An Unusual Case of Emphysematous Cystitis in An Elderly Non-Diabetic Patient

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Case 7696

Clinical History:

We report the case of an 87 year old female patient with unusual urological pathology on a CT Colonogram.

Imaging Findings:

A patient with a history of peptic ulcer disease, presented with dark red stools. Upper GI endoscopy showed a healing ulcer with no evidence of recent bleed. The patient’s symptoms altered to profuse fresh blood loss per rectum (PR). A 3-phase contrast enhanced CT confirmed contrast extravasation into the rectum and incidental DVT and PE. At angiography, coil embolization of a rectal branch of the inferior mesenteric artery was performed. As anticoagulation was contraindicated due to bleeding, an inferior vena cava (IVC) filter was also inserted to prevent further pulmonary emboli from the DVT.

Following a prolonged in-patient stay and multiple blood transfusions a CT colonogram was performed one month later to rule out rectal tumour as a source of the PR bleeding.

CT Colonography demonstrated thrombus and gas within the IVC filter (Fig 1,4) (Intravenous contrast injection was performed in the upper limb). The urinary bladder contained an air fluid level and extensive intramural air suggesting a diagnosis of ‘Emphysematous Cystitis’ (Fig 1-3). The patient was treated with antibiotics and C-reactive protein improved from 67 mg/L to normal levels. Escherichia coli was isolated in urine samples. The patient was discharged shortly afterwards.

Discussion:

Emphysematous cystitis is a rare condition in which urinary infection proceeds to gas formation within the bladder wall, and also often within the lumen. The majority of reported cases are in patients with diabetes. Poor glycaemic control is thought to play a role. Prognosis can vary greatly and treatment of this sometimes fatal infection can range from a course of antibiotics to extensive medical and surgical therapy. Organisms previously identified as a cause are Escherichia Coli and Enterobacter aerogens, although fungi have also been isolated. Early identification and treatment are the key to successful management as ascending infection to involve the kidneys (emphysematous pyelonephritis) carries a higher mortality.

Diagnosis is often made radiologically. Plain abdominal/pelvic radiograph may display an intramural curvilinear gas opacity or chain of bubbles outlining the urinary bladder, with or without intra luminal air. CT scanning more accurately assesses for intramural air and can better demonstrate ascending emphysematous infection. CT can also help to identify differential diagnoses, such as vesico-colic fistula, although this rarely causes intramural gas. Ultrasound may also be used to demonstrate intramural air and bladder wall thickening.

The patient in this case report was not diabetic, neither was she known to be immunosuppressed, however the
severe blood loss and prolonged period of infirmity may have caused a transient immunosuppression. Indirect biomarkers to support this included a low (19 g/L) serum albumin level, hypophosphataemia (0.46 mmol/L) and recurrent drops in haemoglobin (largest drop 4.2 g/dL).

The venous drainage of the bladder is mainly to the vesical plexus, which surrounds the inferior bladder and fundus, draining via several vesical veins into the internal iliac (hypogastric) veins (Fig 5). We postulate that venous drainage of the emphysematous bladder is the source of the gas visualised within the IVC filter.

It is also interesting to note the DVT on the initial CT scan had propagated into the common iliac vein when the diagnosis of emphysematous cystitis was made. It could perhaps be theorised that this caused vascular congestion of the bladder and an impaired host response, allowing gas to more readily accumulate in the vesicular tissues.

**Differential Diagnosis List:** Emphysematous cystitis.

**Final Diagnosis:** Emphysematous cystitis.

**References:**


Description: Gas is demonstrated within the IVC filter. Origin:
**Description:** The vesical plexus drains the urinary bladder into the internal iliac veins.


**Origin:**
Description: Gas is visible within the bladder lumen and also within the bladder wall. Origin:
Figure 4

Description: Gas is visible within the bladder lumen and also within the bladder wall. Origin:
**Figure 5**

*Description:* Gas is visible within the IVC filter. Chain of bubbles (intramural gas) demonstrated in the bladder wall. Left common femoral vein thrombus is visible. **Origin:**