JACC: CASE REPORTS VOL. 1, NO. 2, 2019

IMAGING VIGNETTE

INTERMEDIATE

CLINICAL VIGNETTE

Pericardiocentesis Complicated by Pneumopericardium

Tardu Özkartal, MD,[a,b] Susanne A. Schlossbauer, MD,[a] Francesco Faletra, MD,[a] Giovanni Pedrazzini, MD[a]

ABSTRACT

This report presents the case of pneumopericardium with trapped air in the pericardial sac occurring after a pericardiocentesis, probably caused by air leakage secondary to a defect in the drainage system and/or accidental removal of the pericardial tube. This condition is very rare and should be considered in case of hemodynamic worsening despite complete evacuation of the pericardial effusion, since immediate recognition and treatment are crucial. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2019;1:249–50) © 2019 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

A 73-year-old female patient with metastatic pulmonary neoplasia, a right-sided malignant pleural effusion, and a large pericardial effusion (**Figure 1A**, stars) was referred for diagnostic and therapeutic pericardiocentesis. On arrival, she was in respiratory distress with distended jugular veins, tachypnea, and sinus tachycardia but normal blood pressure. Pericardial drainage was performed, and the effusion was evacuated completely.

Unfortunately, the patient accidentally removed the pericardial tube, and her clinical condition and hemodynamic status worsened progressively during the night (heart rate 109 beats/min; blood pressure 92/63 mm Hg). Echocardiography was repeated and showed recurrent formation of pericardial effusion and unexpectedly swirling microbubbles within the pericardial fluid, which were interpreted as trapped air (**Figure 1B**, arrows, Video 1). Pneumopericardium was suspected and confirmed by chest radiograph, which showed air surrounding the cardiac silhouette (**Figure 1C**, arrows). This condition was probably caused by air leakage secondary to a defect in the drainage system and/or accidental removal of the pericardial tube. Immediate pericardiocentesis was performed, and pericardial fluid and 100 ml of trapped air were removed (**Figure 1D**, Video 2). This procedure led to prompt hemodynamic stabilization.

Pneumopericardium is a rare but potentially severe condition. In the literature, different causes, such as intestinopericardial or pneumopericardial fistula (1,2), penetrating chest trauma, and pericarditis with gas-forming organisms, have been described (3).

Fortunately, iatrogenic pneumopericardium caused by pericardiocentesis is very rare. However, in case of hemodynamic worsening despite complete evacuation of a hemodynamically significant pericardial effusion, it should be considered in the differential diagnosis because immediate recognition and treatment are crucial.

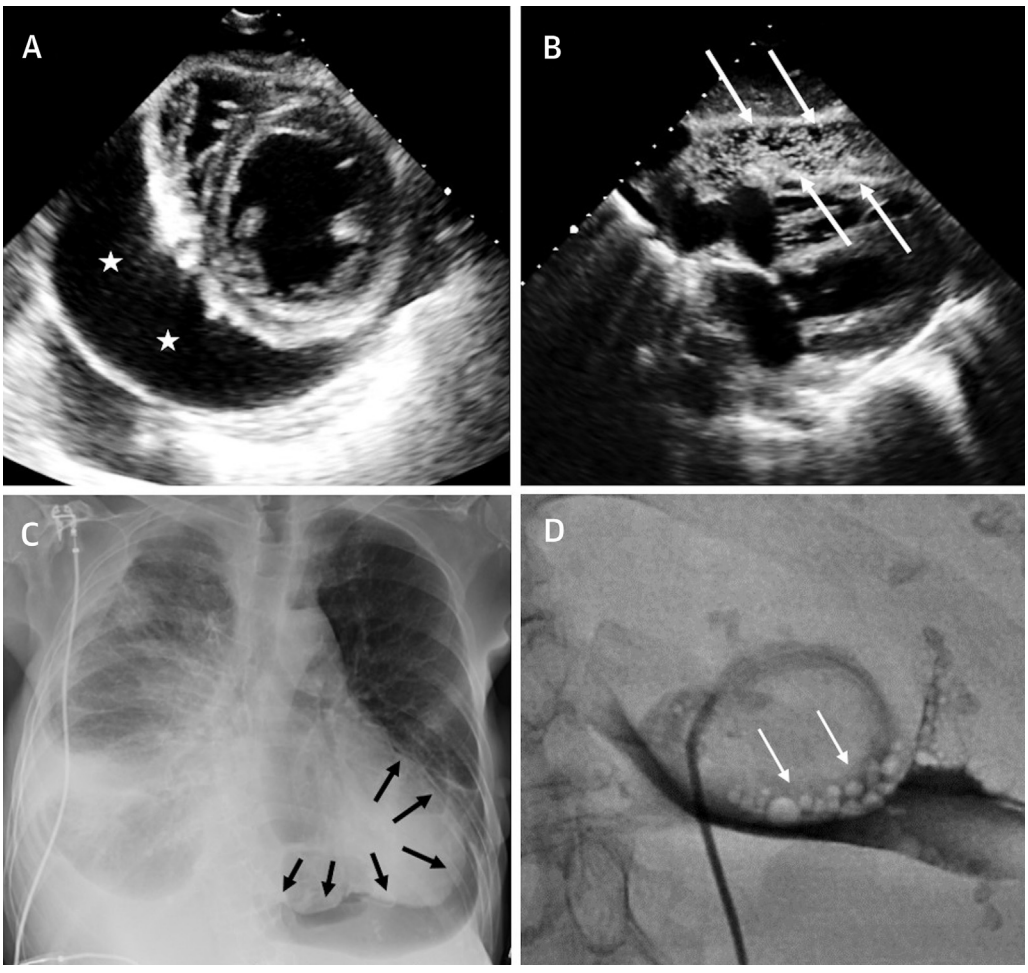
From the [a]Fondazione Cardiocentro Ticino, Lugano, Switzerland; and the [b]Department of Cardiology, Ospedale San Giovanni, Bellinzona, Switzerland. The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received April 15, 2019; revised manuscript received May 28, 2019, accepted June 5, 2019.

ISSN 2666-0849 https://doi.org/10.1016/j.jaccas.2019.06.024

JACC: CASE REPORTS, VOL. 1, NO. 2, 2019
AUGUST 2019:249–50

FIGURE 1 Pericardiocentesis Complicated by Pneumopericardium



(A) Echocardiographic parasternal short-axis view in which a large pericardial effusion **(stars)** can be appreciated. The image was taken before the first pericardiocentesis. **(B)** Subcostal echocardiographic view showing swirling microbubbles of trapped air in the pericardial sac **(arrows).** This image was taken after the patient had accidentally removed the pericardial tube and her clinical condition worsened. See Video 1. **(C)** Chest radiograph obtained immediately after the echocardiography image in **B;** air surrounding the cardiac silhouette **(arrows)** can be seen. **(D)** Intraprocedural fluoroscopy image after injection of contrast agent during the second pericardiocentesis, where bubbles of trapped air in the pericardial sac **(arrows)** can be appreciated. See Video 2.

ADDRESS FOR CORRESPONDENCE: Dr. Tardu Özkartal, Cardiology Department, EOC Ospedale San Giovanni. Via Ospedale 12, 6500 Bellinzona, Switzerland. E-mail: udratus@gmail.com.

REFERENCES

1. Müller AM, Betz MJ, Kromeier J, et al. Images in cardiovascular medicine. Acute pneumopericardium due to intestino-pericardial fistula. Circulation 2006;114:e7–9.

2. Gołota JJ, Orłowski T, Iwanowicz K, Snarska J. Air tamponade of the heart. Kardiochir Torakochirurgia Pol 2016;13:150–3.

3. Hymes WA, Itani KM, Wall MJ Jr., Granchi TS, Mattox KL. Delayed tension pneumopericardium after thoracotomy for penetrating chest trauma. Ann Thorac Surg 1994;57:1658–60.

KEY WORDS complication, echocardiography, pericardial effusion

APPENDIX For supplemental videos, please see the online version of this paper.