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Endoscopic ligation of the sphenopalatine artery (ELSA): a preliminary description

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Abstract
Two cases of transantral endoscopic ligation of the sphenopalatine artery are presented, and the surgical technique described. The main advantage of this minimal access operation being avoidance of the morbidity associated with the conventional Caldwell-Luc approach.

Key words: Epistaxis; Endoscopy; Arteries; Ligation

Introduction

The traditional management of posterior epistaxis involves the indirect techniques of nasal packing and balloon catheterization. If these fail, a ligation technique, usually internal maxillary artery ligation, is called for. If a Caldwell-Luc approach is used, a sub-labial incision is required, and the anterior sinus wall is removed. The morbidity associated with the Caldwell-Luc operation is well recognized, with dental anaesthesia and parathesia being especially common (Stammberger, 1991). In some centres, the advent of minimally invasive techniques such as endoscopic guided cautery, has led to less reliance on the traditional techniques (Wurman *et al.*, 1988; McGarry, 1991). Preliminary studies have shown that these techniques reduce both patient length of stay and morbidity (McGarry, 1991). So far these techniques have not been adopted on a large scale, nor have they been tested as a feasible alternative to the ligation techniques. As arterial ligation is still the most popular treatment for severe epistaxis, we wished to explore the feasibility of minimal access trans-antral maxillary artery ligation. We began with cadaver dissection studies, and from these evolved a new technique of clipping the sphenopalatine branch of the internal maxillary artery using an endoscopic transantral route. Endoscopic sphenopalatine artery ligation has been described previously (Budrovich and Saetti, 1992). The operation involves clipping the artery on the medial side of the sphenopalatine foramen. The problem with this technique is the difficulty encountered isolating the artery on the medial side of the foramen, and this the authors elude to themselves.

This first description of the trans-antral endoscopic technique is a natural combination of three well established surgical procedures; trans-antral ligation, canine fossa sinoscopy and middle meatal antrostomy. The posterior wall of the maxillary sinus is visualized through a canine fossa sinuscope, and instrument access is gained endonasally through a large middle meatal antrostomy. A description of the technique is outlined and our first two cases described.

Indications

Endoscopic ligation of the sphenopalatine artery (ELSA) is reserved for patients suffering posterior epistaxis who do not achieve haemostasis by the usual conservative means including endoscopic diathermy. In this respect the indications are the same as those for trans-antral maxillary artery ligation.

Surgical technique

Following adequate resuscitation measures, the procedure is best performed under general anaesthesic with an orotracheal tube and a pharyngeal pack inserted. The nose is prepared by the careful placement of neurosurgical patties soaked in 1/1000 adrenaline.

Infundibulotomy and middle meatal antrostomy

A standard endoscopic infundibulotomy is carried out, the uncinate process is first injected with 1/80 000 adrenaline. Uncinectomy is achieved and a middle meatal antrostomy fashioned (Figure 1) as described by Stammberger (1986). It is also helpful to remove the front wall of the ethmoidal bulla to improve access into the maxillary sinus. The

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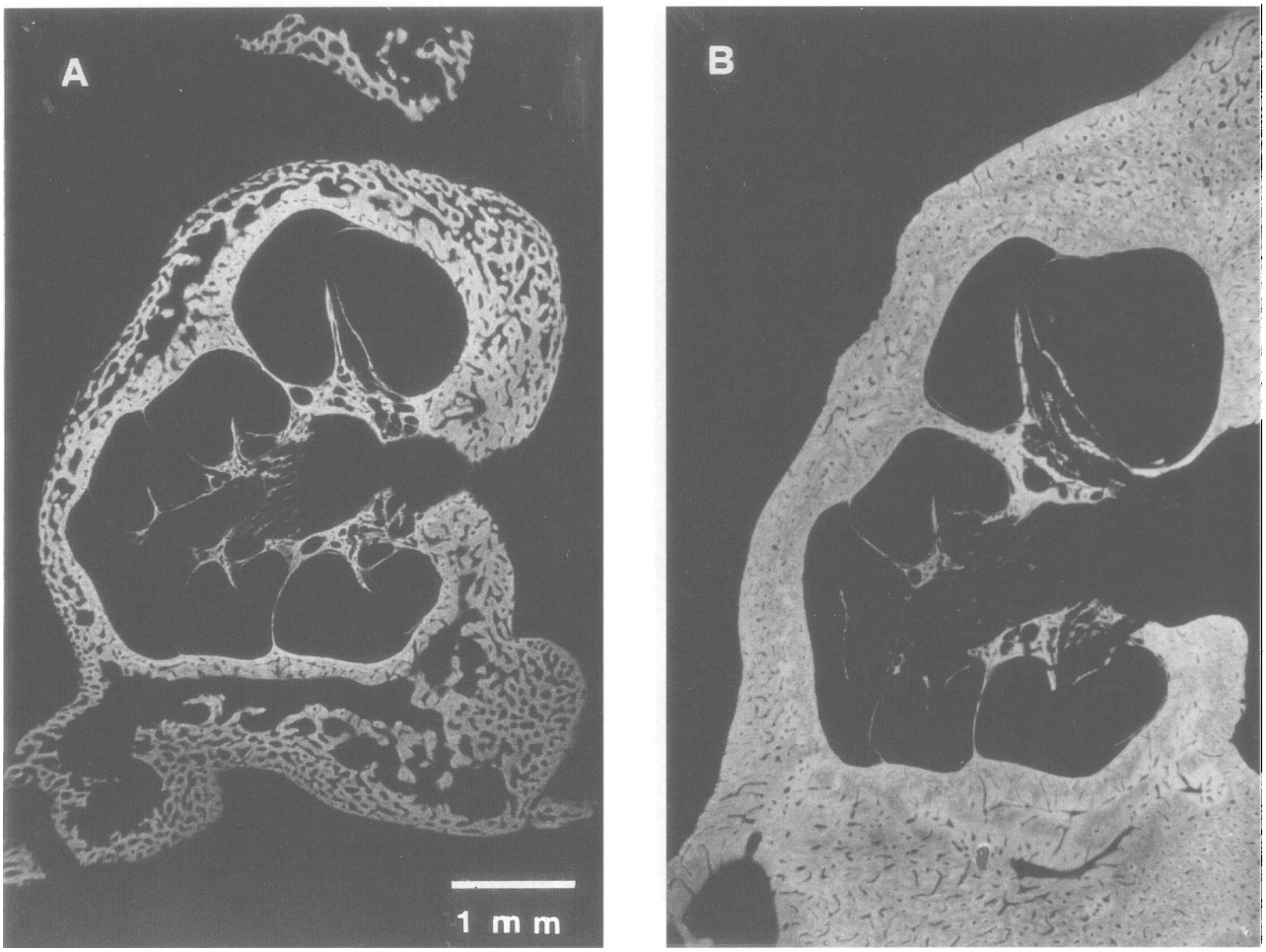

FIG. 4

Microradiographs of the cochlea mid-modiolar sections from 10-day (A) and 90-day-old dogs (B). In the oldest animal the thickening of the cochlear wall and its compaction with respect to the youngest sample is appreciable.

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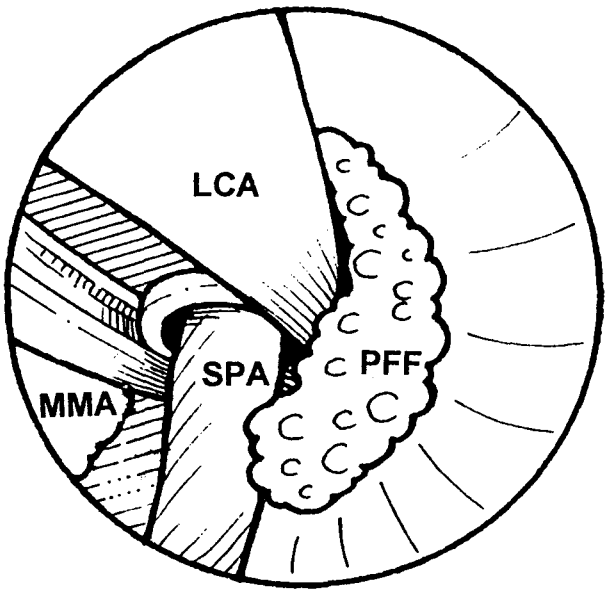

FIG. 3
The artery once dissected free, is clipped using a Ligge clip applicator (LCA).

Profuse intermittent epistaxis occurred in two patients and the diathermy technique proved unsuccessful in achieving haemostasis. Endoscopic ligation of the sphenopalatine artery (ELSA) was performed successfully on these two patients, and no patients admitted during 1994 required a traditional open operative measure for epistaxis.

Case 1

A 79-year-old man presented with a five-day history of intermittent right epistaxis. Examination during bleeding confirmed posterior epistaxis, and he initially responded well to BIPP nasal packing. Five days after pack removal he bled again and packing was reinstated. This trend continued for a further five days until the patient was listed for artery ligation. ELSA was performed successfully on the right side under general anaesthesia. The patient made an uneventful recovery without complication or further epistaxis.

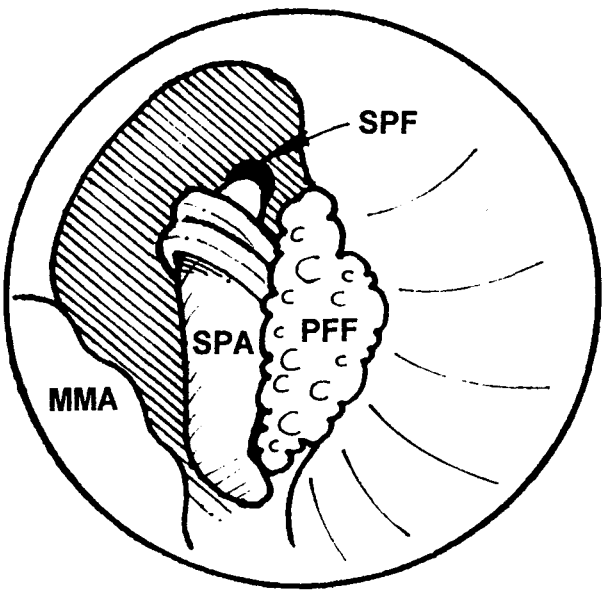

FIG. 4
The artery is seen clipped in two places just lateral to the sphenopalatine foramen (SPF).

Case 2

A 59-year-old woman with labile hypertension presented with a three-day history of severe intermittent left epistaxis. She responded well initially to the insertion of a left nasal balloon. Despite medical intervention, control of her labile blood pressure proved difficult. She bled again heavily following balloon removal and emergency nasendoscopy under general anaesthesia was arranged. The extent of her bleeding was such, that even at operation, a bleeding point at the posterior end of the middle meatus could not be accurately identified for endoscopic diathermy. ELSA was performed successfully on the left side. Three days post-operatively the patient suffered two minor nose bleeds associated with straining. At a second endoscopy under local anaesthesia the patient was asked to strain again, the small bleed produced responded to diathermy. Thereafter the patients recovery was uncomplicated and free of further epistaxis.

Discussion

When minimally invasive procedures set out to replace a traditional open approach, they should ideally offer equal or better visualization of the main operation site and an additional benefit to the patient such as reduced length of hospitalization. Canine fossa sinuscopy gives excellent visualization of the maxillary sinus, and when instrumentation is carried out through a middle meatal antrostomy the sphenopalatine artery can be ligated. The rapid increase in nasal endoscope skill levels amongst surgeons has encouraged the development of minimal access therapies for epistaxis. In most cases of posterior epistaxis, haemostasis can be achieved by endoscopic electrocautery. An audit of epistaxis admissions to this unit during 1994, showed that of the nine patients requiring operative intervention, all but the two cases presented above responded to endoscopic diathermy and none required a traditional open procedure. We therefore do not see ELSA as a replacement for endoscopic diathermy, but rather an operation to complement it, available for when haemostasis cannot be achieved by packing or by electrocautery.

Conclusion

Endoscopic ligation of the terminal branch of the internal maxillary artery is a feasible alternative operation to that achieved by the conventional Caldwell-Luc approach. Since the experience to date is limited, the endoscopic operation is not yet advocated as a replacement for the traditional operation. However, surgeons with advanced endo-

scopic skills may wish to consider this as an alternative to the traditional operating microscope procedure. More case experience is required before the endoscopic operation can be fully evaluated.

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