Early diagnosis of renal pelvis villous adenoma: A case report

Renal pelvis villous adenoma

Abstract

BACKGROUND

Villous adenoma is a rare tumor in the urinary system, which usually occurs in the bladder, but is extremely uncommon in the renal pelvis. Most of the previously reported cases have been diagnosed with severe hydronephrosis associated with renal parenchyma atrophy prior to surgery. Because of its rarity, available information on the pathogenesis, diagnosis, treatment and prognosis of the disease is limited. We here report a case of kidney stones with hydronephrosis. During percutaneous nephroscopic lithotripsy (PNL), a renal pelvis tumor was found. Biopsy confirmed that the tumor was a villous adenoma of the renal pelvis.

CASE SUMMARY

A 68-year-old woman was admitted to hospital due to right kidney stones with right hydronephrosis. After admission, a urinary system plain computed tomography (CT) scan was performed, which revealed right kidney stones with right hydronephrosis and right upper ureteral dilatation. Multiple new cauliflower-like papillary masses were then discovered in the renal pelvis and calyces during right PNL. Biopsy results indicated villous adenoma with high-grade glandular intraepithelial neoplasia. The patient underwent laparoscopic radical resection of the right kidney and ureter. Based on histopathological and immunohistochemical examination, the patient was diagnosed with villous adenoma without adenocarcinoma.
CONCLUSION

Villous adenoma is rare in the urinary system. We report a case of renal pelvis villous adenoma, which may provide useful information for the early diagnosis and treatment of this tumor.

**Key Words:** Villous adenoma; Renal pelvis; Primarily; Hydronephrosis; Early diagnosis; Case report


**Core Tip:** Villous adenoma is a rare tumor in the urinary system. We here report a patient who was admitted to hospital due to right kidney stones with right hydronephrosis. Biopsy indicated a villous adenoma with high-grade glandular intraepithelial neoplasia after right percutaneous nephroscopic lithotripsy. The patient underwent laparoscopic radical resection of the right kidney and ureter. Based on histopathological and immunohistochemical results, the patient was diagnosed with villous adenoma without adenocarcinoma.

INTRODUCTION

Villous adenoma is characterized by mucous glandular neoplastic cells appearing in a sessile papillary arrangement. It is commonly seen in the gastrointestinal tract, especially in the colon and rectum. It is worth noting that villous adenoma is uncommon in the urinary tract. They can occur in the bladder, urachus, ureter, and urethra. The typical clinical presentations are hematuria, irritative voiding symptoms, and mucinous urine[1,2]. Villous adenoma is rare in the renal pelvis[3]. We here report the early diagnosis of a case of renal pelvis villous adenoma, which has not previously been reported.
CASE PRESENTATION

Chief complaints
A 68-year-old female complained of pain and discomfort in her right back for 10 days beginning on December 2, 2020.

History of present illness
Her symptoms were aggravated after anti-inflammatory treatment at a local hospital.

History of past illness
The patient had right kidney stones with hydronephrosis for 5 years.

Personal and family history
The patient denied any family history of related conditions.

Physical examination
Physical examination revealed no obvious percussion pain in bilateral renal regions or obvious tenderness in bilateral ureteral regions.

Laboratory examinations
A radionuclide renogram showed that the left and right renal glomerular filtration rates were 57.8 and 15.6 mL/min, respectively. Serum carcinoembryonic antigen (CEA) was 25.43 ng/mL and serum carbohydrate antigen 19-9 (CA 19-9) was 69.29 U/mL.

Imaging examinations
Urinary system CT scan revealed right kidney stones with right hydronephrosis and right upper ureteral dilatation (Figure 1). Contrast-enhanced CT scan of the entire abdominal pelvic cavity showed no obvious suspicious space-occupying lesion in the right renal pelvis, or obvious abnormalities in the gastrointestinal tract.

FURTHER DIAGNOSTIC WORKUPS
After right ureteroscopy, a right PNL was performed. A large amount of turbid gelatinous effusion was found in the upper ureter and pelvis, and multiple new cauliflower-like papillary masses were discovered in the renal pelvis and calyces, and biopsy was performed. The biopsy results indicated a villous adenoma with high-grade glandular intraepithelial neoplasia (Figure 2). Differential diagnoses showed an urothelial carcinoma of renal pelvis; squamous cell carcinoma of renal pelvis; and inflammatory polyp of renal pelvis.

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**FINAL DIAGNOSIS**

Based on the results of the biopsy and pathological examination, the final diagnosis was renal pelvis villous adenoma.

**TREATMENT**

The patient underwent laparoscopic radical resection of the right kidney and ureter. In brief, the ureter was clamped in advance to prevent tumor dissemination, and an enlarged lymph node at the renal hilus was removed. After surgery, we found that the right ureter and pelvis were enlarged and filled with a large amount of mucinous effusion, obvious enlargement was observed in the upper segment, and a large amount of gelatinous mucinous effusion was found in the dissected specimen. A solid brown mass approximately 2.5 x 2.0 cm in size was found on the dorsal side of the kidney, and a stone was wrapped inside. In addition, the mass, which was convex to the renal pelvis, was covered with necrotic tissue, but this was not obvious in the papillary mass, residual
renal parenchyma, calyx or ureter (Figure 3). According to the histopathological and immunohistochemical results, the patient was diagnosed with villous adenoma without adenocarcinoma (Figure 4).

OUTCOME AND FOLLOW-UP

The patient recovered well without any discomfort. At 1 mo follow-up, serum CEA and CA 19.9 decreased to 2.05 ng/mL and 21.23 U/mL, respectively. At 1 year follow-up, serum CEA and CA 19.9 were 1.80 ng/mL and 19.85 U/mL, respectively, and no significant abnormalities were observed on urinary system CT.

DISCUSSION

The renal pelvis villous adenoma in our patient was found relatively early. CT showed dilation of the renal pelvis and upper ureter, with no obvious obstruction in the ureter. All previously reported patients initially underwent non-functional nephrectomy, and villous adenoma was found in the postoperative pathological examination. Possible tumors cannot be identified by preoperative CT or other related examinations[4,5]. After admission, the CT in our case indicated favorable function in the right kidney; therefore PNL was scheduled. During the operation, a large number of new papillary masses were discovered in the renal collecting system and the upper ureter, which were similar in appearance to common urothelial tumors. Notably, we first discovered the appearance of renal pelvic villous adenoma under endoscopy and successfully diagnosed it early through biopsy, which has not been reported before. Urinary calculi are frequently seen, but villous adenoma in the urinary system is very uncommon. Furthermore, the incidence of renal pelvis adenoma is extremely low. As in our patient, previously reported cases showed that most of the kidneys were complicated with stones, which had been present for a few years. Consequently, we considered that the development of renal pelvis villous adenoma might be associated with long-term stone stimulation. It is generally believed that renal pelvis villous adenoma is caused by long-term stimulation of stones and chronic inflammation[6]. The long-term stimulation
of stones and associated infections will cause injury to the urinary tract epithelium, which stimulates the regeneration and repair of urinary tract epithelium. Intestinal metaplasia occurs during the process of repeated repair, and later the heterogeneity increases step by step. These processes may gradually result in villous adenoma and advanced intraepithelial neoplasia, or even further malignant development of mucinous adenocarcinoma[7].

Due to the non-specific clinical and imaging findings, the diagnosis of renal pelvis villous adenoma before surgical treatment is challenging. All previously reported cases had been diagnosed by pathological examination after nephrectomy[8-12]. Unfortunately, our patient also ended up having a right nephrectomy due to concerns about the complicating mucinous adenocarcinoma. We envision that percutaneous laser resection of renal pelvis villous adenoma may be attempted in future cases, especially in isolated kidney patients, which would preserve good renal function.

According to previous reports, most patients have urinary tract infections and kidney stones. Moreover, some patients may also have fever, low back pain, abdominal discomfort, weight loss, and a small portion may have mucinous urine[10,11]. However, no obvious specificity was found in these patients, and plain or enhanced CT scan usually only show renal calculi with renal effusion, but the exact tumor tissue cannot be identified. There is no obvious causality of the effusion and obstruction caused by renal calculi. Therefore, constant vigilance is necessary in patients whose stones do not easily cause severe obstruction or hydronephrosis.

In our case, ureteroscopy was initially attempted. During the operation, a large amount of mucinous urine was found in the upper segment of the ureter, but no obvious stenosis or other obstruction was found. This situation might be interpreted as the upper ureter and pelvis calyces were narrowed due to mucinous urine with high viscosity which was not eliminated, resulting in hydronephrosis. Subsequently, PNL was performed, during which, a large number of papillary space-occupying tissues were found around the stone, which were similar in appearance to common urothelial tumors. Pathological examination showed that it was a villous adenoma. After the exclusion of metastatic
villous adenoma, no suspicious tumor tissue was found on abdominal and pelvic cavity CT scanning or gastroenteroscopy. All the results indicated that it was a primary renal pelvis villous adenoma. Therefore, ureteroscopy and percutaneous nephroscopy play important roles in the early diagnosis of suspicious masses. Moreover, relevant tumor indicators in the patient were reduced after the operation. Serum CEA was 25.43 ng/mL and serum CA19-9 was 69.29 U/mL before surgery, which decreased to 2.67 ng/mL and 30.63 U/mL, respectively, one week after the operation. According to the literature, CEA and CA19-9 Levels also increase in patients with renal pelvis mucinous tumors[12]. Therefore, for patients without related primary tumors, the levels of CEA and CA19-9 have certain reference significance for preoperative diagnosis, and can also be used as reference indices during postoperative follow-up.

CONCLUSION
The incidence of villous adenoma of renal pelvis is low, and early diagnosis and treatment are difficult. We reported the appearance and characteristics of a renal pelvis villous adenoma for the first time through PNL biopsy, which provides valuable data for the early diagnosis and treatment of this tumor. The relevant serum tumor markers have certain reference value for the diagnosis and follow-up of renal pelvis villous adenoma.

Figure Legends

Figure 1 Urinary system CT scan. A: Right kidney stones with hydronephrosis and upper ureteral dilatation; B: No obvious suspicious space-occupying lesion in the right renal pelvis was seen on the contrast-enhanced CT scan.

Figure 2 The biopsy results. A: Multiple papillary space-occupying masses in percutaneous nephroscopy; B: Villous appearance of the lesion shown with hematoxylin-eosin staining (×100).

Figure 3 Gross pathology of the resected right kidney and ureter. A: A large amount of gelatinous mucinous fluid was found in the renal pelvis and calyces; B: A hard solid mass
about 2.5 x 2.0 cm in size was found in the middle pole of the kidney. Furthermore, there was a stone about 1 cm in the mass and a papillary neoplasm below the mass.

Figure 4 Histological and immunohistochemical findings. A: Hematoxylin and eosin staining of the specimen from the lesion shows villous appearance (× 100 magnification); B: Immunohistochemical results show that cytokeratin (CK) 7 was positive; C: Immunohistochemical results show that CK20 was positive.
