

VIDEO SESSION

Pericardial Fluid Drainage in the Thoracic Cavity During Pericardiocentesis

Panagiotis Margos, MD, Michalis Mariolis, MD, Athanasios Kranidis, MD

ABSTRACT

An 86-year-old male with dizziness and dyspnea due to cardiac tamponade, underwent pericardiocentesis under ultrasound guidance. The procedure was done through the 5th intercostal space at the left sternal border. A 6-F sheath was placed in the pericardial sac. Although only a minimal quantity of pericardial fluid could be removed through the sheath, complete evacuation of the pericardial fluid could be detected with echocardiography, a few minutes after the puncture of the sac. Clinical improvement with hemodynamic stability were present after the procedure. We discuss the mechanism of this strange phenomenon.

*First Department of Cardiology,
General Hospital of Nikea, Piraeus,
Greece*

KEY WORDS: *pericardiocentesis;
cardiac tamponade; drainage; pleural
cavity*

INTRODUCTION

Pericardiocentesis is usually an urgent invasive procedure in patients with cardiac tamponade, which is performed the subxiphoid approach, or through the 5th intercostal space.¹ Echocardiography is the gold standard for the diagnosis of pericardial fluid causing impairment of cardiac function. It is also essential for the selection of puncture site and the confirmation of pericardial drainage at the end of the procedure.² We describe a case of an elderly patient with cardiac tamponade, whose pericardiocentesis channelled the fluid into his thoracic cavity.

CASE PRESENTATION

An 86-year-old male, without medical history of cardiovascular disease, was admitted due to progressive dyspnea and dizziness. Sinus tachycardia, low blood pressure with pulsus paradoxus, distended neck veins and depressed oxygen saturation were compatible with cardiac tamponade. The above diagnosis was confirmed with echocardiography. For pericardiocentesis, the 5th intercostal space at the left sternal border was chosen as the puncture-site. Patient was positioned supine with the head of the bed raised to a 50-degree angle. After needle insertion into the pericardial sac and successful inspiration of 2 ml of transparent, yellow-colored fluid, a 6-F sheath was introduced over a guidewire in the pericardial space without any difficulty. No more fluid could be drained through the sheath. The patient complained for severe chest pain and echocardiogram was repeated urgently. Paradoxically, pericardial fluid became progressively less, up to total elimination (under direct visual-echo control) in the next few minutes. Chest pain was limited and clinical improvement was present. The patient

Corresponding author:
Athanasios Kranidis, MD
E-mail: athanasioskranidis@gmail.com

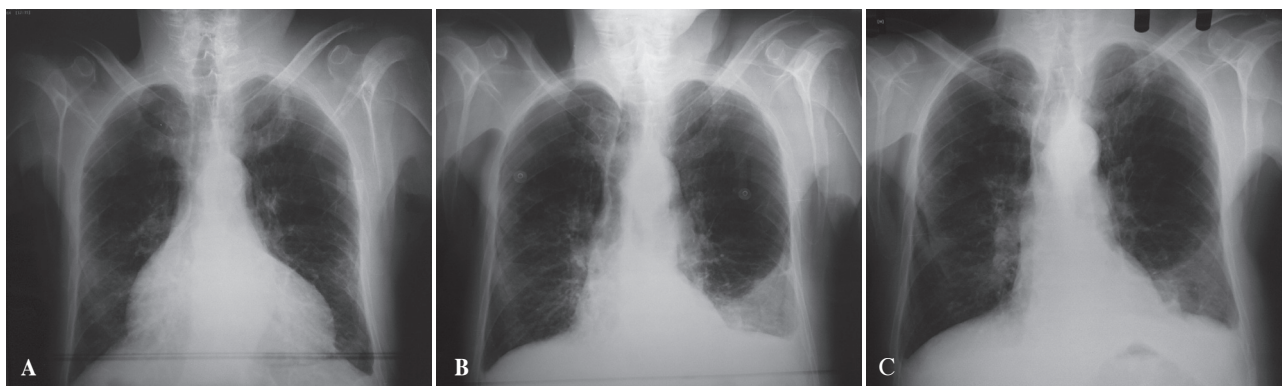


FIGURE 1. A: Posteroanterior chest X-ray before pericardiocentesis, typical for large pericardial effusion. B: Posteroanterior chest X-ray after pericardiocentesis: Pericardial fluid drainage to the left pleural cavity. C: Reduction of “pleural” effusion two days after pericardiocentesis.

remained hemodynamically stable. Comparison of chest X-rays before and after the procedure provide the diagnosis of fluid drainage into the left pleural cavity (Figure 1, panels A & B). Two days after pericardiocentesis, reduction of the pleural fluid was obvious in a new chest X-ray, without any medical or invasive re-intervention (Figure 1, panel C). The patient remained stable, but denied further diagnostic evaluation.

DISCUSSION

The use of emergency pericardiocentesis to aspirate fluid in patients with cardiac tamponade can be a lifesaving procedure that restores normal cardiac function and peripheral perfusion. Nevertheless, this is an invasive procedure with potential complications, i.e. myocardial perforation, coronary artery/vein perforation, pneumothorax, cardiac arrhythmias (particularly bradycardia), peritoneal/liver puncture.³ Cardiologists who perform the procedure of pericardiocentesis should be able to diagnose each one of these complications.

In our case, the alarming development of severe chest pain in combination with our inability to aspirate fluid through the sheath, raised the suspicion of pneumothorax. Echocardiogram showed an “automatic” fluid drainage, apparently inside the thoracic cavity. Chest X-ray excluded pneumothorax

and confirmed the presence of the ex-pericardial fluid in the left pleural cavity. Pericardial tearing after needle or sheath insertion is the only reasonable explanation for this bizarre phenomenon. To our knowledge, there are no similar reports in the literature.

In conclusion, cardiologists should be aware of the quite rare phenomenon of automatic pericardial fluid drainage into the thoracic cavity after needle and sheath insertion in the pericardial sac, in patients with cardiac tamponade. This “complication” can be detected through echocardiography during the procedure, followed by chest X-Ray.

REFERENCES

1. Degirmencioglu A, Karakus G, Góvenc TS, et al. Echocardiography-guided or “sided” pericardiocentesis. *Echocardiography* 2013; 30:997-1000.
2. Nagdev A, Mantuani D. A novel in-plane technique for ultrasound-guided pericardiocentesis. *Am J Emerg Med* 2013;1424. e5-9.
3. Loukas M, Walters A, Boon JM, et al. Pericardiocentesis: a clinical anatomy review. *Clin Anat* 2012;872-881.
4. Emmert MY, Frauenfelder T, Falk V, et al. Emergency pericardiocentesis: a word of caution! Accidental transhepatic intracardiac placement of a pericardial catheter. *Eur J Cardiothorac Surg* 2012; 42:e31-32.