Case 3085

Transitional cell carcinoma of the ureter demonstrated with computed-tomography
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Section: Uroradiology & genital male imaging
Imaging Technique: CT
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Case Type: Clinical Cases
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Patient: 77 years, male

Clinical History:

The patient presented with painless gross intermittent hematuria.

Imaging Findings:

The patient had history of smoking for several years and presented with signs of painless gross intermittent hematuria. He was initially investigated with renal ultrasound and IV urography. Both examinations showed right hydronephrosis and dilatation of the proximal right ureter but were unable to reveal the cause of obstruction. CT was subsequently performed with additional injection of IV contrast-medium (CM). Right hydronephrosis with dilatation of the proximal right ureter was confirmed. Additionally, a focal distension of the right ureter was identified at the level of its mid third with no evidence of stranding of the periureteral fat. An intraluminal soft-density lesion was revealed on the delayed post-contrast images with the patient prone in position. It occupied the ureteral lumen and showed board attachment surface to the ureteral wall. There was no evidence of lymphadenopathy in the abdomen.

Discussion:

Ureteral tumors are rare lesions accounting for only 1% of all upper genitourinary tract neoplasms. Review studies report that almost 80% of the ureteral neoplasms are malignant. The radiological features of differential diagnosis between malignant and benign ureteral lesions may be ambiguous, so that radiologists should be aware of their clinical presentation and the predisposing factors. Non-contrast Computed Tomography (NCCT) has the ability to diagnose a wide range of entities that result in renal colic and ureteral obstruction. Under the suspicion of an underlying ureteral tumor in a patient with ureteral obstruction, NCCT can exclude calicular causes of obstruction (apart from the indinavir urolithiasis, all stones are visible on NCCT). Additionally it can reveal the tumor itself and its possible association with a stone causing obstruction. Transitional cell carcinoma (TCC) appears on NCCT as an intraluminal soft tissue mass and/or as an eccentric or circumferential thickening of the ureteral wall. In cases where the renal function permits the use of contrast medium, Contrast Enhanced Computed Tomography (CECT) appears to be complementary to NCCT. CECT can overcome potential pitfalls in the interpretation of NCCT such as phleboliths in the anatomic course of the ureter mimicking ureteral stones or a gonadal vein that can be confused with a dilated ureter. Moreover CECT gives the radiologist information about the lumen of the ureter and it helps to differentiate between a malignant and a benign tumor: In CECT, fibroepithelial polyps appear as solid intraluminal, longitudinal masses attached to the ureteral wall with presence of a continuous rim of contrast medium surrounding the central part of the solid mass. This kind of CT appearance excludes stones, blood clots, fungus balls as well as polypoid transitional cell carcinomas provided that the surrounding ureteral wall is thin. In CECT, TCCs may appear
as intraluminal filling defects with thickening of the wall that may be concentric, eccentric and/or irregular. Since CT has the ability to assess the periureteral extension of these tumors, it enables staging. Stage I lesions limited to the lamina propria and Stage II lesions infiltrating the muscular layer can not be differentiated with current CT technology; nevertheless, there is no therapeutic differentiation for these two stages. Soft tissue stranding in the periureteral fat in the vicinity of the tumor is regarded as evidence of Stage III. Enlarged retroperitoneal lymph nodes and distant metastases render the patient Stage IV.

**Differential Diagnosis List:** Transitional cell Ca of the right ureter (Stage II)

**Final Diagnosis:** Transitional cell Ca of the right ureter (Stage II)

**References:**


Description: Delayed post-contrast axial CT section of the abdomen with the patient prone in position: there is right hydronephrosis with dilatation of the proximal right ureter. Origin:
Figure 2

**Description:** Axial section at a lower level: a soft-tissue density lesion is seen within the right ureteric lumen (note that the patient is prone in position) surrounded by an incomplete rim of CM. **Origin:**
Description: Magnified view for Figure 2, focused in the region of the right ureter. The irregular surface of the soft-tissue lesion is highlighted by the surrounding rim of CM. A relatively broad attachment surface to the ureteric wall is noted but there is no stranding of the periureteral fat. Origin: