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CASE REPORT

Peritoneal–mediastinal communication complication of peritoneal dialysis demonstrated by multidetector-row CT peritoneography: A case report☆

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KEYWORDS

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Subserous space;
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Abstract Pleural effusion secondary to peritoneal–mediastinal communication is an uncommon complication in continuous ambulatory peritoneal dialysis (CAPD) patients. CT peritoneography (CTP) is a useful diagnostic and differential diagnosis method for evaluating a wide variety of complications due to CAPD. We report a case of peritoneal–mediastinal communication with specific imaging features on CTP.

1. Introduction

Ultrafiltration failure (UF) in a patient treated with continuous ambulatory peritoneal dialysis (CAPD) poses a diagnostic dilemma. There are many causes resulting in UF problems. Leakage, which is usually due to a tear in the membrane and causes migration of dialysis fluid, is one of the etiology (1). It usually presents with localized subcutaneous edema. However, in some situations, there is no localized subcutaneous edema (2). Hydrothorax may constitute a unique marker. UF accompanied by hydrothorax secondary to pleuroperitoneal communication is not an unusual complication of CAPD any more (3,4). However, leakage of dialysate to the mediastinum which results in hydrothorax has not been reported previously. Herein, we report a case of peritoneal–mediastinal communication using CT peritoneography (CTP).

2. Case report

A 40-year-old women with uremia secondary to chronic glomerulonephritis had been under CAPD treatment for 2 years. Her usual net ultrafiltration volume was 200 mL with 2.5% glucose dialysate solution and she performed four 2-L exchanges daily of glucose-based dialysate solution. She still

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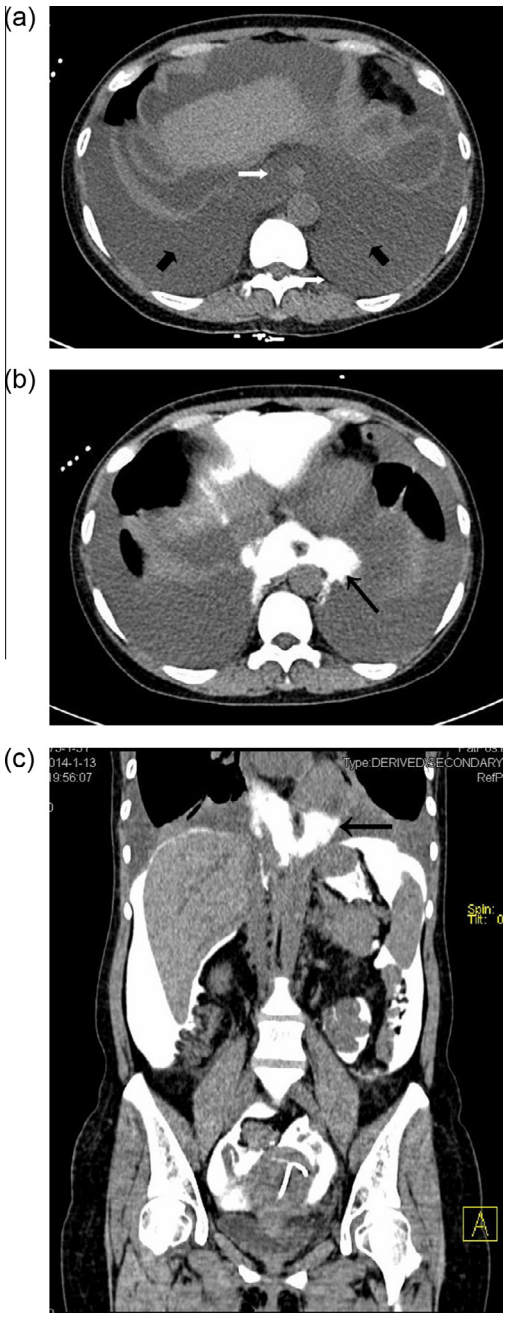

Fig. 1 Non-enhanced CT (a) shows that a moderate amount of watery density shadow was seen in the posterior mediastinum (white arrow) and bilateral thoracic cavity (black arrow), axial (b) and coronal (c) CT peritoneography shows the posterior mediastinum surrounded by peritoneal dialysis solution containing contrast media (black arrow).

had daily urine volume of 800 mL. However, three weeks before admission, she complained of mild dyspnea and dry cough for about one month. She noticed a reduction in peritoneal dialysis effluent volume and developed progressive breathlessness. Her daily net ultrafiltration volume fell from 800 mL to 400 mL. Physical examination showed she had a weight gain of 3 kg, with only ankle edema and pulmonary congestion. There was no localized edema over the abdomen or perineum. Dialysate/plasma creatinine ratio measured 3 months prior was 0.60. Net ultrafiltration volume did not improve obviously, despite a higher concentration of dialysate solution being used. An abdominal X-ray revealed the Tenckhoff catheter was in good position. And chest radiography performed showed a moderate amount of bilateral pleural effusion and cardiomegaly. We suspected pleuroperitoneal leakage based on clinical impression and the timing of manifestation, but the supposed diagnosis had to be differentiated from other causes of transudative pleural effusion, such as congestive cardiac failure and hypoalbuminemia, or other causes of fluid overload. Pleural fluid analysis showed a normal glucose concentration, which also suggested no pleuroperitoneal leakage. The routine laboratory examinations, including the chemistries and electrolyte profiles, were unremarkable except for elevation of blood urea nitrogen/creatinine levels. Her blood pressure was 140/80 mmHg.

A CTP was performed to assess the presence of pleuroperitoneal leakage 5 days after admission. CT was performed using a 64-detector row CT system (Brilliance 64, Philips Medical Systems, Eindhoven, the Netherlands). 50 mL non-ionic contrast medium (iohexol, 300 mg iodine/mL; Beijing Beilu Pharmaceutical, Beijing, China) was mixed with 2 L dialysate and infused into the peritoneal cavity via a Tenckhoff catheter. After 30 min of ambulation to ensure an even distribution of fluid throughout the peritoneum, CT scans were obtained by using 145 mA and 120 kVp parameters. The CTP also showed a moderate amount of bilateral pleural effusion. There was no contrast leakage from the peritoneal cavity to the bilateral pleural cavities through bilateral diaphragms. However, peritoneal dialysis solution containing contrast media was showed in the posterior mediastinum, which suggests the possibility of peritoneal–mediastinal communication (Fig. 1a–c).

After temporary interruption of CAPD and switching to hemodialysis for about 2 months, a follow-up CTP performed and showed that peritoneal–mediastinal communication persisted. After weighting the poor long-term effectiveness of CAPD and surgical risk, the patient decided to switch to hemodialysis permanently. The pleural effusion resolved over a number of days. A follow-up chest radiograph was normal. The symptoms such as dyspnea and dry cough were also disappeared.

3. Discussion

CAPD is used to treat end-stage renal failure in an increasing number of patients all over the word (5). However, certain complications are more frequent with CAPD than with hemodialysis and often force cessation of CAPD. Patients on CAPD have a high incidence of abdominal hernias and dialysate leakage caused by chronically increased intraperitoneal pressure (6). As reported, intra-abdominal pressure measured at the inguinal level would be approximately 30 cm higher than that at the xiphoid in the vertical position, thus resulting in 38–40 cm of water pressure with a 2 L intra-abdominal dialysate (7). Other factors such as walking, coughing, and straining may induce abrupt increases in intra-abdominal pressure. In general, pressure-related complications in patients on CAPD include inguinal hernia, hiatal hernia, periumbilical hernia, incisional hernia, subcutaneous leakage, retroperitoneal leakage, peritoneopleural communication and so on, which