

## Persistent Thoracic Airleak After Implantation of a Subcutaneously Port-Chamber Catheter

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### Authors' contributions:

Kut A, Burak İlhan B, these authors are contributed equally to this article.

### Keywords:

Thoracic airleak; Port-catheter; Complication; Blood patch pleurodesis

### Abbreviations:

COPD: Chronic obstructive pulmonary disease; PCC: Port-chamber catheter; PTA: Persistent thoracic air leak

## 1. Abstract

**1.1. Introduction:** Persistent thoracic airleak is a rare complication after totally implantable port-chamber catheter(PCC) implantation. Prolonged airleaks are undesirable because they prolong the duration of chest tube drainage with associated pain and risk of infection and they also prolong hospitalization. In cancer patients, it is important to prevent this rare complication and to recognize it early if it does occur.

**1.2. Case presentation:** A 56 years old male patient with a diagnosis of larengeal cancer admitted to Istanbul Faculty of Medicine Surgery clinic for subcutaneously PCC implantation. With electrocardiogram monitoring and saturation tracking, under local anesthesia a successful implantation was performed. Patient did not state any complaints such as chest pain or dyspnea during the procedure. Chest X-ray was obtained after the procedure to confirm correct positioning of the venous device or to identify possible immediate complications, respectively, as a routine protocol. A total pneumothorax was detected in the X-ray. Chest tube drainage was performed. After 6 days of tube drainage airleak resolved and drainage catheter removed, however control X-ray showed again a total collapse of right lung. After three replacement of chest drainage tube case consulted to thoracic surgery department and for ongoing air leak digital tube drainage system (Medela) was started

to use. Blood-patch technique was performed for ongoing airleak despite drainage system. On thirty-third day after operation airleak resolved and drainage catheter removed without any further complication.

**1.3. Conclusion:** Persistent thoracic airleak is a serious complication after central venous access catheter implantation. It is important to be aware of this possibility and to make an early diagnosis in order to prevent prolonged hospital stay and complications such as infection or serious dyspnea.

## 2. Introduction

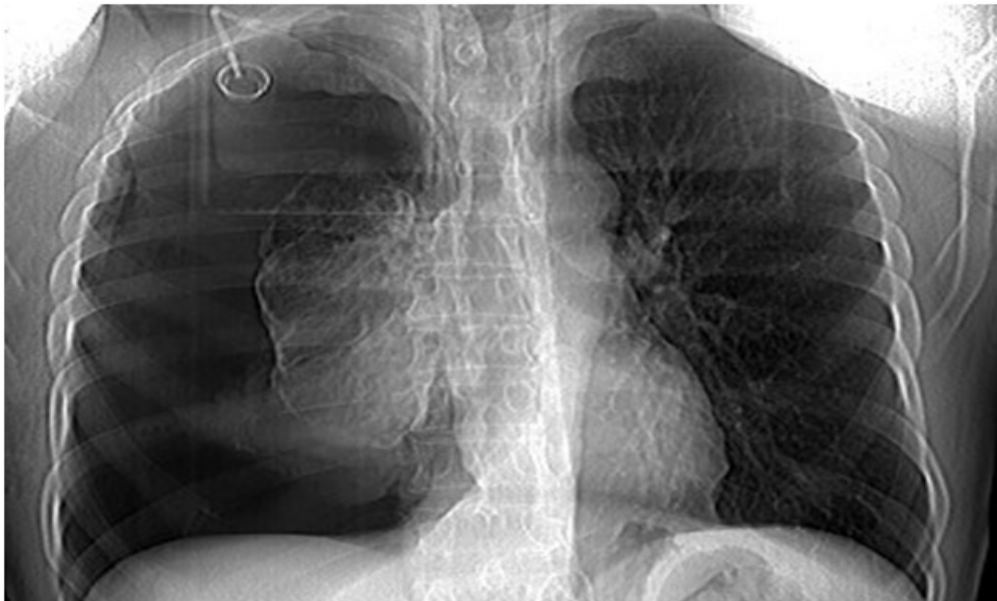
Venous device systems facilitate the safe administration of cytotoxic drugs, antibiotics, blood products, fluids, and parenteral nutrition, as well as the collection of blood samples. However, their use may be associated with several complications. Implantation of these devices is occasionally associated with immediate complications such as pneumothorax, arterial or venous injury and late complications can include infections and catheter malfunction resulting from venous thrombosis [1]. In this present study authors presented a rare case with persistent thoracic airleak(PTA) after PCC implantation.

## 3. Case Presentation

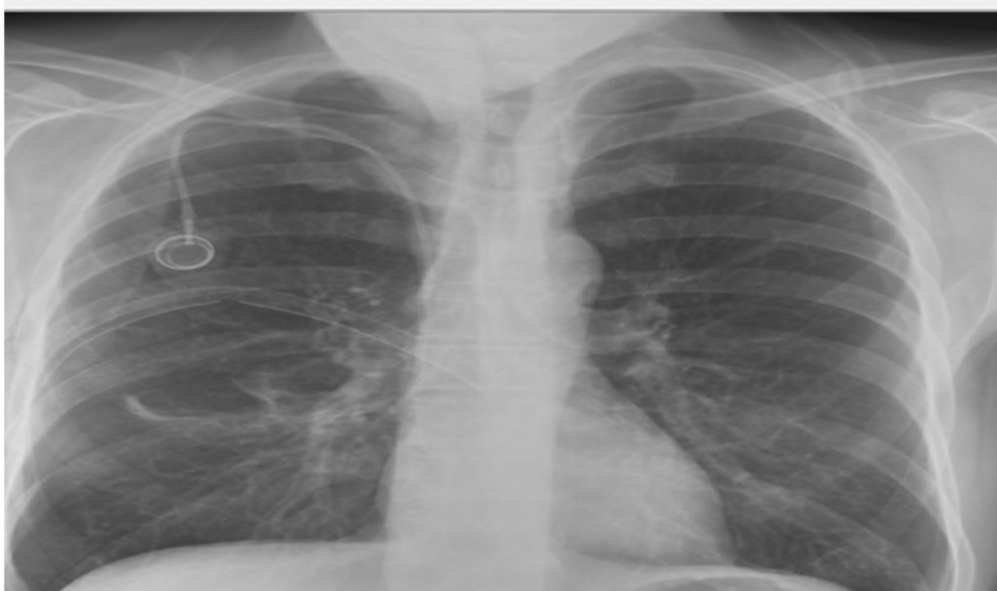
A 56 years old male patient with a diagnosis of larengeal can-

cer admitted to Istanbul Faculty of Medicine Surgery clinic for subcutaneously PCC implantation for further treatment. It was learned that the patient had a smoking history of 120 pack years. Also patient had 10 years long chronic obstructive pulmonary disease(COPD) history. With electrokardiogram monitoring and saturation tracking, under local anesthesia in the operation room a successful implantation was performed. Patient did not state any complaints such as chest pain or dyspnea during the procedure. Saturation track decreased to minimum 96. Chest X-ray was obtained after the procedure to confirm correct positioning of the venous device or to identify possible immediate complications, respectively, as a routine protocol. It was detected that catheter reached to right superior vena cava accurately, however a total pneumothorax was detected in the X-ray (Figure 1). Chest tube drainage was performed. After 6 days of tube drainage, airleak resolved and drainage catheter removed (Figure.2), however control

chest X-ray showed again a total collapse of right lung (Figure 3). Chest drainage tube system placed again to right thorax. On the fifteenth day of hospital stay, there was a growth of klebsiella in the sputum culture taken after the patient had a fever attack. Treatment continued with carbapenem antibiotherapy daily. After three replacement of chest drainage tube (Figure 4), case consulted to thoracic surgery department and for ongoing persistant air leak a digital tube drainage system (Medela) was started to use on nineteenth day. Despite digital drainage system for ongoing air-leak, thoracic surgery department performed blood-patch technique. Patient received 120 mL autologous blood into his chest drain on the twenty-second postoperative day, and again on days 5. and 7. after, because the air leak persisted. On thirty-third day after operation airleak resolved and drainage catheter removed without any further complication (Figure 5). After three weeks patient recieved oncologic agents via PCC. As a result two month hospital stay and oncologic treatment delay was observed.



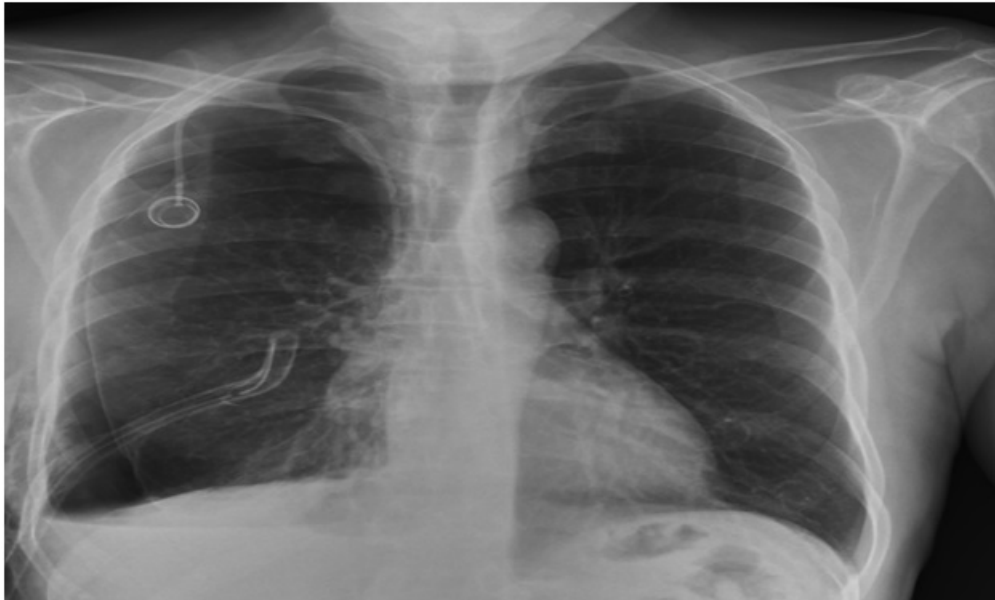
**Figure 1:** Total pneumothorax in the X-ray



**Figure 2:** Resolved pneumothorax in the X-ray



**Figure 3:** Total pneumothorax after removing the drainage tube



**Figure 4:** The view after drainage tube replacement



**Figure 5:** Airleak resolved after blood patch infusion and drainage catheter has been removed

#### 4. Discussion

The use of indwelling central venous catheters represent a major advance for oncology patients, enabling the effective delivery of chemotherapy and/or blood products particularly for prolonged infusions or in the situation of difficult venous access. However, their use may be associated with several complications [2].

Complications of venous port systems are divided into periprocedural early ( $\leq 30$  days after implantation) and delayed ( $> 30$  days) complications. Complications can be defined as “minor” or “major.” Minor complications are events, which do not require additional surgical or interventional therapy or medical therapy  $> 24$  h, whereas major complications require surgery/intervention, prolonged medical therapy, a hospital stay  $> 24$  h, or even result in death. Hemothorax and pneumothorax are the most likely major complications, based on the severity [3].

The overall complication rate has been reported to be 7.2–12.5%, with port system infection being most common [4-7]. With an incidence of 5–18%, catheter-related thrombosis is also relatively common and does not necessarily require catheter explantation. Depending on the need for central access, functional status of catheter system, review of contraindications against anticoagulation, and patient’s condition the further management should be individually discussed [8]. Also another additional diseases such as pulmonary diseases or cardiovascular anomalies may be main causes to develop complications. In this report, patient had 10 years long COPD history.

#### 5. Conclusion

In literature a few studies reported PTA due to central venous access, however persistent airleak, delayed oncologic treatment and prolonged hospital stay due to subcutaneously implanted PCC is not presented in literature. Questionare additional diseases in detail, early diagnosis with routine X-ray and close follow-up after diagnosis is very important.

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