



## Oncology

# Primary renal angiosarcoma mimicking urothelial carcinoma – A case report and literature reviews



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## ABSTRACT

Angiosarcoma (AS) is a rare aggressive tumor originating from endothelial cells. We reported a 66-year-old female with primary renal angiosarcoma (PRA) who presented as urothelial carcinoma with hematuria and dysuria. Based on ureterorenoscopic tumor biopsy, the initial diagnosis suggested low-grade non-invasive urothelial carcinoma. However, the specimen retrieved from nephroureterectomy confirmed the diagnosis of primary renal angiosarcoma.

Primary renal angiosarcoma could uncommonly present as urothelial carcinoma in renal pelvis. Surgical resection remains to be the most effective therapy but there is no consensus about adjuvant therapies. The overall prognosis of primary renal angiosarcoma is dismal.

## Introduction

Primary angiosarcoma (PA) accounts for less than 2% of soft tissue sarcoma. It is a malignant neoplasm originating from endothelial cell. Two third of all reported PA cases arise in skin and soft tissues. Other anatomical sites including bone, liver, spleen and breast have also been recorded.<sup>1</sup> Primary renal angiosarcoma (PRA), also known as renal hemangiosarcoma, is an extremely rare disease that scarcely presented in kidney.<sup>2</sup> To date, less than 71 cases have been reported.<sup>3</sup> Most of the cases are difficult to be differentiated from other renal tumors due to their overlapping features. However, none of the previous cases were highly correlated with urothelial carcinoma.

Here, we presented a rare case of PRA with hematuria and dysuria that mimics urothelial carcinoma.

## Case presentation

A 66-year-old female was referred from a local medical clinic due to dysuria and hematuria with an incidentally detected right renal lesion

on abdominal ultrasonography. The patient had a medical history of hypertension, Diabetes Mellitus type II and hyperlipidemia. There was no related family history of malignancy and there was no personal history of smoking and alcohol consumption.

In the physical examination, no special findings were noted. Besides, no leukocytosis and normal creatinine level was shown in laboratory tests. Yet, urine routine revealed glucosuria and occult blood. The patient also underwent contrast enhanced abdominal computed tomography (CT) scans. The image study revealed 3.4\*3.6 cm demarcated hyper-vascular mass lesion in right renal pelvis to calices with gradual enhancement (Fig. 1). Because of the suspicious of renal pelvis tumor, the patient underwent right ureterorenoscopy and tumor biopsy. The pathologic report showed low-grade non-invasive papillary urothelial carcinoma (Fig. 2).

Based on the above image study and surgical results, the patient underwent Hand-assisted laparoscopic right nephroureterectomy with bladder cuff excision. The right kidney and ureter were dissected and excised carefully. A histologic examination revealed atypical vascular spaces lined by endothelial cells with cytologic atypia. The immuno-

*Abbreviations:* PRA, Primary renal angiosarcoma; PA, Primary angiosarcoma; CT, Computed tomography; PET, Positron emission tomography.

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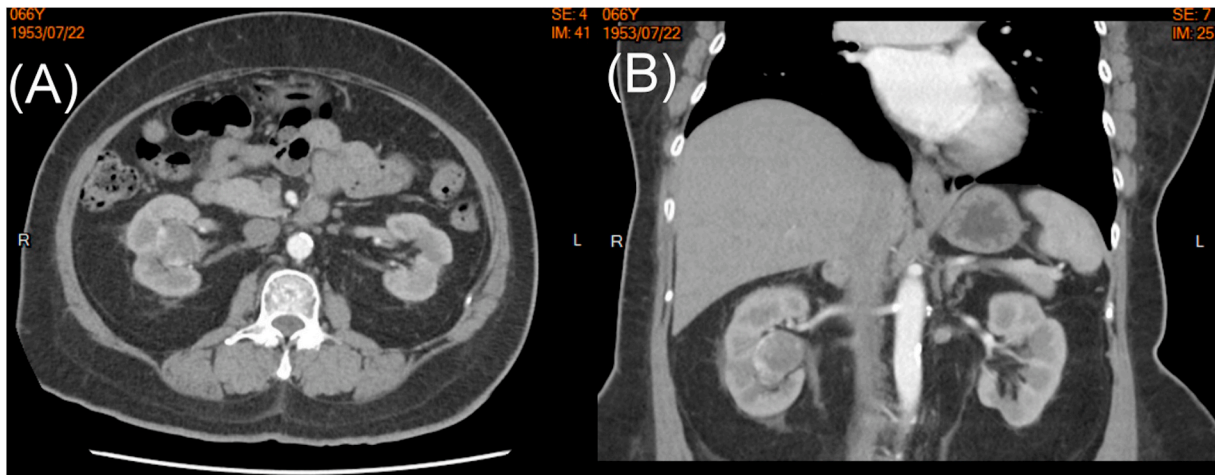
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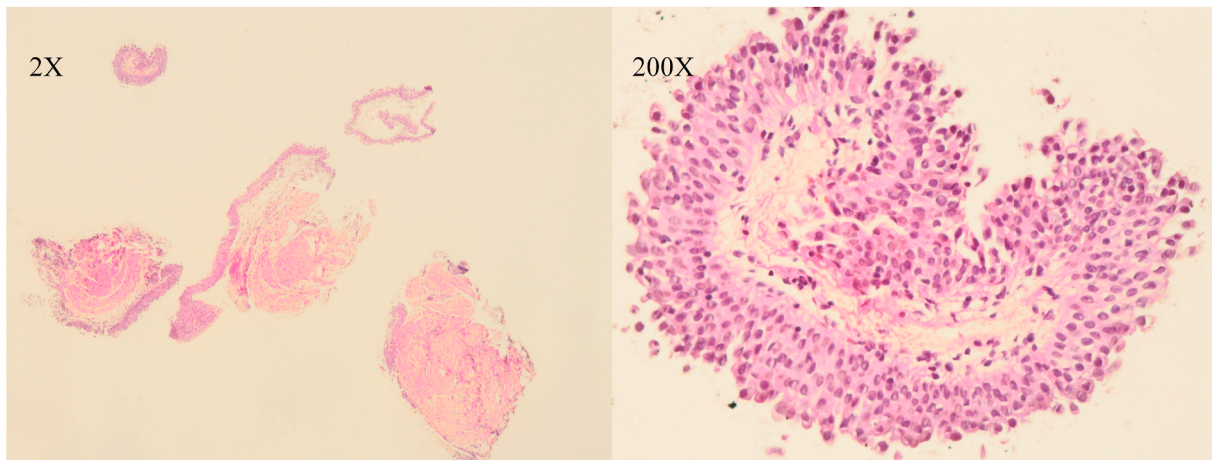
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**Fig. 1.** Contrast enhanced computed tomography (CT) of abdomen.

Contrast enhanced computed tomography (CT). A CT image reveals a suspicious renal pelvis tumor with peripheral contrast enhancement (orange arrows). (A) Transverse section and (B) coronal section. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)



**Fig. 2.** Histological examination of specimen from ureterorenoscopic tumor biopsy.

The findings of histological examination indicated papillary urothelial proliferation with mild cytologic abnormality mimic non-invasive low grade papillary urothelial carcinoma.

histochemical study (Fig. 3) revealed highly positive for CD31 (endothelial cell), CD34 (endothelial cell), FLI-1 (endothelial cell), and negative for HHV-8, HMB-45, CDK4, MDM2. The endothelial cell origin tumor of angiosarcoma is highly suggestive.

After operation, the patient was referred to oncology for further evaluation. Positron emission tomography was performed, and the result indicated no evidence of lung and lymph node metastasis. Thus, the oncologist suggested adjuvant chemotherapy therapy with Mesna, Doxorubicin, Ifosfamide, and Dacarbazine (MAID) and radiotherapy.

### Discussion and conclusion

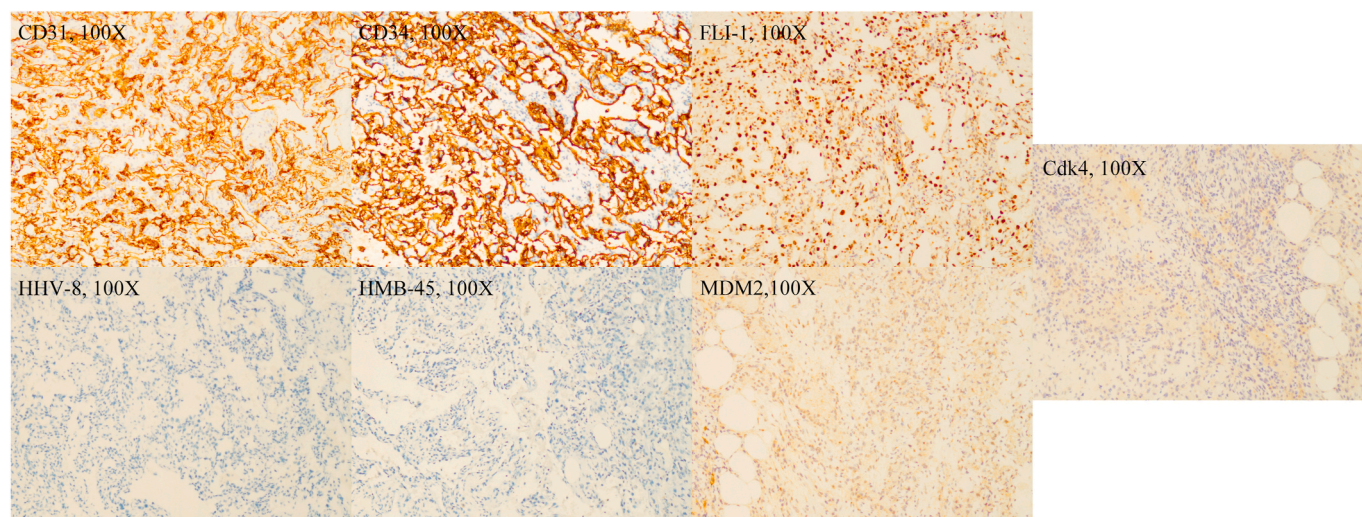
Primary renal angiosarcoma (PRA) is an extremely rare angiosarcoma that originates from endothelial cells. The etiology is still poorly understood. In previous studies, recorded 62 cases, indicated a male to female ratio of 7:1 and the median age of 61.<sup>1</sup> One literature review stated that androgen might be associated with PRA because the tumor was male predominant. However, no conclusive evidence has been provided. On the other hand, predisposing factors include polyvinyl chloride, arsenic, radiation and chronic lymphedema have been reported but the evidence is inconclusive. A few cases of PRA correlated

with pre-existing acute-myeloblastic leukemia, multicystic kidney disease, swannoma and angiomyolipoma.<sup>4</sup>

Early diagnosis is a challenging issue for PRA since the disease progresses rapidly. About 69.4% of patients have metastasis at the time of diagnosis or shortly after the operation.<sup>4</sup> The most common metastatic sites are liver, lungs and bones. Clinical presentations are overlapping in primary renal angiosarcoma and renal cell carcinoma. The most common presentations of PRA are flank pain, hematuria and palpable mass. In our case, hematuria and dysuria, commonly seen in urothelial carcinoma, were noted at the time of diagnosis.

Even though there is no consensus of radiologic studies in PRA, contrast-enhanced computed tomography remains to be the first option for tumor staging. Generally, heterogeneous hypodense renal mass with peripheral enhancement and fast wash out of the contrast agent at delayed phase are typical features in PRA. However, the image feature of renal cell carcinoma can be hyper-vascular, making it difficult to differentiate from PRA. In our case, the image study of the tumor depicted a solid mass lesion in renal pelvis and calices.

To make the diagnosis of PRA, histologic examination is essential. The morphologic features vary between cases, ranging from well-formed endothelial tumor cells with anastomosing capillary-size vessels to



**Fig. 3.** The immunohistochemical staining.

The immunohistochemical study revealed positive findings of CD31, CD34 and FLI-1 which are sensitive and specific for vascular tumors highlight the endothelial cells of blood vessels. Negative findings for HHV-8, HMB-45, MDM2 and CDK4.

poorly differentiated tumor cells. Nevertheless, the morphologic features are not the only diagnostic factors because subtypes of renal cell carcinoma such as clear cell, papillary and chromophore could also exhibit papillary or sarcomatoid differentiation seen in PRA.<sup>2</sup> To confirm the diagnosis, the histologic immunostaining. CD31, CD34, Factor 8 and FLI-1 are considered to be the positive markers for angiosarcoma. Among these markers, CD 31 is the most sensitive and specific to endothelial cell.<sup>5</sup>

The evidence of therapeutic treatment is limited due to paucity of PRA cases. Nevertheless, surgical resection remains to be the mainstay of the treatment. Adjuvant radiation therapy may have benefit on local disease control and survival rate, meanwhile, adjuvant chemotherapy is still controversial. Taxane-base and gemcitabine chemotherapy are the first line options for angiosarcoma as well as traditional anthracycline-based chemotherapy. Also, target therapy such as tyrosine kinase inhibitor may also play a role in alternative treatment.<sup>1</sup>

The prognosis was extremely poor in previous review of 64 PRA cases, the median follow-up time of which was 8.3 months and the median survival time was 7.3 months.<sup>2</sup> Local recurrence and metastasis commonly occur after the surgery, which may be due to the hematogenous nature of the angiosarcoma.

To sum up, primary renal angiosarcoma could uncommonly present as urothelial carcinoma in renal pelvis. Surgical resection remains to be the most effective therapy but there is no consensus about adjuvant therapies. The overall prognosis of primary renal angiosarcoma is dismal. Here, we presented a rare case of PRA with images and histologic features mimicking urothelial carcinoma.

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#### Availability of data and materials

The authors do not wish to share the patient's data. The patient only agreed to provide clinical materials for manuscript writing. The privacy of this participant should be protected.

#### Authors' contributions

KS-C performed the surgery. YS-J analyzed and interpreted the patient's image of CT. CC-C examined and interpreted the pathology. CW-C reviewed the literature, and was a major contributor in writing the manuscript. All authors read and approved the final manuscript.

#### Ethics approval and consent to participate

Approval for the study was obtained from the institutional review board of Kaohsiung Municipal Ta-Tung Hospital.

#### Patient consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

#### Declaration of competing interest

The authors declare no conflicts of interest.

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