RESIDENT'S CORNER

A rare presentation of nephrogenic adenoma: multiple upper tract lesions in a female patient

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Nephrogenic adenomas are rare benign lesions of the urinary tract occurring most frequently in the bladder of male patients. We report the case of a female patient presenting with gross hematuria, which lateralized to the left ureter on cystoscopy. At the time of ureteroscopy, two polypoid lesions were identified in an upper and lower pole calyx, which were found on biopsy to be nephrogenic adenomas. In addition to reporting this case, we review the literature for the pathophysiology of nephrogenic adenomas.

Key Words: nephrogenic adenoma, hematuria, urothelial

Introduction

Nephrogenic adenomas are relatively rare benign lesions found within the urinary tract. While the pathophysiology of the lesions is not completely known, they often appear in patients with underlying trauma or irritation of the urothelium. They are also found at a relatively high rate in renal transplant recipients.[1-3] While occurring most often in the urinary bladder, these lesions have also been reported in the urethra, ureter, and very rarely in the renal pelvis. We report the case of nephrogenic adenomas found within two renal calyces in an otherwise healthy female patient.

Case report

A 65-year-old otherwise healthy female presented with the complaint of gross hematuria. The patient denied a history of urinary tract infections, prior urinary tract instrumentation, stone disease, or tobacco use. Her father had a history of bladder cancer. She had no flank pain or constitutional symptoms.

Urinalysis demonstrated 250 red blood cells per high-powered field, and 10 white blood cells per high-powered field. Urine cytology was negative, but a urine culture demonstrated greater than 100 thousand colony-forming units per milliliter of Staphylococcus aureus. Noncontrast computed tomography demonstrated only a simple right renal cyst, Figure 1. The patient underwent cystoscopy in the office, with the finding pink-tinged efflux of urine from the left ureteral orifice. A decision was made based on this finding to perform ureteroscopy and biopsy under anesthesia.

At the time of surgery, bilateral retrograde pyelograms were performed, which showed normal filling of the collecting systems without filling defects. Left ureteroscopy identified an approximately 1 cm polypoid lesion in a minor calyx of the upper pole. A similar lesion was found in a minor calyx in the lower pole. Biopsy of both lesions was performed with piranha biopsy forceps. Pathologic evaluation demonstrated both lesions to be nephrogenic adenomas.

The patient has not had any additional episodes of gross hematuria. Six month follow up with urine cytology, renal ultrasound, and urinalysis were completed. The urinalysis showed only 0 to 1 red blood cell per high-powered field, the urine cytology was negative, and renal ultrasound showed a stable simple right renal cyst. The patient will be evaluated again in 6 months with urine cytology, blood pressure monitoring, and urinalysis.

Discussion

Nephrogenic adenomas were first described in 1949 by Davis.[4] Since that time, there have been multiple reports in the literature of these benign lesions. The lesions occur more frequently in male patients, with a 2:1 to 3:1 ratio compared to female patients.[2,5,6] Pathologic evaluation can show several patterns of growth, including tubular, cystic, papillary, and rarely solid growth.[5] Tong described a histological diagnostic triad, which includes

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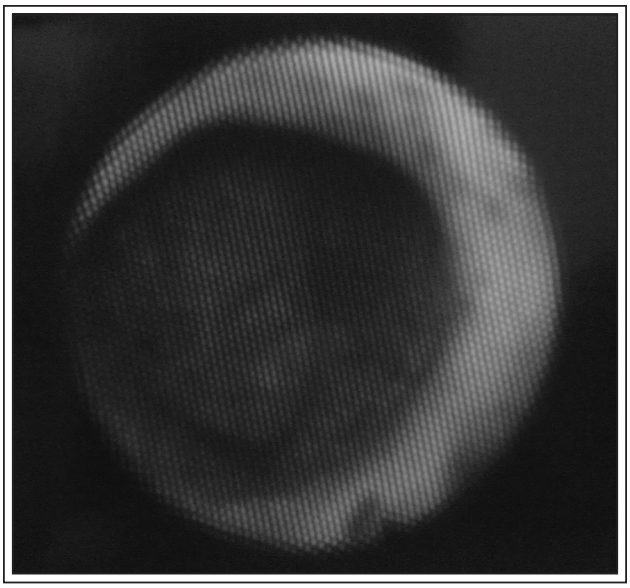

Figure 1. Intraoperative image of the mass.

small tubules and microcysts in the lamina propria, associated with papillary projections on the surface, all lined by a single layer of flat, cuboidal, or low columnar cells.[7] Histologically, nephrogenic adenoma must be distinguished from other malignancies that can be found within the urinary tract, including prostate cancer and urothelial carcinoma. The lesions may recur, with recurrence rates ranging from 27% to 90%.[1,2,5] The use of PAX2 staining may help distinguish nephrogenic adenomas from other urothelial lesions. PAX2 is a transcription factor found in the epithelial cells of fetal kidneys, and expression of the factor decreases in adult renal tissue. In a series of 39 nephrogenic adenomas from 36 patients, strong PAX2 staining was found in all 39 cases. This may be useful to distinguish nephrogenic adenomas from malignant lesions of the urinary tract.[7]

Nephrogenic adenomas are most commonly found in the urinary bladder, though they have been reported in the ureter and renal pelvis.[5,8,9] The case described here is one of the few reports of nephrogenic occurring in the kidney, and to our knowledge the only case of synchronous multifocal lesions within the kidney.

The pathophysiology of nephrogenic adenomas is not completely understood, though a history of urothelial trauma or inflammation is frequently observed. Predisposing factors may include urologic trauma or surgery, mechanical irritation, chronic inflammation, renal stones, repeated urothelial fulgurations, recurrent urinary tract infections, and intravesical therapy.[2,5] Nephrogenic adenomas are found in a surprising number of renal transplant recipients, with time from transplant to diagnosis of nephrogenic adenoma ranging from 9 months to 13 years in one study.[2] Nephrogenic adenomas were once thought to arise from metaplastic proliferation of cells within the urothelial mucosa. In a review of renal transplant patients diagnosed with nephrogenic adenomas, Mazal proposed that the lesions form when renal tubular cells detach and are incorporated into the urothelial mucosa. This was based on the finding that nephrogenic adenomas contained chromosomal material opposite the recipient's gender but concordant with the donor's gender. In this model, tissue from the donor kidney contributed to the formation of the nephrogenic adenoma.[3] While nephrogenic adenomas usually follow a benign course, there has been one report of bladder adenocarcinoma in the setting of recurrent nephrogenic adenomas.[10]

In conclusion, nephrogenic adenomas are benign lesions, most commonly found in the bladder. While they have a propensity to recur, their course is almost uniformly benign. While there are no accepted monitoring guidelines for this rare lesion, patients treated for a nephrogenic adenoma should probably be followed for a period of time with urine studies and possibly imaging studies. We report a case of nephrogenic adenoma in two minor calyces of a patient with gross hematuria, with the unusual characteristics of multiplicity and upper tract location. □

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