CLINICAL CASE

Echographic diagnosis of a urothelial tumor in the renal pelvis


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KEYWORDS
Urothelial tumor; Renal pelvis, Upper urinary tract tumors; Echographic diagnosis; Spain.

Abstract  Urothelial tumors of the upper urinary tract make up 5%-10% of all urothelial neoplasms. In those patients with clinical manifestations, hematuria is usually the first symptom and imaging studies are necessary for diagnosing this pathology. Presented herein is the case of an 82-year-old woman in whom a urothelial tumor in the renal pelvis was detected in an ultrasound study ordered as part of the urologic consultation. A computerized axial tomography (CAT) scan corroborated the diagnosis. A hand-assisted laparoscopic right nephroureterectomy was performed. The pathologic anatomy confirmed the existence of 2 urothelial tumors located in the renal pelvis and proximal ureter. More and more, ultrasound is being used as the initial imaging study in urologic consultations because of its elevated level of diagnostic cost-effectiveness. It has a high sensitivity for detecting bladder tumors, which are the most frequent. It is also useful in diagnosing upper urinary tract tumors. Consequently, it is important that the specialist be familiar with the echographic signs that these tumors present.

Diagnóstico ecográfico de tumor urotelial en pelvis renal

Resumen  Los tumores uroteliales de tracto urinario superior suponen un 5%-10% de todos los tumores uroteliales. En aquellos pacientes que presentan clínica, la hematuria suele ser el síntoma de inicio y son necesarias pruebas de imagen para llegar al diagnóstico. Presentamos el caso de una mujer de 82 años, a la cual se le detecta un tumor urotelial en pelvis renal, al realizar ecografía en la consulta de Urología. La tomografía axial computarizada...
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Introduction

Ninety percent of urothelial tumors are located in the bladder. Only 5%-10% are situated in the upper urinary tract, with pyelocalyceal implantation being twice as frequent as ureteral implantation. The progression and management of urothelial tumors differ notably in relation to their position (upper or lower urinary tract), and so they are treated as different entities.1 In those patients presenting with clinical manifestations, hematuria is usually the first symptom, regardless of location, and imaging studies are necessary for diagnosis.

Case presentation

An 82-year-old woman had a past history of smoking, high blood pressure, and dyslipidemia. She was referred to the urology service for an episode of a single symptom, self-limited gross hematuria of approximately 1-month progression. Physical examination was unremarkable. Urine sediment only presented with hematuria and the urine culture was negative. The remaining tests showed no clinically relevant alterations.

A kidney and urinary tract ultrasound study was ordered during her consultation and showed good bilateral corticomedullary differentiation. The right renal sinus was poorly defined and its interior was hypoechoic and isoechoic with respect to the renal cortex, suggesting invasion of the right renal pelvis (fig. 1). There were several simple bilateral renal cysts, the left kidney had no alterations, the ureters were not visualized, and the bladder, partially filled, showed no pathologic images.

Because invasion of the renal pelvis by urothelial tumor was suspected, a computerized axial tomography (CAT) scan was ordered. Not only did the CAT scan confirm the presence of the tumor in the renal pelvis, but it also showed a tumor implant in the right ureter (fig. 2). There were no adenopathies or other images of distant extension.

The patient underwent a hand-assisted laparoscopic right nephroureterectomy with endoscopic electrocoagulation of the right terminal ureter. Pathologic anatomy confirmed the existence of 2 low-grade urothelial tumors (G2 of the WHO). The larger one measured 5 cm in diameter and was located in the renal pelvis. The smaller one measured 1 cm in diameter and was located in the proximal ureter. The surgical margins and the distal ureteral edge were not affected. The final TNM classification was pT3N0M0.

The patient is currently disease-free and has periodic control CAT scans and cytology tests.

Discussion

Monosymptomatic hematuria is the most frequent symptom in cases of urothelial tumors. Initial diagnosis is based on the clinical history, physical examination, and complementary tests (full blood count, urine culture, cytology, and imaging studies).2 There are numerous radiologic examinations in the study of hematuria that include ultrasonography, intravenous urography (IVU), multidetector computerized tomography (MDCT) urography, and magnetic resonance (MR). Nevertheless, the order in which the specialist should request them and the selection of one over another has not yet been established. The decision is based on the signs and symptoms of the patient, the suspected pathology, the preferences of the specialist, and the availability of these resources at the center where the patient is being studied.3

Ultrasonography is being used more and more frequently as the initial imaging study for the diagnosis of many urologic pathologies because it is effective, inexpensive, noninvasive, it does not require contrast medium, and it is accessible in all centers.4 It is highly sensitive for detecting bladder tumors, which are the most frequent. In addition, in the study of microhematuria, it has not been inferior to IVU in the diagnosis of upper urinary tract tumors.5
Nevertheless, it is often necessary to perform additional imaging studies to confirm the diagnosis, especially in cases of upper urinary tract urothelial tumors. 6

There are a series of echographic signs that aid in the suspicion of renal pelvis tumor. Grant et al. 4 described a series of 11 cases of urothelial tumors in the renal pelvis that were diagnosed through ultrasonography. All of them demonstrated a hypoechoic lesion in the renal sinus. Of the 11 patients, 9 presented with echogenicity similar to the cortex and the other 2 were hypoechoic, with respect to the cortex.

Only 2 of the cases presented with associated hydronephrosis. Chang et al. 7 presented another series of 7 cases with hypoechoic lesions in the renal sinus, 5 of which were confirmed as urothelial carcinomas of the upper urinary tract. They described additional echographic characteristics that were suspicious of urothelial tumor in the renal pelvis: irregular and poorly defined tumor edges, the presence of a posterior sonic attenuation that made visualization of the posterior margin difficult, and the displacement of the hilar vessels by the mass.

There are a series of pathologies that can give a false image of urothelial carcinoma of the renal pelvis, that include coagulates, fungal balls, papillary desquamation, pyonephrosis, lipomatosis of the renal sinus, or renal tuberculosis. 8 Thus, when there is echographic suspicion of upper urinary tract tumor, it is necessary to confirm the diagnosis through another imaging study. Recent reports have shown that MDCT urography is more effective than IVU for detecting urothelial carcinomas of the upper urinary tract. 7 Likewise, MR is reserved for those cases in which it is not possible to carry out MDCT urography. And finally, it is accepted practice that, because there is a significant percentage of concomitant bladder tumors, cystoscopy be performed to rule out their presence. 5

**Conclusions**

Ultrasonography is being used more and more as the initial management study in urologic consultations because of its great diagnostic rentability. 11 It is highly sensitive for the detection of bladder tumors, which are also the most frequent. It is also useful in diagnosing upper urinary tract tumors. Thus, it is important that the specialist be familiar with the echographic signs these tumors present. When there is sonographic suspicion of urothelial tumor of the upper urinary tract, the study of choice for confirming the diagnosis is MDCT urography, because it has shown greater sensitivity than IVU.

**Conflict of interest**

The authors declare that there is no conflict of interest.

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