

## Renal cell carcinoma: a pediatric case report

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### Summary

A 12-year-old girl was admitted to the Department of Pediatrics with the complaints of a large swelling and pain in her upper left quadrant following a blunt trauma three days prior to the referral. Computed tomography revealed a mass around the left kidney compatible with a large hematoma, and open surgical exploration was performed. Left nephrectomy was carried out since the frozen section specimen obtained from the wall of the mass that was full of hematoma was suspicious for malignancy. Result of the histopathological examination was clear cell carcinoma limited to the kidney. Our case, who developed a renal cell carcinoma at a young age, might have been diagnosed too late if the trauma had not happened. Literally, "a blunt trauma to her kidney might have saved her life."

**Key words:** Pediatric renal carcinoma, trauma

### Özet

**Böbrek hücreli karsinoma: bir pediatrik olgu sunumu**  
On iki yaşında kız hasta, karnına aldığı künt travmadan 3 gün sonra, sol üst kadranda ağrı ve büyük bir şişlik yakınması ile çocuk hastalıkları kliniğine getirildi. Çekilen tomografisinde sol böbrek çevresinde geniş hematoma ile uyumlu kitle tespit edilen hasta explore edildi. İçi hematoma ile dolu olan kitle duvarından alınan örneğin "frozen section" incelemesi malignite şüpheli gelmesi üzerine hastaya sol nefrektomi uygulandı. Histopatolojik inceleme sonucu böbreğe sınırlı berrak hücreli karsinom olarak belirlendi.

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Genç yaşta böbrek hücreli karsinomu olan olgumuzun tanısı, eğer travma olmasaydı çok geç konabilirdi. Daha doğru bir deyişle "böbreğine aldığı künt travma olgumuzun hayatını kurtarmış olabilir."

**Anahtar kelimeler:** Pediatrik böbrek karsinomu, travma

### Introduction

Renal cell carcinoma (RCC) which constitutes 90% to 95% of renal tumors in adulthood is very rare among children (5.9% of pediatric kidney tumors) (1). Approximately 350 patients have been reported in case reports and small series. Pediatric RCC may be quite different from adult type in terms of clinical presentation, behavior, and coexistence with genetic abnormalities and neuroblastoma (2). Pediatric RCC usually presents with the symptoms of primary tumor as opposed to the incidental diagnosis of adult RCC in almost 50% of the cases. We hereby report a 12-year-old patient with RCC who was diagnosed upon referral for a blunt trauma to the kidney.

### Case Report

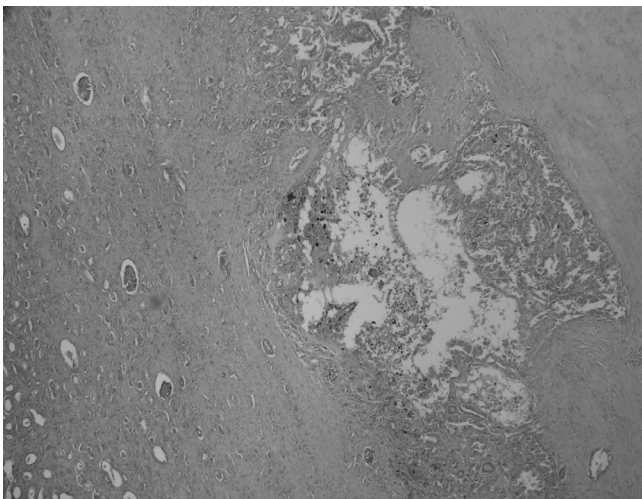
A 12-year-old girl was brought to the Emergency Department of Pediatrics with the complaints of a large swelling and pain in her upper left quadrant following a blunt trauma three days prior to the referral. On physical examination, a mass was palpated, which almost entirely invaded the upper left quadrant and left flank. WBC count, blood biochemistry and urine analysis were found to be normal while hematocrit and hemoglobin values were 27.7% and 9.9 gr/dL, respectively. Abdominal ultrasound revealed a 15-cm thick-walled mass that originated from lower pole of the left kidney

and lied towards umbilicus, and that contained internal septations. The wall of the mass showed contrast uptake and its contrast content was calculated to be 26 HU on abdominal computed tomography (CT), which was consistent with hematoma (Figure 1).



**Figure 1.** The mass originating from left kidney and invading the left upper quadrant of the abdomen almost entirely

Open surgical exploration revealed that the mass contained a hematoma, and a nephrectomy was carried out since the frozen section of the wall of the mass was suspicious for malignancy. Eventually, clear cell carcinoma limited to the kidney was diagnosed on histopathological investigation (Figure 2). The patient was evaluated in terms of Von-Hippel-Lindau disease in the Department of Pediatrics postoperatively. Her abdominal and cranial CT, retinal examination and other laboratory findings were normal. The patient is disease-free in terms of her primary pathology at the 10th postoperative year now.



**Figure 2.** Histopathologic view shows tumor entrapped in the fibrotic capsule separating the tumor from renal parenchyma

## Discussion

RCC is extremely rare among pediatric population. Only 0.3% to 1.3% of all cases are younger than 15 years. The mean age for pediatric RCC is around 9 years as opposed to the relatively earlier age for Wilms' tumor (3). Due to its rareness among children, there is no distinct criteria pertaining to the diagnosis, treatment and follow-up of pediatric disease. Therefore, characteristics of adult RCC have been considered in this regard.

Two recent studies reported that around 45% of the cases were at stage I at the time of diagnosis while previous studies reported advanced disease at presentation (4,5). Increase in the rate of early diagnosis may be explained by the increase in the availability of advanced imaging modalities.

The most common sign of pediatric RCC is abdominal mass (21.9% to 64%) and hematuria (29.2% to 50%) (5,6). Abdominal mass is palpable in around 20% of the cases (5). The mass in our case belonged to the hematoma from the injured kidney with tumor, and the tumor had manifested after a blunt trauma. Kidneys with tumors have been shown to be more vulnerable to trauma than normal kidneys. Tumors were found incidentally in 4 of the 675 cases who underwent surgical exploration after renal trauma (7). This is a higher rate than the incidence of the disease in normal population, which is 8.7/100 000 new patients per annum (8).

Papillary histology has previously been reported to be more frequent among children (8). However, the ratio of clear cell carcinoma were 45% and 58.5% in two recent pediatric series (4,5).

The prognosis in children has been reported to be no different than adults, and patient age, dimensions of the tumor, histologic type and vascular invasion were important criteria for prognosis (3,9). However, a more recent retrospective study suggested contradictory findings, and it was suggested that the stage of the tumor and completeness of the excision were the most important prognostic factors (10). Estimated 20-year event free survival rates for stage I and II cases were 89%, while the ratio decreased to 18% and 22.6% in stages 3 and 4 patients, respectively (5).

It is a pity that many patients remain undiagnosed until their masses become palpable since there are usually no symptoms during the early period of the disease. Our case, who developed a RCC at a very young age, might have presented after it was too late if the trauma had not happened. Literally, "a blunt trauma to her kidney might have saved her life."

## References

1. Geller JI, Dome JS. Local lymph node involvement does not predict poor outcome in pediatric renal cell carcinoma. *Cancer* 2004; 101: 1575-1583.
2. Fleitz JM, Wootton-Gorges SL, Wyatt-Ashmead J, et al. Renal cell carcinoma in long-term survivors of advanced stage neuroblastoma in early childhood. *Pediatr Radiol* 2003; 33: 540-555.
3. Dehner LP, Leestma JE, Price EB. Renal cell carcinoma in children: a clinicopathologic study of 15 cases and review of the literature. *J Pediatr* 1970; 76: 358-369.
4. Estrada CR, Suthar AM, Eaton SH, et al. Renal cell carcinoma: Children's hospital Boston experience. *Urology* 2005; 66: 1296-1300.
5. Indolfi P, Terenziani M, Casale F, et al. Renal cell carcinoma in children: a clinicopathologic study. *J Clin Oncol* 2003; 21: 530-535.
6. Asanuma H, Nakai H, Takeda M, et al. Renal cell carcinoma in children: experience at a single institution in Japan. *J Urol* 1999; 162: 1402-1405.
7. Giannopoulos A, Serafetinides E, Alamanis E, Constantinides C, Anastasiou I, Dimopoulos C. Urogenital lesions diagnosed incidentally during evaluation for blunt renal injuries. *Prog Urol* 1999; 9: 464-469.
8. Novick AC, Campbell SC. Renal tumors. In: Walsh PC, Retik AB, Vaughan ED, Wein AJ (eds). *Campbell's Urology*. 8th ed. Vol 4. Philadelphia: WB Saunders, 2002: 2672-2731.
9. Motzer RJ, Bander NH, Nanus DM. Renal cell carcinoma. *N Engl J Med* 1996; 335: 865-875.
10. Aronson DC, Medary I, Finlay JL, et al. Renal cell carcinoma in childhood and adolescent: a retrospective survey for prognostic factors in 22 cases. *J Pediatr Surg* 1996; 31: 183-186.