Misdiagnosis of pulmonary bulla

We read with considerable interest the diagnostic challenge on bullous emphysema in a young man in India.[1] It brought to mind a recent unreported case, experienced by one of us, which led to a significant diagnostic error. A 73-year-old man with known chronic obstructive pulmonary disease (COPD) presented with acute onset of severe shortness of breath. Based on his acute presentation and his initial chest x-ray, (Fig. 1; which a radiologist confirmed represented a pneumothorax), the emergency physician (EP) made a diagnosis of acute pneumothorax in a patient with pre-existing respiratory compromise and performed a decompression using a Heimlich valve. This procedure led to collapse of the wall of a large apical bulla and complete collapse of the lung (Fig. 2), which was confirmed by CT scan (Fig. 3). The patient went on to be treated with a large bore chest tube, in addition to being treated for exacerbation of his COPD, which was complicated by a persistent air leak. He was discharged at his baseline state 2 weeks later.

"Diagnostic challenges" in journals (and Morbidity and Mortality rounds to some extent) typically emphasize the medical features of competing diagnoses. This is inevitably divorced from the clinical context and prevailing ambient conditions that are known to influence diagnostic reasoning. On reviewing the present case, we identified the following cognitive dispositions to respond (CDRs)[2] as probable determinants of this diagnostic error.

Anchoring

The EP fixated on specific features of the presentation too early in the diagnostic process and subsequently failed to adjust to other information that might have been available. This is characteristic of a System 1 pattern recognition type of error.[3]

Premature diagnostic closure

Following on the above, the EP accepted the diagnosis before it had been fully verified. Had he asked himself what else might this be, he might have looked for previous x-rays that would have shown similar findings at the patient's baseline status.

Availability bias

The EP had recently treated a patient with COPD with spontaneous pneumothorax and a similar presentation, and the outcome following Heimlich valve treatment had been excellent. Awareness of this bias when facing situations that appear familiar could help clinicians avoid premature diagnostic closure.

Fig. 1. Chest x-ray taken on the patient's presentation showing an absence of lung markings in the right upper lobe and the suggestion of the outline of a collapsed lung running along the posterior shadow of the fifth rib diagnosed as an acute pneumothorax by both the emergency physician and the radiologist.

Fig. 2. Chest x-ray taken immediately after the insertion of a Heimlich valve showing the collapsed wall of a large apical bulla.

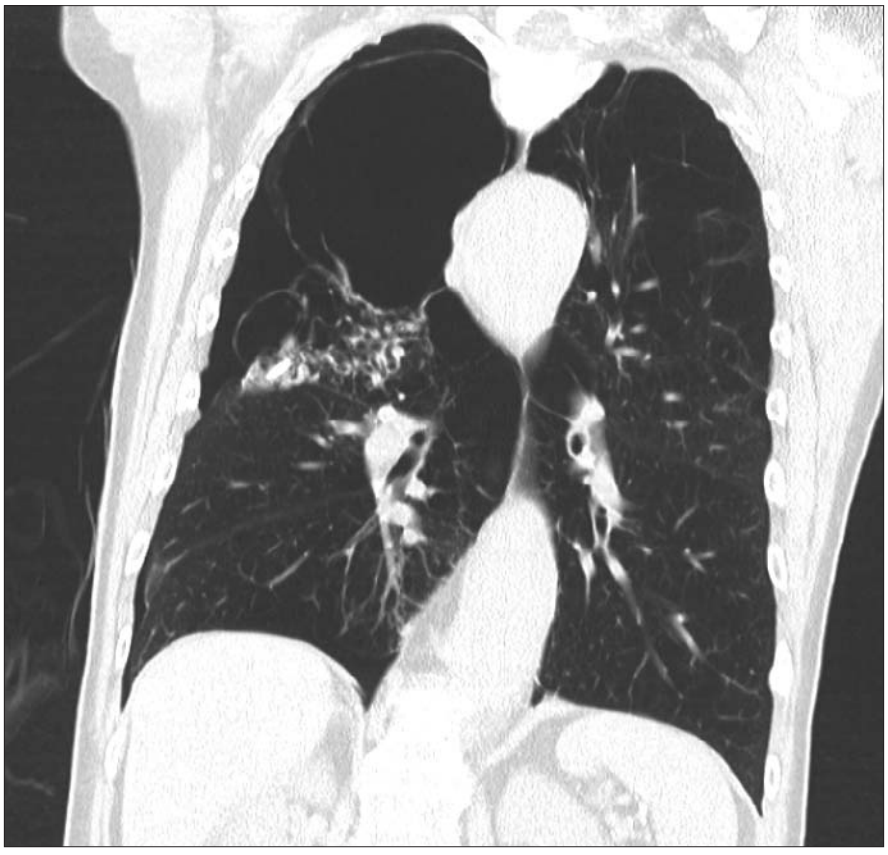

Fig. 3. CT scan taken after Heimlich valve placement demonstrating bullous lung disease and a large, partially collapsed apical bulla on the right.

Commission bias

The acute and emergent presentation demanded rapid action by the EP, who was reticent to endotracheally intubate a patient with "vulnerable" lungs. The diagnosis of an acute condition, ameliorable with a procedural intervention, may have competed with alternate diagnoses requiring more complex management. Although errors of omission are generally more common than errors of commission, the latter may prevail in emergent situations.

The present case adds to that of Shah and collagues[1] as well as to those of others[4] who have described pulmonary bullae mimicking a pneumothorax. Diagnoses that are based on pattern recognition are often compelling, but their inherent vulnerability to cognitive bias needs to be appreciated. When EPs engage the rapid cognitive style that underlies System 1 decision making, also referred to as thin slicing,[5] we should always exercise restraint and be prepared to ask the question: What else might this be?

Sam G. Campbell, MB, BCh
Pat Croskerry, MD, PhD
Department of Emergency Medicine,
Dalhousie University
Halifax, NS

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