

# Atypical cause of bronchial cut-off sign

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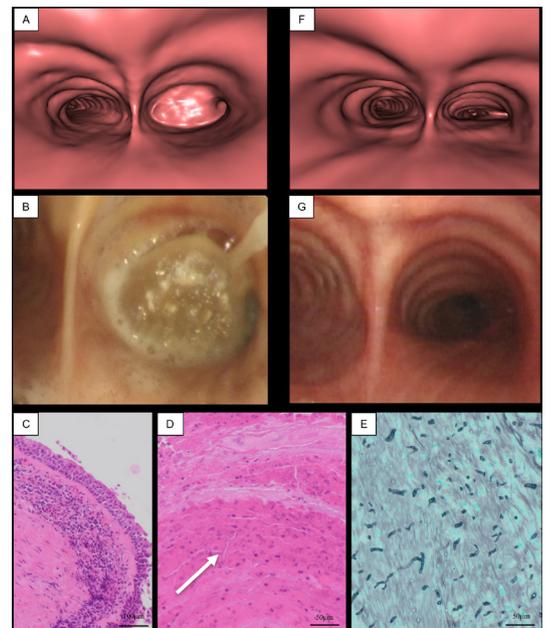
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A 58-year-old woman with no prior medical history, presented with a 5-month history of productive cough, worsening breathlessness and weight loss of 5 kg despite three courses of oral antibiotic therapy. On examination she was afebrile, there was reduced air entry in the right lung base to auscultation and oxygen saturations on room air were 86%. Serum C reactive protein was elevated at 26.2 mg/L (range 0–5 mg/L) and white cell count was  $9.6 \times 10^9/L$  ( $3.5\text{--}11 \times 10^9/L$ ), and evidence of eosinophilia was  $1.7 \times 10^9/L$  ( $0\text{--}0.5 \times 10^9/L$ ). Chest radiograph showed complete collapse of the right middle and lower lobes and bronchial cut-off sign of the right main bronchus (figure 1A). CT of the chest demonstrated a large endobronchial obstructing lesion in



**Figure 1** (A) Chest radiograph demonstrating bronchial cut of sign and lobar collapse. (B and C) Axial and coronal CT images demonstrating a large endobronchial lesion in the right mainstem bronchus with collapse of right lower lobe. (D) Chest radiograph 6 weeks postrigid bronchoscopy demonstrates complete resolution of bronchial cut-off and re-expansion of lobar collapse. (E and F) CT thorax performed postremoval of mucus plug showing no evidence of intrathoracic malignancy and subsequent. (F) Mild cylindrical bronchiectasis (arrow) in right upper lobe on axial CT image and residual borderline hilar adenopathy.



**Figure 2** (A) Virtual bronchoscopy reconstructed from CT thorax indicating an obstructing lesion in the right main stem bronchus. (B) Flexible bronchoscopy demonstrating thick mucus secretions evident at the corresponding location. (C) H&E stain of bronchial mucosa demonstrating inflammation and numerous eosinophils. (D) Evidence of 'ghost outlines' of fungal hyphae (arrow). (E) Positive Grocott's methenamine silver stain with morphological features consistent with *Aspergillus* species. (F–G) Virtual and flexible bronchoscopy 6 weeks postremoval of mucus plug exhibiting patent right main stem bronchus.

the right main bronchus highly suspicious for an endobronchial tumour (figure 1B,C)

Virtual bronchoscopy identified an obstructing lesion (figure 2A) and flexible fiberoptic bronchoscopy identified thick mucus secretions in the right main bronchus. The bronchial tree could not be intubated beyond this point despite different instrumentation, and the mucus plug could not be removed despite direct administration of dornase alpha bronchoscopically (figure 2B). To determine if there was a distal endobronchial lesion or foreign body, a rigid bronchoscopy was performed. A large mucus plug was removed, and airway inspection did not identify any endobronchial lesions. Histological analysis demonstrated eosinophilic inflammation with fungal hyphae, and *Aspergillus fumigatus* was cultured on microbiological samples (figure 2C–E). Serology revealed an IgE of 1648 IU/mL ( $0\text{--}<100\text{ IU/mL}$ ) and a specific IgE *Aspergillus* of 26.1 IU/mL ( $<0.35\text{ IU/mL}$ ). Oxygen saturations improved postprocedure, and oral voriconazole



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therapy was commenced and the patient discharged home 3 days later.

Repeat chest radiograph and CT 6 weeks later showed complete re-inflation of the right middle lobe and resolution of bronchial cut-off sign, with evidence of previously unknown significant bronchiectasis in the right middle and upper lobes (figure 1D–F). Repeat bronchoscopy indicated a patent bronchial tree throughout with evidence of significant bronchiectatic appearing airways in the right middle and upper lobe, allowing intubation to sixth and seventh order bronchi. Mucoïd secretions were evident, and bronchial washing cytology was benign. *A. fumigatus* was not cultured on repeat bronchial washings. A diagnosis of allergic bronchopulmonary aspergillosis (ABPA) was made.

Several conditions can result in mucus plugging leading to lobar collapse, particularly allergic bronchopulmonary aspergillosis (ABPA), plastic bronchitis, asthma or occasionally *Aspergillus* infection.<sup>1</sup> However, in this case, the presentation of such a delineated bronchial cut-off sign is atypical, especially in a pre-morbidly well person. This unusual case of ABPA resulting in severe mucus plugging mimicking an endobronchial tumour demonstrates the importance of differentiating the two, as both lung cancer may masquerade as a fungal infection<sup>2</sup> and

aspergillus infection may be associated with underlying malignancy.<sup>3</sup> Although it is not clear in this case if the bronchiectasis preceded or was a result of ABPA, this case highlights the importance of considering quiescent bronchiectasis as a cause of unresolving pulmonary infection, which may go unnoticed or tolerated by patients for many years.

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