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MINI-SYMPOSIUM: IMAGING AND INTERVENTIONAL RADIOLOGY

Haemoptysis and bronchial artery embolization in children

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KEYWORDS

 haemoptysis;
 cystic fibrosis;
 therapeutic embolization;
 bronchial arteries;
 tuberculosis

Summary Haemoptysis varies in significance from trivial to fatal. The most common causes in children are tuberculosis, fungal infections and bronchiectasis of any cause. In populations of European origin, cystic fibrosis is the most common predisposing factor. Chronic or life-threatening haemoptysis requires further investigation. Various forms of treatment are possible, and management is optimized when a multidisciplinary team is available.

Bronchial artery embolization (BAE) is effective in controlling haemoptysis in most cases, although recurrent bleeding is not uncommon. BAE is often technically challenging, however, and requires angiographic skills that are not always available in children's hospitals. Although the procedure is usually regarded as relatively safe, complications are not uncommon and may be severe or even fatal.

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HAEMOPTYSIS

Introduction

Haemoptysis, the expectoration of blood from the respiratory tract, is an unusual symptom in children. The common underlying causes (Table 1) vary considerably between different parts of the world, and also with patient age. In general, tuberculosis and other chronic lung infections are the most common causes in children in resource-challenged nations.¹

In children of European descent, cystic fibrosis (CF) is the most common cause of haemoptysis. About 4% of patients with CF suffer from massive haemoptysis. The median age at the time of the first episode is early in the third decade;² only 7% of episodes occur in children younger than 7 years.^{3–5} This age distribution means that this complication is uncommonly seen in children's hospitals. Haemoptysis is probably a poor prognostic factor in CF.^{4,5}

Haemoptysis related to congenital heart disease has a bimodal age distribution, being more common in infants and adolescents.³

There are various contradictory proposals for grading the severity of haemoptysis.^{3,5–7} Most cases of haemoptysis in children are mild and self-limiting. A reasonable definition of life-threatening haemoptysis in a child is a 24-h volume of >8 ml/kg.⁸

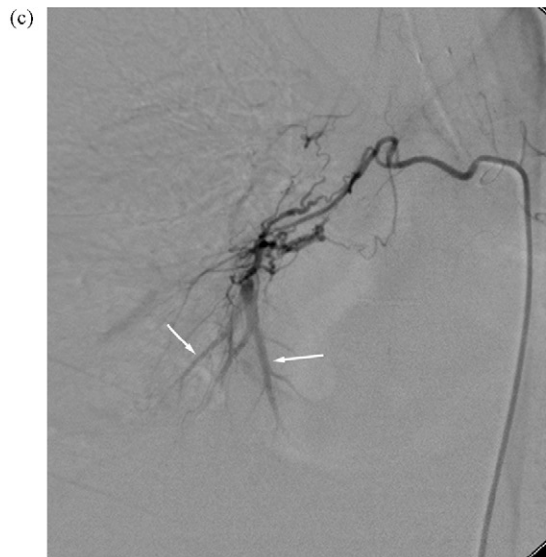
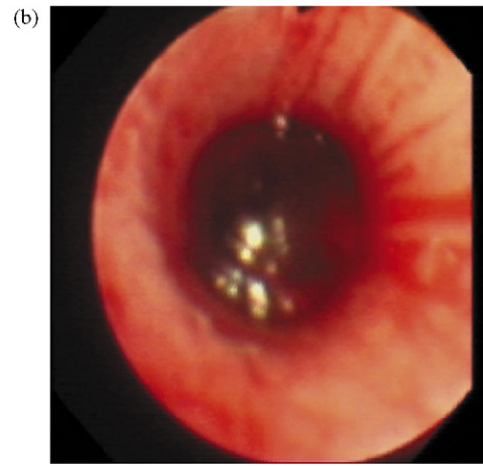
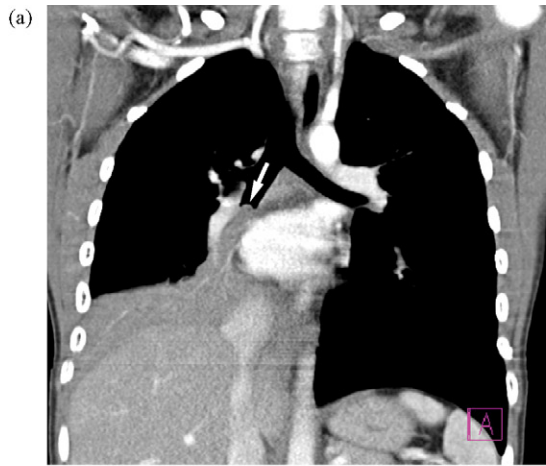
When massive haemoptysis occurs, death is usually due to asphyxiation rather than exsanguination, and immediate management should focus on the risk of airway compromise before the site of bleeding is addressed. Extrapulmonary causes of bleeding, e.g. from the nasopharynx or the gastrointestinal tract, must be excluded before assuming that the lungs are the source.

Radiological evaluation

On the basis that if the bleeding lung can be identified prior to embolization, this procedure is likely to be safer, investigations should be targeted at lateralization of the bleed. Although it is widely recognized that the patient can often

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