The Dangers of Distal Airway Endotracheal Suction Trauma

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A 28 week old premature male twin was referred to the regional neonatal intensive care unit with lobar collapse presumed to be caused by mucus plugging. We describe the management and finding of a bronchial granuloma likely secondary to distal airway suction trauma.

Image 1: Chest x-ray's showing pre and post excision of lesion. The left image shows mid and lower lobe collapse. This is resolved in the post excision x-ray on the right

Image 2: Axial and coronal slices of CT scan showing lesion in right lower main bronchus. Originally thought to be a mucus plug.

Image 3: Endoscopic images from the rigid bronchoscopy demonstrating a pedunculated mass arising from the wall of the right main bronchus

Image 4: Appearance of the right main bronchus after removal of lesion

A 28 week year old premature male twin was transferred intubated (orotracheal intubation) to Bristol Royal Children's hospital from an outlying unit. Prior to transfer he had been intubated at birth and noted to have a large right pneumothorax. This had been managed with a chest drain and had resolved. He had been jaundiced and had suffered a small intraventricular haemorrhage (grade 2). Both of these had resolved.

He was extubated at day 3 to high flow oxygen then at day 11 to low flow oxygen. At day 12 he suffered frequent desaturations and bradycardia and then required CPAP. He moved between CPAP and high flow for a further 21 days. At day 33 of life the baby's work of breathing increased significantly. Serial chest x-rays demonstrated right upper lobe hyperinflation, along with right middle and lower lobe collapse (image 1). This was thought to be a right congenital pneumonia.

Upon transfer CT thorax (image 2) demonstrated an obstructing opacity in the right lower main bronchus which was thought to be a mucous plug. Initially he was referred to the respiratory team for consideration for flexible bronchoscopy to clear the mucus plug but they felt that this would be too small for their endoscopes so an ENT referral was suggested.

Rigid bronchoscopy under general anaesthesia was performed. A pale soft tissue mass was noted in the right lower main bronchus (image 3). This was pedunculated and attached to the lateral wall of the bronchus by a thin stalk. The mass was removed with foreign body forceps (images 4 and 5) which lead to an immediate improvement in ventilation. The baby was subsequently weaned off CPAP and discharged. Histological analysis of the mass revealed necrotic granulation tissue.

We believe that the granulation is due to distal suction trauma when the child was initially intubated.

Image 5: The excised granuloma measuring 3.5 mm

Summary

Trauma from suctioning can cause significant morbidity in both intubated patients and tracheostomised patients. In this case the resulting granulation led to unilateral hypoventilation and collapse. It is important that intensive care staff are aware of the importance of suctioning to the correct depth.