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CASE REPORT

A rare case of pericardial tamponade during Transthoracic Echocardiogram.

Abid Ullah[1,2] **& Colin Cunningham**[2]

[1]Peshawar Institute of cardiology, Peshawar-Pakistan.

[2]The University of Manchester, NHS foundation trust, Manchester-England.

Abstract

Pericardial effusion is not an uncommon finding in cardiology practice and the clinical picture depends on various factors including size of the effusion, etiology and speed of accumulation. Significant hemodynamic abnormalities, including cardiac arrest, can result from pericardial tamponade. We report a case of pericardial tamponade in a patient precipitated by added pressure from a transthoracic echo probe. Hemodynamic changes occurred unexpectedly during acquisition of subcostal echo images. The patient was promptly resuscitated and urgent pericardiocentesis was performed. Soon after the pericardiocentesis, hemodynamic indicators improved, and the patient achieved a satisfactory clinical recovery.

Keywords

Pericardial Tamponade, Transthoracic, Echocardiogram, Effusion, Hemodynamic.

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Corresponding Author Email:
draabed@yahoo.com

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Introduction

Summary

Pericardial effusion is not an uncommon finding in cardiology practice and the clinical picture depends on various factors including size of the effusion, etiology and speed of accumulation[1]. Significant hemodynamic anomalies, including cardiac arrest, can develop from pericardial tamponade[2]. We report a case of pericardial tamponade in a patient precipitated by added pressure from a transthoracic echo probe. Hemodynamic changes occurred unexpectedly during acquisition of subcostal echo images. The patient was promptly resuscitated and urgent pericardiocentesis was performed. Soon after the pericardiocentesis, hemodynamic indicators improved, and the patient made a satisfactory clinical recovery.

Background

Low blood pressure, increased JVP, and tachycardia are the three primary symptoms of pericardial tamponade, together known as the "Beck triad"[3]. A clinical phenomenon known as pericardial tamponade puts pressure on the heart as a result of fluid in the pericardial space, severely compromising hemodynamics[4]. Due to the significant mortality risk, a preventive diagnosis and treatment are necessary. Acute myocardial infarction, heart surgery, trauma, widely spreading tumours, chest radiation, end-stage renal failure, invasive cardiac intervention, hypothyroidism, autoimmune disease, and acute inflammatory pericarditis are the main causes of pericardial effusion causing pericardial tamponade[2]. In chronic situations, 1-2 L of fluid retention may not cause any symptoms, but in acute processes, pericardial tamponade may develop with just 150–250 ml of fluid retention[4].

According to the authors, this case progressed to pericardial tamponade by mechanical compression secondary to transthoracic echocardiographic examination.

Case Presentation

History

For elective PCI to the right coronary artery, a 78-year-old woman was admitted. The RCA had a lot of calcifications. The mid-vessel perforation made PCI more difficult. By inserting a covered coronary artery stent, this was treated. After the surgery, a moderately sizable pericardial effusion was visible on a transthoracic echocardiography around the right atrium and right ventricle. Patient was sent to an acute cardiac care unit for overnight observation because there were no signs of pericardial tamponade on the patient's echocardiogram.

The patient had atrial fibrillation in the early morning hours of the following day, along with a fast ventricular response that beat at a pace of 130 beats per minute. Physical examination revealed no increased JVP, a blood pressure reading of 117/60, and no signs of pulsus paradoxus. To evaluate pericardial effusion, a bedside transthoracic thoracic echocardiography was conducted. This revealed a significant pericardial effusion and hematoma development, primarily around the right heart (Figure 1).

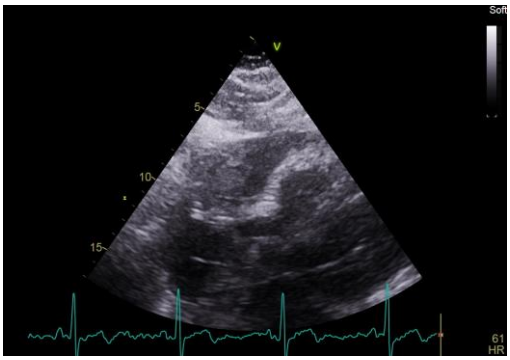


Figure 1: Echo showing size and location of pericardial effusion.

During the subcostal window of TTE, the patient experienced an 11-second asystole (Figure 2).

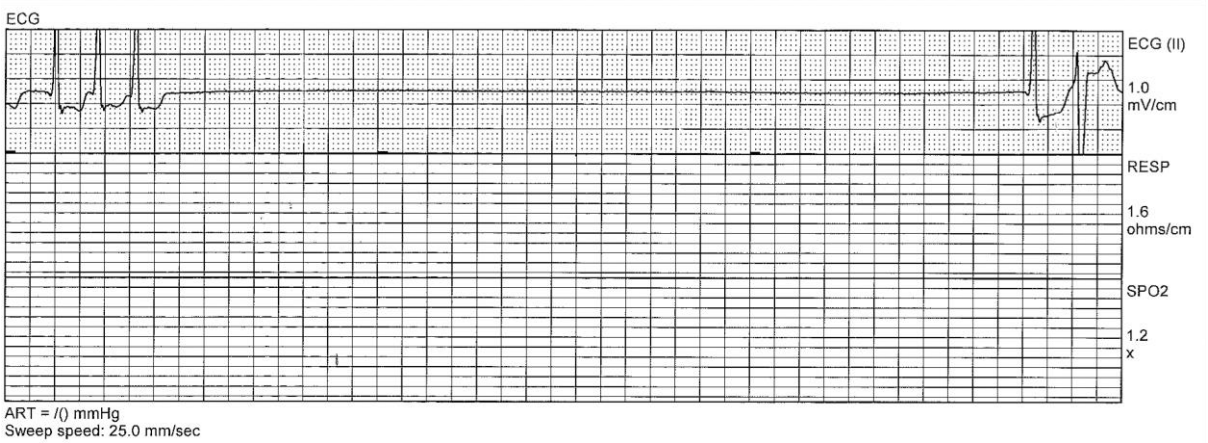
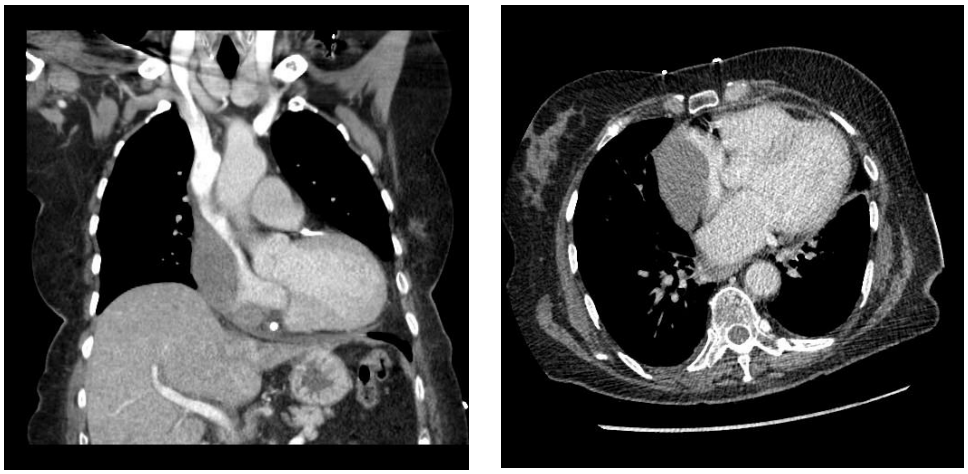


Figure 2: Ventricular standstill lasting 11 seconds.

The initiation of CPR was immediate. With the patient now in SR, circulation started to recover. A percutaneous drainage of the pericardial effusion was considered inappropriate due to the pericardial fluid's highly posterior placement. The patient was assessed by the cardiothoracic surgery team. An immediate CT of the thorax revealed that the pericardial effusion had nearly completely collapsed the right atrium and right ventricle (Figure 3a and 3b).



3a **3b**

Figure 3a and 3b: CT chest confirming the very posterior location of the pericardial effusion.

The patient was brought to the cardiac theatres so that a pericardial window could be made. During surgery, 500 cc of blood and blood clots were removed. The patient's recovery went without incident.

Discussion

Pericardial tamponade usually occurs when the volume of pericardial effusion rapidly increases. The heart still functions to some extent even when 1-2 L of fluid have accumulated when pericardial effusion progressively develops due to stretched parietal pericardium. However, if pericardial effusion develops quickly, pericardial tamponade

may occur due to dramatically increased intrathoracic pressure[2]. Therefore, if pericardial tamponade is suspected, timely diagnosis and treatment must be started right away.

Dyspnea, tachycardia, jugular venous distension, and pulsus paradox are seen when pericardial effusion causes pericardial tamponade, which worsens hemodynamics and eventually results in hypotension and shock[3].

Hypotension, elevated central venous pressure, and tachycardia make up the traditional trio (also known as Beck's triad) of pericardial tamponade. Patients have reportedly had rapid circulatory collapse without obvious evidence of progressive worsening or obvious clinical presentations however majority of them are associated with very sudden accumulation of pericardial fluid occasionally mitigated by iatrogenic factors like anesthetic induction.

In our reported case, there was sudden increase in the intrathoracic pressure caused by transthoracic echo probe in the subcostal position. This caused total collapse of the right side of the heart and asystolic cardiac arrest. Immediate resuscitation and definitive management of the pericardial effusion lead to satisfactory clinical outcome.

Conclusion

Pericardial effusion can lead to acute cardiac emergency if it compromises cardiac function, and all clinicians should be aware of this possibility even in the unlikely of circumstances.

Acknowledgment

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