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CLINICAL RECORD

Coblation for epistaxis management in patients with hereditary haemorrhagic telangiectasia: a multicentre case series

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Abstract

Objective: To propose radiofrequency coblation as a potential treatment modality for mild to moderate epistaxis in patients with hereditary haemorrhagic telangiectasia.

Method: Case reports and review of the world literature concerning coblation and other treatment modalities for epistaxis in patients with hereditary haemorrhagic telangiectasia.

Results: Effective epistaxis control was achieved in four out of five cases of hereditary haemorrhagic telangiectasia. In the fifth case, we struggled to achieve haemostasis due to disease severity.

Conclusion: Radiofrequency coblation is a novel technique, which was found to be a safe, effective, quick and well tolerated treatment option for epistaxis management in patients with hereditary haemorrhagic telangiectasia.

Key words: Hereditary Haemorrhagic Telangiectasia; Epistaxis; Surgical Techniques, Operative; Coblation; Nasal Cavity

Introduction

Hereditary haemorrhagic telangiectasia is an autosomal dominant disorder characterised by diffuse telangiectasia and arteriovenous malformations on both cutaneous and mucosal surfaces.[1]

The clinical course of the illness is dominated by chronic, recurrent epistaxis which can be difficult to manage.[2] Many techniques have been used to control epistaxis in such patients, including hormonal manipulation,[3,4] various lasers,[5–8] microdebriding,[9] chemical and electrical cautery,[10] septodermoplasty,[11] and nasal closure (Young's procedure).[12]

The ideal technique for hereditary haemorrhagic telangiectasia would be effective, long-lasting and minimally invasive while preserving mucociliary function.

The KTP laser can arguably claim to be the current 'gold standard' for hereditary haemorrhagic telangiectasia management.[5] However, it is an expensive piece of equipment and can be difficult to use in a bloody field.

Microdebriders have been successfully used to remove telangiectasia, but also require bipolar diathermy to seal the feeding vessels.

Radiofrequency coblation is a relatively new technique which is being increasingly used in ENT surgery. This technique destroys tissue by a process of radiofrequency energy application to a conductive medium (e.g. normal saline), which produces a localised plasma field that breaks molecules into inert, low molecular weight gases at low temperature (classically 60–70°C). This contrasts with conventional electrosurgery, in which direct electric energy applied to tissue causes temperatures of over 400°C. Coblation has been demonstrated to promote good healing and to preserve surrounding normal tissue.[13] Despite low temperatures, small blood vessels are sealed by this process. Additional, prospective studies have demonstrated that radiofrequency coblation significantly decreases blood loss during endoscopic tumour removal,[14] and is a fast, effective method for reducing encephalocoeles.[15]

Radiofrequency coblation can therefore theoretically achieve both ablation and haemostasis of telangiectatic and arteriovenous malformations, using the same instrument. The use of coblation in patients with hereditary haemorrhagic telangiectasia has not previously been formally reported. However, informal discussion has indicated that several surgeons worldwide have now begun to use coblation to treat hereditary haemorrhagic telangiectasia.

We describe a multicentre series of five patients with hereditary haemorrhagic telangiectasia, in whom radiofrequency coblation was used for disease management.

Case reports

We present the experience of two surgeons from different centres, both of whom have used coblation to manage epistaxis related to hereditary haemorrhagic telangiectasia. Cases one and two were treated at the Division of

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TABLE I
OVERVIEW OF CASES WITH REGARDS TO INTERVENTIONS AND OUTCOMES

Age/sex	Symptom duration	Prior intervention?	Operating time (min)	Epistaxis control?
45/F	2 years	Yes	8	Yes
70/F	4 months	Yes	10	Yes
54/M	5 years	Yes	40	No
61/M	2 years	Yes	10	Yes
61/M	2 months	No	8	Yes

Min = minutes; F = female; M = male

Otolaryngology, Department of Surgery, University of Alabama at Birmingham, USA, while cases three to five were treated at Flinders Medical Centre, Adelaide, Australia.

The operating time for all procedures ranged from 8 to 40 minutes (Table I). All procedures were performed under general anaesthesia using the Coblation PROcise EZ View Sinus Wand (Arthrocare ENT, TX, USA).

Case one

A 45-year-old woman with hereditary haemorrhagic telangiectasia presented with recurrent episodes of epistaxis for two years, despite previous septodermoplasties. Bleeding was from hereditary haemorrhagic telangiectatic lesions involving the lateral nasal wall (Figure 1). She received several four-weekly coblation treatments (Figure 2), after which she remained symptom-free.

Case two

A 70-year-old woman was diagnosed with hereditary haemorrhagic telangiectasia four months before presentation. She was referred after several attempts at embolisation had failed to improve her recurrent, bilateral epistaxis.

The patient received two coblation treatments six weeks apart, resulting in excellent epistaxis control.

Case three

A 54-year-old man with a long history of hereditary haemorrhagic telangiectasia and secondary pulmonary hypertension presented with life-threatening epistaxis. Previous treatments included septodermoplasty, septectomy, ND:YAG laser and KTP laser (Figure 3).

Despite an extensive coblation procedure, the wand failed to clear blood clots, and the patient required nasal packing and subsequent embolisation. A second coblation procedure gained control for a further six months, but another episode of life-threatening epistaxis necessitated further embolisation and a Young's procedure. The patient then developed telangiectasia on the skin over his Young's closure, but these were easily controlled with coblation. He remained well following this procedure.

Case four

A 61-year-old woman presented with a two-year history of hereditary haemorrhagic telangiectasia. Previous

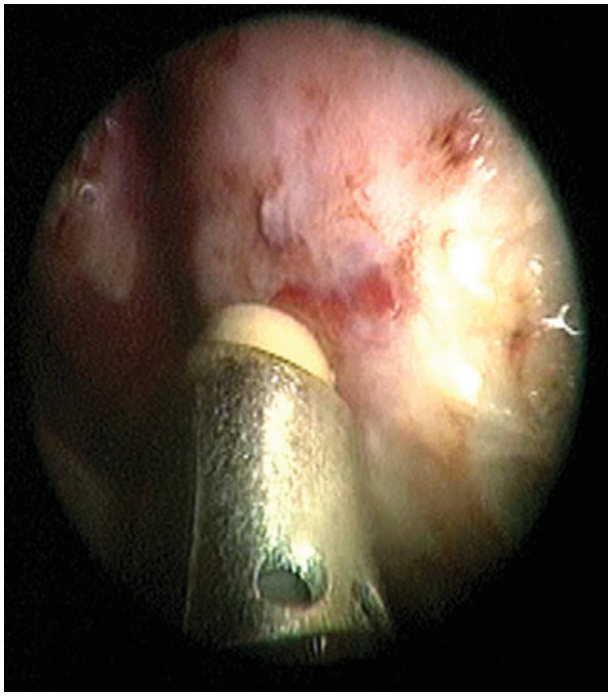

FIG. 1
Case one: telangiectasia involving the nasal septum.

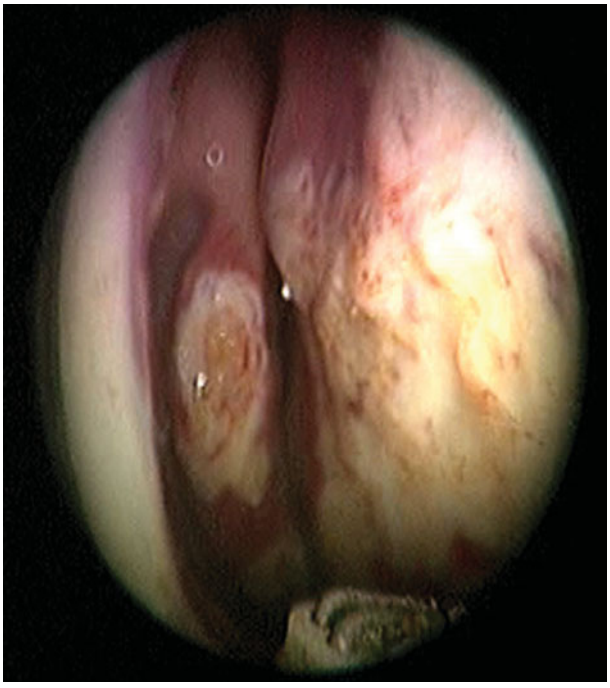

FIG. 2
Case one: excision of the lesion and haemostasis achieved with coblation.

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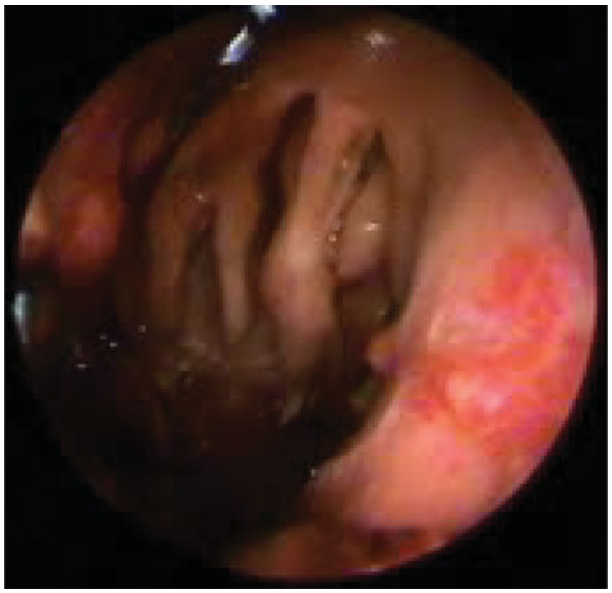

FIG. 3
Case three: recurrence of telangiectasia despite extensive surgery.

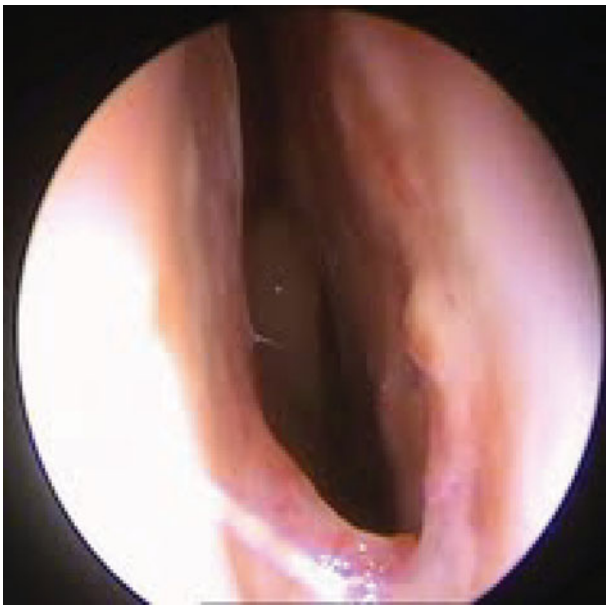

FIG. 5
Case five: telangiectasia on the floor of the nasal cavity.

lesions had been treated with silver nitrate cautery. A single, quick coblation procedure ablated all lesions (Figure 4), and the patient remained well eight months post-operatively.

Case five

A 61-year-old man presented with recently diagnosed hereditary haemorrhagic telangiectasia. Coblation was used to ablate all hereditary haemorrhagic telangiectatic lesions.

However, the patient presented one year later with a large arteriovenous malformation on the floor of the right nasal cavity (Figure 5). Coblation ablated this arteriovenous malformation with ease. Ten months later, the patient remained symptom-free (Figure 6).

Discussion

Hereditary haemorrhagic telangiectasia usually presents with recurrent epistaxis from the anterior third of the nasal septum or the anterior ends of the turbinates.[16]

A myriad of surgical modalities have been described to manage epistaxis in patients with this condition.[5–12]

As regards laser treatment of hereditary haemorrhagic telangiectasia, there is controversy over which type of laser is best. Carbon dioxide,[2] ND:YAG,[3] pulsed dye laser, diode[4] and KTP[5] lasers have all been used for this purpose, with the KTP laser now gaining consensus as the most popular device. It has been suggested that laser can easily ablate the periphery of larger lesions to reduce central blood flow,

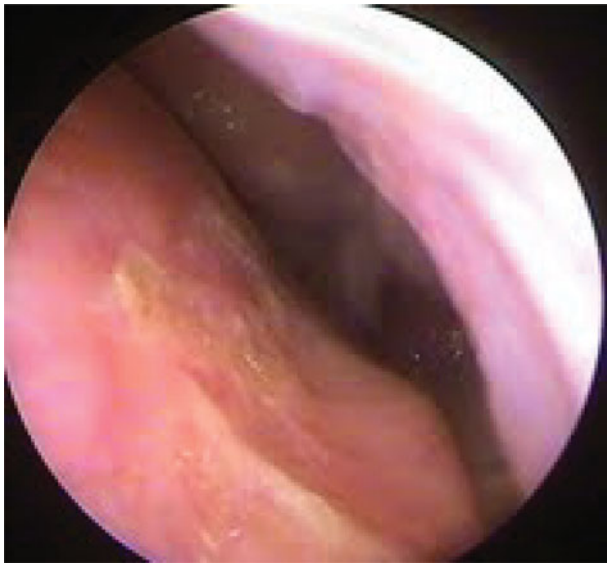

FIG. 4
Case four: minimal post-operative crusting following coblation.

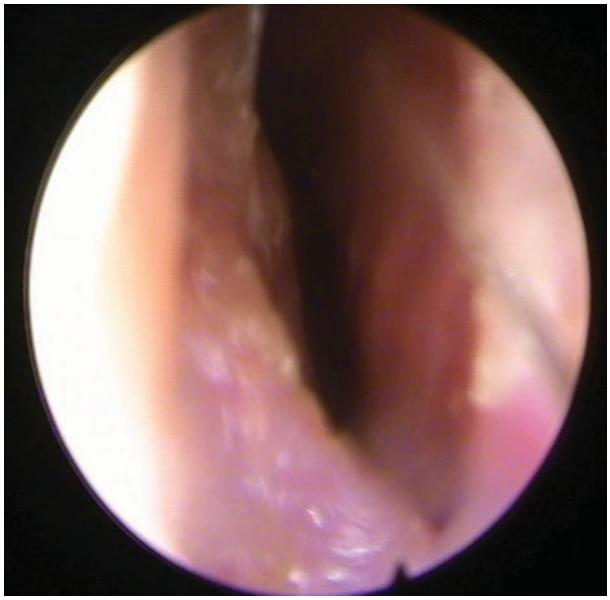

FIG. 6
Case five: a good result following coblation of telangiectasia.

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but that direct laser focussed on the centre of a lesion causes extensive bleeding and makes further treatment difficult.[6] In one study, the majority of hereditary haemorrhagic telangiectasia patients with moderate to severe bleeding reported no change in bleeding severity and no improvement in quality of life following laser ablation of telangiectasias.[17] In fact, the use of carbon dioxide laser has been found to provoke lesions on the mucosal surface,[18,19] in contrast with other laser types which target submucosal tissues.[20] Whilst in the USA and UK most teaching centres will have access to a wide spectrum of lasers for treatment, this is not the case in Australian hospitals, nor in the private clinic. Hereditary haemorrhagic telangiectasia remains a rare condition, and it is difficult to justify the cost of a US$100 000 (or more) laser which may only be used a few times a year. Unlike the laser, coblation works at low temperatures (classically less than 60°C), thereby causing less thermal injury to adjacent tissues, and theoretically reducing the amount of crusting and scarring.[13]

Microdebriders have also been trialled and found to be beneficial for the removal of telangiectasias on nasal mucous membranes; however, bipolar cautery is also needed to achieve haemostasis after lesion removal.[9] There is a risk of septal perforation if both sides of the nose are treated simultaneously. In contrast, the use of coblation enables both lesion removal and haemostasis, with the same instrument. The low temperatures minimise the risk of septal perforation. As well as traditional coblation probes (e.g. the Evac 70; Arthrocare ENT, TX, USA), newer probes designed for the nasal wall are now available (e.g. the PROcise EZ View Sinus; Arthrocare ENT, TX, USA).

Bipolar cautery[10] remains an option for hereditary haemorrhagic telangiectasia treatment. However, it produces thermal injury, with secondary crusting, mucosal damage and an inevitable reduction in mucociliary function. As such, it has fallen from the list of recommended techniques for the management of hereditary haemorrhagic telangiectasia.

- **Hereditary haemorrhagic telangiectasia can present with chronic, recurrent epistaxis**
- **There is currently no single standard treatment**
- **Radiofrequency coblation is an effective, logical and well tolerated treatment for mild to moderate cases of epistaxis due to hereditary haemorrhagic telangiectasia**
- **In severe epistaxis cases, coblation may struggle to achieve control (as may other treatment modalities)**

Septodermoplasty[11] involves removal of nasal mucosa from the anterior part of the nasal cavity and replacement by a split skin graft. This technique has been found to have good initial outcomes in patients with hereditary hemorrhagic telangiectasia patients, which unfortunately decline over time due to contraction and revascularisation of the graft. The technique has also been found to be associated with nasal crusting and halitosis.[21]

Young's procedure[22] is a radical technique involving closure of the nasal vestibule. Although it provides long term relief in patients with moderate to severe epistaxis secondary to hereditary haemorrhagic telangiectasia,[12] the disadvantages (dry mouth, loss of smell and complete nasal obstruction) are often not tolerated by patients. Upon reviewing the procedure, Young himself found that many patients had to have the procedure reversed because of these problems. Young's procedure is best reserved for cases of hereditary haemorrhagic telangiectasia unresponsive to other treatment modalities. One patient in the current series failed coblation management and required a Young's procedure to control his disease.

The use of coblation for hereditary haemorrhagic telangiectasia epistaxis is a much more conservative procedure, which can be safely repeated without significant complications.

One limitation of coblation for hereditary haemorrhagic telangiectasia related epistaxis is the difficulty experienced when manoeuvring the instrument inside the nasal cavity, along with the endoscope, due to its width and angulation. Smaller coblation wands are being developed which will hopefully enable easier manipulation. We have also found that severe bleeding can block the suction port of the coblation wand. This potentially limits its use in severe cases of hereditary haemorrhagic telangiectasia. However, in the current series coblation was successful in managing a patient with a large arteriovenous malformation. We must concede that more experience with coblation is required in order to clarify the ideal candidates for, and limitations of, its use in hereditary haemorrhagic telangiectasia therapy.

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