Nephrol Dial Transplant (2005) 20: 652–653
doi:10.1093/ndt/gfh566

Nephrology
Dialysis
Transplantation

Images in Nephrology
(Section Editor: G. H. Neild)

Emphysematous cystitis

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Keywords: cystitis; urinary retention; urinary tract infection

Case

A 39-year-old homeless man presented with weight loss, urinary frequency and urinary incontinence. On examination he had a palpable bladder and extensive peripheral neuropathy. Initial blood glucose level was 43.5 mmol/l, serum creatinine was 107 μmol/l and Hb_{A1c} was 16.2%. He was started on insulin for newly diagnosed diabetes mellitus and a urinary catheter was inserted (residual volume was 500 ml). An abdominal ultrasound scan showed bilateral hydronephrosis with hydroureters and an abnormal and grossly thickened bladder wall. Urine was sterile. Intravenous urography showed severely dilated pelvicalyceal systems. The bladder had multiple filling defects and a moth-eaten appearance circumferentially (Figure 1). Computerized tomography showed a thickened, trabeculated bladder wall containing pockets of gas (Figure 2). Urodynamic assessment showed normal detrusor function during filling with a normal cystometric capacity but reduced compliance. Bladder sensation was absent and a voiding phase could not be obtained. The overall picture suggested detrusor acontractility. Cystoscopy revealed multiple submucosal bullous lesions visible throughout and bladder mucosal biopsy showed mild non-specific active inflammation, with marked oedema and congestion of the lamina propria. The investigations were all consistent with a diagnosis of emphysematous cystitis in a patient with newly diagnosed diabetes mellitus, diabetic neuropathy and a neuropathic bladder.

Discussion

Emphysematous cystitis is a rare condition with important clinical correlates, but relatively unknown to physicians. It is characterized by gas collections within the bladder wall and was first identified in post-mortem examination in 1888. It is thought that

Fig. 1. Intravenous urogram showing gas within the trabeculated bladder wall.

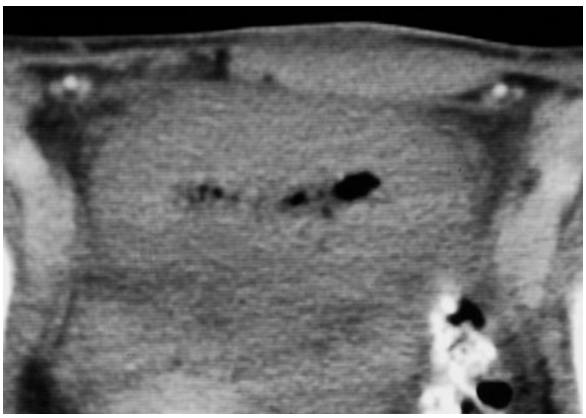

Fig. 2. Computerized tomographic scan through the bladder showing pockets of gas within its wall.

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the gas collections are carbon dioxide produced by the fermentation of glucose or albumin by micro-organisms infecting the bladder [1]. The most common causative organisms are *Escherichia coli*, *Enterobacter aerogenes* and *Klebsiella pneumoniae*. The majority of patients are diabetic, but it is also associated with neuropathic bladders, bladder outlet obstruction, in-dwelling urinary catheters, chronic urinary tract infections and immunosuppression. Emphysematous cystitis can be an incidental finding on imaging or cause dysuria, haematuria, pneumaturia, fever and severe abdominal pain. The radiological findings include small gas-filled vesicles in the bladder mucosa, producing a cobblestone appearance, and can go on to form a thin zone of gas outlining the perimeter of the bladder. The bladder wall is thickened. Gas-filled blebs are seen in the bladder wall, which, when ruptured, allow gas into the bladder lumen. Emphysematous cystitis usually responds well to treatment, which includes glycaemic control, appropriate antibiotics and good urinary drainage.

Conflict of interest statement. None declared.

References

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