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Short Communication

The 'double bag': a device for protection against blood spray in the management of epistaxis

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Abstract
Nasal bleeding is one of the commonest emergencies that place medical staff at risk of blood contamination during management. A sizeable proportion of incidents have been reported where blood splashes in the facial area caused such contamination, and the exposed conjunctivae are potential sites for transmission of human immunodeficiency viruses (HIV). We present a simple self-made device named the 'Double Bag', which is highly effective in preventing blood spraying during the management of epistaxis. It was designed to be used while treating epistaxis or removing nasal packing after surgery, when transient bleeding is expected.

Key words: Blood; Infection; Epistaxis; Prevention and control

Introduction

Epistaxis has a reported prevalence of 10–12 per cent in the general population and is thus one of the commonest otorhinolaryngological emegencies.[1] Although bleeding is most often self-limiting, epistaxis can be difficult to control and not infrequently may be life-threatening. Management of epistaxis may range from simple measures such as nasal packing or chemical cauterization, to ligation of major arteries.

In current times, medical staff are at high risk of exposure to blood-borne infectious diseases such as hepatitis B and human immunodeficiency viruses (HIV) through blood contamination.[2] Management of nasal bleeding is one of the commonest emergencies that place medical staff at risk of contamination, particularly as the exposed conjunctivae are potential sites for transmission of HIV.[3] Carney *et al.*[4] reported that 69 per cent of documented blood-contamination cases among medical staff occurred while actively treating patients with epistaxis. Furthermore, a sizeable proportion of incidents have been reported where blood splashes in the facial area caused such contamination.[5] The contamination rate varied according to the severity of the bleed and the type of treatment offered; nasal packing accounted for double the rate as compared with chemical or electrical cauterization of bleeding vessels.[6] Traditional methods for protection against blood contamination call for wearing a mask, a visor, an apron, a gown and gloves during treatment. While these methods may be adequate for surgeons or nursing staff assisting treatment, blood that contaminates the surrounding area may also pose a potential health risk for other healthcare staff.

We present a simple self-made device named the 'Double Bag', which is highly effective in preventing blood spraying during the management of epistaxis. It was designed to be used while treating epistaxis or during removal of nasal packing after surgery, when transient bleeding is expected.

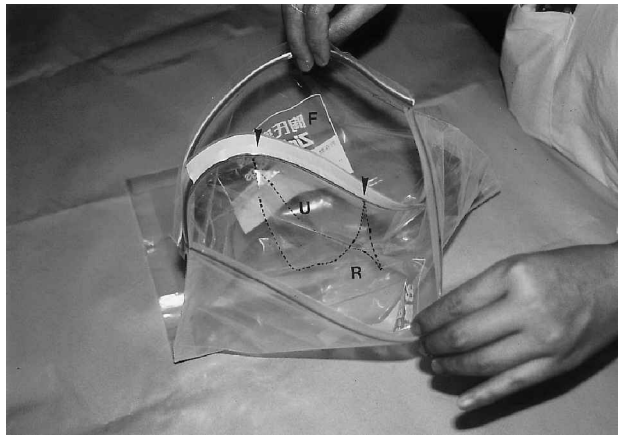

Fig. 1
The 'Double Bag' is prepared by sticking one plastic bag to the other using transparent double-sided adhesive plastic tape at their upper, lower and lateral borders. F is the front bag, R is the rear bag, U is the U-shaped incision making the U flap.

A self-made disposable protective device and its applications

Figure 1 illustrates how the 'Double Bag' is assembled. Two large size transparent plastic bags one assigned as the front bag and the other as the rear one, are attached together using double-sided adhesive tape with one bag

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FIG. 2

The 'Double Bag' in use during nasal bleeding. Note the rear bag is applied to the front of the patient's neck with double-sided adhesive tape. The opposite rim of the rear bag (common wall) is fixed to the upper lip with double-sided adhesive tape. The rear bag collects the blood from the mouth. The front bag collects blood and packing from the nose. The 'bucket handle' stents the opening of the front bag.

overlapping the other. A strip of double-sided adhesive tape is affixed to the upper border of the common wall lining the rear bag. A U-shaped cut (recommended width $\times$ length: 10 cm $\times$ 15 cm) is made in the common wall of the two plastic bags to create a U-flap 2 cm below its upper border. In order to keep the mouth of the front bag wide open, a strip of disposable malleable metal wire is fixed to its upper border on the side that is opposite to the common wall.

When the device is in use, a double-sided adhesive tape is used to attach the upper border of the rear bag to the patient's neck at the hyoid bone level. Another long strip of double-sided adhesive tape, which has already been fixed to the upper free border of the common wall lining the rear bag, is used to affix the device to the patient's cheeks and upper lip, just below the columella of the nose (Figure 2).

When the assembled 'Double Bag' is attached to the patient's face as illustrated in Figure 3, blood from the nostrils will drain into the front bag. Moreover, any blood-contaminated gauze or nasal packs can conveniently be dropped into the front bag. The front bag also readily collects blood sprayed during sneezing, as the nostrils are directed downwards towards it. The metal wire affixed to the upper free border of the front bag is bent to a 'bucket handle' shape in order to stent the opening of the bag. All blood flowing out of the mouth will be collected in the rear bag. The U-flap in the common wall between the two bags acts as a shield, should the patient inadvertently spray blood by spitting or coughing. The U-flap also provides an opening to ensure adequate ventilation for mouth breathing while the device is in use. This allows uninterrupted examination and packing of the nose during active nasal bleeding. Simultaneous clearing of blood or secretions from the mouth can be achieved by the patient.

Pulling the U-flap upwards allows free access to the mouth and oropharynx in order to monitor post-nasal bleeding during insertion or removal of nasal packs. This bag can also be used effectively in male patients with a moustache without compromising its efficacy, as there would be considerable support from the adhesive tape on the cheeks. Estimation of the blood loss can be made easily, as the bag is transparent and all blood is collected. The device can be easily removed should any problem arise during the procedure.

The 'Double Bag's' protection proved effective during the management of 70 cases of epistaxis in the Division of Otorhinolaryngology, Prince of Wales Hospital, from January 1998 to January 1999. There were no reports of blood contamination of eyeglasses, face masks or clinicians' gowns while the device was in use. Transcutaneous oximetry on the first 40 consecutive patients recorded no episode of desaturation on room air (SaO_2 range, 96–100 per cent). Similarly, patients reported no subjective sensation of airway obstruction while the 'Double Bag' was being used.

FIG. 3

Front view of the bag in use.

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Discussion

Blood contamination is a potential hazard for all medical staff, especially those involved in the management of emergencies, because of exposure to infection by blood-borne diseases through blood contamination. Epistaxis is a frequently encountered medical emergency, which poses as a real risk for medical staff since conjunctival contamination by sprayed blood can easily occur during its management and would be a potential route for transmission of HIV. Meticulous precautions and the use of protective clothing by medical staff are required under these conditions. Prevention of blood splashing or spraying from the patient could further reduce the chance of blood contamination. We found the 'Double Bag' to be extremely effective in achieving this goal. The 'bucket handle' design facilitates optimal collection of blood flowing from the nostrils to the front bag. The rear bag provides an effective barrier against blood spraying from the mouth. This device is also particularly effective when examining or packing the nose, because it allows the doctor to proceed uninterrupted even when patients are actively bleeding or clearing blood from the mouth. Moreover, the U-flap design of the device allows a clear view of the mouth and oropharynx to monitor post-nasal bleeding. The dimensions of the device can be adjusted according to the size of the plastic storage bags available and the age of the patient. Finally, this device is cheap, disposable and simple to assemble. However, clinicians who manage patients with active bleeding are advised to wear gloves, a facemask and plastic apron for added protection.

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