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CLINICAL QUIZ

Recurrent pleural effusion during peritoneal dialysis: question

Jozef J. M. I. De Dooy · Joanna A. E. van Wijk · Frans B. Plötz · Arend Bökenkamp

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Case Summary

A 3-year old girl with a body weight of 15 kg was admitted to our pediatric intensive care unit with acute renal failure. She was the first of a twin pregnancy, born at a gestational age of 28 weeks with a birth weight of 1140 g. There had been no significant neonatal complications. The present history began 5 days before admission with diarrhea and vomiting. She was admitted to a local hospital with signs of severe dehydration and progressive renal failure, which persisted after aggressive fluid therapy. Hemolytic uremic syndrome (HUS) was suspected and she was referred to our hospital. On admission, hemoglobin level was 5.5 mmol/L (9.2 g/dL), serum LDH 4459 U/l and platelets 55×10^9/L with schistocytes on blood smear. While faeces culture was negative for *E. coli* 0157, there was a positive PCR for *E. coli* 0157 on peripheral white blood cells. Complement studies showed no evidence for atypical HUS/thrombotic microangiopathy. Serum creatinine was 458 μmol/L (5.2 mg/dL) and urea 33.1 mmol/L (92.7 mg/dL) in the anuric child. Under the diagnosis of a diarrhea-associated HUS, a Tenckhoff catheter was placed and peritoneal dialysis (PD) begun with a dwell volume of 15 mL/kg of Gambro-Trio (Gambro BCT Europe NV/SA, Zaventem, Belgium) containing 1.9% glucose. Ultrafiltration was 20 mL per hour on day 1. Despite this therapy, the patient remained ventilator-dependent and needed increasing amounts of supplemental oxygen. In order to increase ultrafiltration, the glucose concentration was increased to 2.5% with good effect (ultrafiltration rate 41 mL per hour). A large pleural effusion was noted on the right side (Fig. 1) and about 200 mL of a clear transudate (RBC 5–10/field, WBC 5–10/field, protein concentration 0.594 g/L) was aspirated. Despite this intervention, her respiratory situation deteriorated rapidly and she developed a severe acute respiratory distress syndrome (ARDS). This required high-level ventilatory support with mean airway pressure values of up to 30 cmH_2O. Mechanical ventilation was complicated by subcutaneous and mediastinal emphysema and recurrent pneumothoraces (Fig. 2). During this period, peritoneal dialysis was continued with dwell volumes between 8 and 20 mL/kg and transiently combined with continuous veno-venous hemodiafiltration. When her respiratory situation improved and the ventilator settings could be reduced, leakage of clear fluid of around 150 mL per day was noted from an incision site of a previous thorax-drain on the right side.

Questions

1. What is the most likely etiology of the recurrent pleural effusion?
2. Which diagnostic test should be done?
3. How can the time-course of the pleural effusion and leakage of clear fluid from the incision site be explained?
4. What is the next step in management regarding the pleural effusion?

The answers to these questions can be found at http://dx.doi.org/10.1007/s00497-007-0590-3

J. J. M. I. De Dooy · F. B. Plötz
Departments of Pediatric Intensive Care,
VU University Medical Center,
Amsterdam, The Netherlands

J. A. E. van Wijk · A. Bökenkamp (✉)
Department of Pediatric Nephrology,
VU University Medical Center,
de Boelelaan 1117, NL-1081 HV Amsterdam, The Netherlands
e-mail: Bokenkamp@vumc.nl

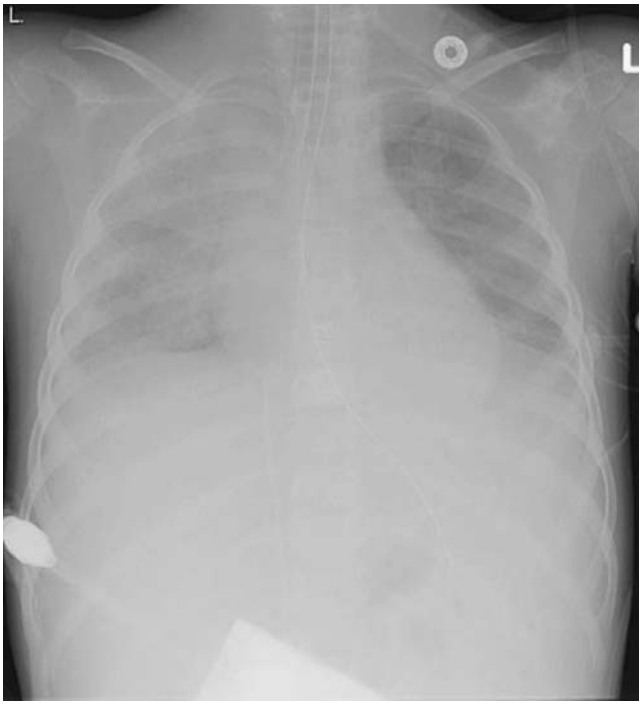

Fig. 1 X-thorax showing a large pleural effusion on the right side

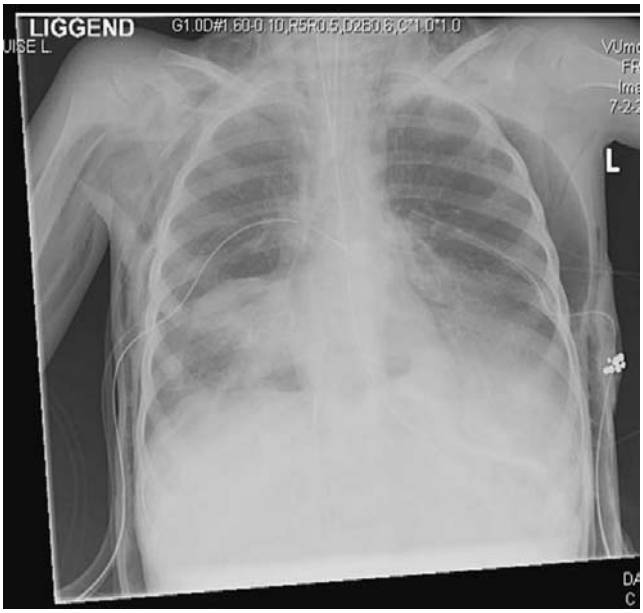

Fig. 2 X-thorax showing significant subcutaneous and mediastinal emphysema with bilateral pneumothorax