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## Case Report

Asymptomatic adult Wilms' tumor: A case report<sup>☆</sup>

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## ABSTRACT

**Background:** Wilms' tumor, also called nephroblastoma, is an extremely uncommon kidney tumor of adulthood. We reported a adult man with a left kidney mass diagnosed as Wilms' tumor.

**Case presentation:** A 25-year-old man was hospitalized due to injury of the anterior cruciate ligament of the right knee. Preoperative imaging accidentally revealed a mass measuring 53 × 46 mm involving the middle and lower segments of the left kidney without evidence supporting the invasion of the surrounding structures or metastasis. The patient didn't show any symptom commonly occurred in Wilms' tumor, such as flank pain or hematuria. After nephrectomy, the diagnosis of adult Wilms' tumor was confirmed based on the tumor morphology and immunohistochemical findings.

**Conclusion:** In adult patients without any clinical manifestations or favorable imaging findings for low-stage renal cell carcinoma, the diagnosis of Wilms' tumor should be taken into consideration.

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## Introduction

Wilms' tumor, also called as nephroblastoma, is presumably originated from primitive metanephric blastema and is the

most common pediatric renal tumor, however, is extremely rare in adults [1]. In the adult population, the most common solid renal masses are angiomyolipoma, renal cell carcinoma (RCC), and oncocytoma [2]. It is suggested in adults that any primary renal neoplasm characterized by small blue

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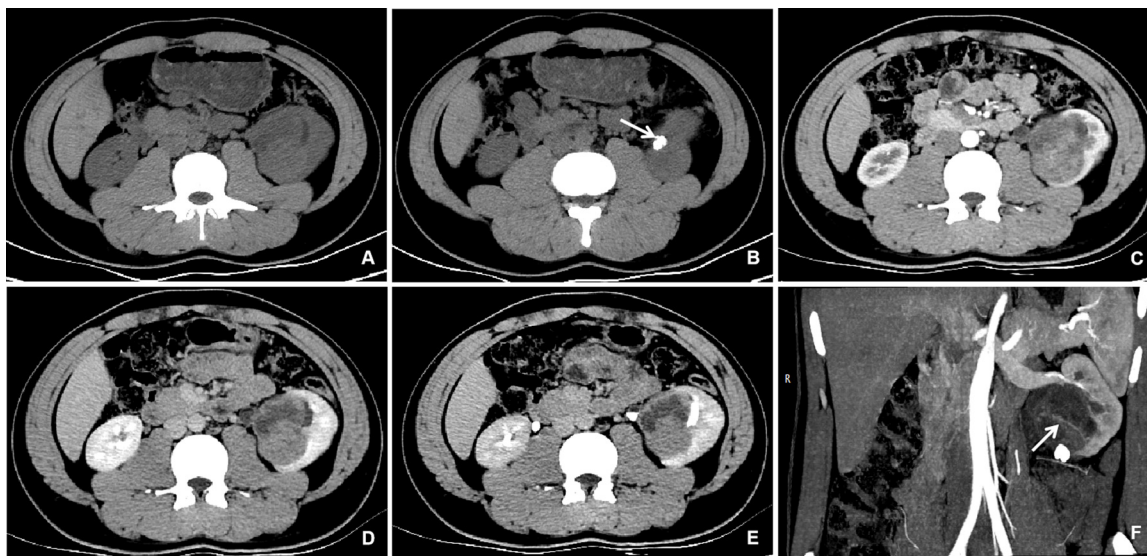
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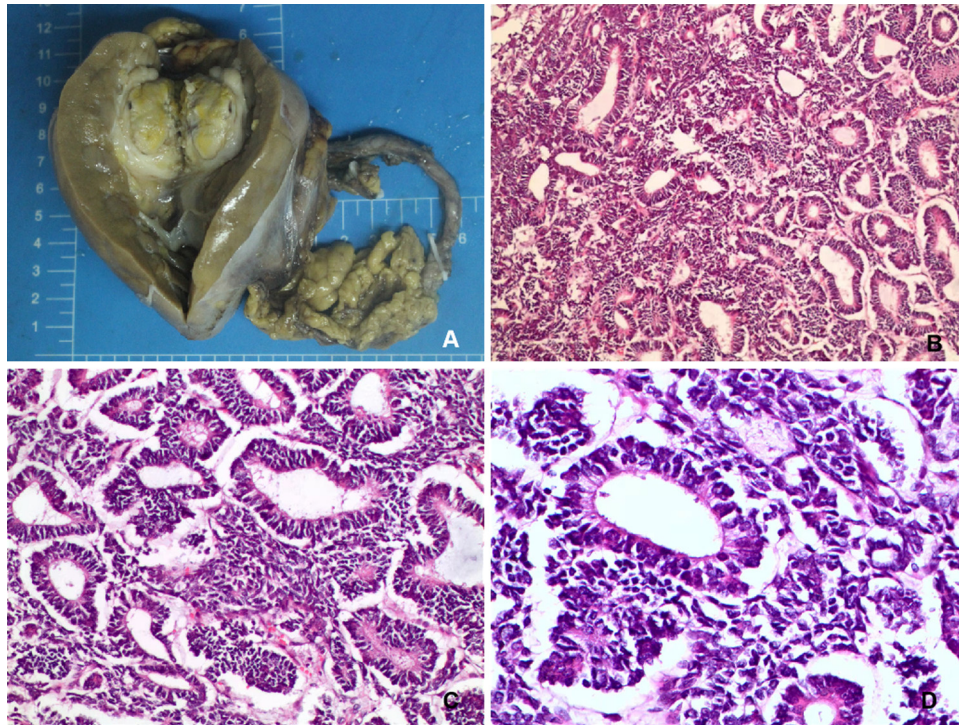
**Fig. 1 – Computed tomography (CT) images of our patient. On non-contrast enhanced CT, a heterogeneous solid-cystic mass was revealed in the middle and lower part of the left kidney (A,B) with nodular calcification (arrows in B). On the contrast enhanced CT, the solid lesion was enhanced during the cortical (C), medullary (D) and delayed (E) phases, but the cystic component was not enhanced. The blood vessels were indicated in the Maximum Intensity Projection images CT (arrows in F).**

round appearance with formation of embryonal tubules should be considered as potential Wilms' tumor or other primitive neuroectodermal tumor, when lacking histopathologic features of RCC [3]. In Wilms' tumor, a large palpable mass in the flank without any pain is the features for child patients [1,4], while flank pain and hematuria are the most frequently reported ones. Distant metastases are most likely to occur in the liver and lungs [5]. We reported a rare adult Wilms' tumor without flank pain or hematuria accidentally revealed during imaging examination.

## Case Presentation

A 25-year-old male patient was admitted to our hospital for surgical treatment of the right anterior cruciate ligament injury. Preoperative routine abdominal ultrasound revealed a hypoechoic mass involving the middle and lower segments of the left kidney. However, the patient didn't show any urinary related symptoms, such as flank pain or hematuria. A slight percussion pain in the left lumbar region were detected on the physical examination without any other unremarkable complaints. Laboratory examinations were negative but urinalysis was positive for crystallization (11.9/uL, while the reference value was 0/uL) and bacterium (110.2/uL, while the reference value was 0/uL). Glomerular filtration examination showed that the morphology of the left kidney was irregular, and the glomerular filtration rate was lower than the normal range (LGFR = 36.1 mL/min, RGFR = 46.7 mL/min, while the reference value was 45-60 mL/min). In abdominal non-contrast computed tomography (CT) scan, heterogeneous solid-cystic mass with clear boundary involving the middle and lower part of the left kidney was detected with approx-

imately 53 × 46 mm in diameter (Fig. 1A), the CT values of solid and cystic components were about 47.5 ± 6.6 Hu and 36.0 ± 7.4 Hu, respectively, with nodular calcification (Fig. 1B) and the collecting system was distorted and displaced. On the dynamic contrasted CT scan, the lesion showed uneven enhancement with the CT values of 68.3 ± 7.3 Hu, 65.1 ± 5.9 Hu, 67.1 ± 8.6 Hu for the solid components during the cortical (Fig. 1C), medullary (Fig. 1D), and delayed phases (Fig. 1E), respectively. The solid lesion enhancement was less than renal cortex during all phases while no significant enhancement of cystic components was observed. In cortical stage, small blood vessels were seen (Fig. 1F), and the affected renal pelvis and calyces were dilated and hydronephroid. The kidney mass did not invade to the surrounding structures and no enlarged lymph node was observed. Other abdominal organs were reported normal. Pulmonary and mediastinal spiral non-contrast CT was performed but offered no evidence for pulmonary or pleural metastasis. With a primary diagnosis of RCC, robot assisted laparoscopic nephrectomy and ureterectomy was performed. Macroscopic examination shows kidney with the connecting ureter. It has a mass with dumbbell like outer surface and size of 52 × 45 × 30 mm with the grayish yellow cut surface (Fig. 2A). In the light microscopic examination, renal pelvis and renal sinus fat were not involved (Fig. 2B–D). Immunohistochemistry demonstrated positive labeling for Ckp, CD34, CD56, PAX-8, sporadic positive labeling for ki-67 (index 60%), S100, but no positive labeling for Vimentin, WT-1, Syn, CgA, Renal Cell CM (RCC), TFE-3, NeuN, GFAP, Inhibin-α, CD10, EMA (image not offered). A adult Wilms' tumor (stage II) with hybrid type and high risk was diagnosed. Adjuvant chemotherapy with vincristine and actinomycin D regimen was given after surgery, and no recurrence was observed during 18 months of follow-up.



**Fig. 2 – Pathological findings of the adult Wilms' tumor. The gross specimen (A) and Hematoxylin and Eosin(H&E) stainings of the current Wilms' tumor were demonstrated at 100 (B), 200 (C) and 400X (D) magnifications.**

## Discussion

Wilms' tumor, is one of the most common embryonic tumor in children younger than five years old but very rare in the adult population that is often misdiagnosed. The presence of embryonic glomerulotubular structures within the immature spindle stroma are essential features for Wilms' tumor, but rare for RCC [6].

The most common presenting symptoms in adult Wilms' tumor include pain (flank, abdominal, or back), hematuria, abdominal mass, and complains of weight loss or fever. While in children, it more likely to present a palpable mass [7]. Most Wilms' tumors are in advanced stages with a poor prognosis but are seldomly revealed as with low stage and good prognosis [8] as in our case.

Wilms' tumors are often with ill defined margin, and more likely presented as a nonhomogeneous solid cystic mass with reduced attenuation or enhancement toward renal parenchyma, with or without calcification components [9]. Calcification is suggested to be a marker for localized and well-differentiated tumors, indicating slow tumor growth and a favorable prognosis [10]. In consistent with this, nodular calcification was revealed in our case and the patient is doing well to date with no relapse. MRI is the gold standard for staging renal tumors. On T2WI MRI, Wilms' tumor is described as an isointense or hypointense lesion in distinction to many other hypervascular renal tumors that are heterogeneous and hyperintense on T2WI imaging. Therefore, one may confidently distinguish WT from other hypervascular renal tumors based on the enhanced features on

MRI and CT [11]. In addition, the Wilms' tumor angiogram shows as a hypovascular mass with some tortuous neovessels but without arteriovenous shunting [12]. Except for the above-mentioned imaging features, adult Wilms' tumor are usually diagnosed in advanced stages with large renal mass and extensive regional lymphadenopathy [13] not like our current case with typical CT features but no lymphadenopathy or metastasis.

In conclusion, although most adult Wilms' tumors are with symptoms such as flank pain and hematuria, as well as at the advanced stages, but when patients without clinical symptoms were presented, adult Wilms' tumor diagnosis should be taken into consideration based on the typical imaging findings as lesion margin, enhancement and calcification.

## Authors' contributions

Bai YF and Niu JQ contributed equally to this article as co-first authors. All authors read and approved final version of this manuscript.

## Patient consent

Written informed consent was obtained from the patient for the publication of patient information in this article.

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