

Retrieval of Broken Pigtail Catheter from Right Lung in a Case with Massive Pericardial Effusion: A Rare Complication

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How to cite this article:

Tarun Kumar Patra, Sambhunath Das, Sukhjeet Singh/ Retrieval of Broken Pigtail Catheter from Right Lung in a Case with Massive Pericardial Effusion: A Rare Complication/J Cardiovasc Med Surg.2021;7(2-3): 61-64.

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Abstract

Drainage of pericardial effusion by pigtail catheter is one of the techniques. Breakage and retention of pigtail catheter is a rare complication. If the patient is sick and hemodynamically unstable, then the retrieval of the broken part is challenging.

A 48 year old male patient with multiple co-morbidities presented with shortness of breath and episodes of syncope was diagnosed with retention of pigtail catheter and massive pericardial effusion. The retrieval of broken pigtail catheter and drainage of massive pericardial effusion by thoracotomy approach in a patient with multiple co-morbidities under the monitoring and guidance of transesophageal echocardiography may be a unique and novel useful technique.

Keywords: Lung injury; Pericardial effusion; Pigtail catheter; Restrictive cardiomyopathy; Transesophageal echocardiography.

Introduction

Pericardial effusion is the unusual collection of fluid inside pericardial cavity. Pigtail Catheter (PC) insertion is the safest and less invasive method for draining the pericardial effusion.¹ Although PC

insertion for draining pericardial effusion is the safest method but there are many complications reported due to its insertion.² Occasional retention of PC caused pleural breach leading to pleural pericardial window causing pathological effusion.^{2,3}

We describe the management of retrieval of broken PC and drainage of pericardial effusion in a sick patient of massive pericardial effusion with restrictive cardiomyopathy, hypothyroid, diabetic, bilateral pleural effusion and mitral regurgitation.

Case Report

A 45 year old man, diabetic and hypothyroid was admitted to hospital with bilateral lower limb swelling since 8 months, shortness of breath since 6 months. He had associated orthopnea, paroxysmal nocturnal dyspnea and palpitation since 10 days. He had past history of cough and intermittent fever due to left pleural effusion for which syringe aspiration had been done twice in 5 years. He developed grade IV dyspnea 1 year back for which PC was inserted in a peripheral hospital to drain out pericardial effusion (PE). At the time of

removal, the catheter was broken. He was receiving anti-tubercular drugs since 1 year. He had raised proBNP levels (7613 pg/ml), HbA1C=6.55% and TSH= 8.24mIU/L. Chest x-ray, showed grossly enlarged cardiac silhouette with PE (Figure1).



Fig. 1: X-ray chest PA view showing cardiomegaly with obliteration of left cardiophrenic and costophrenic angles.

Computerized tomography revealed cardiomegaly with gross PE and bilateral pleural effusion. The broken pieces of PC were detected inside middle lobe of right lung nearer to pulmonary veins. Electrocardiography showed atrial fibrillation with ventricular premature complexes.

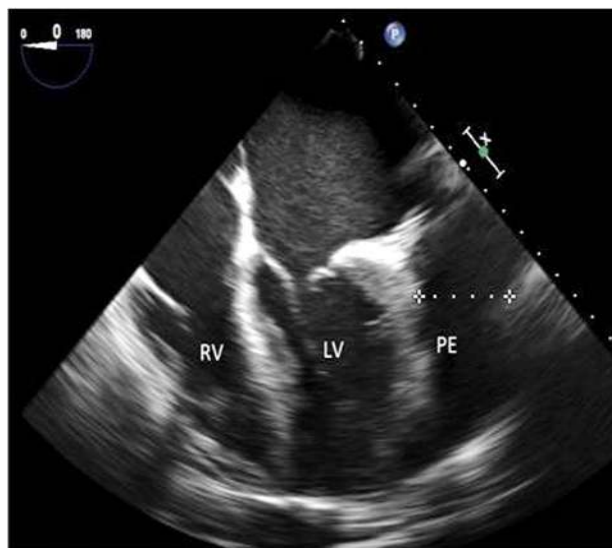


Fig. 2a: Transesophageal echocardiography midesophageal four chamber view showing massive pericardial effusion (PE) of 3.5cm diameter.

Echocardiography revealed large PE with mild aortic regurgitation, moderate mitral regurgitation, restrictive cardiomyopathy (RCM), dilated left atrium and moderate pulmonary artery hypertension. He was receiving thyroxin 25mcg once daily, metformin 500mg BD, clexane 0.3ml OD and dytor 20mg OD. Based on clinical findings and laboratory investigations patient was finally diagnosed to have congestive heart failure, RCM, moderate mitral regurgitation with massive PE and retained PC. Due to the COVID-19 outbreak non-covid surgeries and investigations were postponed. Hence the patient had to wait for few months for the surgery. The patient was planned for retrieval of broken PC and drainage of massive pericardial effusion under high risk.

Anesthetic management was very challenging due to multiple co-morbidities. Patient shifted to operation room and all ASA monitors were attached. Peripheral venous access was secured by 2 large bore cannulas and arterial catheter was inserted into left radial artery. Patient was induced with fentanyl 100mcg, etomidate 20mg and rocuronium 60 mg and intubated with 8.5mm cuffed endotracheal tube. Left lateral position was made for right anterolateral thoracotomy incision. Transesophageal echocardiography (TEE) revealed massive PE over left ventricle which extends up to right ventricle (Figure 2).

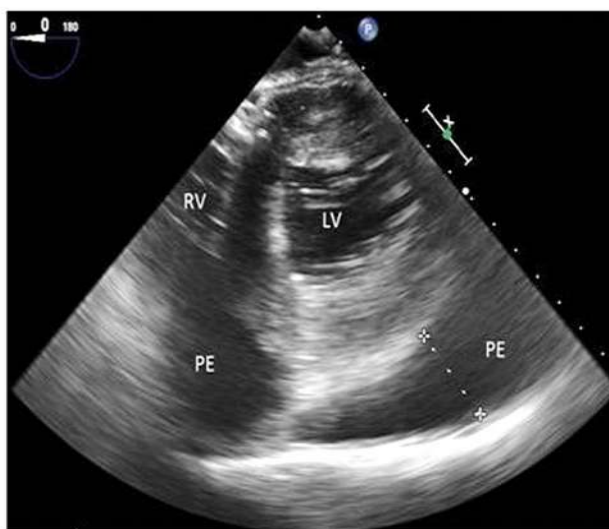


Fig. 2b: Transesophageal echocardiography transgastric short axis view showing massive pericardial effusion (PE) encasing both left ventricle (LV) and right ventricle (RV).

Pigtail catheter tip around 6cm was found in between right upper and lower pulmonary veins. Pigtail catheter removed in piecemeal as it was friable due to long standing retention (Figure 3).



Fig. 3: Broken pieces of pigtail catheter.

Drainage of the massive PE was performed by a small hole in the pericardium from the right pleural cavity under TEE guidance (Figure 4).

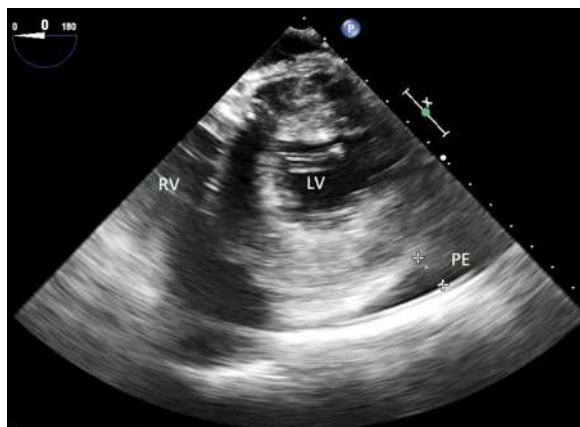


Fig. 4: Transesophageal echocardiography transgastric short axis view showing minimal pericardial effusion (PE) after successful drainage.

Right pleural drain placed in the same surgical site. Patient shifted to ICU after surgery and extubated after 2 hours in postoperative period. In postoperative period, chest x-ray revealed absence of pleural effusion and decrease in PE encasement

(Figure 5).



Fig. 5: X-ray chest AP view showing no pleural effusion and normal size of heart.

Discussion

Pericardial effusion is the accumulation of fluid or blood inside the pericardial space. Massive PE may lead to cardiac tamponade resulting in impaired cardiac filling and haemodynamic collapse.² The classical features are dyspnea on exertion leading to orthopnea and chest pain. The classical findings in cardiac tamponade are hypotension, increased JVP, small and quiet heart, called as Becks triad.³

Massive PE with or without cardiac tamponade is always life threatening; and require immediate intervention.^{4,5} Pericardiocentesis may be required for the early resolution of large effusion but reappearance is a problem. Although PC helps in successful drainage, there are still complications like pneumothorax, hydrothorax, breakage of PC, cardiac chamber rupture.² In our case, there was retention of PC which was entangled with the right lung parenchyma due to breakage during removal. There was massive PE which entrapped the heart circumferentially over left ventricle and extends up to right ventricle. The patient was a diagnosed case of RCM, mitral regurgitation, pleural effusion, type II diabetes mellitus and hypothyroidism. The combination of multiple risk factors increases the morbidity and mortality.

Patient with diabetes and hypothyroid have altered cardiovascular dysfunctions along with involvement of other organs.⁶ In our case oral

hypoglycemic drug was omitted on the day of surgery to avoid hypoglycemic episodes. The anti-hypothyroid drug was continued. Diuretic therapy was stopped on the day of surgery due to probability of serum electrolyte disturbances. Patient was positioned carefully during thoracotomy to avoid nerve injury.⁷

Surgical intervention for both retrieval of broken PC and drainage of massive PE was successfully achieved in the same seating. Right anterolateral thoracotomy approach was chosen because the broken part of PC was entangled to the right lung tissue. After removing the catheter an opening was created in the pleura facing the lower pericardium. Pericardial drainage tube was passed through the opening to drain pericardial effusion. We avoided another incision to drain the effusion. Intra-operative TEE was helpful to reconfirm the diagnosis, guided for the correct passage and placement of drainage tube and also confirmed the complete evacuation of pericardial effusion. Transesophageal echocardiography also helped to monitor the cardiac function like contractility, volume status, degree of mitral regurgitation and RCM throughout the surgery and anesthesia.

Conclusion

Pigtail catheter provides safe, reliable and less invasive technique for drainage of pericardial effusion but it is not without complications. The retrieval of broken pigtail catheter and drainage of massive pericardial effusion by thoracotomy approach in a patient with multiple comorbidities under the monitoring and guidance of transesophageal echocardiography may be a unique and novel useful technique.

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