

An unusual example of *Aspergillus* species lung disease

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A 37-year-old man developed persistent hemoptysis after sustaining a gunshot wound to the right shoulder and lung. A right upper lobectomy was performed, in which *Aspergillus* species microorganisms were identified within retained bullet fragments. The role of infected bullet fragments in the pathogenesis of hemoptysis in this patient is discussed.

Key Words: *Aspergillus species; Hemoptysis; Pulmonary foreign body*

CASE PRESENTATION

A 37-year-old man complained of a one-year history of mild hemoptysis, in which he would cough up small, dark clots most mornings and streaks of bright blood with vigorous exertion. The initial onset of hemoptysis occurred 10 days after he was shot in the right shoulder in Honduras. Treatment at the time of the shooting included emergency surgical repair of the right humerus. He was otherwise in excellent health; he had no shortness of breath, his weight was stable, and he had neither night sweats nor fever.

Cas rare d'infection pulmonaire à *Aspergillus*

Un homme de 37 ans a commencé à présenter des hémoptysies persistantes après avoir subi une blessure par balle à l'épaule et au poumon droits. On a procédé à une lobectomie supérieure droite et décelé la présence de germes de l'espèce *Aspergillus* dans les fragments de balle retirés. Suit une discussion sur le rôle de ces fragments infectés dans la pathogenèse des hémoptysies chez cet homme.

The patient had no history of bleeding from his nose, genitourinary tract or bowel. There was no family history of bleeding disorders. The patient had a 20 pack-year smoking history and reported modest alcohol intake. He had no history of respiratory disease, but his purified protein derivative was strongly positive on immigration to Canada. He was taking no medications.

A physical examination was normal, apart from the scars in the area of his right humerus and shoulder from the bullet wounds and surgery. In particular, he was not clubbed, nor

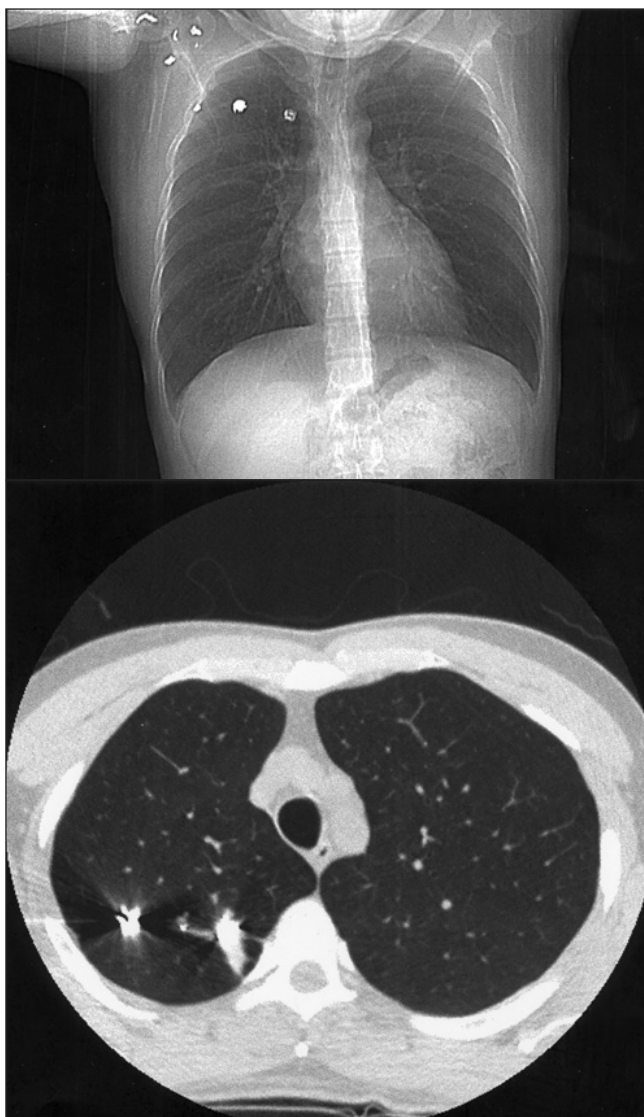


Figure 1 Scout film (**Top**) and high resolution computed tomography (**Bottom**) images of the patient. Note the radiodense bullet fragments within the right upper lobe and axilla, with strands of fibrosis extending to the pleura

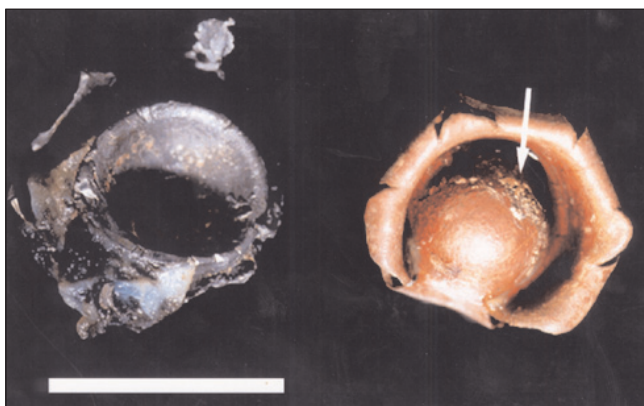


Figure 2 Bullet (**Left**) and copper jacket (**Right**) recovered from the deep lateral and subpleural medical aspect of the apical segment, respectively. The arrow indicates granular material on the surface

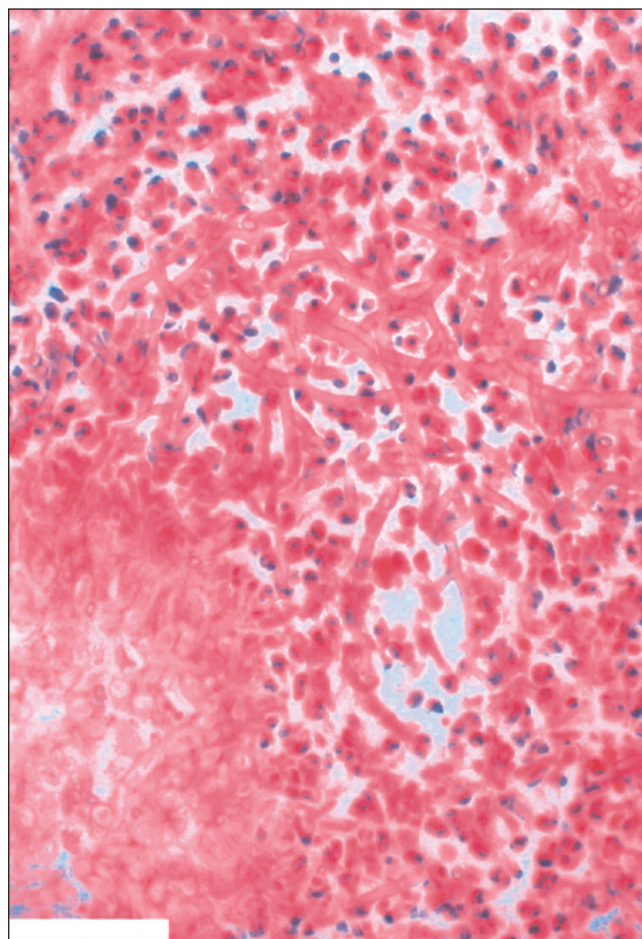


Figure 3 Fungal hyphae with neutrophilic inflammation with a laminated appearance taken from the surface of the copper jacket (hematoxylin and eosin stain)

did he have telangiectasias on the trunk or oropharynx. His cardiac and respiratory system examinations were normal, as were his pulmonary function tests.

The patient's plain chest films were unavailable. The scout view and high resolution computed tomography scan (Figure 1) showed several metallic fragments in the right upper lobe and axilla. Two fragments were surrounded by homogeneous soft tissue with irregular contours, and strands extending to the pleura were consistent with an inflammatory or fibrotic process.

No source of bleeding was identified at bronchoscopy. Bronchial washings were negative for microorganisms, and cytology was negative for malignancy. In view of persistent hemoptysis, a right upper lobectomy was performed. Examination of the lobectomy specimen revealed a bullet within the lung parenchyma that was surrounded by a thin band of fibrosis, with minimal associated inflammation. Granular material adherent to the surface of the copper jacket (Figure 2) from the bullet contained a fungus with dichotomous branching septate hyphae, consistent with *Aspergillus* species (Figures 3 and 4).

DISCUSSION

Hemoptysis is a well-recognized complication of gunshot wounds to the lung (1) and may result from erosion of bronchi or blood vessels by the slowly changing position of retained metallic fragments (2). The role of infection in the pathogenesis of hemoptysis remains unclear, given that the heat generated during discharging of a firearm is generally considered to render a bullet sterile (3). However, there is experimental evidence challenging this assumption (4), such that the possibility of pre-existing fungal contamination of the bullet cannot be excluded. Alternatively, retained bullet fragments are foreign bodies that potentially could provide a nidus for colonization by inhaled microorganisms (4,5). Overall, this case illustrates that the role of infection in the pathogenesis of hemoptysis complicating a gunshot wound to the lung is difficult to establish definitively.

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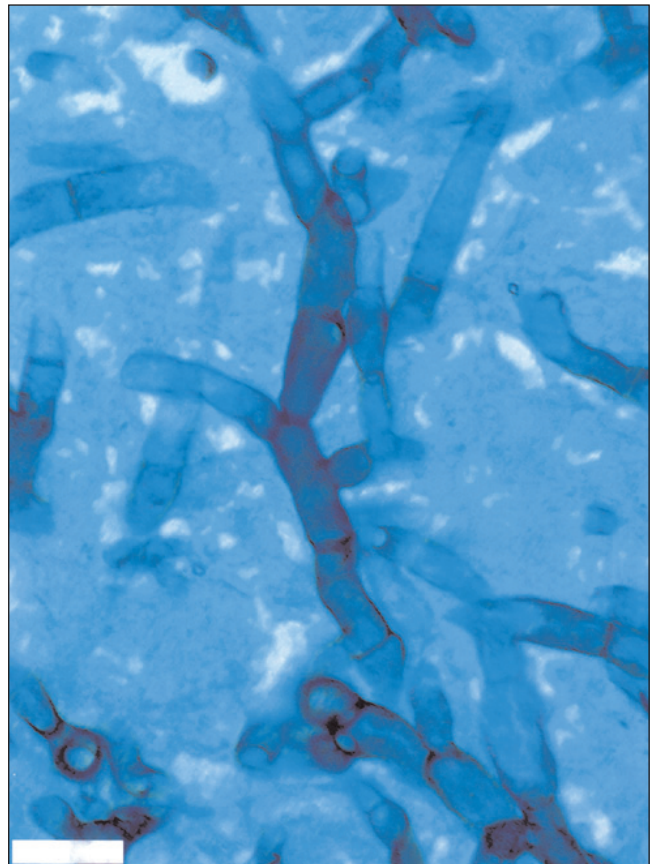


Figure 4) Fungal hyphae showing dichotomous branching and septation consistent with *Aspergillus* species (Grocott's stain)



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