Abdominal gas is not always bowel associated: lessons from an allograft recipient

Case

A 39-year-old female, who underwent renal transplantation 2 years earlier, was referred to our unit with a 2-week history of high-grade fever and graft dysfunction. She was on an immunosuppressive regime containing cyclosporin, azathioprine and prednisolone. Six months post-transplantation she developed hyperglycaemia and was treated with insulin. Nine months later she developed disseminated tuberculosis and received antituberculous therapy. At the time of referral, apart from immunosuppressives, she was on isoniazid 200 mg and ethambutol 400 mg, daily. Her serum creatinine ranged between 1.5 and 1.8 mg/dl in the past year.

On examination she was febrile, normotensive and complained about vague abdominal discomfort. The abdomen was distended with no tenderness guarding or rigidity, but bowel sounds were absent. She was anuric with anasarca and had fine basal crackles. She was disoriented but without focal neurological deficits. Investigations revealed a serum creatinine of 3.9 mg/dl and arterial blood gas analysis showed metabolic acidosis (pH 7.195, pCO₂ 24.1 mmHg, pO₂ 87.8 mmHg, HCO₃ 14 mmol/l, ABE -9.4 mmol/l, sO₂ 96.4%). She had a platelet count of 12,000/mm³, white blood cell count of 36,900/dl with 90% polymorphs and a blood sugar of 343 mg/dl. An X-ray of the abdomen in the erect position (Figure 1) was taken followed by an ultrasonogram. A few hours later, she developed pulmonary oedema and hypotension with a blood pressure of 90/60 mmHg. While on ionotrophic support she received haemodialysis.

Questions

1. What is the abnormality on the abdominal X-ray and what is the possible diagnosis?
2. What tests would you perform to substantiate the diagnosis?
3. What therapy would you recommend?
Answers to the quiz on the preceding page

The X-ray of the abdomen showed an abnormal gas shadow in the right iliac fossa corresponding to the graft kidney area. A helical computerized tomography (CT) scan of the abdomen showed features of emphysematous pyelonephritis (EPN) of the graft kidney (Figure 2) with perirenal extension. Relatives of the patient refused to consent for a graft nephrectomy. A CT-guided percutaneous nephrostomy was made and ~200 ml pus admixed with air was drained. The culture of pus and blood grew *Escherichia coli* sensitive only to meropenem/imipenem. After 5 days with four sessions of haemodialysis and appropriate antibiotics, she became normotensive and her general condition improved. The serum creatinine stabilized at 2.3 mg% and platelet count became normal. After 12 days of drainage a repeat CT scan showed complete resolution of the emphysematous cavity (Figure 3). She was discharged and, subsequently, the nephrostomy tube was removed. Following this she recovered and graft function remained stable.

EPN is an uncommon clinical condition, which results in necrosis of the renal parenchyma and perirenal tissues leading to gas formation in the renal collecting system, parenchyma or surrounding tissues [1]. Risk factors for the entity include diabetes mellitus and urinary tract obstruction caused by calculi, tumours or strictures. Involvement of a graft kidney is quite rare [2]. In the management of these patients, the role of surgical nephrectomy vs conservative percutaneous drainage is still debated. In the renal allograft recipient, preciousness of the graft against the precarious clinical state with a removable focus of infection compounds this dilemma. This is a major issue in many developing nations.

In a review of EPN of the native kidney [3], the renal involvement according to the severity is graded as: class 1, gas in the collecting system only; class 2, gas in the renal parenchyma without extension to extrarenal space; class 3A, extension of gas or abscess to perinephric space; class 3B, extension of gas or abscess to pararenal space; and class 4, bilateral EPN or solitary kidney with EPN. Class 3 or 4 patients with two or more risk factors, such as thrombocytopenia, acute renal functional impairment, disturbance of consciousness or shock, have a significantly higher failure rate with percutaneous drainage and antibiotics when compared with nephrectomy.

This renal allograft recipient is one of the rare patients with an EPN of the graft complicated by multiorgan failure, who could be treated successfully with percutaneous drainage and antibiotics.

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References


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