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CASE REPORT

# Wilms Tumor Mimicking Renal Pelvis Hematoma in a Post-Traumatic Pediatric Patient: Case Report


## ABSTRACT

Wilms' tumor (WT) is the most common renal tumor of childhood. Children with WT may present with a large, painless, abdominal mass and usually no constitutional symptoms. In our case, there were neither symptoms nor any physical examination findings that would lead us to WT. Herein, we report a 4-year-old male who presented to our clinic with concern for a traumatic lesion in abdomen. He was asymptomatic and had a small bruise on left upper quadrant. Ultrasound revealed a heterogeneous lesion which fills the renal pelvis. Renal pelvis hematoma and space-occupying lesions originating from the collecting system epithelium was considered as differential diagnoses. After kidney biopsy, the diagnosis of WT was confirmed. We present this case of WT to keep it in mind in the differential diagnosis of renal pelvis hematoma in a pediatric post-traumatic patient. We emphasise the importance of using multimodal approaches to make the correct diagnosis.


**Keywords:** Case report, post-traumatic patient, renal pelvis hematoma, Wilms tumor

Wilms' tumor (WT) is the most common renal tumor of childhood which influences nearly one child per 10,000 global under the age of 15 in one year (1). 80% of patients with WT are diagnosed between 1-5 years of age (2). Boys are generally diagnosed at a younger age than girls, while the frequency of WT is moderately higher in girls (3).

WT is a malignant embryonal renal tumor composed of variable amounts of embryonic renal elements (blastema, epithelium, and stroma) (2).

The most typical manifestation of WT is an asymptomatic abdominal mass. Abdominal pain, fever and microscopic hematuria are other common findings at diagnosis, while gross hematuria is rare (4).

In this case report, we report an unusual case in which a child presented with a clinical picture suggestive of a renal pelvis hematoma, however was instead found to have an intrapelvic WT extending to the proximal ureter.

## CASE

A 4-year-old male patient was admitted to our clinic with a concern of traumatic lesion in the abdomen. It was learnt from his family that he fell on iron rods in a construction zone (Figure 1). On inspection, there was a small wound on the left upper quadrant (Figure 1). On physical examination, no abdominal mass was detected.

Renal ultrasonography revealed a heterogeneous-hypoechoic lesion which is approximately 82x60 mm in size, almost completely filling the renal pelvis. The lesion showed increased vascularity on colour doppler ultrasound (Figure 2). Left renal vein, left renal artery and inferior vena cava were patent. The lesion extended to the calyceal structures within the parenchyma and inferiorly to the ureteropelvic junction. In addition, there was a grade III increase in echogenicity in the upper pole of the left kidney due to venous engorgement secondary to a possible compression effect. In the differential diagnosis, space-occupying lesions originating from the collecting system epithelium, hematoma, angiomyolipoma with a connection to the collecting system and hydropyonephrosis due to ureteropelvic stenosis were considered. Hence, CT (Computerized Tomography) scan and MRI (Magnetic Resonance Imaging) were performed.


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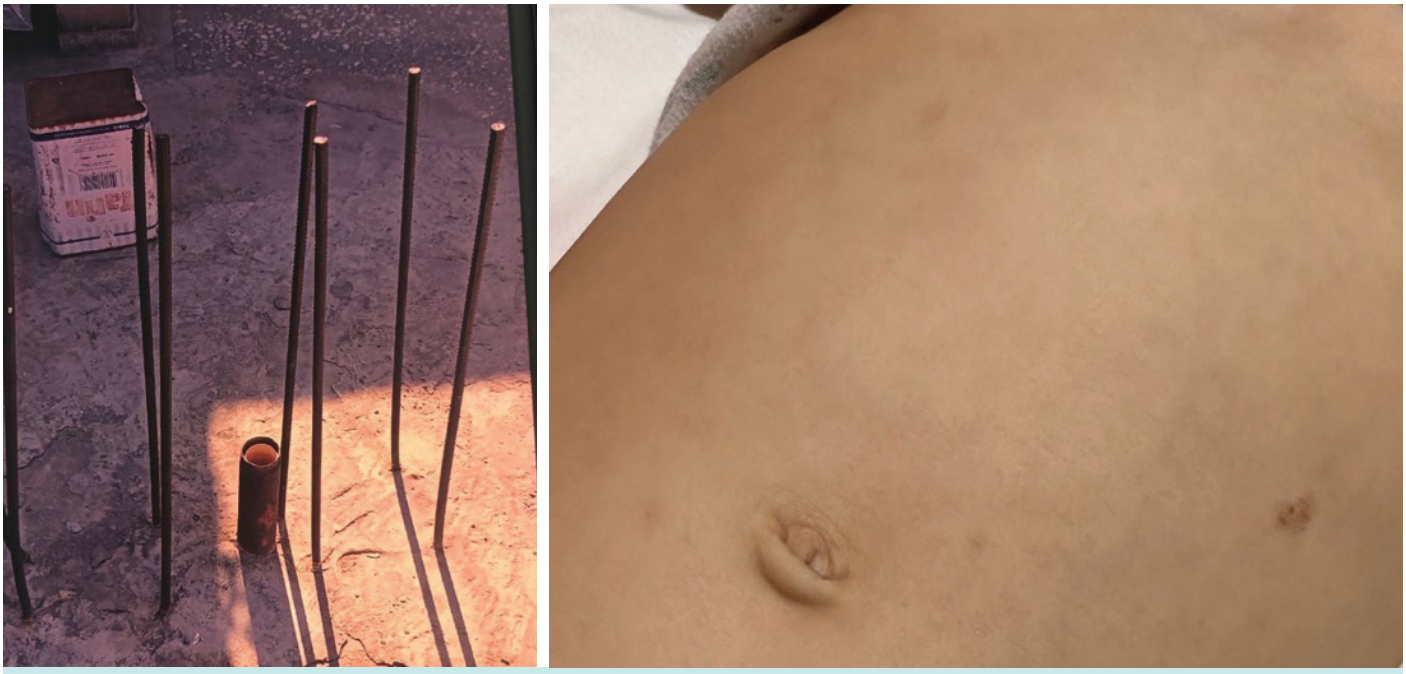

**Figure 1. Small wound on the left upper quadrant from falling on iron rods in a construction zone.**

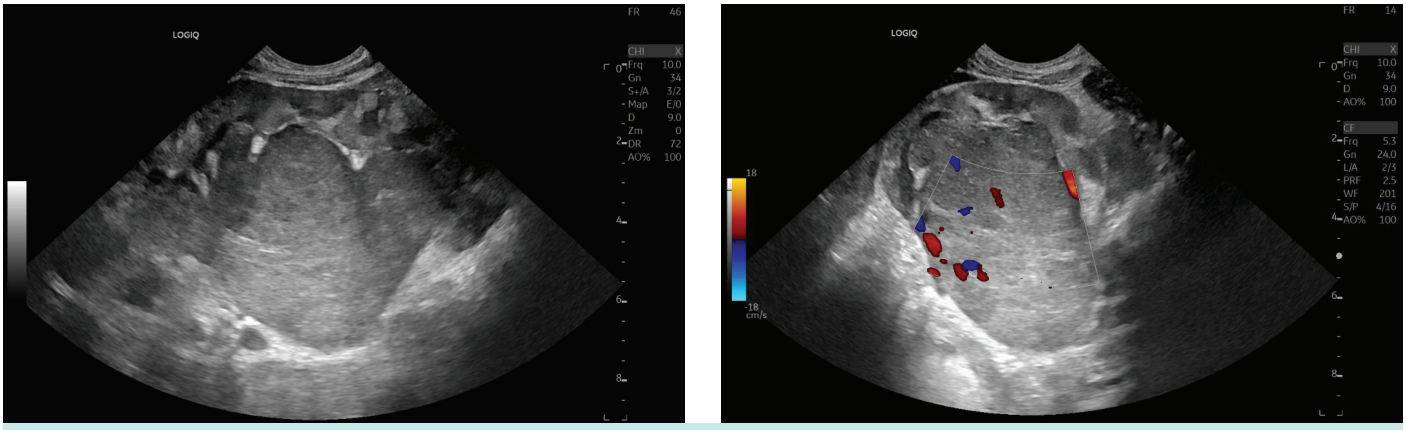


**Figure 2. Gray-scale and color-doppler ultrasound images.**

On CT examination, there was minimal contrast enhancement in the identified expansile mass. Delayed nephrogram phase was observed in the left kidney. In addition, in the late pyelography phase, no passage of contrast material into the left ureter was observed (Figure 3).

On MRI, the mass was observed within the left renal pelvis, filling the pelvicalyceal system almost completely, extending inferiorly to the proximal to the ureter in a polypoid manner. The mass was hypointense on T1 weighted images and hyperintense on T2 weighted images. After intravenous contrast injection, pathological contrast enhancement was observed in the defined mass (Figure 4). Diffusion-weighted imaging (DWI) (b=800) showed a pathological diffusion restriction in the mass (Figure 5).

CT and MRI demonstrated similar imaging findings. No accompanying lymphadenopathy was observed. In the light of all the findings, the diagnosis of botryoid WT originating from the left renal pelvis was considered. Although renal pelvis hematoma was included in the differential diagnosis due to the patient's history of simultaneous falls, this clinical history was thought to be a coincidence due to the contrast enhancement of the lesion and other radiological findings.

Kidney biopsy was performed. A neoplastic structure with a biphasic appearance was observed. Histomorphological findings and immunohistochemical staining pattern suggested WT in the foreground in the case.

## DISCUSSION

WT can be discovered after trauma as seen in our patient. In a review of 13 mass lesions found after trauma, malignancy was diagnosed in 6 patients. This study emphasised the importance of blunt abdominal trauma in revealing an occult cancer or hydronephrosis (5).

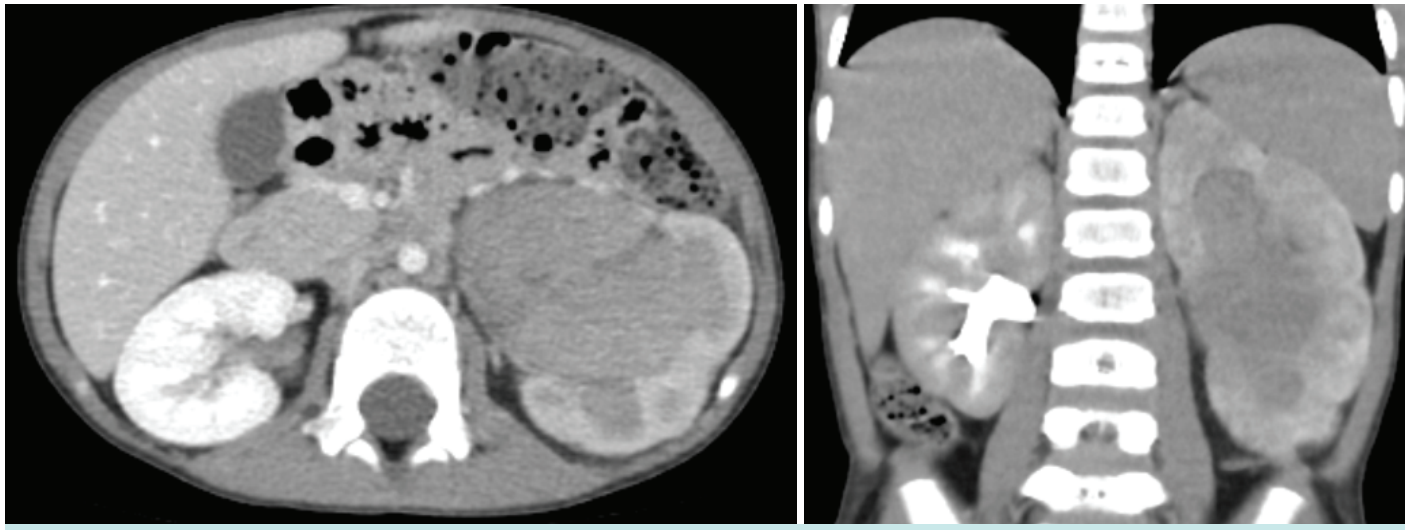

**Figure 3. Axial (nephrogram phase) and coronal (pyelography phase) CT images.**

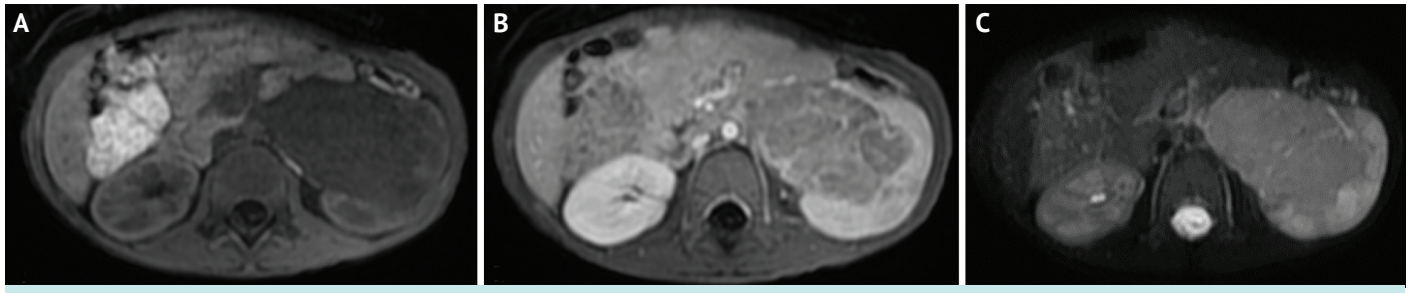


**Figure 4. Pre-contrast (A) and post-contrast (B) T1 weighted images, (C) T2 weighted image-fat supressed.**

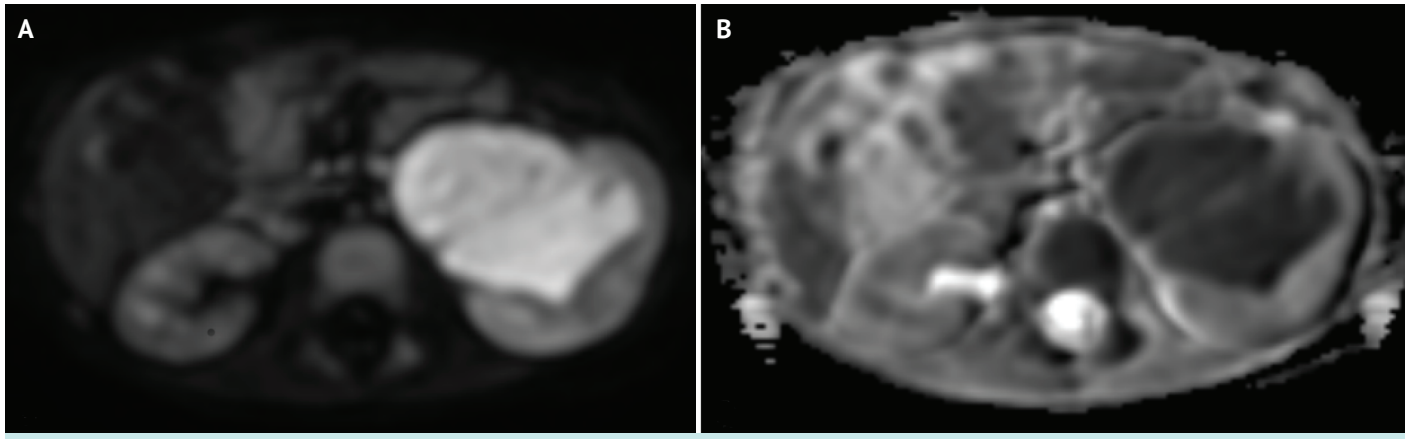


**Figure 5. (A) Diffusion-weighted imaging (DWI) (b=800), (B) Apparent diffusion coefficient (ADC).**

Approximately 7% of patients with WT have synchronous or metachronous bilateral renal tumors, so a thorough examination of the other kidney is required (6). If a mass was found in the contralateral kidney, we would have considered WT as a potential diagnosis, however in our case, the contralateral kidney was normal.

In cases with WT, abdominal ultrasound usually shows a predominantly solid but heterogeneous mass, with anechoic areas due to necrosis, hemorrhage or cyst formation. However, in our case, a heterogeneous-hypoechoic lesion without anechoic areas was detected. On MR imaging, WT appears as a mass with low signal intensity on T1-weighted sequences and high signal intensity on T2-weighted sequences, as in our case (2).

It is important to consider angiomyolipoma with a connection to the collecting system in the differential diagnosis, since it may manifest as a hematoma. The tumor weakens the vessel walls and eventually forms aneurysms, which can result in hemorrhage. In children without tuberous sclerosis, angiomyolipomas are rare and

no microscopic fat was found in the mass on opposed-phase chemical shift MRI. Therefore, we excluded this diagnosis (7).

Renal pelvis hematoma is the most important disease in the differential diagnosis, because it usually presents in patients with pre-existing renal pathology or in the setting of trauma (8). Doppler ultrasound may be helpful to differentiate these two lesions. Renal hematoma doesn't have any vascular coding on doppler ultrasound, while WT mostly has vascular coding unless necrosis develops. Another clue that may suggest WT is the presence of lymphadenopathy along with a mass. The prognostic and therapeutic implications of lymph node involvement in children with WT are noteworthy. However, no lymphadenopathy was observed in our case (9).

## CONCLUSION

Ultrasound is a fast, cheap and non-invasive diagnostic tool for the evaluation of renal lesions and must be used to evaluate every pediatric patient who had a trauma. This case emphasizes that WT should be kept in mind in the differential diagnosis of renal pelvic hematoma in a child with a history of trauma.

**Informed Consent:** Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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**Author Contributions:** Concept – M.C.P., N.A., M.M.O., Ç.Ü.; Design – N.Ö.T., M.C.P., Ç.Ü.; Supervision – M.C.P., N.A., M.M.O.; Resource: M.C.P., B.U.; Materials: M.C.P., M.M.O., Ç.Ü.; Data Collection and/or Processing – N.Ö.T., B.U., Ç.Ü.; Analysis and/or Interpretation – N.Ö.T., N.A.; Literature Search – N.Ö.T.; Writing – N.Ö.T., M.C.P.; Critical Review – M.C.P., N.A., B.U., Ç.Ü.

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