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Renal replacement lipomatosis: A novices nightmare

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Abstract
Renal replacement lipomatosis (RRL) is a no touch lesion of the kidney that must be recognized at imaging in order to avoid inadvertent biopsy or surgery. The imaging features of RRL can sometimes be confused with a fat containing renal mass. Therefore the imaging characters of this entity need to be highlighted for accurate diagnosis. We present a typical case of RRL which was confused as a renal mass initially and was referred to our tertiary center for biopsy and further management.

Keywords: novices nightmare, Renal replacement lipomatosis

Introduction
Renal Replacement lipomatosis (RRL) also known as renal replacement Fibrolipomatosis is a benign condition seen as an advanced form of renal sinus lipomatosis. RRL is characterized by proliferation of renal sinus and perinephric fatty tissue with marked atrophy of renal parenchyma. RRL is seen in association with renal calcular disease in 70% of cases [1]. other common associations include infections and long term hydronephrosis [2]. RRL can simulate renal malignancies, therefore it its differential diagnosis is important. We report a case of RRL in 45 year old female.

Case Report
A 45 year old female presented to out emergency department with complaints of right flank pain and mild grade fever. Routine urine examination revealed urinary tract infection with hematuria. Her other clinical and laboratory findings were unremarkable. An abdominal ultrasound showed expansion of renal sinus fat with central hyperechoic shadowing calculus causing focal caliectasis of upper pole (fig.1a and1b). A contrast enhanced CT was performed to document peri-renal area, with suspicion of renal neoplasia. CT confirmed the presence of right renal mass like proliferation of sinus fat extending into perinephric area with its epicenter around the calculas, with loss of renal parenchyma. Several regions within the mass revealed attenuation values between -85HU to -95HU, suggestive of fat predominance (fig.2a and 2b).

Fig 1a: Transverse USG scan showing a renal calculus surrounded by hyperechoic ill defined area which was confused as a mass

Fig 1b: Transverse USG scan showing marked hyperechoic ill defined area occupying the renal sinus which was confused as a mass

Discussion

A varying amount of fat and fibrous tissue is normally present within the renal sinus that covers the major branches of renal artery and vein along with major and minor calyces of collecting system; this fatty tissue becomes more prominent with age, obesity and use of exogenous steroids, with preserved volume of renal parenchymal tissue [3, 4]. RRL is an advanced and aggressive form of renal sinus lipomatosis that typically occurs unilaterally. These continuous changes can be confused with neoplasms and can sometimes cause a diagnostic dilemma. There are two schools of thought when it comes to possible pathogenesis of RRL. One school of thought believes that it is a compensatory mechanism in which proliferated fatty tissue occupies the destroyed or atrophied renal parenchyma. It is worth mentioning that this proliferated fatty tissue does not infiltrate into the renal parenchyma. Others believe that it is an inflammatory response where the renal parenchymal loss causes inflammatory induction of fatty proliferation [5]. Different imaging methods including abdominal X-ray, IVU, USG, CT and MRI have been used for the cases of RRL. Abdominal X-RAY may reveal calculi while IVU can demonstrate poorly and non finding kidneys. USG shows echogenic lobulated mass, usually with a central calculus as in our case, however cannot confidently detect perinephric changes [6]. CT appears to be imaging modality of choice showing various features of RRL like renal parenchymal atrophy, calculi and characteristic distribution of adipose tissue with negative attenuation values.

Xanthogranulomatous pyelonephritis and fat containing neoplasms including lipoma, liposarcoma and AML should be considered in the differential diagnosis of RRL.

At USG in Xanthogranulomatous pyelonephritis, there are hypoechoic areas that represent purulent material, as well as medium amplitude echoes that correspond to fibrofatty and or necrotic debris [1]. CT shows hydronephrosis or pyonephrosis along with the xanthogranulomatous tissue, which typically has attenuation values close to that of water [-15HU to +15HU]. Xanthogranulomatous and RRL may coexist [7]. Renal liposarcoma is typically located peripherally between kidneys and renal capsule and does not produce renal parenchymal defect while as in case of angiomyolipoma, atrophy of renal parenchyma, calculi and absence of contrast concentration and excretion are not observed.

RRL being a relatively uncommon disorder with possible erroneous initial impressions. This case is presented to increase the awareness among radiologists and surgeons.

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