

Horseshoe kidney lymphoma: report of a case and imaging findings

Abstract

This research seeks to illustrate the efficacy of imaging for the precise identification of tumor masses in individuals with horseshoe kidneys. A patient hospitalized with febrile syndrome without focus undergoes a tomographic scan. So as to characterize the findings in detail, it is decided to perform an MRI with intravenous contrast. Computed tomography in axial sections and sagittal reconstruction shows a voluminous formation in renal topography on the left side with soft tissue density and irregular borders. In the left cardiophrenic angle a rounded image with smooth edges apparently adenopathy is identified. Axial MRI shows a horseshoe kidney with a voluminous formation with lobulated borders and heterogeneous signal in T2 fat sat sequence in the posterior sector of the left kidney. After intravenous contrast administration, peripheral enhancement areas are seen in T1 + C sequence. The diffusion sequence shows peripheral restriction area. The histopathological result in this case was infiltration by high-grade large B-cell lymphoma. After reviewing the literature, we can conclude that the tumors found in horseshoe kidneys present incidence rates very similar to those of the general population. Renal lymphomas are rare entities, although extranodal dissemination usually involves the urinary tract. Despite the definitive diagnosis is histopathological, MRI imaging studies have proved to be useful in this particular case.

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Introduction

It has been observed that the horseshoe kidney is the most frequently occurring congenital fusion malformation of the genitourinary tract, with an incidence ranging from 0.4 to 1.6 per 10,000 live births, and a greater prevalence among males than females in a ratio of 2.5 to 1. Moreover, it is typically observed that the lower poles are fused in over 90% of the cases.

The cause is to a defect in embryological development when the two metanephric blastemas join approximately between the fifth and sixth week of fetal life after the ureteral bud joins the blastema.

Most patients with horseshoe kidneys do not have any symptoms and their diagnosis is often an incidental finding during other medical tests. However, some patients with horseshoe kidneys may experience pain and/or hematuria due to obstructions or infectious processes.¹

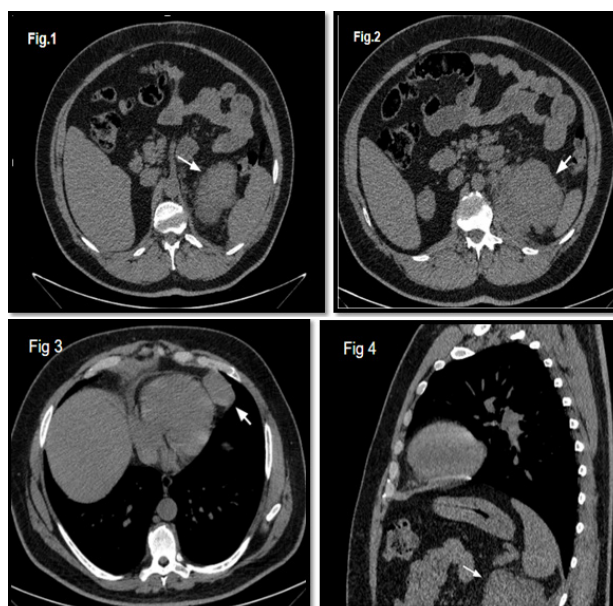
Imaging findings

Renal cell carcinoma is the most common tumor found in horseshoe kidneys, although this does not occur at a higher rate than in the general population.²

Primary renal lymphoma rarely occur, as the renal parenchyma does not contain lymphatic tissue.³ The final diagnosis of this condition is made with a renal biopsy, but imaging studies can be very helpful for the identification and characterization of these renal masses.⁴

Case presentation

A 62-year-old male patient was hospitalized for febrile syndrome. He had no symptoms other than thermal elevation. A thoracic computed tomography and subsequent magnetic resonance imaging with gadolinium were performed.

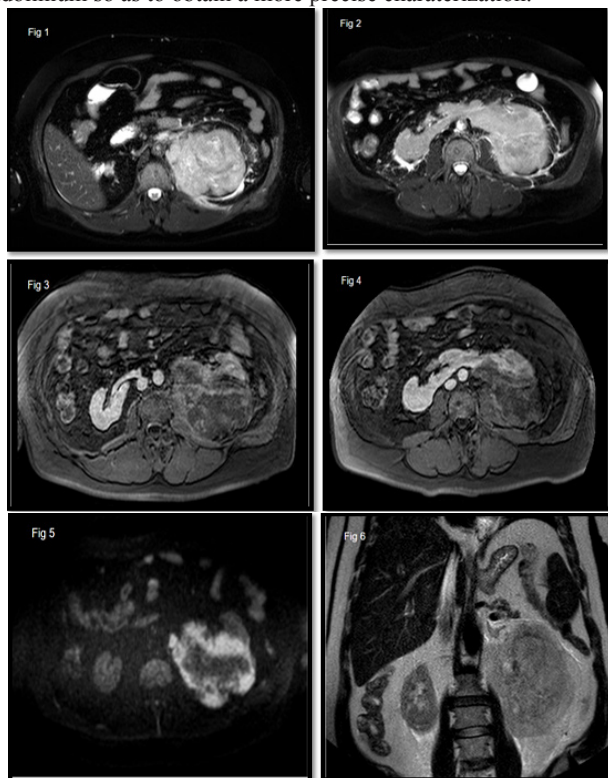


CT

Computed tomography in axial sections (Figure 1, 2 and 3) and sagittal reconstruction (Figure 4). In sections that partially include the upper abdomen there is a voluminous formation in renal topographon the left side with soft tissue density and irregular borders (white arrow Figure 1 and 2).

In the left cardiophrenic angle a rounded image with smooth edges apparently adenopathy is identified (white arrow Fig 4).

Based on this finding, it is suggested to perform MRI with gadolinium so as to obtain a more precise characterization.

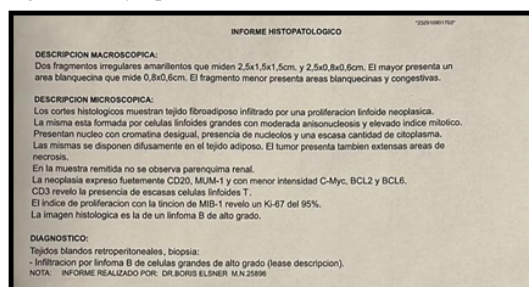


MRI

Axial MRI shows a horseshoe kidney with a voluminous formation with lobulated borders and heterogeneous signal in T2 fat sat sequence in the posterior sector of the left kidney (Figure 1 and 2). After intravenous contrast administration, peripheral enhancement areas are seen in T1 + C sequence (Figure 3 and 4). The diffusion sequence shows peripheral restriction area (Figure 5). Coronal T2-weighted image shows the voluminous left-sided renal lesion with predominantly heterogeneous signal (Figure 6).

Biopsy

The histopathological result in this case was infiltration by high-grade large B-cell lymphoma.



Discussion

Renal cell carcinoma is the most frequent malignancy associated with the horseshoe kidney. It can be located in any part of the kidney, although it occurs predominantly in the isthmus.⁵ It is relevant to shed light on the fact that, even though renal cell carcinoma continues to be the most frequent neoplasm in horseshoe kidneys, no evidence of a higher incidence than in those with normal anatomy has been found.²

Furthermore, renal lymphoma is poorly documented, since the disease is often clinically silent and renal biopsy is rarely indicated to confirm the diagnosis in the context of systemic disease.³ It accounts for 0.7% of all extra-nodal lymphomas and 0.1% of all malignant lymphomas.⁶ Extranodal spread of lymphoma often affects the genitourinary system, with the kidneys being the most commonly involved organs.³

The etiology is unknown, although primary renal lymphoma has been linked with factors like chronic inflammatory processes, chronic pyelonephritis, Sjogren's syndrome, systemic lupus erythematosus and Epstein-Barr virus. Several hypotheses have been postulated on the histogenesis of the neoplasm. It has been suggested that primary renal lymphoma may originate in the lymph nodes of the renal sinus or in the lymphatic network of the renal capsule, and form cords of cells that penetrate the renal parenchyma.⁷

On imaging, findings include multiple masses, contiguous retroperitoneal extension, solitary mass, diffuse infiltrative disease, and perirenal involvement.⁴ Multi-detector row CT is the imaging modality which is chosen for the evaluation of patients with suspected renal lymphoma.³ In spite of the fact that the role of magnetic resonance imaging in renal lymphoma is less clearly documented in the literature, small series have shown MR imaging to be as accurate as contrast-enhanced CT in demonstrating renal and perirenal disease. MR imaging is the optimal imaging modality in patients with iodinated contrast material allergy or renal insufficiency.³

Renal lymphoma, like most malignant and inflammatory renal lesions, exhibits hypointense, slightly hypointense or isointense signal relative to normal renal cortex on T2-weighted images.³ Diagnosis is established by renal biopsy, although it is often presented as a mass simulating renal cell cancer and is diagnosed after radical nephrectomy.⁷

Conclusion

After reviewing the literature, it can be concluded that the tumors found in horseshoe kidneys present incidence rates very similar to those of the general population. Generally, settling in the isthmus and the most frequent presenting tumor is clear cell carcinoma. Renal lymphomas are rare entities although extranodal dissemination usually involves the urinary tract. Even though the definitive diagnosis is histopathological, imaging studies, precisely MRI, have proved to be useful in this particular case.

Acknowledgments

None.

Conflicts of interest

There are no conflicts of interest.

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