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Case Report

A Case Report of Renal Replacement Lipomatosis

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Abstract: Replacement lipomatosis of the kidney (RLK) is an advanced form of renal sinus lipomatosis, in which infection, renal calculi and long-standing hydronephrosis are accompanied by renal parenchymal atrophy. The kidneys are usually poor or non-functioning. We present CT and MRI findings of an unusual focal RLK of a 52-year-old male, who was examined with the suspicion of renal malignancy.

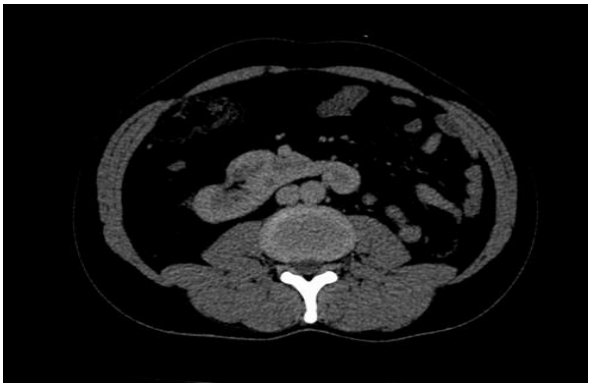
Key words: Replacement lipomatosis of the kidney (RLK); Renal replacement lipomatosis (RRL); TRUFI [True (FISP) Fast Imaging with steady precession].

INTRODUCTION

Renal replacement lipomatosis (RRL) is an extremely rare condition, which occurs secondary to atrophy or destruction of renal parenchyma, with proliferation of excessive lipomatous tissue in renal sinus, renal hilum and perirenal space. Clinical presentation, radiological features and pathological findings aid in confirming the diagnosis. Magnetic resonance imaging (MRI) has evolved as a valuable alternative and complementary imaging modality to ultrasound (US) and computed tomography (CT) in renal replacement lipomatosis, especially in patients with renal failure and those allergic to iodinated contrast agents. Till date, there are only a few case reports regarding the MR imaging findings in RRL. Herein, we are reporting a rare case of RRL depicting most of the radiological findings.

CASE REPORT

A 40 year old male came with the complaints of lower abdominal pain. CT plain abdomen was done and it shows Gall bladder is distended. Multiple calculi noted within the lumen, largest measuring~ 5 mm. Horse shoe kidneys seen. Upper pole of Left kidney seen crossed / fused with lower pole of right kidney in midline forming "L" shape. Renal pelvis seen facing anteriorly. A large irregular calculus (~ + 1400 - 1500 HU) measuring ~ 4.5 x 3.4 x 3.5 cm noted in right renal pelvis and extending till the upper ureter. Upper ureter till the level of L4 appears mildly dilated. Large area (~ 11. 5 x 8.7 cm) of fatty replacement noted along anterior perirenal region. Right kidney appears scarred with significant perinephric fat stranding. Pelvicalyceal system appears moderately dilated. Cyst measuring ~ 2.7 x 2.4 cm noted in lower pole of right kidney .Tiny cyst noted in upper pole of right kidney No evidence of calculi / hydronephrosis seen in left kidney. Adrenal glands appear normal bilaterally.



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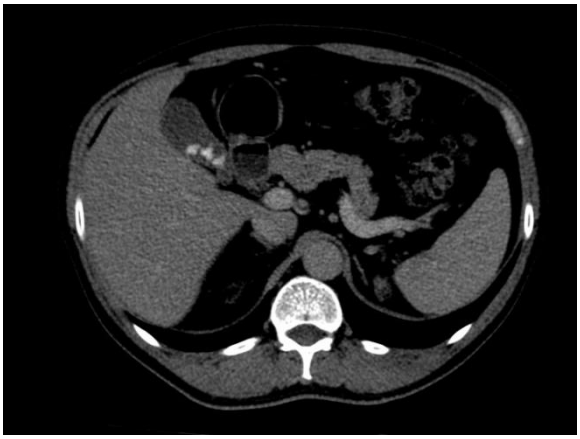

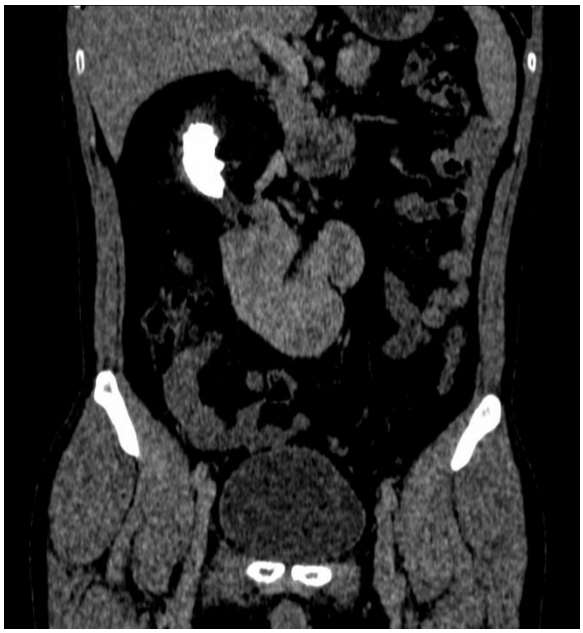

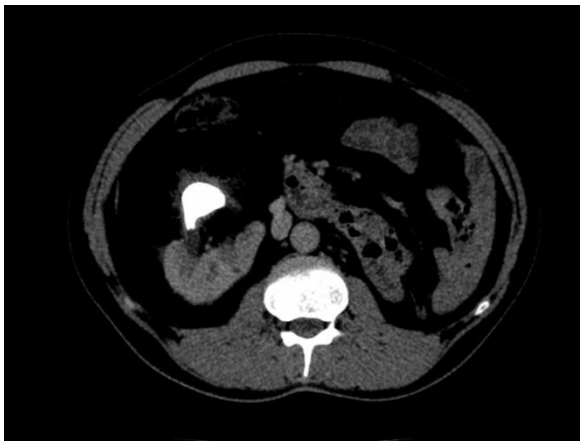

DISCUSSION

RRL is an uncommon, chronic debilitating disorder, usually occurring unilaterally. There is marked proliferation of fatty tissue within the renal sinus, hilum and perirenal space, usually secondary to destruction or atrophy of renal parenchyma due to longstanding inflammation [1, 2]. This condition most commonly follows calculous disease. However, associations with conditions such as aging, renal tuberculosis and post renal transplantation have also been reported [3, 4].

Fatty proliferation in kidney represents a spectrum of disorders ranging from mild lipomatosis in the renal sinus with underlying normal parenchyma (renal sinus lipomatosis) to a severe variety with lipomatosis involving renal sinus, hilum and peri-nephric region with underlying atrophic parenchyma (renal replacement lipomatosis). The presence of atrophic renal parenchyma distinguishes this condition from other causes of fibro-fatty proliferation in and around the kidney, as in obesity, Cushing's disease or excessive corticosteroid therapy and idiopathic [1]. There is no specific clinical feature to diagnose this condition. Patients usually present with complaints of recurrent flank pain, fever, weight loss and mass per abdomen.

By using conventional radiological methods, it is very difficult to diagnose this condition. Ultrasound, CT and MRI aid in accurate diagnosis. Sonologically, RRL appears as a hyperechoic mass in the renal fossa, suggestive of fatty tissue with variable atrophic parenchyma with or without visualization of calculus [2]. Computed tomography is the most accurate imaging modality. It differentiates with certainty the fatty nature of the lesion from other non-fatty lesions, can define the extent of the fatty proliferation in the renal fossa [5], and can detect associated complications like peri-nephric abscesses, hydronephrosis and renal/ ureteric calculi.

MRI provides further confirmation of disease. HASTE sequence is a heavily T2-weighted sequence; hence depicting hydronephrosis, renal cysts and perirenal edema explicitly. Moreover, being an ultrashort sequence, it is not affected by respiratory motion artifact. TRUFI [True (FISP) Fast Imaging with steady precession] is a fast sequence which provides great anatomic detail [3]. A recently introduced post-contrast gradient-echo technique with a volumetric interpolation during breath-hold (VIBE) sequence depicts excretory function of kidney without motion-related artifacts.

Using combined modalities, it is possible to differentiate RRL from other fat-containing neoplasms in the renal fossa, such as angiomyolipoma, lipoma and liposarcoma. It is very difficult to differentiate RRL from xanthogranulomatous pyelonephritis, since both these conditions are associated with longstanding inflammation and calculous disease. However, pathologically, Xanthogranulomatous pyelonephritis shows increased lipid-laden inflammatory foam cells infiltrating the renal parenchyma. In contrast, RRL shows increased lipid content outside the renal parenchyma [6]. CT and MRI show the characteristic radiological features in both conditions. But in patients allergic to iodinated contrast and with raised renal

parameters, inconclusive CT scan findings; MRI is a valuable alternative modality to diagnose the condition.

CONCLUSION

Renal replacement lipomatosis is a rare disorder. This condition may be confused initially with renal tumors due to the presenting complaints of flank pain and vague mass in elderly individuals. As it is a rare disorder, it may be easily misdiagnosed by the inexperienced eye. Detailed history and examination are needed with imaging modalities to diagnose it. Physicians should be aware of signs and symptoms, risk factors, and diagnostic features of renal replacement lipomatosis so that the patients could be managed properly.

Compliance with ethical standards

Funding: There is no funding.

Conflict of Interest: Author declares that they have no conflict of interest.

Ethical approval (animals): This article does not contain any studies with animals performed by any of the author(s).

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from individual participant included in the study.

Authors' contributions

1. DR. MAM ARIVAZHAGAN (MA)
4. DR. PRABHAKARAN.M (PM)

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work –

Drafting the work or revising it critically for important intellectual content

Final approval of the version to be published -

Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved –

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