Renal replacement lipomatosis: A relatively uncommon and underreported entity

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A 45-year-old woman presented with pain in the left flank region for 5–6 months and vague flank mass on the left side of abdomen for 2 months. She had history of left-side nephrolithotomy 8 months ago elsewhere. There was no history of fever, any other chronic illness, comorbidities, or history of chronic medication in the past. In view of the pain and palpable lump in the flank region, detailed radiological work-up for renal tumor was done. Noncontrast computed tomography (CT) scan of the abdomen showed multiple renal calculi in the left kidney, along with thinned out renal parenchyma. Extensive fat proliferation was seen in the renal sinus and perirenal space, extending lower down of the left kidney. The right kidney appeared unremarkable [Figure 1]. On evaluation, the left kidney was nonfunctioning.

Left nephrectomy was done and sent for histopathological examination. The kidney appeared mildly increased in size with normal shape. Cut sectioning showed entire kidney replaced grossly by diffuse yellowish areas, with no normal identifiable renal parenchyma [Figure 2a and b]. No well-defined mass was seen. Microscopic examination revealed extensive mature adipose tissue exhibiting degenerative changes, with only scant, separate, microscopically identifiable renal parenchyma exhibiting chronic pyelonephritis, in the form of dense chronic interstitial inflammatory infiltrate, dilated tubules lined by cuboidal to flattened epithelium and filled with casts (thyroidization of tubules), and only an occasional sclerosed glomerulus [Figure 2c and d; Figure 3]. The pelvicalyceal urothelial lining was unremarkable. After literature search, complete clinicoradiological correlation, and characteristic histopathological changes, final diagnosis of renal replacement lipomatosis (RRL) with coexisting chronic pyelonephritis was made.

The postoperative period remained uneventful and stone analysis revealed oxalate and phosphate combination in 60:40 ratio.

**DISCUSSION**

Adipocytic proliferation in the kidney can range from mild lipomatosis in the renal sinus with normal underlying parenchyma (renal sinus lipomatosis), to severe lipomatosis involving sinus, hilum, and perinephric region with atrophic renal parenchyma (RRL). The atrophic renal parenchyma distinguishes RRL from other entities in which fibroadipose tissue proliferation may be seen in and around the kidney, like obesity, increased endogenous or exogenous steroids, or idiopathic conditions. RRL is a unilateral condition commonly associated with calculous disease, aging, renal tuberculosis, and posttransplantation.[¹⁻³]

This condition may be confused initially with renal tumors due to the presenting complaints of flank pain and vague mass in elderly individuals. Ultrasound evaluation may show hypoechoic mass in renal fossa, which may cause diagnostic dilemmas with xanthogranulomatous pyelonephritis (XGP) or adipocytic tumors.
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such as lipomas, angiomyolipoma, and liposarcoma. CT is the most accurate method of demonstrating this condition. Both RRL and XGP occur in the fifth to seventh decade, with similar clinical presentations. True fat density is usually not seen in XGP, and air inside the urinary tract, and perinephric extension to adjacent organs is also indicative of XGP. On histopathology, XGP demonstrates large lipid-laden macrophages (xanthoma cells) inside the renal parenchyma, whereas demarcation between renal parenchyma and adipose tissue can be made in RRL, as was seen in the present case. The diagnosis in the present case was made by correlation of clinical and radiological details, and finally on histopathology, which further highlights the relative unawareness of this entity. The importance of this uncommon and underdiagnosed entity lies in the diagnostic dilemmas it may cause with XGP or adipocytic tumors such as lipomas, angiomyolipoma, and liposarcoma, especially on clinicoradiological evaluation, and the patient might be subjected to unnecessary, extensive, and costly work-up.

In conclusion, RRL is a relatively uncommon and underdiagnosed entity, which should be kept in mind by the clinicians, radiologists, and pathologists.

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Conflicts of interest
There are no conflicts of interest.

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