Tracheostomy haemorrhage induced blood clot obstructing the carina – managing a potentially fatal situation

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Background

A potential complication of post tracheostomy haemorrhage is a blood clot blocking the trachea. Its removal can be challenging and hence present the clinician with a life threatening situation. It is essential not only to recognise the existence of this problem but also to be able to successfully manage it. Literature search suggests there is not abundant evidence on how to manage these difficult clinical scenarios. Prompted by a recent case in our department, and following literature review, we describe methods of clot removal and highlight steps to take in order to either prevent clots in the airway or manage them when that happens.

Case report

A 60 year old man was admitted to ITU following a myocardial infarction and was put on antiplatelet therapy. An uneventful surgical tracheostomy was performed to aid weaning from the ventilator. Seven days later bleeding from the tracheostomy site was noted and conservative measures were not successful in stopping the bleeding. The patient was taken to theatre, the tracheostomy tube was removed and the patient was intubated with an endotracheal tube (ETT). The tracheostomy tract was explored bleeding sites which were identified and successfully managed. During the procedure a sudden drop in oxygen saturations was noted. A flexible single-use bronchoscope was passed via the ETT and identified a large clot over the carina obstructing the airway and attempts to remove it by suction were futile. The surgeon decided to push the clot further down into the right main bronchus which permitted ventilation of the left lung. A re-useable bronchoscope with a better suction port was brought to theatre, the clot was suctioned up to the ETT and brought to the tracheostomy site where it was removed with forceps. Normal ventilation was established afterwards.

Literature review

The occult presentation of a blood clot obstructing the airway occurs predominantly in the setting of either prolonged mechanical ventilation or tracheostomy placement. Tracheobronchial mucosal damage from infection, tumour, tracheostomy, or endotracheal suctioning may result in subclinical bleeding with subsequent clot formation. Therefore, a consideration of endotracheal clot is warranted when acute airway obstruction arises under these circumstances despite the absence of hemoptysis. When complete obstruction occurs, the signs such as sudden decrease in oxygen saturations and/or rise in peak inspiratory pressures are obvious. In partial obstruction, the degree of hypoxia and hypercapnia will depend not only on the extent of obstruction but also on the underlying condition of the lungs. A notable exception to the typical presenting features occurs with ball-valve obstruction. In this situation, the blood clot acts as a one-way valve in the endotracheal tube or airway, allowing air entry into the lower respiratory tract, but blocking expiratory flow. The consequence is ipsilateral hyperexpansion, with resultant risk of tension pneumothorax and haemodynamic compromise. (2)

Methods for managing clots in the airway	Comments
Simple suctioning	Too much suction can further damage mucosa
Removal via flexible bronchoscope/saline lavage	Clot may be too large to be removed partly or completely
Rigid bronchoscope	Excellent when forceps extraction is needed
Removal of clot via direct suctioning through the tracheostomy tube and remove with tube (1)	Helpful when too large a clot to pass through the tracheostomy tube.
Consider use of thrombolytics (3)	Applied via flexible bronchoscope – streptokinase is the most widely used. Recurrent bleeding has not been reported but should be contemplated as a potential consequence
Manipulation of clot via arterial embolectomy catheters (4)	Consider when clot adherent and severe respiratory compromise only. Re-bleeding is a strong potential complication

Our pathway on management of tracheostomy bleeding to avoid airway blood clots

References:
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