CASE REPORT

doi: 10.4274/jus.75
Journal of Urological Surgery, 2014; 1: 36-38

Suture Granuloma Mimicking Renal Cell Carcinoma: Magnetic Resonance Imaging (MRI) and Pathologic Correlation

Renal Hücreli Karsinomu Taklit Eden Sütür Granülomu: Manyetik Rezonans Görüntüleme (MRG) ve Patolojik Korelasyon

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ABSTRACT

Solid renal masses are generally distinguished with contrast enhancement and intratumoral fatty foci by radiological examinations. The present of enhancement is most important criteria for diagnosis of malignant lesions. Generally, a contrast enhanced solid mass in kidney is accepted as a neoplasm. Foreign body granuloma is an extraordinary cause of enhanced solid renal mass. This case of a renal suture granuloma demonstrated peripheral enhanced exophytic renal mass mimic renal cell carcinoma, and underwent surgery. At the solid renal mass with different radiological features, biopsy is an option to determining the necessity of surgery as well as the surgical approach.

Key Words

Suture granuloma, foreign body, renal cell carcinoma, MRI

ÖZET

Solid böbrek kitleler genellikle radyolojik incelemelerle kontrast ve tümör yağlı odakları ile ayırt edilir. Kontrast tutulumu malign lezyonların tanısında en önemli kriter. Genellikle, böbrekte kontrast tutulumu gösteren solid kitle neoplasmın olarak kabul edilir. Yabancı cisim granülomu, kontrast tutulumu gösteren solid renal kitlenin beklenmedik bir nedenidir. Bu olguda egzofitik yerleşimli, periferik kontrast tutulumu gösteren ve renal hücreli karsinomu taklit eden sütür granülomu ve ameliyatı göstermişlerdir. Farklı radyolojik özelliklere sahip solid renal kitlerde, biyopsi cerrahi gerekliliğin yanı sıra cerrahi yaklaşımın belirlenmesi için bir seçenektir.

Anahtar Kelimeler

Sütür granuloma, yabancı cisim, renal hücreli karsinom, MRG

Introduction

Foreign body granuloma (FBG) is an infrequent complication of renal surgery. The majority of cases are related with nephron sparing surgery. And main cause is oxidized regenerated cellulose, which is a hemostatic agent used in surgery to control bleeding. However suture granuloma is extremely rare. Laparoscopic nephron-sparing surgery has increased, foreign body granuloma incidence also increased. Foreign body granulomas are indistinguishable from RCCs that is the most common solid lesion within the kidney, and both of them have similar radiological features, and this is the most common problem (1). We report a rare case of renal suture granuloma, which has characteristic findings of renal cell carcinoma like exophytic location and peripheral heterogeneous enhancement.

Case Presentation

A 59 years old male presented with right side flank pain. His medical history included nephrolithotomy due to renal colic in 1997. On physical examination, a well-healed right flank incision was seen. And there was no tenderness on abdominal examination. Respiratory and cardiovascular system examinations were normal. His routine urinalysis showed microhematuria. All other laboratory investigations were normal. On routine ultrasonography of upper abdomen, exophytic solid renal mass with heterogeneous echo texture and peripheral calcification was seen in right lower kidney pole. Because of contrast allergy of the patient, magnetic resonance imaging (MRI) was made. The MRI showed exophytic, rounded solid tumor, which contained diffuse calcification in the wall involving the right

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lower kidney pole without macroscopic fat tissue and extra capsular extension (Figure 1a). On T1-weighted fat suppressed gadolinium-enhanced sequence, peripheral and heterogeneous enhancement was observed (Figure 1b). Intracellular, cytoplasmic lipid was not detected on in phase and opposed phase sequences of the MRI (Figure 2a-b). Renal vein involvement, or loco-regional nodal and abdominal visceral metastases were not detected. Clinico-radiologic diagnosis of RCC was made with according to peripherally located, enhancing, large parenchymal mass with patchy calcification. He underwent open nephron sparing surgery. Microscopic examination revealed a chronic granulomatous inflammation secondary to suture material, which was surrounded by macrophages and giant cells (Figure 3). Pathologic examination was reported that structure of the suture material was inorganic and non-absorbable.

Discussion

Generally characterization and diagnosis of renal lesion with CT or MRI are precise. In most cases, it is possible to differentiate those renal masses that require surgery (RCC, transitional cell carcinoma (TCC), and oncocytoma) from those that do not, preoperatively. Nevertheless, in some cases, the correct diagnosis may not be possible. Most important criterion for differentiating renal solid malignant lesions from benign lesions is the presence of enhancement (2). Usually any contrast enhanced solid mass in the kidney should be considered a neoplasm (2). RCC, TCC, angiomyolipoma, oncocytoma, lymphoma, renal leiyomyoma and also foreign body granuloma are included in differential diagnosis of contrast enhanced solid renal lesions.

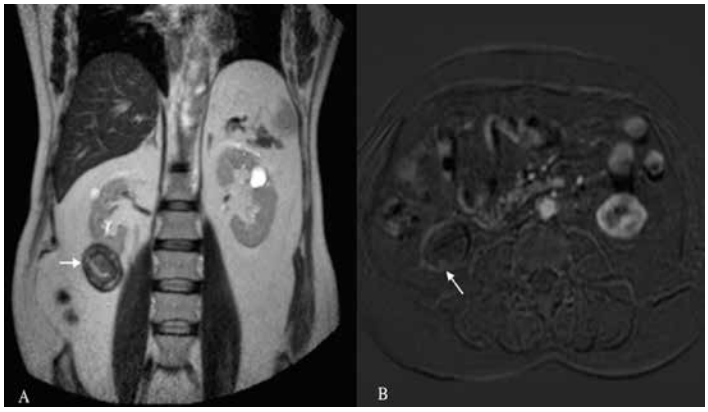

Figure 1. On the coronal T2W image, heterogeneous, exophytic, solid renal mass is seen at inferior pole of right kidney b) On subtracted contrast enhanced axial T1W image, peripheral enhancement is demonstrated by arrow

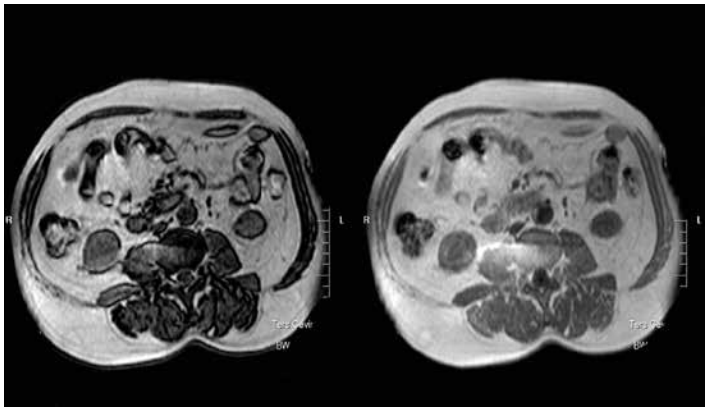

Figure 2. In phase and opposed phase images show no intracellular fat component

The imaging characteristics of renal foreign body granuloma are extremely varied. The MRI appearance of FGB depends on the presence of calcification, fatty component, and necrosis (3,4). Because of these characteristics, radiological distinction between FBG, RCC, and angiomyolipoma is very difficult. FGB shows variable intensities on T2-weighted images and iso or hypointense on T1-weighted images with peripheral enhancement after intravenous contrast material administration.

RCC can be classified into clear cell, papillary, chromophobe, collecting duct carcinoma, medullary carcinoma, and unclassified categories. Clear cell RCC is the most common type and previously referred to as conventional RCC. Clear cell RCC originates from the renal cortex and typically exhibits an expansile growth pattern (5). Clear cell RCC often is seen heterogeneous at imaging due to presence of hemorrhage, necrosis, and cysts. Clear cell RCC is mostly faintly hyperintense on T2-weighted images and faintly hypointense on T1-weight images relative to renal cortex. Necrosis is typically seen as homogeneous hypo intense on T1-weighted images and generally hyperintens and rarely hypointens on T2-weighted images. Loss of signal intensity within the solid portions of clear cell RCCs on opposed-phase images compared with in-phase is due to cytoplasmic fat (6). Up to 60% of these tumors have cytoplasmic fat (7). Postcontrast images demonstrate lack of enhancement in areas of necrosis and marked enhancement in the viable components of the tumor (6).

Papillary RCC is known as chromopil RCC, and the second most common histologic subtype. Larger tumors show heterogeneity due to necrosis, hemorrhage, and calcification. Although extremely rare, the presence of macroscopic fat is also a helpful feature, and it is corresponding histologically to cholesterol-laden macrophages. Another important feature of papillary RCC is that bilateral and multifocal tumors are more common than in other subtypes of RCC (8). On MRI, they demonstrate homogeneous low signal intensity on

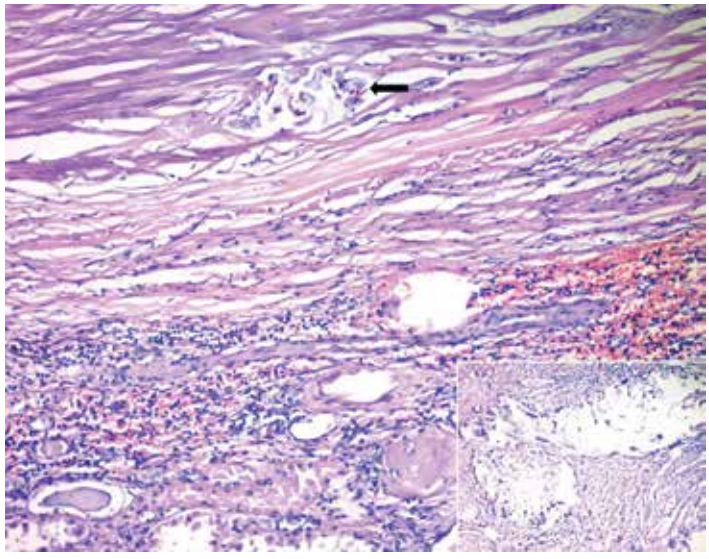

Figure 3. Suture material is surrounded by macrophages and giant cells (arrows and interior photos). Renal parenchyma is seen in the lower part of the picture

T2-weight images. After intravenous contrast material administration, they show homogeneous low-level enhancement (9).

Chromophobe RCC is the third most common subtype. It is assumed to arise from the intercalated cells of the renal cortex. Central necrosis may be absent even in very large chromophobe RCC (6). MRI may show cystic changes within a solid tumor. They may appear hypointense on T2-weighted MRI, and in spite of their large size, they demonstrate relatively homogeneous enhancement on MRI (5). A spoke-wheel pattern of contrast enhancement classically associated with oncocytomas has been described for chromophobe RCC (10). Oncocytomas also develop from intercalated cells and indistinguishable from RCC on images (A).

Renal involvement of lymphoma may be due to hematogenous dissemination or contagious extension of retroperitoneal disease. Primary renal lymphoma is rare. Lymphomatous masses are iso or slightly hypointens on T1 weighted images and hypointens on T2-weighted images. Minimal heterogeneous enhancement is seen on early and delayed contrast MRI in most patients with retroperitoneal masses and renal involvement (11).

A reliable diagnosis of angiomyolipoma can be made when fat is unequivocally demonstrated in a renal mass (12). Angiomyolipomas with a predominant fatty component are isointense relative to fat with all MRI sequences. The use of in-phase and opposed-phase imaging is also help in the diagnosis of angiomyolipoma (13,14). In predominately fatty angiomyolipoma, a characteristic Indian ink artifact is seen at the interface between the mass and the normal renal parenchyma on opposed-phase images, whereas the central portions of the lesion do not demonstrate changes in signal intensity compared with the in-phase images. The appearance of angiomyolipoma on T2-weighted images is variable and depends on the amount of bulk fat presenting the lesion, and typically on T1-weighted images, their signal intensity is higher than the renal parenchyma (6). Caution must be exercised when the diagnosis of angiomyolipoma is made based on the phenomenon alone, since a loss of signal intensity in clear cell RCC with small amounts of intracellular fat (7). The presence of central necrosis may be helpful in suggesting the diagnosis of RCC, since medium to large clear cell RCCs frequently demonstrate central necrosis, a finding that is very rare in angiomyolipoma.

Biopsy of renal masses may be performed for masses with atypical radiological features. Biopsy is also performed in patients who will undergo ablative or thermal therapy to determine the underlying histologic subtypes of tumor. In patients with a history of renal surgery, in the presence of solid renal masses, the diagnosis of FDG should be kept in mind. The biopsy in these patients is important determining the necessity of surgery as well as the surgical approach.

Conflicts of Interest

There are no conflicts of interest.

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