Case Report

Percutaneous balloon pericardiotomy in a patient with advanced case of malignant pericardial effusion and tamponade

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Abstract

Surgical creation of a pericardial window has been a standard procedure for relieving symptoms of patients presenting with recurrent pericardial effusion.. In this report we describe the application of Multitrack balloon catheter for creating a pericardial window in a patient who had recurrent pericardial effusion with tamponade as a result of advance malignant disease of breast.

Introduction

The most common causes of pericardial effusion encountered, are tuberculosis, renal failure, infarction process and malignancy. It can also occur after trauma or acute myocardial infarction, hypothyroid, collagen vascular disease and idiopathic pericardial effusion. Patient presentation is either asymptomatic or symptoms of cardiac tamponade. In elderly patients after tuberculosis, malignant disease is the most common cause of pericardial effusion and cardiac tamponade.[1]

In cardiac tamponade initial management is pericardiocentesis followed by surgical intervention if there is repeated accumulation of fluid in the pericardial sac.[2]

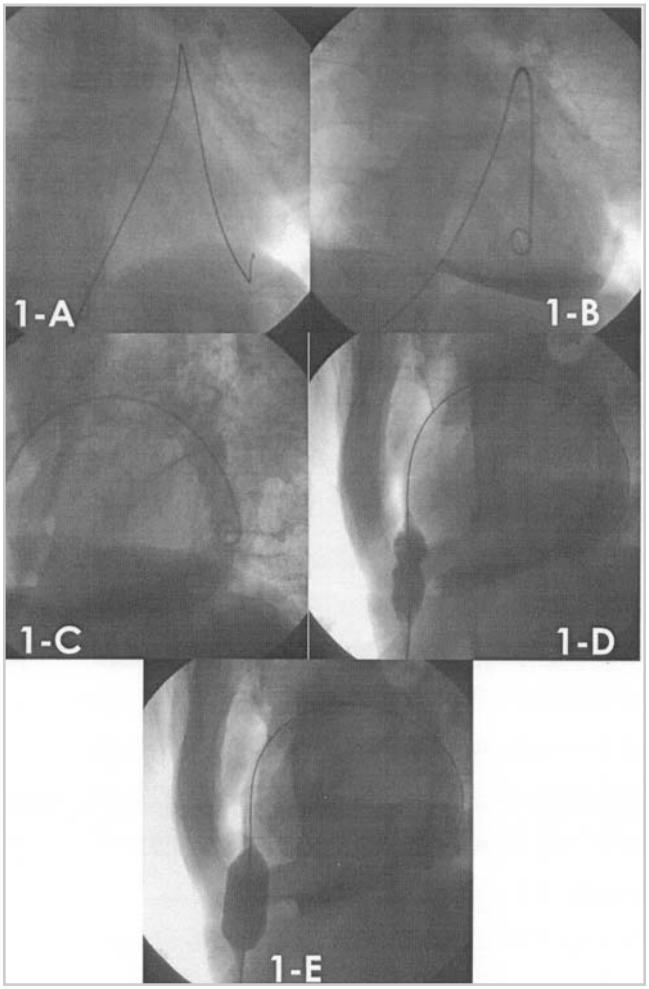
Immediate management of tamponade has its impact on relieving the symptoms, while long term prognosis depends on the root cause of the disease, regardless of any intervening procedure.[2-5]

Different approaches have been described for managing recurring pericardial effusion. This includes pericardiocentesis, surgically created pericardial window[6] and percutaneous balloon pericardiotomy (PBP) which is a less invasive approach as compared to surgery.[7]

Case Report

An 80 year old woman with advanced malignant disease of breast, treated by chemotherapy and radiotherapy was admitted through the emergency with dyspnoea functional class IV. On examination pulse was 150/minute low volume, paradox in character, B.P. 100-114/60 mm of Hg with a paradox of 14mmHg. JVP was raised with respiratory rate of 28/min. Heart sounds were muffled. ECG showed low voltage QRS complex. Emergency Echocardiography showed large pericardial effusion all around the heart with Right ventricular collapse on 2D echocardiography. Pericardiocentesis was done and a pigtail catheter was left in pericardial cavity connected with a bag. Fluid was sent for cytology.

Pigtail catheter was kept for three days with continuous drainage of fluid and with daily echocardiography for confirmation of fluid. Catheter was withdrawn on the fourth day and patient was discharged.



Steps of Percutaneous Balloon Pericardiotomy 1-A, Guidewire in Pericardial Cavity, 1-B, Dye in Pericardial Space, 1-C, Identifying Pericardial Margin, 1-D, Waist at site of Pericardial Margin, 1-E, Fully Inflated Balloon.

Patient was again readmitted with cardiac tamponade on fifth day when PBP procedure was decided.

Patient was taken to catheterization laboratory and procedure was performed under local anaesthesia with 1% lidocane and mild sedation with intravenous 25mg pethidine and 5mg diazepam. An 18 G-needle was attached to a 10cc syringe and punctured through subxiphoid region. Fluid was aspirated and a.0.035 guidewire (Medtronic) was placed in the pericardial cavity (Figure 1-A). 6 Fr. Pigtail (Cordis) was placed in the pericardial cavity for drainage. Dye was injected for confirming the position (Figure 1-B) and to help identify the pericardial margin (Figure 1-C). Pigtail was then withdrawn and subxiphoid region dilated with 14 Fr. Dilator (used for atrial septal dilatation) under fluoroscopy to avoid pericardial tear and trauma to the heart. Multitrack balloon catheter 20mm x 5cm (used for mitral valve dilatation) was inflated to ensure creation of an adequate opening of the pericardium by identifying the waist at the site of pericardial margin. (Figure 1-D). After full inflation of balloon (Figure 1-E) and deflation, the dilating catheter was removed and drainage catheter was inserted into pericardial space.

Drainage catheter was removed after 24 hours with echo check and then after 48 hours with an x-ray chest which was negative for pleural effusion. Patient was discharged in an asymptomatic condition but was lost to follow up. Absence of follow up is a weakness of our study but it is known that this technique has no immediate or late procedure related complications or recurrence of pericardial effusion.

Discussion

The two main objectives in the management of cardiac tamponade are to alleviate life threatening status by removal of pericardial fluid and to prevent recurrence.

Recurrence of pericardial effusion and tamponade after pericardiocentesis have been reported in 14% to 50% cases.[3]

Patients who continue to drain more than 100ml/24 hours three days after catheter drainage have been considered for more aggressive therapy. Surgical approach though offers a lower recurrence but is associated with higher morbidity.[8] Surgical method should be undertaken in patients with a longer survival.

Our patient who had advanced malignancy and cardiac tamponade was a poor candidate for surgical intervention. Moreover, malnutrition and chemotherapy associated with this disease are more prone to infections and peri-operative complications.[2]

PBP technique is relatively simple and safe. Mechanism by which PBP works remains unclear. It is assumed that balloon inflation causes localized tearing of parietal pericardial tissue leading to communication of pericardial space with pleural space and possibly with abdominal cavity.[9]

PBP technique has been studied in multicenter registry.[10] No procedure related variables were found to influence either survival or freedom from recurrence. This technique proved beneficial to the patient by relieving the symptoms.

Conclusion

PBP can be used as an alternative technique to surgery for managing pericardial effusion. This technique is useful for critically ill patients with advanced malignancy and limited survival in which risk and discomfort of anaesthesia and surgery can be avoided.

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