A mimicker of urothelial carcinoma: nephrogenic adenoma of the bladder

Published on 07.05.2011

DOI: 10.1594/EURORAD/CASE.9282
ISSN: 1563-4086
Section: Uroradiology & genital male imaging
Area of Interest: Kidney Urinary Tract / Bladder
Technique: Ultrasound
Technique: CT
Special Focus: Infection Hyperplasia / Hypertrophy

Dysplasias Case Type: Clinical Cases
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Clinical History:

Male patient with 2-year history of HIV infection not undergoing highly active antiretroviral therapy, hospitalised with complaints of fever, dysuria and haematuria.
Serum and urine laboratory tests were consistent with a clinical diagnosis of severe Escherichia coli urinary infection; renal function was within normal limits.

Imaging Findings:

Ultrasound revealed symmetrical renal enlargement with 15 cm craniocaudal diameter, increased cortical echogenicity and mild hydronephrosis; a broad-based endoluminal vegetation was appreciable along the right aspect of the urinary bladder.
CT confirmed bilateral renal enlargement with diffuse perfusion abnormalities consistent with clinical diagnosis of pyelonephritis; bilateral mild hydronephrosis with thickened enhancing walls consistent with purulent urine infection. The moderately distended bladder showed a diffuse mural thickening along its ventral and right lateral walls, with homogeneous solid density and clear enhancement during the venous phase. These findings were interpreted as consistent with primary bladder cancer, without signs of perivesical fat infiltration or lymphadenopathies. Cystoscopy confirmed multiple, diffuse vegetations with irregular mucosal surface and bilaterally patent ureterovesical junction. Extensive transurethral endoscopic resection was performed, and histologic specimen disclosed nephrogenic adenoma of the urinary bladder.
After 3 months, follow-up CT urography depicted well-distended, opacified bladder with postoperative disappearance of previously detected mural and endoluminal abnormalities.

Discussion:

Despite its name, Nephrogenic adenoma (NA) is not a tumour but an uncommon, non-malignant lesion of the urinary tract, histologically characterised by proliferation of tubules, cysts and papillae lined by low cuboidal to columnar epithelium. It is considered as a reactive metaplastic process of the urothelium following chronic mucosal irritation by recurrent infection, stone disease, previous intravesical instrumentation or surgery, or in renal transplant patients [1, 2].
NA may involve the urinary tract but is by far most frequent in the bladder, usually in adult patients with a striking male predominance [3, 4]. Its clinical and endoscopic features are nonspecific and suggestive for carcinoma or
chronic cystitis. Irritative voiding symptoms and haematuria are the usual complaints, occasionally NA is diagnosed accidentally in asymptomatic patients [1]. At cystoscopy, single or multiple polypoid or single sessile growths are observed and easily mistaken for urothelial carcinoma [2, 4]. The diagnosis is invariably histological, following endoscopic resection which is the optimal treatment, allowing both pathology specimen and symptom relief. Although NA is not premalignant, frequent long-term surveillance is needed due to the high recurrence rate reaching 63% [2-4].

With NA, imaging reveals polypoid or sessile masses within the bladder with a very nonspecific appearance [3]. In the past, intravesical masses and luminal irregularities of the mucosa have been reported at excretory urography, without clear radiographic features allowing differentiation from tumour or other inflammatory lesions [5]. Endoluminal projections are usually detected at ultrasound, whereas CT appearances closely resemble those of bladder carcinoma, including polypoid or plaquelike lesions enhancing in the nephrographic phase and appearing as endoluminal vegetations against opacified urine in the excretory phase; circumferential wall thickening may be observed with widespread lesions [6].

Although unusual, NA ranks among a variety of non-neoplastic disorders can cause either focal bladder masses or diffuse mural thickening and mimic urothelial cancer on clinical, endoscopic and imaging findings. Nephrogenic adenoma has no typical features, and careful histomorphologic and immunohistochemical pathologic evaluation is required for diagnosis: suspicion of non-malignant changes may only be raised considering the usually younger age of most patients compared to that of urothelial cancer, the presence of typical risk factors such as chronic urinary infection and history of previous endoscopic or surgical procedures, the absence of calcifications and invasion of the perivesical fat planes [2, 7].

**Differential Diagnosis List:** Nephrogenic adenoma of the urinary bladder, Urothelial bladder carcinoma, Schistosomiasis, Tuberculosis, Radiation cystitis, Chronic cystitis and detrusor hypertrophy, Bladder inflammatory pseudotumour, Malacoplakia, Cystitis cystica/glandularis, Eosinophilic cystitis

**Final Diagnosis:** Nephrogenic adenoma of the urinary bladder

**References:**


Figure 1

Description: Longitudinal scans of the right (a) and left (b) kidneys. Bilaterally enlarged kidneys with echoic parenchyma and hydronephrosis. Origin:
Description: Urinary bladder with right lateral with extensive endoluminal vegetations along the right lateral wall. Origin:
Figure 2

Description: Unenhanced (a), portal venous (b, c) and excretory (d) phase images confirm symmetrically enlarged kidneys with perfusion abnormalities, enhancing pelvicalyceal walls and preserved urine opacification. Origin:
Description: Unenhanced (a), portal venous (b, c) and excretory (d) phase images confirm symmetrically enlarged kidneys with perfusion abnormalities, enhancing pelvicalyceal walls and preserved urine opacification. Origin:
Unenhanced (e) and venous (f) phase images show extensive, enhancing thickening of the ventral and right bladder wall, without signs of invasion of perivesical fat. Origin:
**Figure 3**

**a**

**Description:** Post-treatment CT-urography shows well-distended opacified bladder with disappearance of previously detected abnormalities. **Origin:**

**b**

**Description:** Post-treatment CT-urography shows well-distended opacified bladder with disappearance of previously detected abnormalities. **Origin:**
Description: Post-treatment CT-urography shows opacified and patent urinary tracts with persisting hydronephrosis. Origin: