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Non-invasive treatment of intractable posterior epistaxis with hot-water irrigation*

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SUMMARY

Posterior nose bleeding is a frequent and challenging emergency. The authors report their experience using hot water irrigation as a non-invasive treatment option for posterior epistaxis. Between January 2003 and January 2005 a group of 103 patients were enrolled in this prospective study evaluating the effectiveness of a "hot water irrigation" technique to control acute posterior nose bleeding. All patients with posterior epistaxis were included, whereas anterior epistaxis was controlled using conventional methods. The patient's nose was initially anaesthetized with topical Tetracain 4% (without vasoconstriction) and a modified epistaxis-balloon-catheter was introduced into the bleeding nasal cavity obstructing the choana. The bleeding nasal cavity was continuously irrigated using 500ml of 50°C hot water. In a total of 84 patients (82%) the bleeding was successfully and permanently stopped. Forty-seven of these patients (56%) regularly took antiplatelet agents or anticoagulants. The method failed in 19 of 103 patients (18%). In the group with unsuccessful irrigation, 11 patients (58%) were receiving treatment with antiplatelet agents or anticoagulants. Their proportion was not different from the successfully treated group. The success rate of hot water irrigation as non-invasive treatment of posterior epistaxis appears at least as effective as conventional methods. However it avoids painful packing, hospitalizations, or immediate surgery, and allows the patient to breath normally through his open nasal cavities.

Key words: posterior epistaxis, hot water irrigation, nasal package, surgical occlusion of the sphenopalatine artery

INTRODUCTION

The management of intractable posterior epistaxis can be quite challenging for the physician and may become very painful for the suffering patient. The most common site of bleeding is the region behind the posterior end of the middle turbinate and the most frequent vessels are the sphenopalatine artery and their branches towards the septum. This location does not allow cautery in the awake patient and usual nasal packs will not suffice. Most of these patients are seen by residents in training and end up with a tight nasal packing using inflatable balloons and anterior gauze packs. The duration of this pack is generally a minimum of 48 hours to assure hemostasis and long lasting control. The majority of these patients need to be hospitalized, are medicated for pain and are monitored for respiratory distress. Using a hot water irrigation technique, we reintroduce an old idea and modify it to current needs. Obstetricians used hot water to irrigate a postpartum bleeding wound in the 19th century and Guice [1] introduced this procedure for staunching blood in cases of epistaxis in 1879 with a subsequent publication in 1884. A century later, this almost-forgotten form of treatment was revitalized by Sven-Eric Stangerup in Denmark with a refined and newly designed irrigation catheter [2,3]. Studies involving experiments with rabbits showed that irrigating the nose at 40-46°C does not lead to any histological changes of the mucosa [4]. Temperatures higher than 48°C result in vasodilatation and, in particular, oedema of the mucosa. Only temperatures above 52°C trigger off necrosis. It can be assumed that the temperature induced mucosal oedema leads to local compression of the bleeding vessel and at the same time may propagate the cascade for haemostasis.

MATERIALS AND METHODS

Patients

In a prospective study conducted between January 2003 and January 2005, all patients with spontaneous intractable posterior epistaxis referred to our ENT-Department were enrolled and treated using hot-water irrigation. The total number of patients was 103 (40 women and 63 men), the average age was 66.2 years, ranging from 15 years to 87 years. Initial evaluation included a brief patient's history, the patient's current medication, actual blood pressure and careful assessment of a possible bleeding site. All patients were seen as emergencies and were in stable condition. Patients with anterior nose bleeding (e.g. Kiesselbach's area) were excluded, as well as patients with post-surgical bleeding.

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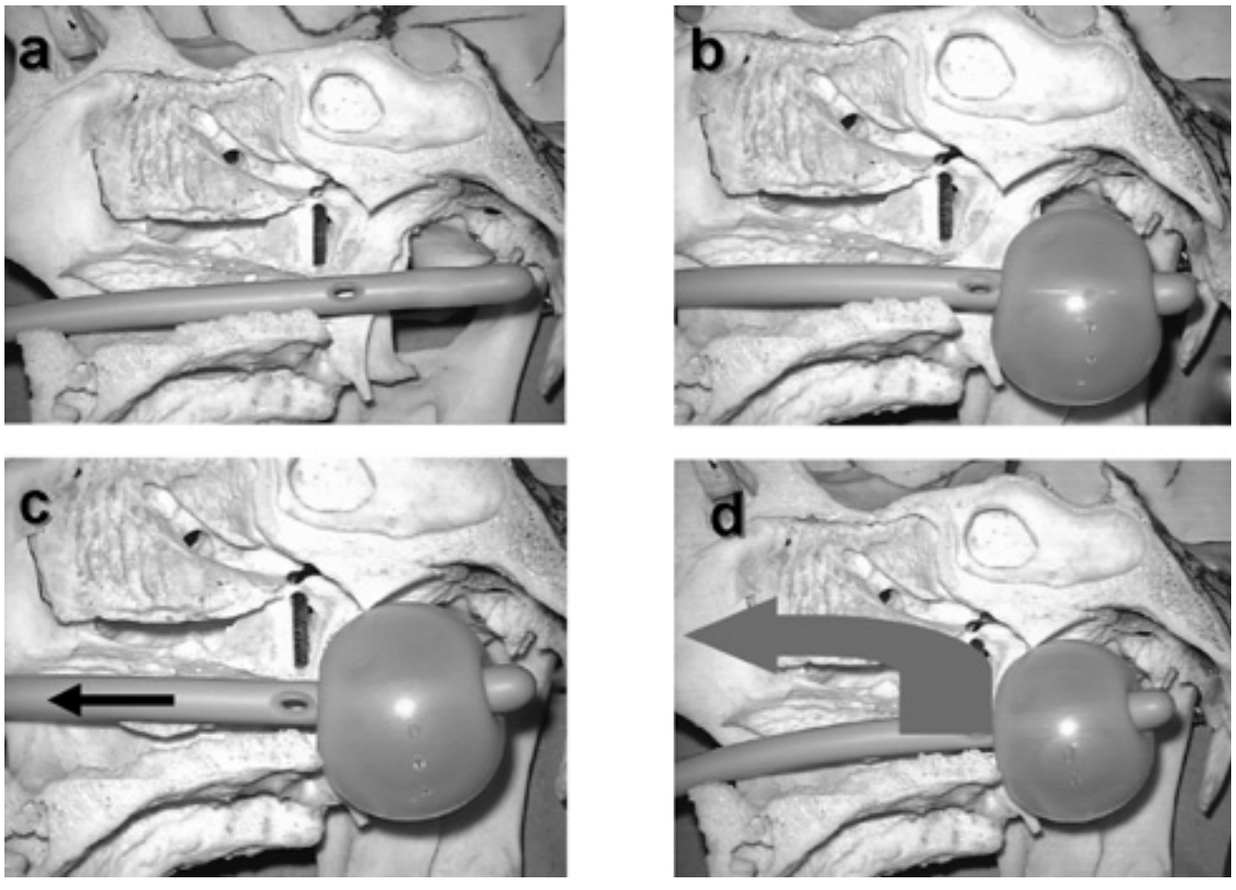


Figure 1a - d Application of modified balloon catheter for treatment of posterior epistaxis with hot-water irrigation. Large arrow indicates water flow through the nose during the continuous irrigation.

Treatment

Before hot-water irrigation, topical anaesthesia of the relevant nasal cavity was administered using 4% Tetracaine. In contrast to the description by Stangerup et al., the application of any vasoconstrictor (e.g. adrenalin or phenylephrin) was strictly avoided in order not to interfere with the oedema formation. Then Stangerup's modified bladder catheter [3] (Epicat® balloon catheter, LeviPart International, Göteborg, Sweden) was inserted in the affected nasal cavity (Figure 1a). The modified catheter has an irrigation opening located proximal to the balloon. The balloon was inflated in the epipharynx (Figure 1b) and the catheter gently pulled back until the choana is blocked off (Figure 1c). The region of the sphenopalatine foramen remains open in order to allow free flow of hot water reaching this area. Hot-water irrigation could now be administred without any risk of aspiration (Figure 1d). The affected nasal cavity was continuously irrigated with tap water at a temperature of 50°C. In contrast to the previous descriptions by Stangerup et al. who repeatedly used a bladder syringe and tap water from a Thermos flask, we applied a water caloric stimulator used for vestibular testing. The testing device was modified to insure a water temperature of 50°C. This enabled us to apply the necessary 500 millilitres of hot water in a continuous irrigation mode and without any fluctuations in temperature. The treatment lasted approximately three minutes with the patient sitting upright to allow outward flow of water from the affected nasal cavity into a basin.

Once the bleeding was successfully stopped using hot water irrigation patients were treated as out-patients and were discharged at home. They were instructed to return immediately to the clinic in case of relapse. A follow-up examination was scheduled either at the ENT-Department or at the referring doctor's office 2 months later. The patients or their referring doctor were contacted by phone to keep track of the outpatients for the study purpose.

RESULTS

The bleeding was successfully and permanently stopped in 84 of 103 patients. Of these 84 successfully treated cases, bleeding stopped in 60 cases during the irrigation itself, in 12 cases within five minutes and in 3 cases within ten minutes thereafter. In 9 cases, the irrigation had to be repeated after one hour. The overall success rate thus amounted to 82% (Table 1). It is important to note that 47 of these patients (56%) were receiving

Table1. Patients with successful hot-water irrigation n = 84 (82%)

haemostasis	immediately	5 minutes	10 minutes
1th irrigation	60 patients	12 patients	3 patients
2 th irrigation	4 patients	2 patients	3 patients

patients with antiplatelet agents/anticoagulants: 47 (56%)

Table 2. Patients with unsuccessful hot-water irrigation n = 19 (18%)

method of haemostasis	
nasal package (i.e. ballon)	13 patients
surgery	6 patients

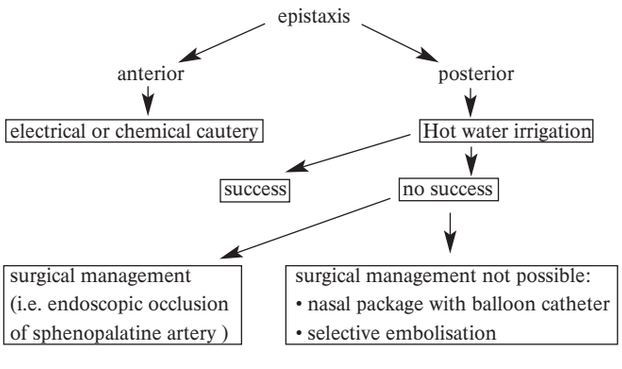
patients with antiplatelet agents/anticoagulants: 11 (58%)

medication with antiplatelet agents or anticoagulants. Subjectively, the hot-water irrigation was tolerated by all patients without any complains and was felt to be highly pain-free and minimally stressful. All patients were treated as out-patients and were discharged after two hours of watchful waiting. If patients received medication with antiplatelets agents, their medication was not interrupted. In patients receiving medication with anticoagulants, the Quick's test (INR) was performed. Their medication was stopped if the INR was higher then 4,5.

The method failed in 19 of 103 patients (18%). In 13 of these 19 cases, the bleeding was stopped with subsequent conventional nasal packing. The other 6 patients required surgical exploration and endoscopic coagulation or clipping of the sphenopalatine artery (Table 2). In this group of unsuccessful irrigation, 11 patients (58%) were receiving medication with antiplatelet agents or anticoagulants. However, there was no difference to the successfully treated group. In patients receiving medication with antiplatelets agents or anticoagulants, the treatment was stopped temporarily.

No relapse occurred during a follow-up period of 4 - 24 months, nor were any complications - such as crusting or synechiae formation - encountered following hot-water irrigation.

Table 3. Treatment of intractable epistaxis



DISCUSSION

Depending on the cause and site of bleeding, epistaxis can be an easily treatable clinical problem or may deteriorate to a painful, prolonged and even life-threatening condition. The treatment of posterior epistaxis represents a therapeutic challenge even for the experienced otolarygologist and becomes stressful for the patient and physician alike. Depending on the hospital's infrastructure and the level of qualification and preference of the doctor, a conservative treatment is carried out by means of a nasal tamponade or early surgery is advocated such as endoscopically assisted occlusion of the sphenopalatine artery and its branches. In the literature, the success rate for posterior nasal packing varies between 55-70% [5,6], while the success rate for surgical interventions is given as 70-90% [7,8].

In comparison to other non-invasive forms of treatment, hot-water irrigation is an efficient method - with a success rate of 82%. Interestingly, this method is just as successful among patients being treated with anticoagulants or antiplatelet agents as it is among patients without any accompanying diseases. However, we would like to point out that all of our patients were in stable condition. In case of hemorrhagic shock, the bleeding must be immediately stopped using a balloon catheter as an emergency measure or by means of urgent surgery.

In case of persistent posterior bleeding the treatment plan should result in successful control with the least amount of tissue trauma and expense. Hot-water irrigation using a distinct temperature of 50°C is minimally invasive and atraumatic on the nasal mucosa. Patients report very little pain, benefit from irrigating any debris from the nasal cavity and remain without further packing. A special catheter with the opening proximal to the balloon needs to be inserted and continuous flow of 500ml can be obtained from any irrigation device used in the vestibular testing laboratory. Hot-water irrigation can even be performed in conditions with severe septal deviation. In comparison, tamponade treatment and, in particular, balloon catheters which have to be left in place for two to three days, are poorly tolerated by patients. Owing to the local pressure of the nasal packing, the healthy mucosa can also be damaged, which can induce further bleeding after removal of the tamponade especially in patients with anticoagulants or antiplatelet agents. In addition, the longer the duration of the packing, the greater the significant increase in morbidity among older patients and those with accompanying cardiovascular diseases [9]. In patients with severe septal deviation any packing of the nose may not be possible and in patients with a weak septum the opposite side may require packing as well.

The economical benefits of successful hot-water irrigations are obvious. All successfully treated patients were observed for 2 hours and discharged afterwards. Patients who receive posterior nasal packing, selective embolisation or undergo surgery are generally hospitalised for several days.

Based on our two year's experience of hot-water irrigation for the treatment of intractable posterior epistaxis, the following treatment concept has become the standard regimen (Table 3):

anterior epistaxis is treated as usual with electric or chemical cautery. For posterior epistaxis in a patient in stable condition, hot-water irrigation is applied as the first method of choice. If hot-water irrigation fails after two attempts, the second line of treatment is a temporary nasal packing followed by early surgery. If an operation cannot be performed due to anaesthetic risks, a tamponade with anterior and posterior packing is applied using a balloon catheter and left in place for 48 hours. Angiography with selective embolisation is very rarely considered.

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SOCIETY NEWS

Notice of Constitutional Amendments of International Rhinologic Society:

The amendments are as follows:

i) that the sentence in parenthesis within Article VI, Executive Committee, Section 1 *(the Presidents or their representatives of the participating societies are ex-officio, non-voting members of any of the activities of the board)* be deleted.

ii) that the following addition be included in Article IV, section 3 (a):
The Society shall hold official scientific Congresses from time to time with the approval and authority of the Board of Directors. No financial responsibility for such a Congress will be accepted by the Board and the responsibility will be solely that of the agent organizing the Congress.
An audited budget (audited by the national society under whose authority the Congress is held or by an external auditor) will be presented to the next meeting of the Board of Directors following such a Congress.

iii) that the current Section 3 of the constitution *Special scientific meetings or courses held under the auspices of the society* shall become Section 3 (b).