

## AN UNFORESEEN COMPLICATION OF PERICARDIOCENTESIS; CASE STUDY OF A 50 YEAR OLD FEMALE WITH PERICARDIAL EFFUSION

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### ABSTRACT

A 50 year old female was referred to us with a broken, stuck pig tail catheter tip within the pericardial cavity which was originally inserted in view of massive pericardial effusion with impending cardiac tamponade. After necessary imaging investigations she underwent pigtail catheter tip surgical removal through an anterolateral thoracotomy approach.

**KEYWORDS:** Broken pigtail catheter, pericardiocentesis.

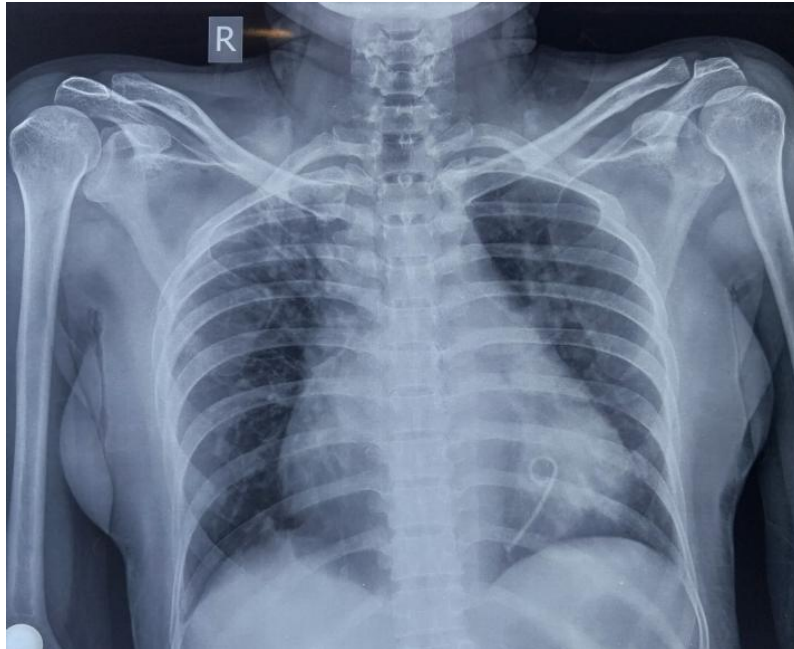
### 1) INTRODUCTION

Pig tail catheter has been used widely by interventionists on a regular basis. Even though it is mostly safe and easy to use, it can sometimes lead to a nightmare as in this case. Approach towards any procedure even as simple as a pigtail catheter insertion/removal for pericardiocentesis should be with at most care.

### 2) CASE PRESENTATION

A 50 year old female was referred to our institution with history of broken and stuck pigtail tip inside pericardial cavity. She had history of pulmonary tuberculosis, diagnosed at the age of 21 years of age. She had taken anti tubercular treatment and was asymptomatic until few months ago. She developed exertional dyspnoea for past 2 months. After a detailed evaluation at peripheral centre, she was detected to have massive pericardial effusion, probably tuberculous, with features of cardiac tamponade. She underwent emergency pericardiocentesis on 16/5/24, for diagnostic and therapeutic purposes. Pericardial fluid analysis showed lymphocytic leucocytosis with exudative properties. Pericardial fluid cytology ruled out malignant cells. She was treated with antitubercular drugs (on empirical basis) & steroid. Due course her symptoms improved and pig tail catheter removal was attempted after seven days. Unfortunately terminal part of the pig tail catheter broken and was trapped inside pericardial space. She was referred to our hospital for further management. The position of the pigtail catheter tip was confirmed through a series of imaging modalities (**Figure 1 & 2**). Percutaneous retrieval was considered difficult due to the curved nature of the tip, and minimal fluid in the pericardial cavity and hence surgical extraction of the broken pig tail catheter tip was planned. Urgent Cardiac surgery consultation was sought. Her initial blood work up revealed neutrophilic leukocytosis, raised CRP. She was

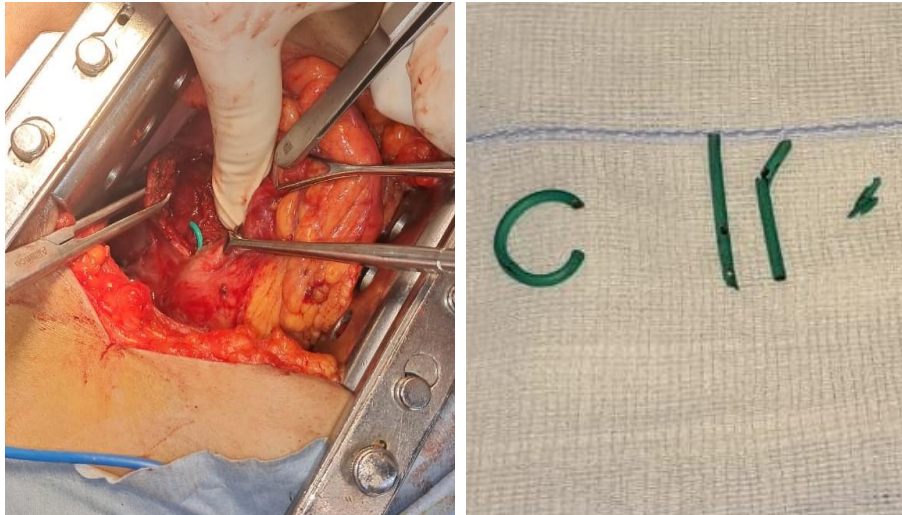
febrile and was treated with empirical antibiotics. On 5/6/24, after 2 weeks of the entrapment, she underwent surgical exploration and retrieval of the broken pigtail catheter tip through anterolateral thoracotomy approach (**Figure 3**). Pericardial window was created and pericardial tissue biopsy was taken. She tolerated the procedure well and the tissue diagnosis is awaited.



**Figure 1: Chest X ray AP view showing broken pigtail catheter tip within the cardiac shadow.**



**Figure 2: 2D transthoracic Echo, parasternal short axis view (acquired on an off axis view) demonstrating mild pericardial effusion with a hyperechoic linear object located within the pericardial cavity, postero-lateral to the left ventricle, measuring a maximum linear dimension of 4.72 cm.**



**Figure 3: Broken pig tail catheter tip retrieved through antero-lateral thoracotomy approach.**

### 3) DISCUSSION

The causative factors for pericardial effusion are many. Most common ones include infections (viral, bacterial), connective tissue diseases, neoplasm, post MI, post traumatic, hypothyroidism, organ failure (heart failure, renal failure), aortic diseases including aortic dissection extending in to pericardium.<sup>[Error! Bookmark not defined.]</sup> Even drugs (Minoxidil) can be a cause.<sup>[1]</sup> A study published in the American Journal of Medicine in 2000 showed that most common causes include acute idiopathic pericarditis (20%), iatrogenic effusions (16%), neoplastic pericardial diseases - primary or secondary (13%) and chronic idiopathic pericardial effusion (9%). Most often (60%) it is associated with known diseases.<sup>[2]</sup> When refractory to medical therapy or when it leads to cardiac tamponade, therapeutic pericardiocentesis is warranted. Pericardiocentesis with fluid analysis/pericardial biopsy may aid in diagnosis.

Pericardiocentesis using pigtail catheter is generally considered a safe and easy procedure. It is conducted in a cardiac catheterisation laboratory under fluoroscopic and echo guidance with ECG monitoring. Subxiphoid access is the most common approach. This extrapleural route helps in avoiding internal mammary, coronary and pericardial arteries. With larger, anterior effusion (>10mm) the feasibility of pericardiocentesis is around 93%, whereas with posteriorly located effusion, it is only around 58%. Usage of fluroscopy improves the success rate (93.1%) when compared to emergency procedure conducted without imaging guidance (73.3%).

Anyhow, one may seldom face unexpected difficulties during pericardiocentesis, as we have explained in this case. Most lethal complications include laceration and perforation of myocardium or coronary vessel. Other complications may include air embolism, pneumothorax, arrhythmia (vasovagal bradyarrhythmia) and injury to visceral organs.<sup>[3]</sup> Though rare, complications like internal mammary artery fistula has also has been reported. Contraindications for pericardiocentesis are absolute (Aortic dissection<sup>[4]</sup>) and relative (uncorrected coagulopathy, anticoagulation therapy thrombocytopenia of < 50000/mm<sup>3</sup>, loculated effusion).<sup>[5]</sup>

In cases with purulent pericarditis and haemopericardium surgical drainage is preferred. Surgical options for refractory cases (malignant effusion) include percutaneous balloon pericardiotomy<sup>[6]</sup> and transthoracic pericardial window creation.<sup>[7]</sup>

Recent studies have shown that CT guided percutaneous pericardial drainage is a better alternative to surgical pericardial window creation in terms of lesser complications and not much difference in the recurrence rate of pericardial effusion.<sup>[8]</sup>

#### 4) CONCLUSION

Proper techniques are to be followed during every procedures to achieve optimal outcome with minimal or no complications. In any cardiac catheterisation lab procedures, the hardwares should be thoroughly inspected before and after the procedure to ensure there are no broken or missing parts. The usage of hardware multiple times is the most common cause of broken catheter. So new catheter must be used for each aspiration, unless its not available. In this case, imaging using 2DTTE and CT was used to identify the location of the broken catheter tip and also to plan the optimal management.

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#### REFERENCES

1. Imazio M, Adler Y. Management of pericardial effusion. *European heart journal*, 2013 Apr 21; 34(16): 1186-97.
2. Sagristà-Sauleda J, Mercé J, Permanyer-Miralda G, Soler-Soler J. Clinical clues to the causes of large pericardial effusions. *The American journal of medicine*, 2000 Aug 1; 109(2): 95-101.
3. Seferovic PM, Ristic AD, Maksimovic R, Mitrovic V. Therapeutic pericardiocentesis: up-to-date review of indications, efficacy, and risks. Maksimovic R, Ristic AD, assoc. editors. *Pericardiology: contemporary answers to continuing challenges*. Belgrade: Science, 2000; 417-26.
4. Isselbacher EM, Cigarroa JE, Eagle KA. Cardiac tamponade complicating proximal aortic dissection. Is pericardiocentesis harmful?. *Circulation*, 1994 Nov; 90(5): 2375-8.
5. Maisch B, Seferović PM, Ristić AD, Erbel R, Rienmüller R, Adler Y, Tomkowski WZ, Thiene G, Yacoub MH, Priori SG, Alonso Garcia MA. Guidelines on the diagnosis and management of pericardial diseases executive summary: the Task Force on the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology. *European heart journal*, 2004 Apr 1; 25(7): 587-610.
6. Palacios IF, Murat Tuzcu E, Ziskind AA, Younger J, Block PC. Percutaneous balloon pericardial window for patients with malignant pericardial effusion and tamponade. *Catheterization and cardiovascular diagnosis*, 1991 Apr; 22(4): 244-9.
7. Vaitkus PT, Herrmann HC, LeWinter MM. Treatment of malignant pericardial effusion. *Jama*, 1994 Jul 6; 272(1): 59-64.
8. Ingber RB, Lodhi U, Mootz J, Siegel A, Al-Roubaie M, Greben C. Comparing outcomes of CT-guided percutaneous pericardial drainage with surgical pericardial window in patients with symptomatic pericardial effusions. *Academic Radiology*, 2023 Nov 1; 30(11): 2533-40.