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The use of nasal endoscopy to control profuse epistaxis from a fracture of the basi-sphenoid in a seven-year-old child

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Abstract
A seven-year-old child sustained a fracture of her basisphenoid resulting in profuse, life-threatening haemorrhage which could not be controlled with a post-nasal pack. The fracture site was identified using rigid endoscopy and packed with oxidized cellulose, resulting in immediate control of the haemorrhage. The use of the nasal endoscope in the management of posterior epistaxis is discussed.

Key words: Endoscopy; Epistaxis; Skull base

Introduction

Skull base fractures can produce dramatic haemorrhage which may, if not adequately controlled, become rapidly fatal (Jones, 1997). The traditional method for controlling profuse epistaxis from the posterior nasal cavity, where the source is often difficult to identify, is anterior and posterior nasal packing in the first instance, with arterial ligation and embolization reserved for the failure of packing (Pritikin *et al.*, 1997). Nasal packing is associated with significant morbidity (Fairbanks, 1986).

Several authors have advocated the use of the rigid nasal endoscope in the management of posterior epistaxis, both in the first instance and in intractable cases. Wurman *et al.* (1986) describe the technique of endoscopic cautery and report their experience with 18 patients treated in this fashion. The procedure was successful in 12 patients and they describe endoscopic cautery as the procedure of choice in posterior epistaxis. McGarry (1991) compared patients with posterior epistaxis treated with endoscopic cautery with patients treated with nasal packing. The patients whose epistaxis was treated endoscopically had a significantly shorter in-patient stay and the author recommended the use of the nasal endoscope in the first instance. O'Leary-Stickney *et al.* (1992) described the endoscopic treatment of six patients with refractory epistaxis using electrocautery. Five out of six patients were treated successfully in this manner. El-Silimy (1993) described the successful treatment of 27 patients with posterior epistaxis with endoscopic cautery and Frikart and Agrifoglio (1998) described 139 patients with endoscopic cautery as first-line treatment for posterior epistaxis. They report a 92 per cent success rate. They also stress, as other authors have, the cost benefit of this technique compared to traditional methods.

The use of the nasal endoscope in ligation of the terminal branches of the internal maxillary artery has also been described (Pritikin *et al.*, 1997). This was performed in 10 patients with intractable posterior epistaxis and was successful in all patients. Sharpe *et al.* (1997) described the endoscopic ligation of the sphenopalatine artery.

We describe the case of a child who presented with torrential epistaxis as a consequence of a skull base fracture, treated successfully with the use of the rigid nasal endoscope.

Fig. 1
CT scan of patient's head on admission showing a probable fracture of the basi-sphenoid.

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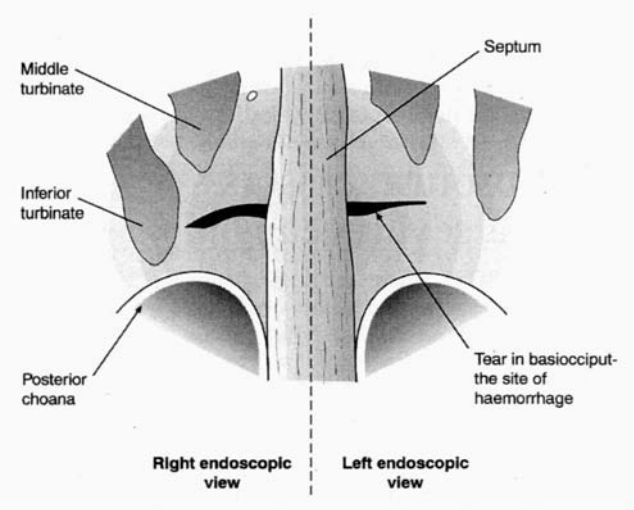

FIG. 2
Diagram showing the endoscopic view of the fracture of the basi-sphenoid.

Case report

A seven-year-old girl was admitted as an emergency having sustained a head injury when a wall fell on top of her. She had soft tissue injuries to her face and a Glasgow Coma Score of 8/14. She had a profuse epistaxis in addition to her other injuries and was intubated on admission.

An emergency computed tomography (CT) scan of the head revealed a fracture of the cranial vault and was suggestive of a fracture of the basi-sphenoid (Figure 1). Attempts to control the epistaxis with a post-nasal pack and an anterior pack with Vaseline ribbon gauze were unsuccessful and arrangements were made for angiography to be performed. Angiography revealed pooling of contrast in the area of the sphenoid bone and the posterior nasopharynx consistent with extravasation from a branch of the right internal maxillary artery and the right internal carotid artery. No caroticocavernous fistula was seen. The exact site of the bleeding could not be located and embolization was not attempted. Over this period the patient had received five units of blood to maintain her circulating blood volume and bleeding had continued to the extent that the patient received the 'last rites'. A surgeon familiar with endoscopic nasal techniques was then contacted and attended.

On endoscopic examination of the postnasal space a tear in the mucosa and an underlying fracture line could be seen. It was possible to visualize this despite severe haemorrhage by keeping a rigid endoscope well behind a 9FG sucker in order to prevent splattering of the endsocope with blood. The site of the fracture as visualized using the endoscope is shown diagrammatically in Figure 2. The fracture site was packed with oxidized cellulose and this successfully controlled the haemorrhage.

The child also required a craniotomy for removal of an expanding extradural haematoma and a period of ventilation on the intensive care unit. She made a full recovery and was discharged home with no neurological deficit. There was no cerebrospinal fluid rhinorrhoea and no evidence of caroticocavernous fistula.

Discussion

Fractures of the anterior skull base and sphenoid may require the involvement of a rhinologist for a number of reasons including the management of CSF rhinorrhoea, reconstruction of the sinuses and facial skeleton and occasionally for the arrest of haemorrhage. Epistaxis resulting from skull base injuries may be severe and rapidly become life-threatening. Traditionally, nasal packing has been used to control severe haemorrhage and failing this arterial ligation or embolization was used. Embolization, however, carries a definite risk of permanent neurological deficit (O'Leary-Stickney *et al.*, 1992). The complications of nasal packing are also well documented (Fairbanks, 1986).

The internal maxillary artery divides into its terminal branches, of which the sphenopalatine artery plays the greatest role in the supply of the nasal cavity including the posterior wall and sphenoid sinus, in the pterygopalatine fossa (Lang, 1989). Although angiography in this case was not conclusive in defining the exact site of the vascular injury it would seem most likely that the arterial bleeding observed arose from a branch of the maxillary artery with the possible addition of a direct injury to the internal carotid artery.

The rigid nasal endoscope allows excellent visualization of the nasal cavity and has an essential role in the assessment of sinonasal and anterior skull base anatomy. In this case the use of the endoscope allowed precise identification of the bleeding site and packing of the fracture site resulting in immediate successful control of the haemorrhage. The potential morbidity of embolization was also avoided. Other workers in this field have suggested that endoscopy should be used as a first-line treatment of choice in posterior epistaxis. This case would suggest that considerable benefits could be derived from its use in traumatic epistaxis as well.

Summary

The rigid nasal endoscope is becoming an established instrument in the management of epistaxis and its use as a first-line treatment for posterior epistaxis has been advocated (McGarry, 1991; O'Leary-Stickney *et al.*, 1992). It has an essential role in the assessment of the anatomy and pathology of the nasal cavity and anterior skull base. In this case the use of the endoscope allowed the fracture site in the basisphenoid to be directly visualized and profuse haemorrhage from it tamponaded with oxidized cellulose. We would suggest that, where circumstances and facilities allow the endoscope could beneficially be used in the initial assessment and treatment of severe traumatic posterior epistaxis.

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