

*Teaching Point*  
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## An unusual cause of pleural effusion in a haemodialysis patient

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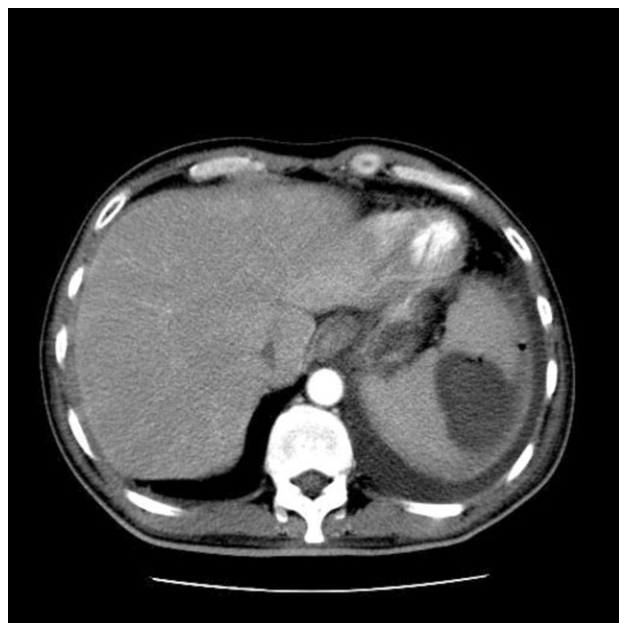
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### Introduction

Pleural effusion in patients receiving long-term haemodialysis is a common finding with an incidence of ~20%. The effusion is unilateral in up to 50% of cases. The most frequent causes of unilateral effusion are hypervolaemia and parapneumonic effusion. In our case, an unexpected and rare cause of the pleural effusion was established.

### Case

A 57-year-old diabetic haemodialysis patient was admitted to our hospital with a history of 1-week left-sided chest pain on inspiration, fever and shortness of breath. He started haemodialysis 1 year earlier due to end-stage diabetic nephropathy and was dialyzed on a polytetrafluoroethylene (PTFE)-graft in the left upper arm. On admission, he had a blood pressure of 120/80 mmHg, pulse of 137/min and his temperature was 38.5°C. Respiratory rate with 16/min was normal. There was a friction rub with dullness on percussion and decreased breathing sounds over the left lung base. The shunt arm showed necrotic lesions on two fingertips, but no signs of infection on the PTFE-graft. Investigations included haemoglobin 11.8 g/dL, white cell count  $18.7 \times 10^9/L$ , platelet count  $30\,000/mm^3$  and C-reactive protein 212 mg/L. Chest radiography showed cardiomegaly without fluid overload and confirmed the suspicion of a small left-sided pleural effusion. A CT-scan of the thorax/upper abdomen showed atelectasis in the left lower lobe with pleural effusion and a hypodense, circular lesion with a diameter of  $6.2 \times 6.3$  cm in the spleen (Figure 1). CT-guided needle aspiration of the splenic abscess yielded foul-smelling pus, and a catheter was in-



**Fig. 1.** Two dimensional CT-scan. Within the spleen there is a fluid collection with signs of gas formation that is suggestive for a splenic abscess. Moreover, there is left sided pleural effusion.

serted for drainage (Figure 2). The patient was initially treated with amoxicillin/clavulan and clindamycin after several blood cultures were taken but had to be switched to meropenem after microbiology results of blood cultures and splenic abscess yielded *Morganella morganii* and *Serratia Marcescens*. Despite percutaneous drainage of the splenic abscess and adequate antibiotic coverage, the patient had persistent fever and the splenic abscess did not resolve. Therefore, a splenectomy was performed (Figures 3 and 4) after immunization against *Streptococcus pneumoniae*, *Meningococcus*, and *Haemophilus influenzae* type b with amputation of the necrotic fingertips and ligation of the graft. The patient was dialyzed by a temporary dialysis catheter. The patient recovered well after these interventions, and after all signs of infections disappeared, a new Tesio® catheter was inserted. Unfortunately, several weeks

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**Fig. 2.** Two dimensional CT-scan. Splenic drain in situ. After two weeks of percutaneous continuous drainage and antibiotics there is no reduction of the splenic abscess.

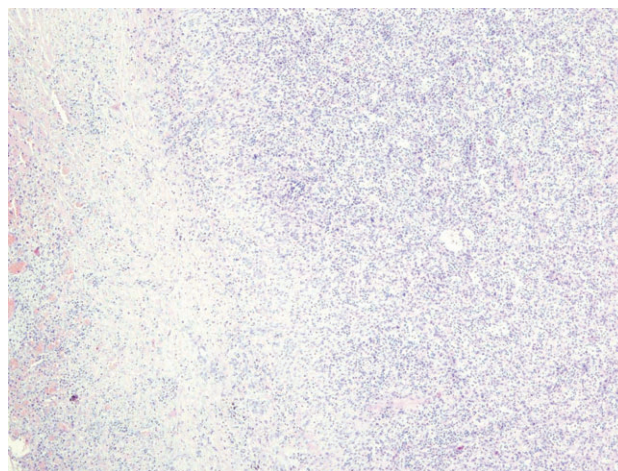


**Fig. 3.** Macroscopic analysis of spleen showing a clear abscess cavity.

later the patient died suddenly during the night. Permission for autopsy was not granted.

## Discussion

Many diseases can cause pleural effusions in haemodialysis patients [1–4]. In this case, the patient had an indolent infectious process and a slight left pleural reaction. Because abdominal symptoms were absent, we initially focused on pulmonary causes. Analysis of pleural fluid was not possible because of the small quantity of the effusion with high risk for iatrogenic complications. A CT-scan of the chest, unexpectedly, revealed a splenic abscess. Any subdiaphragmatic infection commonly elicits a pleu-



**Fig. 4.** Histological analysis of splenic tissue. Normal parenchyma of the spleen with infiltration of inflammatory cells and fibrosis surrounding the abscess cavity.

ral inflammatory reaction and at the left side one should also consider left anterior subphrenic abscesses, pancreatitis, infected pancreatic pseudocysts, xanthogranulomatous pyelonephritis, perforated duodenal ulcers and diverticulitis [1–5].

A splenic abscess is a rare disorder with a high mortality when diagnosis and treatment are delayed. Unfortunately, history and physical examination may be nonspecific and the diagnosis is often missed at first [5–8]. The most common symptoms are fever and abdominal pain in the left hypochondrium. Involvement of the diaphragmatic pleura may cause shoulder pain or pleuritic chest pain in the left lung base. Several factors predispose the spleen to abscess formation such as a history of diabetes, steroid use, immunosuppressive therapy, malignancies, cirrhosis, alcoholism, intravenous drug abuse, AIDS and end-stage renal disease. Diagnosis can be easily established by ultrasonography or CT-scan [5–11].

The most common cause of a splenic abscess is haematogenous spreading originating from an infective focus [8]. Infective endocarditis, in particular, may produce septic emboli and splenic abscess [12], but many other infective sources have been described [5–11]. A wide variety of microorganisms have been reported in splenic abscesses. Blood cultures are positive in 60% of cases with splenic abscess. The most frequent microorganisms found in splenic abscess are *Streptococcus*, *Staphylococcus*, and members of the *Enterobacteriaceae* [6,8]. To our knowledge, this is the first report of a splenic abscess in a haemodialysis patient due to *Morganella morganii* and *Serratia Marcescens*. There are several reports of splenic abscess in haemodialysis patients due to *Staphylococcus* and *Salmonella* infection as a consequence of bacteraemia acquired through the dialysis access sites [3,8]. In this patient, the infected necrotic fingertips may be a possible port of entry into the blood stream as microbiology results of the fingertips, blood cultures and spleen revealed similar species. However, PTFE-grafts are more commonly a source of sepsis and although the graft seemed healthy in this patient, we cannot exclude that it facilitated the bacteraemia.

Broad-spectrum antibiotics should be started as soon as possible, but there is currently no consensus regarding the preferred interventional therapy. Either radiographically guided percutaneous drainage of the abscess or splenectomy should be performed after diagnosis. Some authors consider percutaneous drainage as preferred treatment, reserving splenectomy for only exceptional cases [5]. Drainage preserves the spleen and avoids the risk of severe post-splenectomy infections. The reported success rate of percutaneous drainage is 51–72% [9]. Percutaneous drainage can also be used as a bridge to elective surgery in patients who are clinically unstable or in patients who have multiple co-morbidities. Splenectomy, however, eliminates the source of sepsis and circumvents problems with drainage from the subphrenic area. Splenectomy may be superior to medical treatment and percutaneous drainage in patients with poor prognostic factors, like multiple splenic abscess, gram-negative bacillus infection and high APACHE II scores. Aggressive and early surgical intervention of splenic abscess probably should be encouraged when these risk factors are present [5].

### Teaching points

- (1) Consider processes below the diaphragm in the differential diagnosis of unilateral pleural effusions.
- (2) Unexplained left sided pleural effusion and fever can be the result of a splenic abscess.
- (3) The splenic abscesses in haemodialysis patients are generally due to *Staphylococcus* and *Salmonella* infection, but rare pathogens like *Morganella morganii* and/or *Serratia Marcescens* can also be found.

*Conflict of interest statement.* None declared.

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