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Case Report

A misdiagnosed case report of a parapelvic cyst in the renal sinus with an old hemorrhage and a literature review

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Abstract: A parapelvic cyst in the renal sinus is a type of renal cystic disease, and its incidence is extremely low, accounting for about 5% of renal cystic diseases. A normal parapelvic cyst is not difficult to diagnose with imaging examination. However, when the cyst is accompanied by infection or bleeding, it is difficult to distinguish it from renal pelvic carcinoma or cystic renal cell carcinoma in the renal sinus, and it is easily misdiagnosed and can even lead to excessive treatment. This case reports a patient with a parapelvic cyst in the left renal sinus area, in which there was an old hemorrhage and infection. The patient was misdiagnosed with renal pelvic carcinoma preoperatively, and radical nephrectomy was performed. However, the postoperative pathological diagnosis was a parapelvic cyst. Although the renal function of the patient is normal after surgery, it is still impossible to deny that the preoperative misdiagnosis leads to excessive treatment.

Keywords: Parapelvic cyst, renal pelvic carcinoma, differential diagnosis

Introduction

The kidney is one of the most common organs with cystic disease. It is found in autopsy that about 50% of cadavers whose age is greater than 50-years old have cystic changes in the kidneys [1]. There is a special type of renal cystic disease called the cyst of the renal sinus, including a parapelvic cyst, peripelvic cyst and pyelogenic cyst. Peripelvic cysts are relatively rare, accounting for about 5% of renal cystic diseases, and the peripelvic cysts located in the renal sinus are even more rare, only accounting for about 1% of renal cystic diseases [2]. The renal sinus cyst is special in its location and diversity in morphology, so it is difficult to distinguish it from hydronephrosis, ampullary pyelonephritis and renal tumors, and often leads to misdiagnosis [3]. Here, we report a misdiagnosed case of peripelvic cyst in the renal sinus, review the related literature, investigate the main points of diagnosis and treatment and analyze the causes for the misdiagnosis. Through the reporting of misdiagnosed cases and the summary of clinical experience, we hope to improve clinician's understanding of the disease, so to be more cautious when making diagnosis and reduce the occurrence of misdiagnosis and overtreatment.

Case report

A 60-year-old woman was admitted to our hospital because of intermittent left abdominal pain occurring for a week in October 2018. Physical examination findings were normal, and there was no particularly relevant medical history or family history. Abdominal ultrasound showed a 52×46 mm space-occupying lesion in the left renal hilum in which the echo was low. There were blood flow signals around the mass. A computed tomography (CT) scan and images with enhancement in three phases (**Figure 1A-D**) revealed a 4.2×4.5 cm soft tissue density mass which was unevenly enhanced on the enhanced scanning. The lesion was closely related to the left renal pelvis. The beginning of the wall of the left ureter was thickened and showed an enhanced change in the enhanced scanning. Intravenous pyelography (IVP) (**Figure**

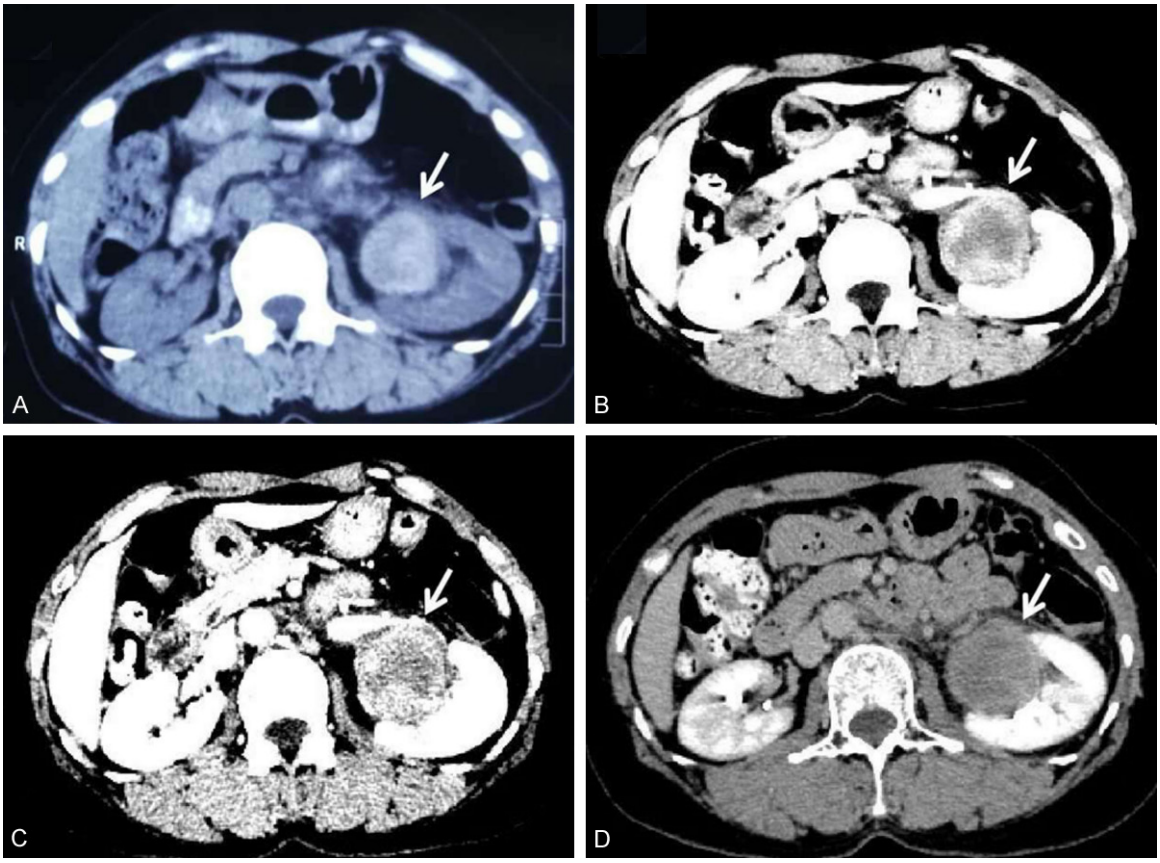

Figure 1. A. The CT scan. 4.2×4.5 cm soft tissue density mass was closely related to the left renal pelvis with some slight high-density shading. B. The arterial phase of CT scan. The mass had some slight reinforcement in the arterial phase. C. The venous phase of CT scan. The mass had an uneven reinforcement in the venous phase. D. The secretory phase of CT scan. The uneven reinforcement of the mass mildly reduced.

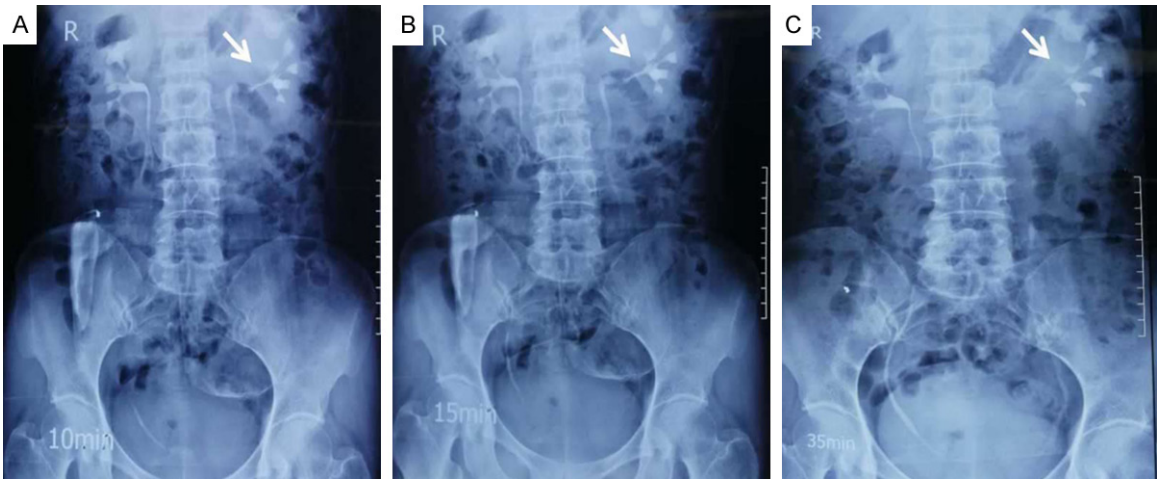

Figure 2. A-C. Intravenous pyelography. After injecting contrast medium, the left renal pelvis and calyces of the upper pole were irregular, and the renal pelvis was narrowed.

2A-C) revealed that the renal pelvis and calyces of the upper pole were irregular, and the renal pelvis was narrowed. Urination through bilateral ureters was clear and there were no abnormalities in the bladder with cystoscopy. The preoperative diagnosis was left renal sinus

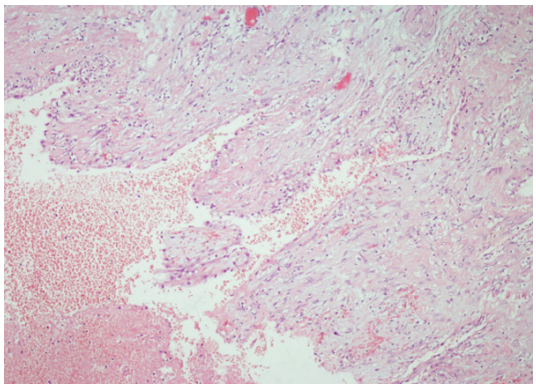

Figure 3. H&E staining. The mass was revealed as parapelvic cyst in the left renal sinus with an old hemorrhage and hematoma formation. There was granulation tissue growth and mechanization around the hematoma. Acute and chronic inflammatory cell infiltrated and hemosiderin deposited.

tumor, considering that left renal pelvic carcinoma was more likely. The tumor involved the left ureter, accompanied with left hydronephrosis.

Radical resection of the left kidney, left ureter and partial cystectomy were performed under general anesthesia. Histopathology (**Figure 3**) revealed a parapelvic cyst in the left renal sinus with old hemorrhaging and hematoma formation. There was granulation tissue growth and mechanization around the hematoma. Acute and chronic inflammatory cell infiltration and hemosiderin was deposited. Immunohistochemistry indicated CK-pan(+), CK5/6(-), CK7(-), P63(-). Combined with the pathological result, the diagnosis of parapelvic cyst in the renal sinus with an old hemorrhage was made. The patient had no fever, incision infection or other complications, and was discharged from the hospital after surgery. There was no abnormality in the B ultrasound and the blood creatinine level was also normal 6 months after surgery. Currently, the patient is still in follow-up.

Discussion

Renal sinus lesions mainly originate from the structure of the renal sinus, some also originate from the renal parenchyma or the renal sinus involving retroperitoneal lesions. The most common lesions are renal sinus hyperliposis and cysts [4]. Cysts in the renal sinus can be divided into two types according to the location of the cyst and the anatomical features of the surrounding tissue. A type I cyst is located in the renal sinus or protrudes into the renal sinus from the outside, and then expands into a round or round-shaped cystic low-density shadow. A type II cyst occurs in the bilateral renal sinus and develops around the renal pelvis into multiple “vine” or irregular morphological cystic low-density areas [5]. The classification helps to identify the anatomical relationship around the cyst. It has great significance in order to avoid damaging important tissue around the cyst and the occurrence of complications, and provides an objective basis for the choice of surgical methods.

The clinical symptoms of patients with renal sinus cysts are different. Most patients have no obvious symptoms and are diagnosed due to physical examinations or other systemic examinations. Some patients may have lumbago and hematuria [6]. When an infection is combined, chill, high fever and sputum pain in the kidney area may appear. Hypertension may occur when the cyst compresses blood vessels and leads to nephrarctia [7]. If the cyst is large or there is a lot of fluid in the renal pelvis, a mass could be felt by abdominal palpation. Renal failure can occur when the disease is advanced [8].

B-ultrasound is the first choice for the diagnosis of renal sinus cysts. It has many advantages, for example low cost, convenient operation, no radioactivity and so on. However, it also has limitations and is only suitable for initial screening and diagnosis [9]. CT plain scan and three-stage enhanced scans are important for the diagnosis of renal cysts and the most accurate diagnostic method for the pararenal cyst whose diameter is greater than 8 mm. Three-dimensional reconstruction by CT can clearly show the relationship between the cyst, renal pelvis and ureter, which greatly improves the accuracy of diagnosis and provides an objective basis for the choice of surgical plan [10, 11]. Intravenous pyelography (IVP) is mainly used for the differential diagnosis with other diseases.

It is not easy to distinguish parapelvic cyst from hydronephrosis, cystic renal cancer and renal pelvic cancer, and there have been a few reports of misdiagnosed cases [12]. So it is necessary to carry out differential diagnosis before making a diagnosis (**Table 1**). Hydronephrosis and parapelvic cyst appear as liquid echos and density in the renal sinus area on color doppler

Table 1. Differential diagnosis of parapelvic cyst and other diseases

	Parapelvic cyst	Hydronephrosis	Cystic renal cancer	Renal pelvic cancer
Age	All ages.	All ages.	> 40-year-old.	> 40-year-old.
Cause	Congenital dysplasia or acquired intrarenal obstruction.	Congenital and acquired factors. Obstruction, stone, tumor, etc.	Exposure to external carcinogens.	Exposure to external carcinogens.
Symptom	Lumbago, hematuria.	Lumbago.	Lumbago, hematuria and mass.	Hematuria.
Ultrasound	No echo area in renal sinus.	No echo area in renal sinus.	Slightly strong echo in hypoechoic fluid with thickened wall and some honeycomb like.	Hypoechoic mass in renal sinus area with renal sinus separation.
CT	Cystic mass is in renal sinus area without enhancement, and there may be high density shadow or enhancement when it combined with hemorrhage or infection.	The renal pelvis and calyces are dilated, and there is liquid density shadow in it without enhancement.	Cystic mass is with thickening and roughness of the cyst wall and nodule formation. The wall and separation are unevenly enhanced on the enhanced scan.	Lobulated or irregular soft tissue density mass is in renal sinus, with slightly enhancement on enhanced scan.
IVP	The developed renal pelvis and calyces are compressed and stretched.	The renal pelvis and calyces are dilated.	Most of urinary tract could be developed normally.	Irregular filling defect in the renal pelvis may combine with dilatation of renal pelvis.

ultrasound and CT. Hydronephrosis is usually a secondary disease and caused by other disease such as obstruction, stone, tumor and so on. Lumbago is a typical symptom of patients. However, parapelvic cyst is usually caused by congenital dysplasia or acquired intrarenal obstruction, and most patients have no clear symptoms. IVP is helpful for differential diagnosis. The renal pelvis and calyces with parapelvic cyst are compressed and stretched. The hydronephrotic pelvis and calyces are dilated and the cause of hydronephrosis may be indicated [13]. When the cyst of the renal sinus is combined with infection or bleeding, it is often difficult to distinguished between cystic renal cancer and renal pelvic cancer, resulting in misdiagnosis [14]. Cystic renal cancer and renal pelvic cancer are usually caused by exposure to external carcinogens. Cystic renal cancer manifests as thickening and roughness of the cyst wall and nodule formation on CT. On the enhanced scan, the wall of the capsule and the irregular separation are unevenly reinforced. Renal pelvic cancer is presented as a lobulated or irregular soft tissue density mass in renal sinus, with slight enhancement on the enhanced scan. A normal cyst is not enhanced on an enhanced scan, however when the cyst is infected or bleeding, it may also have uneven enhancement. Therefore, it is difficult to distinguish it from cystic renal cancer or renal pelvic cancer by imaging and leads to misdiagnosis [15].

The clinical symptoms of the pararenal cysts are not obvious, and most are diagnosed by chance or physical examination. Surgery is required when the following conditions occur. Large cysts with or without clinical symptoms, or the cysts are small, but there are typical clinical symptoms. Cysts combined with complications such as spontaneous or traumatic rupture and bleeding, infection or urinary stones. The preoperative diagnosis of a cysts is not clear and cannot be differentiated from renal malignant tumors. At present, laparoscopic surgery is the preferred treatment for cysts in the renal sinus, including the posterior laparoscopic approach and the transabdominal laparoscopic approach [16, 17]. Both paths have fewer intraoperative and postoperative complications, which can significantly improve the quality of life of patients and reduce the fear of surgery [18, 19]. Clinically, the choice of surgical procedure is mainly based on the location and size of the cyst, so as to achieve the best surgical outcome and the least postoperative complications. In recent years, transurethral ureteroscope laser incision of the cyst and internal drainage are gradually applied because there is only a thin film between the pararenal cyst and the renal sinus [20, 21]. With the development of minimally invasive techniques in urology, this method has been clinically recognized, and the postoperative treatment has no significant difference compared with other treatment methods [22].

In our case report, the patient was diagnosed with a parapelvic cyst combined with infection and an old hemorrhage. However, it was misdiagnosed as renal pelvic carcinoma before surgery, and radical surgery of renal pelvic cancer was performed. Therefore, although the progression of the pararenal cysts is slow, once bleeding or infection occurs, it is easily confused with renal pelvic carcinoma and lead to misdiagnosis and wrong choice of treatment. The report of a misdiagnosis for medical records may increase the clinical understanding of this type of disease, reduce the rate of misdiagnosis and avoid over-treatment.

Disclosure of conflict of interest

None.

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References

[1] Chang CC, Kuo JY, Chan WL, Chen KK and Chang LS. Prevalence and clinical characteristics of simple renal cyst. J Chin Med Assoc 2007; 70: 486-491.

[2] Israel GM and Bosniak MA. An update of the Bosniak renal cyst classification system. Urology 2005; 66: 484-488.

[3] Nahm AM and Ritz E. The renal sinus cyst-the great imitator. Nephrol Dial Transplant 2000; 15: 913-914.

[4] Schrier RW and Levi M. Lipids and renal cystic disease. Nephrol Dial Transplant 2010; 25: 3490-3492.

[5] Bisceglia M, Galliani CA, Senger C, Stallone C and Sessa A. Renal cystic diseases: a review. Adv Anat Pathol 2006; 13: 26-56.

[6] Chan JC and Kodroff MB. Hypertension and hematuria secondary to parapelvic cyst. Pediatrics 1980; 65: 821-823.
[7] Kiryluk K and Gupta M. A large obstructive parapelvic cyst: challenging diagnosis and management. Kidney Int 2007; 71: 955.
[8] Ishida K, Yuhara K and Kanimoto Y. A case of acute renal failure due to parapelvic cyst in a solitary kidney. Hinyokika Kiyo 2005; 51: 261-263.
[9] Deliveliotis A and Chr K. Parapelvic cysts of the kidney: report of seven cases. Br J Urol 2010; 41: 386-393.
[10] Androulakakis PA, Kirayiannis B and Deliveliotis A. The parapelvic renal cyst. A report of 8 cases with particular emphasis on diagnosis and management. Br J Urol 2010; 52: 342-344.
[11] Wood CG, Stromberg LJ, Harmath CB, Horowitz JM, Feng C, Hammond NA, Casalino DD, Goodhartz LA, Miller FH and Nikolaidis P. CT and MR imaging for evaluation of cystic renal lesions and diseases. Radiographics 2015; 35: 125-141.
[12] Koratala A and Alquadan KF. Parapelvic cysts mimicking hydronephrosis. Clin Case Rep 2018; 6: 760-761.
[13] Han D, Ma G, Wei L, Ren C, Zhou J, Shen C and He T. Preliminary study on the differentiation between parapelvic cyst and hydronephrosis with non-calculous using only pre-contrast dual-energy spectral CT scans. Br J Radiol 2017; 90: 20160632.
[14] Choi HS, Kim CS, Bae EH, Ma SK and Kim SW. Bilateral parapelvic cyst misdiagnosed as hydronephrosis. Chonnam Med J 2019; 55: 65.
[15] Parikh PU, Korobkin M, McClennan BL, Platt JF and Weingarten BJ. CT of parapelvic cystic renal cell carcinoma. J Comput Assist Tomogr 1992; 16: 586-588.
[16] Dunn MD and Clayman RV. Laparoscopic management of renal cystic disease. World J Urol 2000; 18: 272-277.
[17] Agarwal MM and Hemal AK. Surgical management of renal cystic disease. Curr Urol Rep 2011; 12: 3-10.
[18] Rossi SH, Koo B, Riddick A, Shah N and Stewart GD. Different successful management strategies for obstructing renal parapelvic cysts. Urol Int 2018; 101: 366-368.
[19] Rabii R, Mezzour MH, Essaki H, Aboutaieb R, El Moussaoui A, Joual A and Meziane F. Retroperitoneal laparoscopic treatment of parapelvic renal cysts: report of 5 cases. Prog Urol 2005; 15: 1070-1073.
[20] Luo Q, Zhang X, Chen H, Liu Z, Chen X, Dai Y and Zhao Z. Treatment of renal parapelvic cysts with a flexible ureteroscope. Int Urol Nephrol 2014; 46: 1903-1908.
[21] Basiri A, Hosseini SR, Tousi VN and Sichani MM. Ureteroscopic management of symptomatic, simple parapelvic renal cyst. J Endourol 2010; 24: 537-540.
[22] Zhao Q, Huang S, Li Q, Xu L, Wei X, Huang S, Li S and Liu Z. Treatment of parapelvic cyst by internal drainage technology using ureteroscope and holmium laser. West Indian Med J 2015; 64: 230-235.