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Case Report

Fat containing bilateral synchronous Wilms' tumor: Imaging findings

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Abstract. The Wilms' tumor (WT), an embryonic neoplasm deemed to arise from metanephric blastema, is the most common renal tumor of childhood. Bilaterality is reported to occur in approximately 5% of such cases. Although the sources in the radiologic literature state that when CT shows definite fat within a renal mass, angiomyolipoma can be established as the diagnosis and fat tissue can be seen in 7% of the WTs, as well. In this case report, we denote radiological features of a synchronous bilateral WT containing fatty tissue.

Key words: Wilms' tumor, bilateral synchronous, fatty tissue, imaging findings

1. Introduction

The Wilms' tumor (WT), an embryonic neoplasm deemed to arise from metanephric blastema (1), is the most common renal tumor of childhood. Fat tissue can be seen in 7% of the tumors (2) and bilaterality is reported to occur in approximately 5% of such cases (3).

We report a case with synchronous bilateral WT containing fatty tissue.

2. Case report

A 2.5-year-old boy suffering from hematuria, stomachache and vomiting, at the department of pediatrics, had no remarkable medical history except hernia operation one year-ago. The results of physical examination and renal function studies were all normal. Red blood cell (RBC) was 2.23 M/uL and the rest of laboratory tests were within normal reference ranges.

In the abdominal ultrasonography (US) there was a mass isoechoic with kidneys, measuring 5 cm, arising from the right kidney and an iso-hypoechoic mass, including necrotic areas, measuring 10 cm, arising from the left kidney (Figure 1).

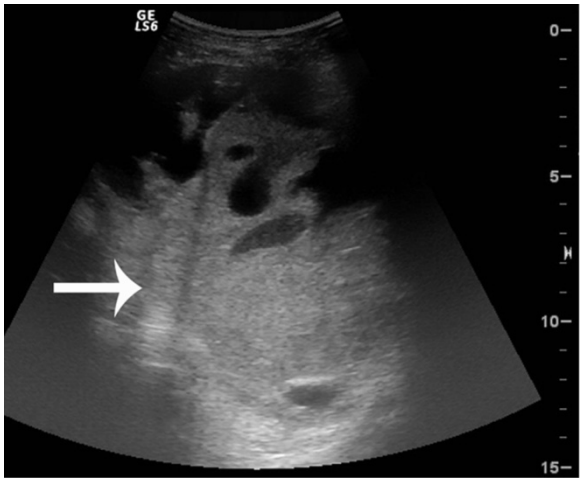

Fig. 1. Ultrasonography demonstrates a mass isoechoic with kidney including necrotic areas (arrow).

In the multidetector contrast-enhanced computed tomography (MDCT), a hypodens lesion containing fatty and necrotic areas in the left kidney, was seen. The pelvicalyceal system was distorted. Also, a hypodens lesion that had milimetric fat tissue in the right kidney was seen. During the portal phase of the MDCT, the lesions were enhancing, heterogeneously (Figure 2).

Both renal masses were slightly hypointense on T1-weighted images and hyperintense on T2-weighted images. The fatty tissue showed increased signal intensity on both T1 and T2-weighted images (Figure 3). T1 weighted fat saturated image obtained after administration of intravenous contrast material demonstrated hypointense (relative to renal parenchyma) lesions (Figure 4). There was no findings of

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metastasis, lymph node enlargement or thrombosis of the renal veins.

The lesions were diagnosed as Wilms' tumor, histopathologically.

3. Discussion

The sources in the radiologic literature state that when CT shows definite fat within a renal mass, angiomyolipoma can be established as the diagnosis. Despite this postulate, other fat containing tumors of the kidney have been reported. These masses include Wilms' tumor, liposarcoma, teratoma, oncocytoma and xanthogranulomatous pyelonephritis (4). The synchronous bilateral WT presented in this case report exhibited this characteristic.

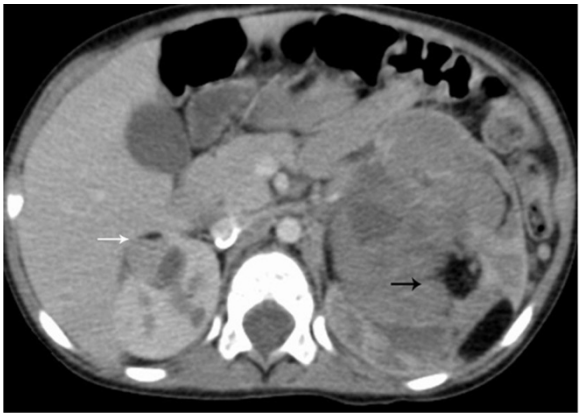

Fig. 2. Multidetector contrast-enhanced computed tomography demonstrates hypodens lesion containing fatty (arrows) and necrotic areas in the right and left kidneys.

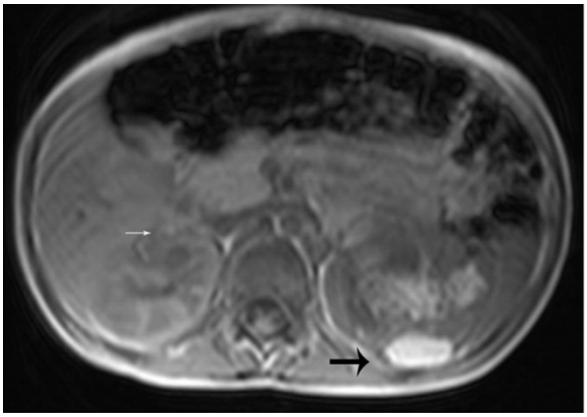

Fig. 3. Axial T1 weighted MR image demonstrates fatty tissue (arrows) in the lesions with hyperintense signal intensity.

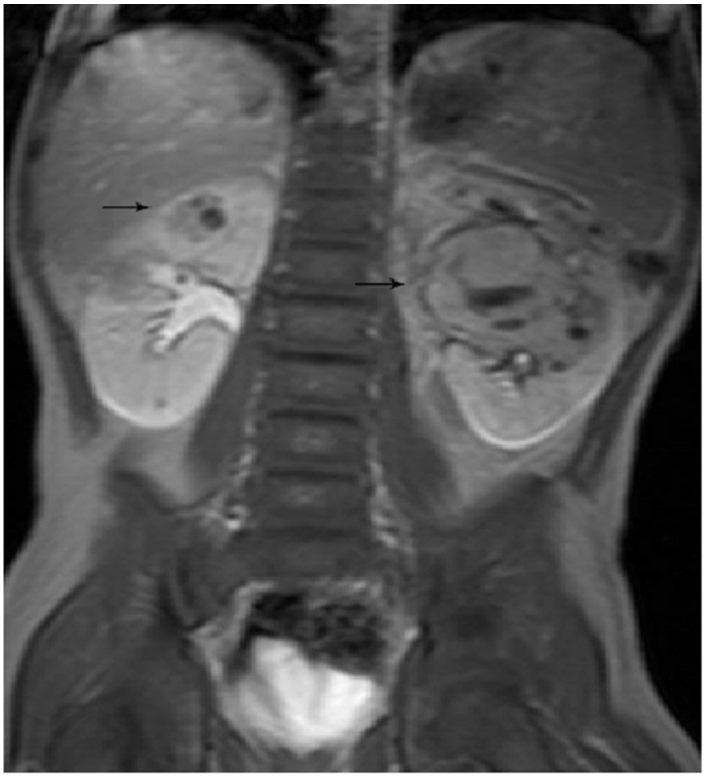

Fig. 4. Coronal T1 weighted fat saturated image obtained after administration of intravenous contrast material demonstrates hypointense (relative to renal parenchyma) lesions (arrows).

Wilms' tumor is an embryonic tumor of mesodermal origin that contains blastemal, epithelial, and stromal elements (1). In WT, fatty tissue may be recognizable radiologically due to the differentiation of stromal elements into fat (5).

A rare histological variant of classical Wilms' tumor, known as teratoid Wilms' tumor, was described to include fat tissue and to involve bilateral kidneys. Although our case had bilateral lesions containing fatty tissue, teratoid WT wasn't established as diagnosis, histopathologically. Variend et al. (6) introduced the term teratoid Wilms' tumor to describe a renal tumor containing a multiplicity of cell types and tissues in a neoplasm where areas of classic nephroblastoma tissue were also identified. Fernandes et al.(7) further defined the teratoid Wilms' tumor as having a clear predominance of teratoid elements comprising more than 50% of the tumor (1). The teratoid elements were comprising 2% of the tumor in our case.

In Wilms' tumor, US typically shows a solid non-calcified heterogeneous lesion containing various degrees of anechoic areas representing hemorrhage, necrosis and/or epithelial cyst (8). On CT scans, WT characteristically appears as a large, spherical, at least partially intrarenal mass. Following contrast administration, the tumor enhances less than the surrounding normal renal parenchyma. On MRI, Wilms' tumor demonstrates mildly low T1-signal and high T2-signal characteristics. Areas of necrosis may result in heterogeneous signal and heterogeneous enhancement within the mass (9). In our case, USG revealed necrotic areas, CT and MRI demonstrated fatty components.

Angiomyolipoma, which should be considered in the differential diagnosis of fat containing renal mass, is rare in the pediatric population, particularly in the absence of a primary diagnosis of tuberous sclerosis. Intrarenal liposarcomas are extremely rare at any age. Liposarcoma is composed of fat with thick linear or nodular septa (1). Xanthogranulomatous pyelonephritis is usually associated with nephrolithiasis and obstructive nephropathy (9). Renal cell carcinoma and oncocytoma are also rare in pediatric population (4, 5).

This unusual case illustrates that the radiologist should be cautious in diagnosing of a benign renal lesion solely on the basis of detection of small amounts of fat within a large renal mass. This report also emphasizes that bilaterality always does not indicate teratoid Wilms' tumor.

Acknowledgments

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