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Management of upper airway obstruction secondary to warfarin therapy: the conservative approach

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Abstract

Airway obstruction secondary to bleeding from warfarin therapy is difficult to manage and uncommon but has been previously described. Previous reports have emphasized the need for reversal of therapy using vitamin K and fresh frozen plasma (FFP). Where a definitive airway has been required, cricothyroidotomy or tracheostomy seem to have been favoured. Several authors have reported failed attempts at endotracheal intubation due to the obstructive effects of a sublingual haematoma. We report here a case which illustrates how endotracheal intubation can be used successfully under the right conditions. It also highlights the superiority of prothrombin complex concentrate over FFP in achieving rapid reversal of abnormal international normalized ratio in the emergency situation.

Key words: Airway Obstruction; Warfarin; Prothrombin Complex Concentrate; Vitamin K; Fresh Frozen Plasma

Introduction

Airway obstruction secondary to bleeding from warfarin therapy is difficult to manage and uncommon but has been previously described. A literature search revealed 12 previously reported cases. The lessons gleaned from these cases include the need for a high index of diagnostic suspicion due to the vague nature of presenting symptoms and the need for prompt control of airway with reversal of therapy and close observation.

Reversal of therapy has been achieved in the past by administration of vitamin K and fresh frozen plasma (FFP). For airway control, conservative management may suffice but, where a definitive airway is required, cricothyroidotomy or tracheostomy seem to be favoured over endotracheal intubation.[1–6]

We report here a case which illustrates how endotracheal intubation can be used successfully under the right conditions. It also highlights the superiority of prothrombin complex concentrate (containing factors II, VII, IX and X) over FFP in achieving rapid reversal of abnormal international normalized ratio (INR) in the emergency situation.

Case report

An 81-year-old man was referred to the ENT department with a four-day history of sore throat. He had initially seen his general practitioner, who prescribed antibiotics. Two days later, he had developed hoarseness of the voice and by the next day he had developed a swelling below the tongue and bruising around the neck. On admission, he had mild difficulties breathing.

The past medical history included hypertension, atrial fibrillation, left ventricular failure, prolonged QT syndrome and previous episodes of ventricular tachycardia. His medications included warfarin for his atrial fibrillation and aspirin for his ischaemic heart disease.

Examination revealed a haematoma involving the floor of the mouth and the undersurface of the tongue (Figure 1). The tongue was raised and pushed backwards. There was marked bruising around the front of the neck (Figure 2) and nasoendoscopy revealed diffuse bruising of the larynx, oedema of the epiglottis and pooling of secretions.

Blood samples were taken for full blood count, clotting and 'group and save'. Vitamin K was administered and the patient closely observed. Over the next two hours, his condition deteriorated. The swelling in the floor of mouth became worse and his breathing became more difficult. At this point, the INR was revealed as 10.

He was rapidly transferred to the intensive care unit (ICU) where he was given 8 ml lignocaine (4 per cent) to the nose and throat and 10 ml lignocaine gel (2 per cent) to gargle in his mouth. A size-7 endotracheal tube was railroaded over a flexible nasoendoscope and the patient carefully intubated nasally under direct visualization. He was then anaesthetized.

Under advice from the haematology department, Beriplex prothrombin complex concentrate (Aventis Behring, Kankakee, Illinois, USA) was commenced (25 units/min, 50 units/kg). The INR three hours post-transfusion was 1.1. The patient was extubated 24 hours later.

In discussion with the cardiologist, the warfarin was stopped. The INR continued to rise from 1.1 to a maximum of 4.3 after the warfarin was stopped. The patient went on to do well and was discharged to the care of his general practitioner.

Discussion

Sublingual and/or pharyngeal haematoma causing upper airway obstruction secondary to warfarin therapy are uncommon but have been previously described. From

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FIG. 1

1967 to the time of writing, only 12 other cases have been reported.[1–9]

Lepore[8] explained how airway obstruction may result from submandibular bleeding (pseudo-Ludwig phenomenon). Swelling of the floor of the mouth displaces the tongue upward and backward, leading to respiratory distress.

Two important points are highlighted by this case.

Firstly, the administration of Beriplex prothrombin complex concentrate was used to rapidly reverse the INR. This is the first case in the medical literature in which a prothrombin complex concentrate has been used successfully in a patient who had been deteriorating rapidly due to airway obstruction from submandibular haemorrhage. Prothrombin complex concentrate is produced by fractionation of pooled plasma and contains factors II, VII, IX and X.[10]

In previous reports FFP was given, but the history of congestive cardiac failure coupled with the urgency of the situation in our case necessitated the administration of prothrombin complex concentrate. Fresh frozen plasma has the disadvantages of being required in large volumes but being available at a slow rate (as it needs to thaw) and also needs to be group-specific. It is, however, much cheaper than prothrombin complex concentrate. The recommended dose of FFP is 4 units for any INR >1.5, whilst that of prothrombin complex concentrate is 50 U/kg for INR >6. Therefore, for a 70 kg man requiring treatment of an INR >10, the cost would be £82.88 for FFP and £1225 for Beriplex. While the half-life of factor VII is only six hours, that of warfarin may be up to 60 hours, thus explaining why the INR in this patient continued to rise after warfarin was stopped. Vitamin K should thus be given together with prothrombin complex concentrate.

FIG. 2

Secondly, our case illustrates the importance of establishing a definitive airway. Previous reports do not seem to favour endotracheal intubation, with only two previous successful cases,[6,8] and examples of failed attempts due to obstructive effects of the haematoma.[1,4,5] The introduction of an endotracheal tube carries the risk of causing further haematomas in the larynx.[7] At least seven of the previously described reports managed such patients by means of cricothyroidotomy or tracheostomy,[1–6] and one author advocates early tracheostomy as the preferred method of management.[6]

Our experience in this case indicates otherwise. Factors critical to our success included the controlled setting (in an ICU), optimal anaesthesia (including extravagant use of topical lignocaine) and use of nasal intubation. Direct visualization of the upper airway via a nasoendoscope and intubation by an experienced operator using the railroad technique allowed the airway to be negotiated and the haematoma circumvented. An invasive surgical airway, together with its attendant risks, was thus avoided.

Conclusions

Sublingual and submandibular haematomas are a rare but life-threatening complication of oral anticoagulant therapy. The use of a prothrombin complex concentrate and direct visualization nasal endotracheal intubation by an experienced operator under controlled conditions may be used successfully in an emergency setting.

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