Pneumopericardium as a complication of pericardiocentesis

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A 48-year-old man with trisomy 21 was transferred to our cardiology service because of acute dyspnea. At presentation, his blood pressure was 70/50 mm Hg, with a heart rate of 130 beats/min and an oxygen saturation of 88%. Physical examination showed muffled heart sounds, clear lungs and distention of the jugular veins. An echocardiogram showed a large circumferential pericardial effusion.

We performed fluoroscopy-guided pericardiocentesis, under local anesthesia, through the subxiphoid approach and inserted a pigtail catheter (8Fr). Drainage of 1000 mL of transudate resulted in rapid clinical improvement. A chest radiograph at 24 hours showed air entrapment between the cardiac silhouette and the pericardium, without signs of pneumothorax (Figure 1). A repeat echocardiogram showed bright echogenic spots swirling in the pericardial cavity, impairing visualization of cardiac structures (video Appendix 1, available at www.cmaj.ca/lookup/doi/10.1503/cmaj.221137/tab-related-content). We made the diagnosis of pneumopericardium. Because he was hemodynamically stable, we treated him conservatively and the pericardial air gradually resolved. Diagnostic work-up to identify a cause of his pleural effusion was negative; therefore, we considered the pericardial effusion to be idiopathic.

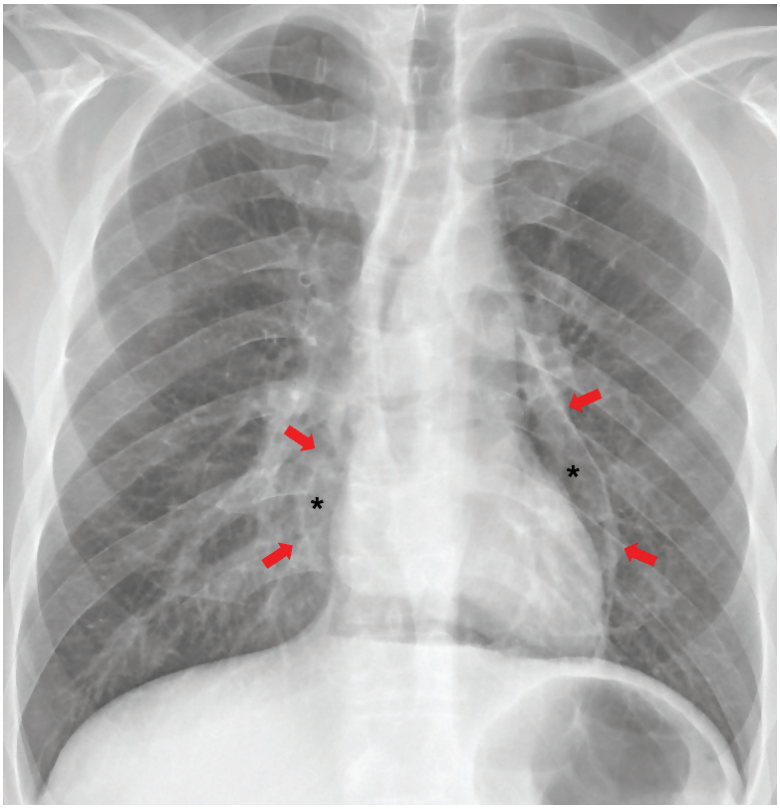

Figure 1: Chest radiograph of a 48-year-old man after pericardiocentesis, showing air entrapment (asterisk) between the cardiac silhouette and the thin, radiolucent line of the pericardium (arrows).

Pneumopericardium after pericardiocentesis is an uncommon complication that results from air insertion through the pericardial drainage or formation of a direct pleuropericardial communication. The diagnosis is made by chest radiography, computed tomography or echocardiography.[1] Differential diagnosis includes pneumomediastinum, in which air does not typically surround the bottom of the heart and is not confined solely to the heart, but can extend to the superior mediastinum and neck.[2] In our case, pneumopericardium was likely induced by coughing in combination with an unsealed system. Avoidance of vigorous inhalation or coughing, confirmation of proper drain position (i.e., no side holes outside the pericardial space), closure of all drainage system connections and application of surgical gel to the skin around the drain to create an airtight seal are essential to prevent this complication.[3] Pneumopericardium is usually self-limiting and requires no specific therapy. However, the development of cardiac tamponade necessitates repeat pericardiocentesis or surgical decompression.[1]

References

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2. Brander L, Ramsay D, Dreier D, et al. Continuous left hemidiaphragm sign revisited: a case of spontaneous pneumopericardium and literature review. *Heart* 2002;88:e5.
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The authors have obtained patient consent.

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A video of the echocardiogram of a 48-year-old man after pericardiocentesis, showing bright echogenic spots swirling in the pericardial cavity and impairing visualization of cardiac structures, is in Appendix 1, available at www.cmaj.ca/lookup/doi/10.1503/cmaj.221137/tab-related-content

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