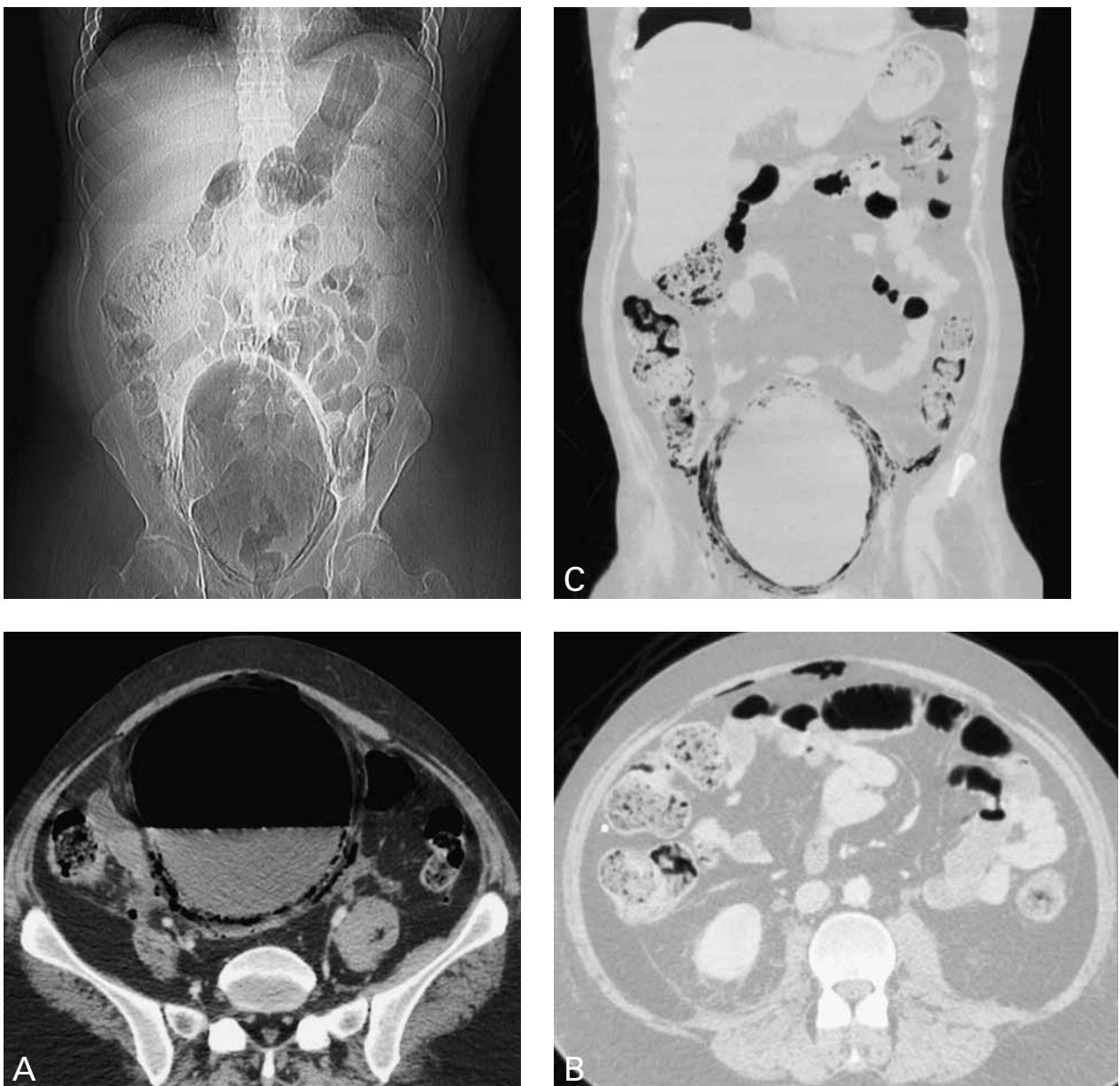


EMPHYSEMATOUS CYSTITIS

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Key-word: Cystitis

Background: A 30-year-old paraplegic man was admitted to the emergency department for hyperthermia, right flank pain and abdominal tenderness. His past medical history revealed a type 2 diabetes mellitus and a cervico-thoracic astrocytoma treated by surgery and radiotherapy. In 2008, he underwent surgery for the placement of a ventriculo-peritoneal derivation for hydrocephalus secondary to meningeal carcinomatosis. The medical treatment included dexamethasone, sodium valproate and levetiracetam for intractable epilepsy. Laboratory tests revealed blood inflammation and urinary infection.



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Work-up

Radiograph of the abdomen (topogram of the CT scan in a supine position) (Fig. 1) shows a marked air-containing bladder distension with linear air density along the bladder wall.

Axial CT image at the level of the bladder (Fig. 2A) demonstrates a thickened bladder wall containing linear pockets of gas. An air-fluid level is shown in the bladder lumen. Axial CT image at supra-umbilical level (lung window setting) (Fig. 2B) shows an anterior pneumoperitoneum. Coronal CT reformatted images (lung window setting) (Fig. 2C) visualizes the multiple punctuate gas foci disseminated along the entire bladder wall. Note the extension of gas dissection laterally to the bladder into the extraperitoneal tissues.

Radiological diagnosis

Based on CT findings the diagnosis of *emphysematous cystitis* complicated by a pneumoperitoneum was made.

Discussion

Emphysematous cystitis (EC) is a rare but severe lower urinary tract infection characterized by the presence of air within the bladder wall. The most common pathogen germ is *Escherichia coli* (58%), followed by *Klebsiella pneumoniae* (21%) and *Enterobacter aerogenes* (5%). Clostridia and fungal species may be occasionally identified. The gas is considered secondary to the presence of gas producing organism and high tissue glucose favouring the production of carbon dioxide (fermentation of glucose). The disease is most common in middle age patient and predisposing factor are diabetes mellitus, neurogenic bladder, urinary outlet obstruction and urethral catheters. EC can be associated with emphysematous pyelonephritis (EP) which is a necrotizing infection of the renal

parenchyma with the presence of gas within the kidney, collecting system and perirenal space. The predisposing factors of EP are the same as in EC. The association between EP and pneumoperitoneum has already been documented). To our knowledge, this is this first case reported to the literature associating isolated EC and pneumoperitoneum. Although EC can be demonstrated or suspected on abdominal plain film, CT is the technique of choice for the diagnosis as it is very sensitive for early detection of intraluminal and intramural gas. This technique can also accurately define the extent and severity of EC. Furthermore, CT can also detect fistulas, intra-abdominal abscesses, adjacent neoplastic disease and other emphysematous intra-abdominal infections such as EP. The treatment for EC involves broad-spectrum antimicrobial therapy and strict control of blood glucose level. In the case of bladder outlet obstruction syndrome, adequate urine drainage with correction of the obstacle is mandatory. In the case of poor response to medical treatment, surgical debridement might be considered. The overall death rate of EC is 7% contrasting with the 50% death rate of EP.

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