

Massive Idiopathic Chronic Pericardial Effusion: A Case Report

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ARTICLE INFO

Article type:
Case report

Article history:
Received: 09 January 2023
Revised: 27 February 2023
Accepted: 06 March 2023

Keywords:
Pericardial effusion
Pericardial syndrome
Cardiac tamponade

ABSTRACT

An idiopathic chronic pericardial effusion which has occurred due to pericardial fluid collection can continue for over a three-month duration without obvious cause. Massive chronic pericardial effusion without cardiac tamponade is quite unusual. We present a male patient with chronic huge pericardial effusion who underwent a pericardial window procedure with 3600 milliliters drainage of pericardial fluid.

► Kahrom, M., Tabari, M. Massive Idiopathic Chronic Pericardial Effusion: A Case Report. *J Cardiothorac Med.* 2023; 11(1): 1129-1133. Doi: 10.22038/jctm.2023.70016.1403

Introduction

Pericardial effusion (PE) is an abnormal fluid collection in the pericardial space that generally should not be over 50 ml (1). Although the etiology is idiopathic in up to 50% of cases, and the PE may have been persistent for years or even decades, a careful physical assessment, laboratory tests, and considering medical history may reveal the cause in some patients (2).

The clinical spectrum of presentation in patients with PE may vary from asymptomatic PE to overt tamponade (3). Echocardiography has a pivotal role in

diagnosing, quantifying PE, and evaluating the PE impact on heart hemodynamics (4). The treatment strategy of patients with PE is programmed by the hemodynamic condition, acuity of the condition, and the effusion volume (5).

We present a male patient with huge chronic PE who underwent therapeutic and diagnostic pericardial windows with enormous drainage of pericardial fluid. The possible condition responsible for effusion was unclear despite a complete assessment that included an examination of pericardial biopsy and fluid analysis.

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Case Presentation

A 54-year-old man was referred to our clinic for two-month worsening dyspnea. Considering the vital signs indicated a normal state, and he denied a history of fevers, weight loss, recent infection and Covid-19, skin rashes, trauma, and malignancy. Auscultation of the heart was muffled. The electrocardiogram showed normal sinus rhythm with low amplitude QRS complex on admission. The chest X-ray incidentally showed the cardiac silhouette enlargement (Figure 1).

Echocardiography illustrated a massive pericardial effusion and a swinging cardiac movement without evidence of overt tamponade or hemodynamic compromise, normal left ventricular systolic function, and valvular function with an ejection fraction of 55% (Figure 2).

Laboratory tests showed a normal range for complete blood count, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), liver function tests, serum creatinine, blood urea nitrogen, blood sugar, serum electrolytes, and thyroid function tests. Tuberculin skin test was also performed. Furthermore, rheumatologic factors, such as rheumatoid factor (RF), antibodies against DNA, and antinuclear antibodies (ANA), were considered normal.

The patient became a candidate for pericardial window operation to relieve the symptoms and obtain the pericardial and fluid samples for diagnostic evaluation. After establishing standard monitoring, a large-bore IV catheter, and the arterial line was inserted. After preoxygenation, induction of anesthesia was done using etomidate, fentanyl and midazolam without significant hemodynamic changes and cisatracurium was also used as a muscle relaxant. Then, 3600 mL of serous pericardial fluid was gradually drained using the sub-xiphoid approach, and a 28F pericardial drain was inserted. Pericardial fluid analysis showed clear transudate fluid with negative malignancy in the cytological examination. Laboratory analysis rejected bacterial or fungal infection. Besides, *Mycobacterium*

tuberculosis tests of ADA level, smear analysis, and negative polymerase chain reaction (PCR) amplification rejected tuberculosis. Pathologic examination of the pericardial sample revealed non-specific chronic inflammation.

Post-operative chest X-ray showed an improved appearance of the cardiac silhouette and expansion of both lung fields (Figure 3). An echocardiogram revealed the resolution of pericardial effusion; hence, the pericardial drain was removed after 48 h. The patient was discharged on the third day in satisfactory condition. Follow-up echocardiography illustrated minimal pericardial effusion after six months and one year, and the patient was completely asymptomatic.

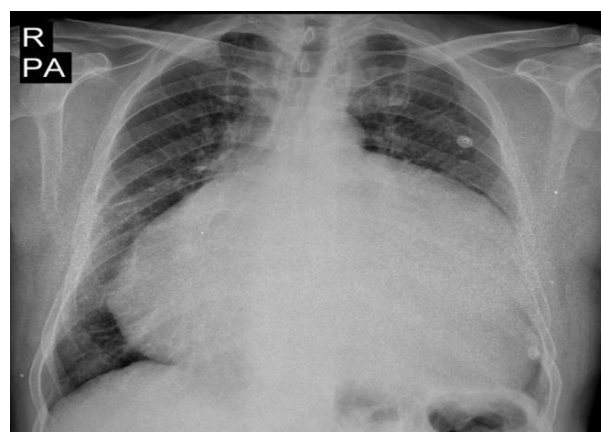


Figure 1. Chest X-ray before surgery.

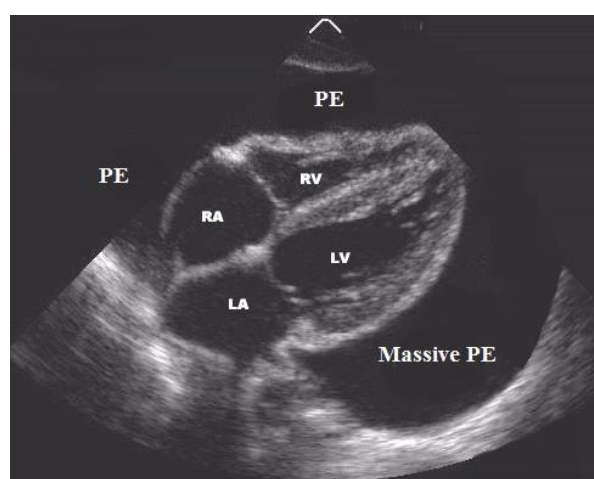


Figure 2. Echocardiography before surgery.

Discussion

Pericardial effusion has been introduced relatively expected discovery in routine clinical practice, which is diagnosed directly following chest pain, pericardial involvement disease, and thoracic complaints or accidentally following routine medical control, dyspnea, or nonspecific chest discomfort (6). In this regard, the chest X-ray presents an enlarged cardiac silhouette with clear lungs, which should raise the doubt of pericardial effusion. Then, echocardiography, as the gold-standard technique, should be performed as the most available and reliable method to confirm the presence and the amount of pericardial effusion and achieve valuable data for analyzing hemodynamic compromise (4). Pericardial effusion can be developed following various conditions, including acute pericarditis, infections, uremia, tumors, and metabolic diseases (7-9). However, based on previous findings, 50% of cases present acute idiopathic or viral pericarditis (10). Chronic PE is referred to the presence of the problem for at least three months and is associated with cardiac tamponade in 30–35% of cases (11). In addition, it is an idiopathic type in 50% of the cases (2). A large number of pericardial effusion patients that present a large (more than 20 mm based on echocardiography and >500 mL pericardial fluid), chronic (longer than three months), and idiopathic type are asymptomatic. These cases may continue clinically stable for many years (11).

The present case at the referral time had two-month worsening dyspnea. Dyspnea-induced pleuritic chest pain is a typical symptoms in pericardial effusion (4). In a previous investigation on patients with unexplained dyspnea, 13.6% of cases presented effusions, and four subjects (3.9%) had large effusions (12). Another study considering malignancies related to pericardial effusion found that dyspnea (81%) was the most common symptom (13). These findings suggested that pericardial effusion should be checked for unexplained dyspnea cases. Moreover, a study has reported that severe effusion without inflammatory signs and tamponade was

predictive indicator for chronic idiopathic pericardial effusion in cases without obvious cause of pericardial effusion at the diagnosis time, (6), similar with the present case.

Although an X-ray incidentally indicated an enlargement of the cardiac silhouette, echocardiography confirmed massive pericardial effusion. Other studies also revealed that extraordinary cardiac enlargement and water bottle signs had been diagnosed following X-ray imaging at the first clinical examination (7, 8, 14). However, echocardiography is the gold standard method to diagnose pericardial effusion. Moreover, echocardiography-guided pericardiocentesis has been introduced a simple, safe, and efficient technique for postoperative pericardial effusions (15). Based on previous data, the method had a 96% diagnostic accuracy (13).

The concentration of fluid more than 50 ml in the pericardial cavity is considered abnormal and needs drainage intervention. Previous retrospective and case-report studies have suggested that avoid fluid re-accumulation. In this regard, the draining catheter should be placed until draining less than 30 ml of fluid per 24 h (2, 16). Besides, pericardial window should be performed in pericardiocentesis failing (17). The method utilizes a sub-xiphoid protocol under echocardiographic guidance and involves the placement of a catheter into the pericardial area. This method prevents recurrence in >80% of cases (18).

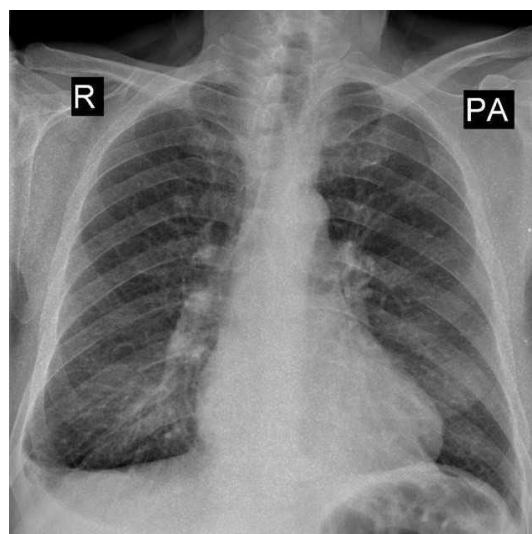


Figure 3. Chest X-ray after surgery.

In this study, the patient underwent a sub-xiphoid pericardial window operation to manage diagnosed large pericardial effusion, and the follow-up program did not indicate any complication after one year. Similarly, previous studies have reported pericardial window reduces the volume of the pericardial sac (9, 19). Patients undergoing this procedure did not present death after the surgery, and large-scale studies on cases of pericardial effusions drainage indicated the safety and effectiveness of these strategies (20).

As cytologic assessment has a substantial diagnostic and prognostic control on malignant pericardial effusions patients (21), further analysis was performed on fluid for the present patient. Based on the cytologic, ADA level, and smear analyses of the fluid, there was no malignancy, as well as no signs of infection induced by bacteria, fungi, and Mycobacterium tuberculosis. Final pathologic diagnosis indicted non-specific chronic inflammation.

In summary, we report on a massive idiopathic chronic pericardial effusion case without a previous history of any underlying disease. As far as we know, there has never been so much effusion (3600 milliliter) in the case reports. The massive pericardial effusion was accidentally diagnosed when the patient was referred for dyspnea, highlighting the attention to the pericardial effusion symptoms and the potential role of echocardiography during follow-up.

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