

# An useful complication of emergent pericardiocentesis procedure in cardiac tamponade: Case report

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## Abstract

We present a case of 19 years old patient whom was admitted to emergency service with abdominal pain and dyspnea and had prodromal symptoms for about ten days. He was hypotensive, tachycardic and dyspneic. CT scan showed large amount of free peritoneal, pericardial and bilateral pleural fluid. With the diagnosis of cardiac tamponade; emergent pericardiocentesis was done with apical approach and quick hemodynamic relief was observed. It was understood that rapid haemodynamic response was a result of complication, characterized by increasing of left pleural effusion.

**Key Words:** Complication, abdominal pain, cardiac tamponade, pleural effusion.

İleri Ç., Çinçin A. A., Doğan Z., Mutlu B. An useful complication of emergent pericardiocentesis procedure in cardiac tamponade: Case report. EJCM 2018; 06 (1): 15-18. Doi: 10.15511/ejcm.18.00115.

## Case Report

A 19 years old man with a history of migraine and smoking, was admitted to emergency service with abdominal pain, nausea, dyspnea and loss of appetite for one week. The abdominal pain was worsening by standing and relieving by lying down. He had prodromal symptoms for ten days. Patient was consulted to our department due to detection of minimal cardiac silhouette enlargement in chest X-ray and sinus tachycardia in electrocardiogram. Computerized tomographic (CT) scan of abdomen and thorax revealed large amount of free peritoneal, 30 mm of pericardial, 30 mm of pleural effusion in left lung as well as 20 mm of effusion in right lung. Transthoracic echocardiography (TTE) showed large circumferential pericardial effusion (PE) with right atrial (RA) systolic and right ventricular (RV) diastolic collapse and >30% variation in mitral inflow pattern suggesting cardiac tamponade (**Figure 1**).

Hypotension, tachycardia and pulsus paradoxus was observed at physical examination. After echocardiographic examination, it was concluded that the most convenient way for pericardiocentesis (PC) was apical approach. However collecting very small amount of pericardial fluid (15 cc), his hemodynamic profile was rapidly improved. A thoracal CT scan was taken immediately, although 15 mm residual pericardial effusion was implemented; 20 mm effusion at right and 45 mm at left lung was identified (**Figure 2**).

Thoracal drainage tube was inserted left pleural cavity and 500 cc of hemorrhagic pleural fluid was collected. Tube was removed 2 days after, and no residual

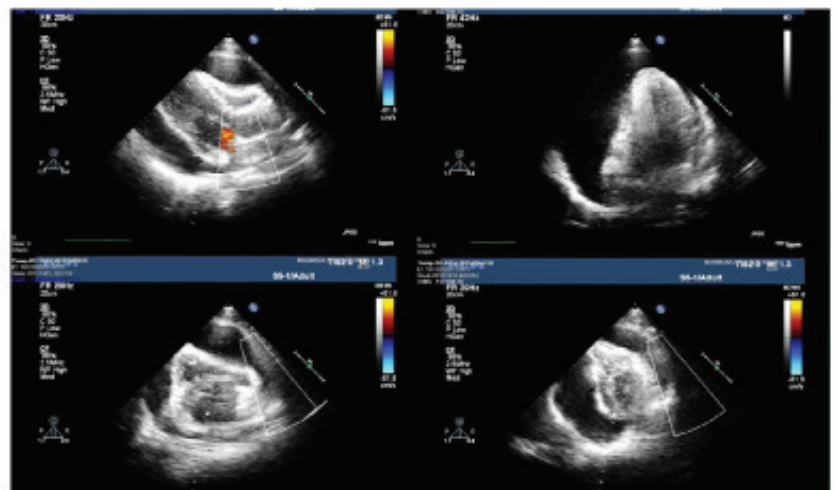
or recurrent effusion existed in the control imaging. Increase in acute phase reactants like, CRP:93 (0-5mg/l) fibrinogen:744 (200-400mg/dl), ESR: 53mm/h and neutrophilic leucocytosis was established in blood tests. However pericardial effusion was exudative quality; aerob- anaerob blood, urine and fluid culture was negative and no acid fast bacilli was seen in fluid; ANA, Anti-CCP, Anti-DNA and ENA profile were also normal. Colchicum 2\*5 mg and brufen 3\*600 mg without antibiotic regimen applied as the treatment strategy. 10 days after beginning of the treatment, only 10 mm pericardial effusion at posterior wall and 8 mm at RV neighbouring was found in TTE (**Figure 3**). He was on treatment for two months without any symptoms; rheumatologic and genetic tests are still having been done.

## Discussion

Cardiac tamponade is the hemodynamic result of increase in pericardial fluid which elevates intrapericardial pressure and prevent filling.<sup>1</sup> Pulsus paradoxus, tachycardia, elevated jugular venous pressure and hypotension are non-specific but important clues for the diagnosis. Echocardiography is an important tool to assess existence of effusion and also its hemodynamic results.<sup>2</sup>

Cardiac tamponade is critical condition and requires emergent treatment.<sup>1</sup> A variety of percutaneous or surgical therapeutic methods have been applied. Pericardiocentesis (PC), pleuro-pericardial window, subxiphoid pericardial drainage and pericardioscopy are the treatment option.<sup>3</sup> Percutaneous balloon pericardiotomy is another technique to create a nonsurgical pericardial

**Figure 1.** Transthoracic echocardiographic images of massive pericardial effusion and diastolic collapse of right ventricular free wall which is a sign of cardiac tamponade.



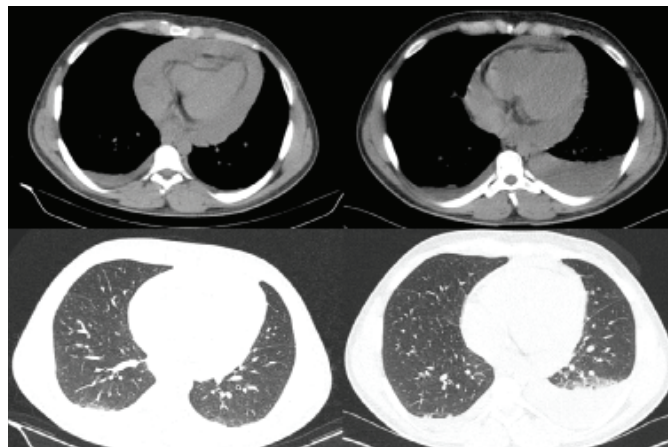
window for large pericardial effusions of critically ill patients especially with limited life expectancy.<sup>4,5</sup>

Percutaneous PC had been done blind or, electrocardiographically or fluoroscopically guided before the 2D-echocardiography-guided era.<sup>6,7</sup> Echocardiography guided pericardiocentesis is safe and effective way for drainage of large, symptomatic pericardial effusions or in case of cardiac tamponade.<sup>6,8,9</sup> Echocardiographic guidance facilitates detection of the puncture site, such as near the cardiac apex or sternal border or where the largest fluid collects. In a large study which investigate more than 1100 echocardiography-guided PC cases, the para-apical location was the most frequently utilized location (68%), while the subcostal or subxiphoid locations were used only in 15% of cases .

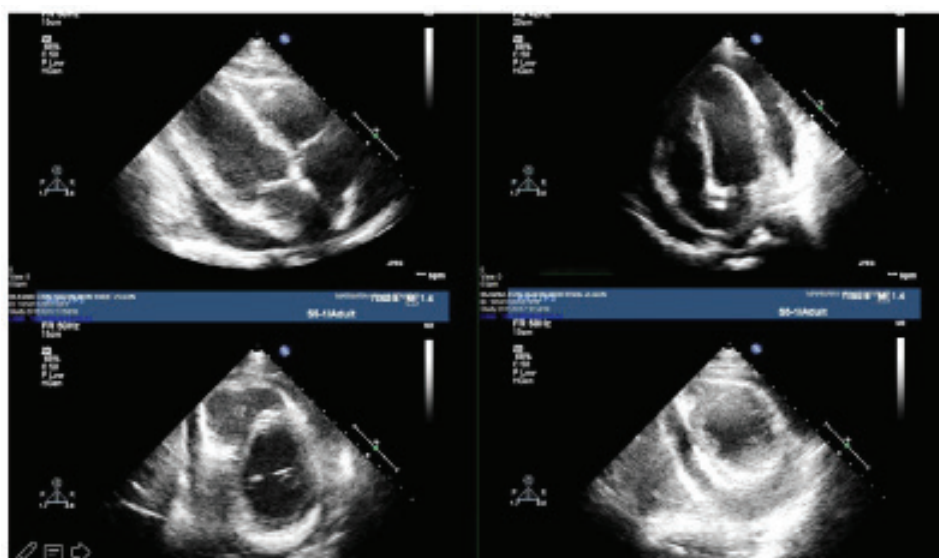
Large observational studies of echocardiography-guided pericardiocentesis report major and minor complication rates of <2% for non-emergent procedures.<sup>10,11</sup> The major complications of pericardiocentesis are myocardial rupture, vascular injury, pericardial hemorrhage, air embolism, injury to the liver or abdominal viscera, infection and arrhythmia.<sup>12</sup>

In our clinic, most of the PC are done by apical approach with lower complication rates. In this case, a complication happened during emergent PC which is

**Figure 2.** Tomographic images of increase in amount of left pleural effusion before (left side images) and after (right side images) the pericardiocentesis procedure



likely to occur. Despite symptomatic and haemodynamic relief of patient, immediate echocardiographic study and CT scan was taken due to continuing of clinical suspicion. Thoracal drainage tube inserted fastly as a result of increase in left pleural effusion. We think that increase in the amount of pleural fluid is an acceptable result confronting with the life threatening feature of tamponade. Mutual result of tamponade, haemodynamic parameters, clinical background of patient as well as collaborative assesment of imaging techniques are contributing to the outcome.



**Figure 3.** Transthoracic echocardiographic images of residual pericardial effusion and absence of right ventricular diastolic collapse.

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Received: 11/08/2016

Accepted: 18/12/2017

Published: 15/03/2018

### Disclosure and conflicts of interest:

The authors declare no conflict of interest.

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*İleri Ç., Çinçin A. A., Doğan Z., Mutlu B. An useful complication of emergent pericardiocentesis procedure in cardiac tamponade: Case report. EJCM 2018; 06 (1): 15-18. Doi: 10.15511/ejcm.18.00115.*