

Clinical Case Study

Evaluation of Etiology and Causes of Massive Pericardial Effusion in Patients with Tamponade, in Mazandaran Heart Center and Shafa Hospital, Sari, Iran

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ABSTRACT

Background: Pericardial effusion is diagnosed as an echo-free space around the heart. This fluid collection follows the anatomic landmarks of the pericardium, covering both ventricles and most of the right atrium, whereas a small portion of the LA wall is surrounded by pericardium. Pericardial effusion should be differentiated from left pleural effusion, an echo free space that extends posterior to the descending aorta, and from increased pericardial fat content, of typical granular appearance, that does not deserve medical attention.

Aim: Aim of this issue is to find the presentation by which the patients have come to the hospital that at last the diagnosis was massive pericardial effusion and finding the laboratory and pathologic causes of this clinical problem.

Materials and Methods: We reviewed the patients who had been admitted in Mazandaran Heart Center and Shafa hospital between Sept 2009 and Jan 2013 with diagnosis of pericardial effusion which were made by echocardiography.

Results: Among these patients there was a history of viral infection including cough, fever, weakness in previous month in 32 (37%) patients and a history of diagnosed malignancy in 15 patients (14%) who at least had a course of chemotherapy in their drug history and history of trauma in one patient, there was history of chronic renal failure and repeated dialysis in 12(14%) but there was no previous disease in the other patients (36%). There was a history of previous surgery for tamponade in 3 of them (3%). After admission the diagnosis of massive pericardial effusion had been made and in 48 (55%) of them, there was echocardiographic signs of RA collapse and RV collapse.

Discussion: Most pericardial effusions are caused by inflammation of the pericardium, a condition called pericarditis. As the pericardium becomes inflamed, extra fluid is produced, leading to a pericardial effusion. Viral infections are one of the main causes of pericarditis and pericardial effusions. In laboratory and pathologic findings of specimen obtained from pericardial fluid and biopsy specimen there was nothing specific to show the exact cause of effusion.

Key-words: Pericardial effusion, subxiphoid window, Tamponade

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Background:

Pericardial effusion is diagnosed as an echo-free space around the heart. This fluid collection follows the anatomic landmarks of the pericardium, covering both ventricles and most of the right atrium, whereas a small portion of the LA wall is surrounded by pericardium¹. Pericardial effusion should be differentiated from left pleural effusion, an echo-free space that extends posterior to the descending aorta, and from increased pericardial fat content, of typical granular

appearance, that does not deserve medical attention. Pericardial effusion is more often compressive if large (with a swinging heart within the effusion), but tamponade may occur in small acute effusions. Diagnosis of tamponade relies on inferior vena cava dilatation, invagination of right atrial wall in diastole, expiratory collapse of the right ventricle, and marked Doppler and respirometer variability (of opposite timing) of mitral and tricuspid inflows^{1,2}. While classically large effusions required surgical drainage, an echocardiography- directed pericardial tap with prolonged catheter drainage is now the mainstay of treatment and is particularly useful in postoperative effusions. Approaches most are often Para-apical and rarely subcostal. Effusions of aortic dissection or myocardial infarction should not be drained percutaneous because full rupture may ensue. The other indications for surgical drainage are purulent effusions, pericardial thrombi, and loculated effusions that cannot be reached safely³. Postoperatively, echocardiography monitors the recurrence of effusions and the possible occurrence of constriction⁴.

Materials and Methods:

We reviewed the patients who had been admitted in Mazandaran Heart Center and Shafa hospital between Sept 2009 and Jan 2013 with diagnosis of pericardial effusion which were made by echocardiography. There were 87 patients who had been referred to these two hospital with symptoms of dyspnea, tachycardia, hypotension and cardiomegaly in chest -x-Ray. Among these patients 70 (80%) were men and 17 (20%) were women. Median age of them was 62+/-4. All of the patients had undergone evaluation by echocardiography. All of the echoes were approved by a cardiologist. They have been admitted in CCU.

Echocardiographic report showed that among these 87 patients all had massive pericardial effusion and in 48 (55%) of them, there was echocardiographic signs of RA collapse and RV collapse. All of the patients in this last group had been sent to operating room after blood products reservation and administration of prophylactic antibiotics.

Results:

Among these patients there was a history of viral infection including cough ,fever, weakness in previous month in 32 (37%)patients and a history of diagnosed malignancy in 15patients (17%)who at least had a course of chemotherapy in their drug history and history of trauma in one patient, there was history of chronic renal failure and repeated dialysis in 12 (14%) but there was no previous disease in the other patients(31%)(table 1).There was a history of previous surgery for tamponade in 3 of them (3%).After admission the diagnosis of massive pericardial effusion had been made and in 48 (55%) of them ,there was echocardiographic signs of RA collapse and RV collapse. Among these 48 patients there were 30 (62%) men and 18(3%8) women; mean age of these group was 68+/- 4 yrs. . Surgical consultation was attempted for all them. After blood product reservation these 48 patients had been sent to operating room emergently. There were underwent surgery via a subxiphoid incision in 45 (93%) and the other 3 patients had underwent surgery via a left anterolateral thoracotomy because of previous incision in subxiphoid region and recurrence to make a pericardiopleural window to prevent recurrence of pericardial effusion in future.

The fluid which had been evacuated was between 700-1200 cc in each patient and 20 patients (43%) of them were bloody fluid (serosanguinous).in the remaining 28 patients (57%) the fluid was clear fluid. In these patients 29 (60%) had been under general anesthesia and in the others we use sedation plus local anesthesia because of severe hypotension. 20 cc of the fluid was sent to laboratory for biochemistry, cell counts and culture. A specimen was resected from the pericard and it was sent to pathology for determining the pathologic cause and finding for granulomatous changes.

Results of Laboratory were serous fluid in 57% and bloody in 43%, none of them showed acute inflammation but it showed nonspecific chronic inflammation. The culture was negative in all.

The pathologic findings were as below:

- 1- There was not enough specimens in 10(20 %)
- 2- Nonspecific chronic inflammation in the others

Therefore none of the laboratory or the pathologic findings showed a specific result.

Table 1: history of previous disease in patients with massive pericardial effusion

32(37%)	Viral infection
15(17%)	malignancy
1(1%)	trauma
12(14%)	Chronic renal failure
27(31%)	nothing
Total:87	

Discussion:

Massive pericardial effusion is one of the emergencies of cardiac surgery if there is evidences of RA and RV collapse in the presence of clinical evidences of hypotension and dyspnea, most pericardial effusions are caused by inflammation of the pericardium, a condition called pericarditis. As the pericardium becomes inflamed, extra fluid is produced, leading to a pericardial effusion. Viral infections are one of the main causes of pericarditis and pericardial effusions^{5,6,9}. Infections causing pericardial effusions include cytomegalovirus, coxsackieviruses, echoviruses, and HIV^{6,9,10}. Other conditions that can cause pericardial effusions include: Cancer, Injury to the pericardium or heart from a medical procedure, Heart attack (myocardial infarction), Uremia (severe kidney failure)^{9,11,13}, Autoimmune disease (lupus, rheumatoid arthritis, and others)(7), Bacterial infections, including tuberculosis, In a large number of people with pericardial effusion, no cause can be identified. These are called idiopathic pericardial effusions^{5, 8, 9, 11}.

In our series among the causes of pericardial effusion there was a history of viral infection in 32(37%) patients and a history of diagnosed malignancy in 15 patients (17%) who at least had a course of chemotherapy in their drug history and history of trauma in one patient, there was history of chronic renal failure and repeated dialysis in 12(14%) but there was no previous disease in the other patients (36%).

But in laboratory and pathologic findings of specimen obtained from pericardial fluid and biopsy specimen there was nothing specific to show the exact cause of effusion.

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