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CASE REPORT

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Systolic dysfunction after pericardiocentesis: A case report of Pericardial Decompression Syndrome

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Abstract

Rationale: *Pericardial decompression syndrome is under appreciated but potentially fatal complication post pericardiocentesis. It should be part of differential diagnosis if patient presents with severe shortness of breath or hemodynamic compromise post-intervention. Prompt management is central to successful outcomes*

Patient concerns: *An interesting 69 year old gentleman who was initially treated for myelodysplastic syndrome and thereafter converted to acute myelogenous leukemia presented with neutropenic fever.*

Diagnosis: *On routine investigations it was identified that patient had large pericardial effusion. Soon after the identification of large pericardial effusion, patient's condition deteriorated and had hemodynamic collapse.*

Intervention: *An emergent pericardiocentesis was performed successfully via sub-xiphoid approach*

Outcome: Clinically the patient deteriorated the next day and we performed echocardiogram which showed a dramatic decrease in ejection fraction (from 60-65% to 35%). Over the course of next two days, the patient showed remarkable recovery with ejection fraction of 50% without any intervention

Lessons: *Pericardial decompression syndrome is not a well-recognized fatal complication of pericardiocentesis. It should be part of differential diagnosis if patient develops hemodynamic compromise post procedure. Prompt management including supportive therapies, and/or administration of heart failure is crucial to the hemodynamic recovery. The major risk factor, based on a small case series, denotes surgical drainage as potential contributor. Large case control series needs to be pooled before bona fide risk factor can be ascertained.*

Keywords: *pericardial decompression syndrome, pericardiocentesis, left ventricular dysfunction*

Introduction

Excessive pericardial effusion can compromise the ventricular ejection capacity owing to the reduced blood inflow. Therefore, immediate drainage is warranted for establishment of normal ventricular function and ameliorating the hemodynamic compromise. Rarely, the ventricles can show reduced contractility post-pericardiocentesis that can cause signs and symptoms of acute heart failure. This rare phenomenon is called pericardial decompression syndrome. We present a case of such an event and we occasionally encounter in our oncological patients.

Case report

69 year old male with recent diagnosis of acute myelogenous leukemia presented with neutropenic fever. Echocardiogram found an incidental large pericardial effusion with hemodynamic stability and ejection fraction of 55-60% (Figure 1; Panel A). Thereafter, the patient started to decompensate few days later with hemodynamic compromise and therefore pericardiocentesis was carried out. Pericardiocentesis resulted in removal of 620 cc of serosanguinous fluid. Post-pericardiocentesis echocardiogram showed 60-65% of ejection fraction (Figure 1; Panel B). However, overnight patient's clinical condition deteriorated requiring intensive care unit admission. An early morning echocardiogram showed ejection fraction of 35% (Figure 1; Panel C). There was no concomitant increase in troponins or creatine kinase-MB. Subsequently, lisinopril 10 mg was initiated and given the sinus bradycardia at a rate of 50, no beta blockers was included in the therapeutic armamentarium. Patient showed dramatic clinical improvement in two days with echocardiogram showing normalization of ejection fraction at 50-55%.

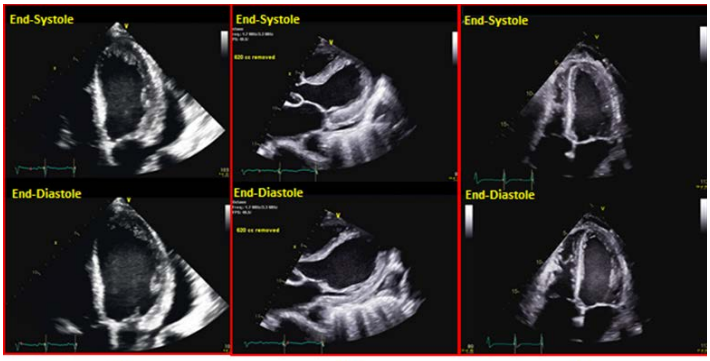

Figure 1. *End-systolic and end-diastolic four chamber view in echocardiogram. Panel A shows the cardiac profile in the presence of pericardial effusion. Panel B shows cardiac function immediately after post-pericardiocentesis. Panel C shows reduced cardiac function 24 hours after the pericardiocentesis.*

Discussion and conculsion

Pericardial decompression syndrome is defined as paradoxical hemodynamic instability due to biventricular dysfunction in a setting of post-pericardiocentesis/pericardiodectomy [1]. This syndrome was first described by Vandyke et. al. [2] in 1983 when removal of 500 ml of pericardial fluid led to pulmonary edema with wedge pressure of 40 mmHg. Since then numerous reports have been published with reported incidence of 5% [3] in the case series. Although the incidence might be much lower in community settings. End-diastolic volume differential between ventricles, increased wall stress, possible low flow state in coronary arteries and unmasking of previous systolic dysfunction post-pericardiocentesis/percardiodectomy [2,4] are among the unproven hypotheses of this phenomenon. Irrespective of the etiology of pericardial decompression syndrome, recognition and prompt acute heart failure management is clearly warranted. Under severe conditions of pericardial decompression syndrome with pulmonary edema and acute hemodynamic compromise, use of inotropic agents can be advantageous in successful clinical outcome. Pericardial decompression syndrome is rare and fatal phenomenon and should be part of differential diagnosis if patient decompensates post-pericardiocentesis/percardiodectomy.

Acknowledgement

Authors have no conflicts to disclose. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

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