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Primary renal squamous cell carcinoma mimicking the renal cyst: a case report and review of the recent literature

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Abstract

Background: Renal squamous cell carcinoma is a rare neoplasm with poor prognosis. Chronic irritation from nephrolithiasis and/or pyelonephritis is the leading cause.

Case presentation: We described a 51-year-old male patient who was admitted because of left flank pain. Ultrasonography showed a renal cyst containing calculus. However, contrast-enhanced ultrasonography and CT scan revealed an irregular-shaped mass derived from a calculi-containing cyst. Ultrasound guided biopsy confirmed the diagnosis of renal squamous cell carcinoma. The patient refused any further therapeutic management and died six months later.

Conclusions: Our present case emphasizes that the careful diagnostic work-up and use of multiple imaging modalities in cases of unusual renal calculi is quite necessary, since they may carry the risk of co-existing hidden malignancy.

Keywords: Kidney, Squamous cell carcinoma

Background

Squamous cell carcinoma (SCC) of the renal pelvis is a rare neoplasm, accounting only 0.5 to 0.8 % of malignant renal tumors [1]. The predisposing factors leading to development of SCC of the renal pelvis include renal calculi, infections, endogenous and exogenous chemicals, vitamin A deficiency, hormonal imbalance and radiotherapy [2–4]. We reported a case of primary SCC of the renal pelvis, which was unsuspected before biopsy, and the most recent related literatures were reviewed as well.

Case presentation

An otherwise healthy 51-year-old male suffering from persist left flank pain for one week and was referred to the urology department. Physical examination revealed mild left costovertebral angle tenderness but was otherwise normal. Routine diagnostic work-up including chest X-ray and laboratory investigations were all within the normal range, but ultrasonography revealed a renal cyst containing calculus. Further computed tomography (CT) of the kidneys revealed an irregular-shaped homogeneous mass derived from the cyst was found. The mass enveloped the renal pedicle, aorta and inferior vena cava (Fig. 1). The mass was biopsied percutaneously under ultrasonographic guidance. The histological examination revealed squamous cell carcinoma (Fig. 2). Considering that the mass was un-resectable, the patient refused any other treatment. He returned to home hospice and unfortunately died six months later.

Discussion

The kidney is an unusual site for SCC. Renal SCC, most of which is known to arise from collecting system, is a rare clinical entity representing only 0.5 to 0.8 % of malignant renal tumors [1]. It usually occurs in late adulthood and is reported of an equal incidence in men and women [5]. However, according to the recent literatures (Table 1), men bear a higher incidence of renal SCC, probably because of higher incidence of nephrolithiasis in men [2, 6–20]. Long-standing nephrolithiasis and/or chronic pyelonephritis are the most common causes for

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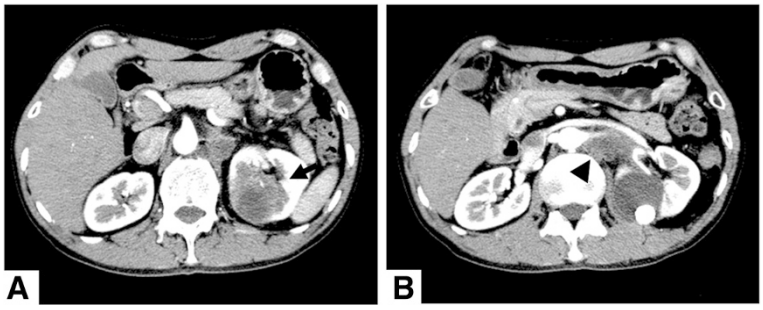

Fig 1 CT showed an irregular-shaped homogeneous mass (arrow) derived from the cyst and enveloped the renal pedicle

renal SCC. Other potential etiology have been described in the literatures, including exogenous and endogenous chemicals (e.g. arsenic), vitamin A deficiency, and prior surgery for renal stones, analgesic abuse, radiotherapy or chronic rejection in a transplant kidney [2–4]. Chronic irritation can cause squamous metaplasia of the renal collecting system, which may subsequently progress to leukoplakia and neoplasia of the urothelium, resulting in SCC of the renal pelvis. In our case, we speculated that the tumor has arisen in a chronically inflamed hydronephrotic calyx or a calyceal diverticulum with long term irritation by calculi.

Patients with renal SCC may present with flank or abdominal pain, microscopic or gross hematuria, fever, weight loss or a palpable abdominal mass (Table 1). It could also be the incidental finding on radiographic imaging for other reasons. Establishing the diagnosis of renal SCC by imaging techniques before biopsy or surgery is a clinical dilemma. Conventional ultrasonography is the choice of imaging modality for renal diseases evaluation, but renal SCC lacks specific echoic pattern in ultrasonography. Real-time CEUS was supposed to provide additional information for improving the diagnosis [21]. CT may play a crucial role in diagnosis and staging of the tumor. The radiologic evidences of renal SCC are diverse and may appear as a solid mass with irregular shape, hydronephrosis, calcifications, or as a renal pelvic infiltrative lesion without evidence of a distinct mass. The most helpful feature in CT of renal SCC is presence of enhancing extra-luminal and exophytic mass in some cases, with an intra-luminal component [16]. Lack of specific clinical and radiologic features in renal SCC would result in diagnostic confusion. Thus, the precise histological diagnosis was usually established after nephrectomy. For the un-resectable cases, both endoscopic and percutaneous biopsy could be applied to obtain the specimen. In our case, we chose ultrasound-guided biopsy because the CT scan presented the feature of extensive peritumoral vascular invasion, which indicated that the tumor was un-resectable.

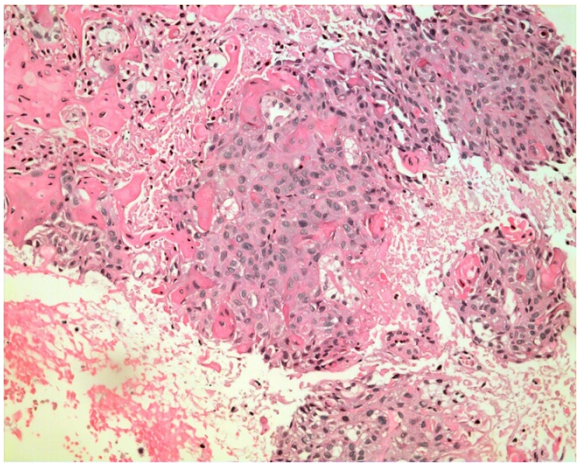

Fig 2 Biopsy pathology showing a high power view of squamous cell carcinoma (H&E x200)

Surgical resection is regarded as the mainstay of treatment for renal SCC [18]. However, the renal SCC is aggressive in nature and concealed. Most cases usually present at an advanced stage-pT3 or higher [16]. Therefore, for the treatment of advanced disease, a multidisciplinary approach comprising of surgical treatment and adjuvant chemoradiotherapy should be applied. Still, the prognosis of renal SCC is generally poor. According to the literatures, the outcome of renal SCC is dismal with a median survival of only several months postoperatively. Holmäng *et al.* reported that the prognosis of renal SCC is usually poor with a mean survival period of 7 months [5]. The 5-year survival rate is reported less than 10 % [14]. Thus, early diagnosis, monitoring of patients with long-standing nephrolithiasis, and new treatment modalities are urgently needed to improve patients' outcomes.

Conclusions

For patient with unusual renal calculi, the careful diagnostic work-up with multiple imaging modalities should be applied to exclude the co-existing hidden malignancy.

Table 1 Characteristics of the reported cases from recent 5 years

Author	Sex	Age	Presentation	Ultrasonographic/radiological feature	Treatment	Prognosis
Bandyopadhyay et al. [6]	M	58	Heaviness and swelling in the left upper abdomen	Hydronephrosis	Nephrectomy	N/A[a]
Imriaco et al. [7]	M	69	Left flank abdominal pain	A solid mass within the left side of a horseshoe kidney, with associated large renal stones	Partial left nephrectomy	N/A
Mathur et al. [20]	M	52	Heaviness and swelling in the left upper abdomen	Non-functional kidney with dilation of renal calyces	Nephrectomy	N/A
Jain et al. [10]	M	50	Right flank pain	Staghorn calculi with right renal hydronephrosis	Nephrectomy	N/A
	M	87	Left lower abdomen pain	Left nephrolithiasis with staghorn calculi and hydronephrosis	Nephrectomy	Die in hospital because of coronary complication
	F	50	Left flank pain	Left renal and ureteric calculi with absence of corticomedullary distinction	Nephrectomy + cisplatin-based chemotherapy	Alive at 3 months after surgery
	M	53	Bilateral flank pain	Right renal calculi with hydronephrosis	Nephrectomy + cisplatin-based chemotherapy	Alive at 5 months after surgery
Paonessa et al. [11]	F	70	Vague abdominal pain	Multiple calcified areas within superior pole of the left kidney	Nephrectomy	N/A
Baseskioğlu et al. [13]	M	56	Left flank pain and fever	Hydronephrosis, staghorn calculi	Nephrectomy + radiation	Local recurrence, died 3 years later
Verma et al. [12]	M	62	Intermittent colicky pain at the right lumbar region	Right pyonephrosis with nephrolithiasis	Pyelithotomy (Palliative) + chemotherapy	N/A
Ham et al. [15]	M	69	Swelling and pain of right upper abdomen	Severe hydronephrosis with calyceal stones	Nephrectomy + Chemo	Died 7 months later
Bhaijee [14]	F	77	Weight loss and severe anemia	Left upper pole renal mass, staghorn calculus and renal vein thrombus	Nephrectomy	Asymptomatic with no evidence of recurrent or metastatic disease 6 months after surgery
Kalayci et al. [16]	M	63	10 kg weight loss	Big, non-functioning right kidney with staghorn calculi and a hypodense mass within the renal parenchyma extending to the upper pole of the right kidney	Nephrectomy	N/A
Palmer et al. [17]	F	46	Incidental finding	Large Coarse calculi with dilated renal collecting systems	Nehprectomy	Died on postoperative day 8
Wu et al. [19]	M	66	Intermittent melena, nausea, malaise, and abdominal pain	Heterogeneous renal mass containing a staghorn stone	Exploratory operation + biopsy	Died less than 5 months
Lin et al. [18]	M	56	Hematuria	Right renal staghorn calculi	Debulking surgery	Asymptomatic with no evidence of recurrent or metastatic disease 6 months after surgery
Hameed et al. [2]	F	41	Chronic backache in the right gluteal region	Complete staghorn calculus with sacral bone metastasis	Chemotherapy	Died 2 weeks after the 3rd cycle of chemotherapy

[a]N/A = Not Available

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Abbreviations

SCC: Squamous cell carcinoma; CEUS: Contrast-enhanced ultrasonography; CT: Computed tomography.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

PJ and JJX drafted the manuscript. JJX provided imaging description and figures. CJW, SWC and JL assisted with manuscript preparation and literatures collection. LPX revised the manuscript. All authors have read and approved the final manuscript.

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