CASE REPORT

Chemothorax: a rare cause of a transudative pleural effusion

Devin Kelly, David Geottman, Bipin Sarodia

Department of Internal Medicine, Wright State School of Medicine, Dayton, Ohio, USA

Correspondence to

Dr Devin Kelly,
devinkel@gmail.com

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SUMMARY

We discovered a rare cause of pleural effusion, chemothorax. In this case, a patient with invasive ductal breast carcinoma was admitted for a large and symptomatic pleural effusion. The radiology report obtained prior to admission did not describe the location of the Infuse-a-Port catheter. After a bedside thoracentesis demonstrated results consistent with chemotherapy infusate in the pleural space, further review of the medical imaging demonstrated that the catheter was in the pleural space.

BACKGROUND

This case highlights the importance of re-evaluating a clinical situation when presented with results that do not match your clinical suspicion. There are times in the practice of medicine when you are presented with results or findings that are unexpected. These cases warrant further investigation or revisiting details in order to accurately diagnose and treat patients.

CASE PRESENTATION

A 50-year-old Caucasian woman diagnosed with invasive ductal breast carcinoma status post left modified radical mastectomy presented to the emergency room, for back pain and shortness of breath that started while receiving chemotherapy earlier that day. The patient received her chemotherapy infusion via a tunnelled right internal jugular port that had been placed a month earlier under ultrasound and fluoroscopic guidance. Placement of the line had been immediately confirmed after the procedure, with a single-view anteroposterior portable chest film, which appeared to show the catheter tip in the superior vena cava. On presentation, she was on cycle 2/4 of docetaxol 140 mg and cyclophosphamide 1150 mg, which she received along with a 1 L bolus of normal saline for prehydration.

The patient had undergone a similar experience 21 days earlier while undergoing her first chemotherapy infusion; her symptoms of shortness of breath and pain had lasted 2 weeks after that infusion. She was afebrile with blood pressure 135/81 mm Hg, pulse rate 92 bpm and respiration rate 20 breaths/min. She had absent breath sounds and dullness to percussion over the right hemithorax.

INVESTIGATIONS

A portable radiograph in the emergency room demonstrated a large right pleural effusion with near complete whiteout of the right hemithorax

(figure 1). Computerised axial tomography of the chest following administration of 100 cc of intravenous iohexal demonstrated a large right pleural effusion with near complete atelectasis of the right lung without evidence of a pulmonary embolism. The patient was admitted for a large symptomatic right pleural effusion. Once admitted, she underwent a bedside thoracentesis. Clear fluid measuring 1.2 L was removed, and the patient's dyspnoea and pain improved. The fluid studies demonstrated a transudative effusion with a pleural lactate dehydrogenase 22 U/L, protein 0.2 g/dL, white cell count $16/\text{mm}^3$ and red blood cell count $173/\text{mm}^3$. Fluid sodium was 144 mEq/L and fluid chloride was 125 mEq/L. A re-evaluation of the imaging showed that the catheter was in an extravascular location, terminating in the right pleural space (figures 2 and 3).

DIFFERENTIAL DIAGNOSIS

The patient presented with her second occurrence of acute dyspnoea over the past month, and both of these occurrences started during chemotherapy infusion of docetaxel and cyclophosphamide. The gross appearance of the fluid returned on the thoracentesis was atypical, as it was as clear as water, and not bloody or the typical straw colour of a transudative fluid. We were expecting a malignant effusion that was grossly bloody, hazy or opaque. The water-like appearance of the fluid caused us to re-assess the imaging. We discovered that the previously placed 'right internal jugular' Infuse-a-Port was not in the vein but, rather, its tip was located

Figure 1 A large right pleural effusion.

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Figure 2 The port catheter in an extravascular location.

within the right pleural space. As a result of this malposition, the patient's infusate was being delivered into her pleural space.

TREATMENT

After discovery of the port catheter location, the patient underwent placement of a right pleural pig-tail catheter with further removal of the remaining pleural fluid. The right jugular port was then removed and replaced.

OUTCOME AND FOLLOW-UP

The patient developed a recurrent right pleural effusion with exudative characteristics from pleuritis caused by the previously infused chemotherapy agents. She gradually improved with repeat thoracentesis, which was negative for malignancy on cytology testing. A small effusion remained on her most recent CT scan.

DISCUSSION

Published reports have described cases of central venous catheters being placed in the pleural space, with infusion of various medications causing pseudochylothorax, hydrothorax or tension

Figure 3 The port catheter tip in the pleural space.

pneumothorax.^{1–3} There are numerous complications from the placement of an Infuse-a-Port, such as pneumothorax, bleeding, infection, thrombosis, arrhythmia, vascular injury, migration and venous air embolism.^{4–10} We found a previous case report of a chemotherapeutic agent infused in the pleural space with an Infuse-a-Port. Accidental injection into the chest near the side of the port and not into the port caused the infusion into the pleural space; the port functioned properly.¹¹ While malposition of an Infuse-a-Port is a complication, it is usually discovered early.⁶ There have been occasions of central venous catheters that were functioning properly at placement, but then delayed perforation occurred with migration of the catheter tip into the pleural space.¹² Our patient's port was in an extravascular location throughout its course, making delayed perforation and migration unlikely. We did not find reports of complications due to medication from an Infuse-a-Port inserted into the pleural space.^{5–11}

Learning points

- ▶ Re-evaluate a clinical situation when results do not match your clinical suspicion.
- ▶ Review all images and results yourself.
- ▶ Investigate unexpected findings further.

Competing interests None declared.

Patient consent Obtained.

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