CASE REPORT

Management of Massive Pericardial Effusion with Pericardial Adhesions Post-Large-L-to-R- Shunt ASD Secundum Closure Using Pericardial Patch and TVr De Vega Procedure with Severe Pulmonary Hypertension and Severe Tricuspid Regurgitation in A 10-Year-Old Girl: A Case Report

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ABSTRACT

Pericardial effusion is the abnormal fluid accumulation in the pericardial space. This journal describes the management of massive pericardial effusion with pericardial adhesion. A 10-year-old girl with a history of failed arterial switch operation and post-ASD (atrial septal defect) closure using the pericardial patch and TVr De Vega procedure came with chest tightness. The transesophageal echocardiography showed massive pericardial effusion with collapsed right atrium and ventricle, severe tricuspid regurgitation, adhesion of cardiac apex with the pericardium. Urgent sub-xiphoid pericardiostomy was performed. Intrapericardial pigtail insertion was performed and produced 320 ml of fluid after 9 hours. The pericardial effusion may be due to severe pulmonary hypertension and pericardial injury syndrome. Open pericardiostomy should be considered if hemopericardium is suspected to prevent Pericardial Effusion.
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INTRODUCTION

The pericardium is made up of the outer parietal pericardium layer, which envelopes the heart and is composed of collagenous and elastic tissue as well as villi that release pericardial fluid, and the inner visceral pericardium layer, which is linked to the myocardium. The normal pericardial cavity contains 5-50 ml of pericardial fluid, which acts as a lubricant. The term "pericardial effusion" refers to an abnormal accumulation of fluid in the pericardial cavity. A disease that is brought on by trauma, cancer, or infection may develop pericardial effusion as a result of its clinical course. Acute or chronic pericardial effusions are possible, and the patient's symptoms are significantly influenced by how long it takes for the condition to get worse.(1)

Fluid build up over the "full" level of the pericardium causes pericardial effusion, which puts pressure on the heart and eventually requires cardiac catheterization. Pericardial Effusion, or blood or liquid compressing the heart, is the result of this condition. A disease brought on by trauma, cancer, or infection may reach its final stage of clinical manifestation with pericardial effusion.(1)

A general examination, radiographic examination, and other tests can be used to diagnose pericardial effusion. Other clinical findings included tachycardia, pulsus paradoxus, and Kussmaul's sign, which is a decrease in JVP pressure and distension that had previously increased upon inspiration. An enlarged globular heart with a "water bottle-shaped heart" appearance is seen during the chest X-ray examination. A condition called pericardial effusion is an emergency that requires hospitalization due to an overabundance of fluid. The fluid surrounding the heart needs to be removed.(2)

A needle is used to extract fluid from the pericardial bag during pericardiocentesis. By using a pericardial window, a portion of the pericardium can also be cut and removed. Fluids are administered to maintain normal blood pressure until the pericardiocentesis is completed.(2)

CASE REPORT

A 10-year-old girl presented with chest tightness to the cardiothoracic vascular surgery (Fig. 1). The examination suggested a massive pericardial effusion. The need for a sub-xiphoid pericardiostomy is urgent. Pericardial adhesions were also discovered. A history of leaking heart disease that was identified as early as age eight was found in the patient's previous medical history. Additionally, the patient had heart surgery at Soetomo General Hospital in May 2023.

Fig 1: Clinical Of Patient

Upon physical examination, the patient was found to be stable and completely conscious. A vital sign examination revealed that, in the absence of additional oxygen equipment, the patient's oxygen saturation was 99%. The heart rate was 78 beats per minute, and respiration rate was 20 times per minute. This patient did not have any breathing difficulties. Without any abnormalities in the lung sound, the auscultation revealed a distant cardiac sound. X-ray images show diffuse enlargement of the cardiac silhouette consistent with pericardial effusion, Enlarged cardiac silhouette, no significant pulmonary congestion, no accompanying large pleural effusion. The size of the aortic root was noted to be approximately 1.32 cm, which tends to be smaller than normal (normal values: 2-3.7 cm). The left ventricular dimension measured approximately 5.04 cm, which is close to the upper limit of normal (normal adult male: 4.2-5.9 cm, female: 3.9-5.3 cm). Left ventricular contractility was seen to be good, with the walls moving symmetrically. This indicates systolic function is likely within normal limits. A massive pericardial effusion, a collapsed right atrium and ventricle, adhesion of the cardiac apex with the pericardium, and an ejection fraction of 66.7% were all seen on transesophageal echocardiography (Fig.2).

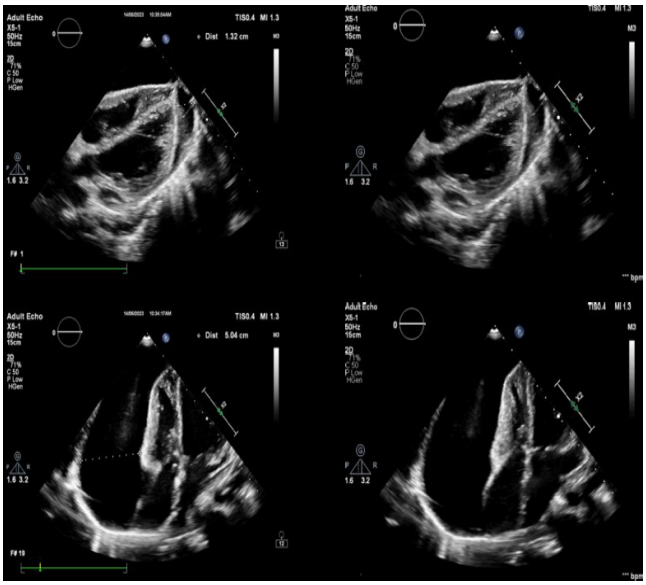

Fig 2: Echocardiography Massive Pericardial

A sub-xiphoid pericardiostomy was done urgently (Fig. 3). A 350 ml of pericardial fluid were obtained. The fluid was alkaline, and no infectious process was discovered. During the procedure, the patient produced 400 ml of urine in nine hours. Following the procedure, the patient exhibited spontaneous breathing and was fully conscious.

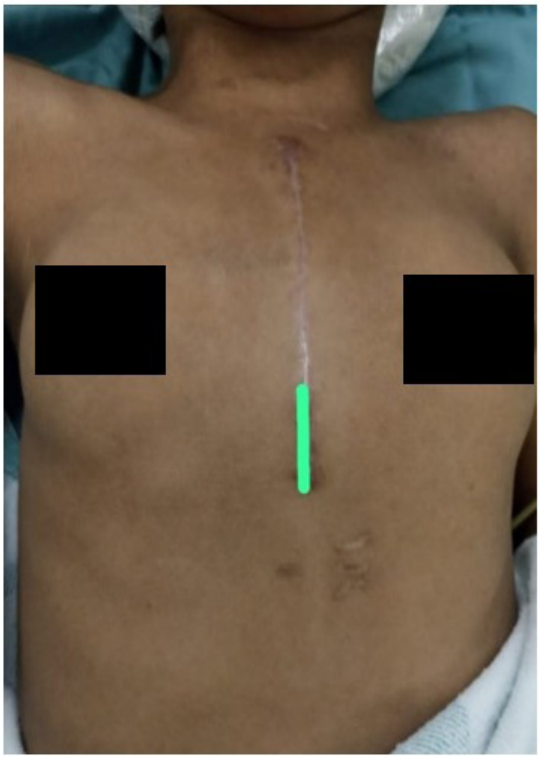

Fig 3: Marking of Subxypoidheus incision

After surgery, the patient's condition remained stable. In the operating room, the patient's ventilatory support was removed after the operation, and the patient was able to breathe spontaneously. The symmetrical chest movement is unretracted, and no abnormal cardiac or lung sound was detected during auscultation and CXR Examination (Fig. 4). The patient was admitted to lowcare for 4 days, after which the patient was discharged. The patient then controlled at the poly for 5 times and obtained good results, the patient had no complaints and the physical examination was found to be quite good.

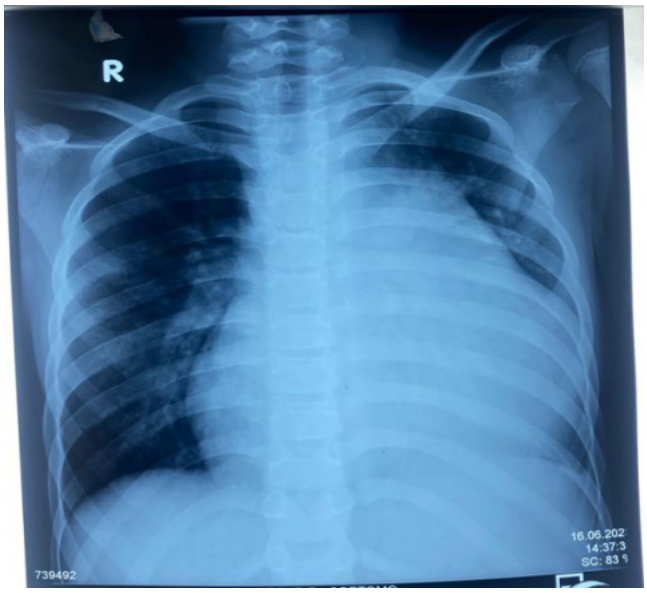

Fig 4: Pre operative CXR

DISCUSSION

Pericardial effusion is a common issue in clinical practice. It is often associated with several conditions, including advanced renal disease, infections, cancer, collagen diseases, pericarditis, acute myocardial infarction, heart failure, and heart disease. It may also develop as an adverse reaction to medical treatments such as heart surgery and other procedures. Cancer incidence is the second most common cause of pericardial effusion (9.5%).(3,4)

Patients with pericardial effusions often have no symptoms at all. Patients usually have an echocardiogram or chest x-ray to rule out other ailments once the issue has been detected. In order to make room for the extra fluid, the pericardium could, Diastolic heart failure, a disorder in which the heart cannot beat consistently, can also cause symptoms. Extra compression that stops the heart from beating normally can potentially lead to cardiac failure.(4,5)

For pericardial effusion, patients enduring hemodynamically stable pre-tamponade and those having unstable tamponade may require alternative treatments. Those who are unstable require early care to reduce myocardial compression. Draining pericardial fluid is the best treatment available. This entails providing patients with tamponade with basic breathing, circulation, and airway treatment prior to pericardial fluid drainage. Intubation and artificial breathing should be avoided unless absolutely necessary, as they tend to worsen heart failure in tamponade.(4,5)

When pericardial effusion is discovered, pericardial drainage is advised in every case. These are the indications that drainage is required. Urgent surgical intervention is indicated for any of the following conditions: trauma, purulent effusion in patients with unstable sepsis, ventricular wall rupture in acute myocardial infarction, pericardial effusion from hemopericardium from type A aortic dissection, and effusion localization that is not manageable by percutaneous means. For the purpose of triaging patients with pericardial effusion, stepwise scoring may be useful. In patients who are quickly declining, pericardial draining should be performed as soon as possible for laboratory studies.(5)

CONCLUSION

A condition known as pericardial effusion is defined by a buildup of fluid in the pericardial cavity. It can be brought on by several local, idiopathic, or systemic problems. Acute or chronic pericardial effusions are also possible, and the patient's symptoms are significantly influenced by how long the condition takes to progress. The clinical progression of an illness brought on by trauma, infection, or cancer results in pericardial effusion. Pericardial effusion symptoms are connected to the underlying condition and are not specific. Pericardial effusion can be caused by a variety of factors, such as disease-related inflammation, but it can also happen in the absence of inflammation in the pericardium, as in the case of hematologic malignancies and malignant neoplasms. Reducing fluid in the pericardial cavum is the main goal of therapy for pericardial effusion, whether non-surgical or surgical. The volume of fluid in the cavum pericardial and the underlying etiology of the disease have an impact on the prognosis in cases with pericardial effusion pericardial effusion.

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