

## There's Air in There: An Image of Extensive Pneumopericardium and Pneumomediastinum

Aparajita Singh, MD, MPH<sup>1</sup>  
Brian Harte, MD<sup>2</sup>

<sup>1</sup> Department of Internal Medicine, University of California San Francisco, San Francisco, California.

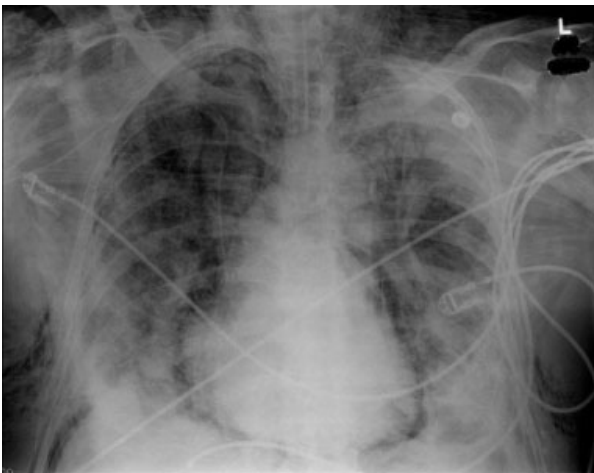
<sup>2</sup> Department of Hospital Medicine, Cleveland Clinic, Cleveland, Ohio.

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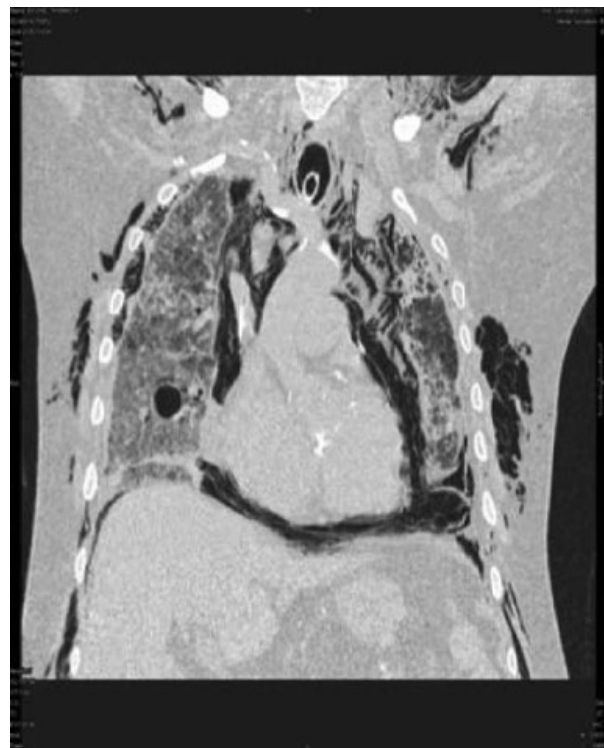
A 73-year-old male presented with acute congestive heart failure and non-ST elevation myocardial infarction. His initial chest x-ray and computed tomography (CT) demonstrated pulmonary vascular congestion and alveolar infiltrates, and he promptly underwent cardiac catheterization with placement of a coronary stent. Subsequently, his respiratory status deteriorated, and repeat films and chest CT demonstrated extensive pneumomediastinum and pneumopericardium (Figures 1–3). The patient was intubated, and bronchoscopy and upper gastrointestinal (GI) endoscopy were performed, but demonstrated no evidence of perforation that could cause such an air leak. There was no evidence of tamponade, clinically or on echocardiogram. His condition worsened abruptly, and he expired following a cardiac arrest. Postmortem, the team considered that the extensive air leak could have been caused by catheterization, stent placement, central line placement, or mediastinitis or pericarditis causing microscopic fistulae. The patient's tracheal aspirate and biopsy grew *Candida albicans* but no

evidence of invasive candidiasis was found on autopsy. No definitive etiology was found.

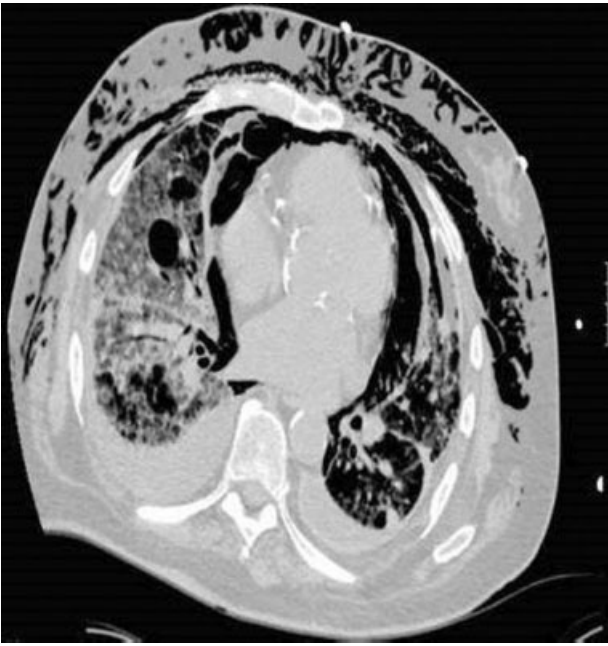
In contrast to pneumomediastinum, pneumopericardium is a rare condition and its pathophysiology is not well understood. Most cases have been reported in newborns receiving mechanical ventilation. In adults, the condition occurs due to chest trauma, or can be iatrogenic secondary to laparoscopy, bronchoscopy, or endotracheal intubation. There have been case reports of pneumopericardium after cardiac catheterization and central line placement.<sup>1,2</sup> Other causes include lung transplant, esophageal perforation, severe asthma, positive pressure ventilation, and pericarditis (eg, histoplasmosis and tuberculosis).<sup>3,4</sup> Clinical findings include distant heart sounds, shifting precordial tympany, and a succussion splash with metallic tinkling (known as



**FIGURE 1.** Chest x-ray demonstrating extensive pneumopericardium and pneumomediastinum, subcutaneous emphysema, and the "continuous diaphragm sign," (ie, the entire diaphragm can be visualized from one side to the other because air in the mediastinum outlines the central portion), which is usually obscured by the heart and soft tissues.



**FIGURE 2.** Chest CT (coronal view) demonstrating extensive air in pericardium, mediastinum, and subcutaneous tissues.



**FIGURE 3.** Chest CT (axial view) demonstrating extensive air in pericardium, mediastinum and subcutaneous tissues.

“mill wheel murmur”) in hydropneumopericardium.<sup>5</sup> Chest CT can distinguish pneumopericardium from pneumomediastinum: with the former, the air changes position when

the patient adopts a supine position.<sup>6</sup> Cardiac tamponade can occur in up to 37% of cases, and pericardiocentesis or pericardial tube drainage in these cases can be lifesaving.<sup>7</sup>

**Address for correspondence and reprint requests:**

Aparajita Singh, MD, University of California, San Francisco, 533 Parnassus Ave., C-430, Box 0131 San Francisco, CA 94143; Telephone: 415-476-4853; Fax: 415-476-4818; E-mail: asingh@medicine.ucsf.edu Received 30 July 2008; revision received 19 November 2008; accepted 16 December 2008.

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