Emphysematous cystitis
Published on 26.06.2017

DOI: 10.1594/EURORAD/CASE.14802
ISSN: 1563-4086
Section: Uroradiology & genital male imaging
Area of Interest: Abdomen
Procedure: Diagnostic procedure
Imaging Technique: CT
Special Focus: Neoplasia Infection Case Type: Clinical Cases
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Patient: 60 years, male

Clinical History:


Imaging Findings:

CR: Conventional radiography characteristically shows curvilinear or mottled areas of increased radiolucency in the region of the urinary bladder, separate from more posterior rectal gas (Fig. 1). Intraluminal gas will be seen as an air-fluid level that changes with patient position, and, when adjacent to the nondependent mucosal surface, may have a cobblestone or "beaded necklace" appearance. This is thought to reflect the irregular thickening produced by submucosal blebs as seen at direct cystoscopy.

The ultrasound can demonstrate echogenic air within the bladder wall with dirty shadowing artefact. Ultrasound will also commonly demonstrate diffuse bladder wall thickening and increased echogenicity.

CT is a highly sensitive examination that allows early detection of intraluminal or intramural gas (Fig. 2, 3).

Discussion:

Background: Emphysematous cystitis is an infection of the bladder wall, and may or may not have intraluminal gas. Therefore, the existence of gas within the urinary tract (pneumaturia) is not sufficient for the definition of EC, in fact only 27% of patients with EC present in this way [1, 3]. The main risk factors for developing it are diabetes (considered the commonest predisposing factor), female sex, immunocompromised state, neurogenic bladder transplant recipients.

Clinical perspective: The clinical presentation of EC is nonspecific, ranging from the absence of symptoms to septic shock. The most frequent form of presentation is abdominal pain (80%), followed by lower urinary tract symptomatology, both filling and emptying. The presence of haematuria is more frequent than in the usual form of bacterial cystitis [1, 2, 3].

Imaging Perspective: The key to the diagnosis is the radiological images. The most valuable imaging test for the diagnosis of emphysematous cystitis is abdominal-pelvic CT, which allows an early detection of intramural gas in the urinary bladder as well as the extent and severity of the condition [4, 5]. Intramural gas in the bladder wall gives the definitive diagnosis. CT allows differential diagnosis with other pathological conditions in which there may be gas in
the pelvis such as enterohepatic or vesico-vaginal fistula, intestinal cystic pneumatoisis, emphysematous vaginitis or gas gangrene of the uterus.

Outcome: Antibiotic intravenous therapy with piperacillin-tazobactam, urinary bladder catheterization and strict glycemia control. As in any patient with diabetes mellitus, in patients with emphysematous cystitis, it is indicated to carry out a microbiological study of urine prior to the initiation of treatment and after the end of treatment to confirm eradication of the germ [6]. Complete clinical, radiologic and microbiologic resolution may be possible.

Teaching points: Emphysematous cystitis is a rare entity, most common in diabetic patients, which results from infection of the urinary bladder with gas-producing pathogens, mainly E. coli (also in this case). Clinical presentation is variable. Emphysematous cystitis can be diagnosed radiologically, mainly with CT scan. The management consists of broad-spectrum antibiotics, strict glycaemic control and bladder drainage. Emphysematous cystitis usually has a benign course, but complications may arise in up to 10-20% of cases, requiring surgical treatment. **Differential Diagnosis List:** Emphysematous cystitis, No differential diagnosis list, Gas within the bladder wall is virtually always due to emphysematous cystitis

**Final Diagnosis:** Emphysematous cystitis

**References:**


Description: Scanogram shows curvilinear areas of increased radiolucency in the region of the urinary bladder wall, separate from more posterior rectal gas. We can also see the colonic self-expandable metallic stent. Origin: Department of Radiology of HCUVA, Murcia, Spain.
Figure 2

Description: Diffuse intramural gas in the urinary bladder. There is also a bladder diverticulum on the right wall. Origin: Department of radiology, HCUVA, Murcia, Spain.
Description: Diffuse intramural gas in the urinary bladder, with hydroaereal level. We can also see the colonic self-expandable metallic stent. Origin: HCUVA, Murcia, Spain. Radiology.
**Figure 4**

**Description:** Intraluminal air in left common femoral vein is evident. It is not clear that it is related to the bladder process. There was no local procedure to justify this air. **Origin:** HCUVA, Radiology department. Murcia, Spain.