity of the procedure, our current practice is to consider this treatment option early on in the management of cases not responding to conventional nasal packing.

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