AMERICAN JOURNAL OF DIAGNOSTIC IMAGING
2024; 10(3): 74-76
10.5455/ajdi.20240725072347

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CASE REPORT

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Renal sinus lipomatosis: A case report and review of the literature

Otmane Soussi[1], Yousra Sekkat[1], Asmaa Mourachid[2], Houria Tabakh[1], Abdellatif Siwane[1], Omar Kacimi[1], Nabil Chikhaoui[1]

[1]Emergency Unit of Radiology, Ibn Rochd University Hospital Center, Casablanca, Morocco

[2]Department of Nephrology, Ibn Rochd University Hospital Center, Casablanca, Morocco

ABSTRACT

Renal sinus lipomatosis is a benign disorder characterized by fatty enlargement of the renal sinus. It is related to a variety of conditions, including stone disease, obesity, and hypercortisolism. Clinical signs are not specific, and imaging is necessary to differentiate them from renal tumors and infectious diseases. Replacement lipomatosis of the kidney is the most aggressive form, leading to severe renal atrophy and impaired renal function. We report a case of sinus lipomatosis in a patient treated for renal lithiasis over 4 years.

ARTICLE HISTORY

Received 25 July 2024
Accepted 10 August 2024
Published 10 August 2024

KEYWORDS

Sinus lipomatosis; renal lithiasis; CT scan

Introduction

The renal sinus is a fatty region bordered by the renal parenchyma that contains the excretory tracts as well as vascular, neural, and lymphatic elements. This adipose tissue expands proportionally with age and obesity; however, it can be affected by various pathologic conditions [1].

Renal sinus lipomatosis (or fibrolipomatosis) is a non-tumorous disorder characterized by a benign proliferation of sinus fat that occurs after parenchymal atrophy induced by hypercortisolism (endogenous or exogenous), persistent lithiasis and hydronephrosis, or infection. This condition causes a mass effect on the intrarenal urinary tract and neurovascular structures; however, it is usually asymptomatic and is often diagnosed incidentally through imaging [1,2,3].

We present the case of a 59-year-old male who underwent treatment for recurrent intrarenal lithiasis and exhibited unilateral sinus lipomatosis.

Case report

A 59-year-old male, treated for recurrent intrarenal lithiasis for 4 years, presented for 2 days with right lower back pain, without hematuria, fever, or urinary signs, evolving in a context of preservation of general condition.

Clinical examination revealed minimal tenderness to palpation of the right flank, with no ballotting of the kidneys. Murphy's sign was negative, and there were no abnormalities noticed during percussion or auscultation of the right lung.

The laboratory tests were unremarkable, with a normal blood count, adequate renal function (urea 0.4 g/l and creatinine 9 mg/l), and no urinary tract infection on cytobacteriological examination of urine. The ultrasound revealed minimal dilatation of the right pyelon as well as evidence of lithiasis in the lower calyx group.

An abdomen CT scan was performed to investigate for the presence of additional lithiasis and to analyze the status of the kidneys. The right kidney was enlarged (130 × 84 × 53 mm), with lobulated contours, keeping an appropriate nephrograph, with minor pyelocalicial dilatation and cortical atrophy by location (Fig. 2). There was a large lower calyceal lithiasis (12 × 10 mm) with a density of 1063 HU and a medium calyceal microlithiasis (2 × 1.5 mm). The sinus fat showed pseudo-tumoral hypertrophy (−103 HU of spontaneous density), encompassing the calyceal groups and suppressing the arterial and venous branches of the renal pedicle, which remained permeable (Fig. 1). There was no contrast uptake or neighborhood infiltration.

The diagnosis of sinus lipomatosis complicating chronic lithiasic obstruction was made.

Contact Otmane Soussi otmanesoussi@gmail.com Emergency Unit of Radiology, Ibn Rochd University Hospital Center, Casablanca, Morocco.

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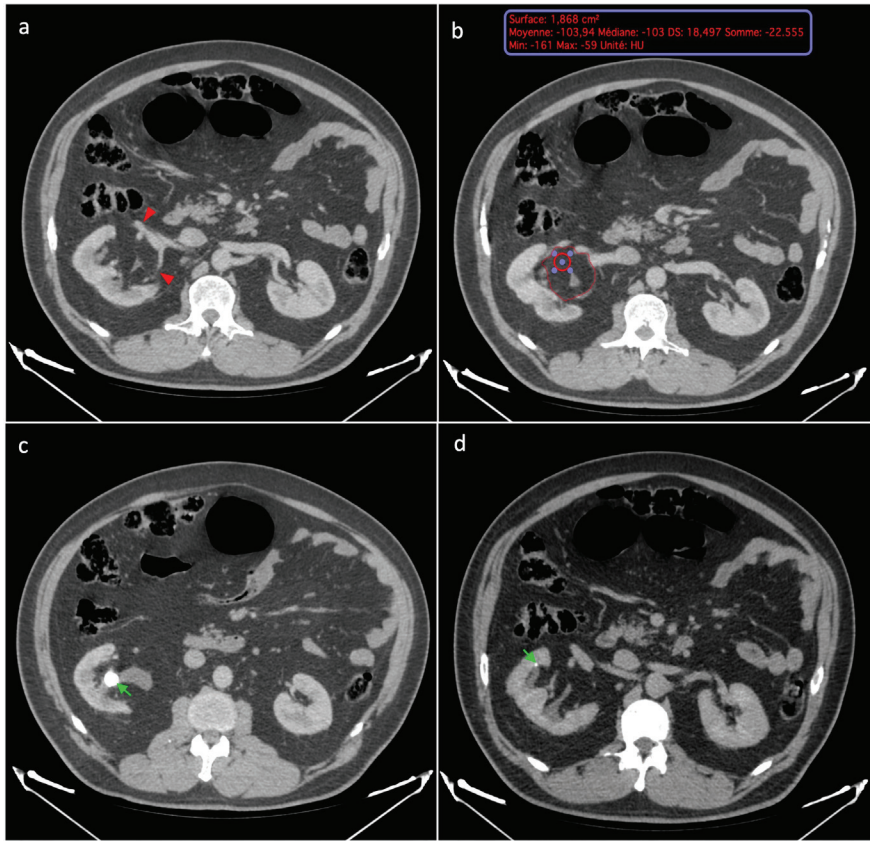


Figure 1. Abdominal CT with iodized PDC injection, in axial slices. a,b: Pseudotumoral enlargement of right renal sinus fat (circled in dotted lines), restraining renal pedicle elements (red arrowheads). c,d: We note the presence of lower calyceal lithiasis and middle calyceal microlithiasis (green arrows).

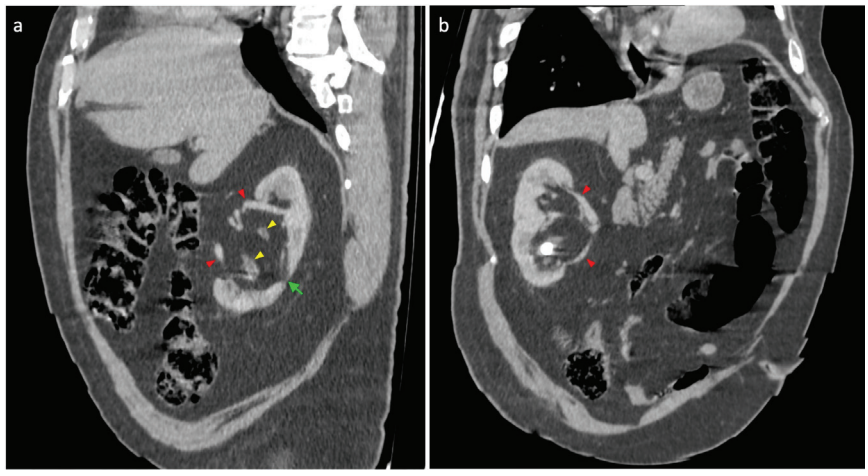


Figure 2. Abdominal CT with iodized PDC injection in sagittal (a) and coronal (b) oblique reconstructions. Lipomatosis of the right renal sinus encompasses the excretory pathways (yellow arrowheads) and represses the elements of the renal pedicle (red arrowheads). Note a focal area of cortical atrophy (green arrow).

Discussion

Sinus lipomatosis is a disorder defined by the excessive buildup of adipose tissue in the renal sinus, which occurs most commonly in adults aged between the sixth and seventh decades and is usually unilateral. In its most severe form, it is linked to perirenal space damage that progresses towards

atrophy and results in the replacement of the renal parenchyma by a fatty pseudotumor [3,4].

The causes that have been implicated are parenchymal atrophy related to aging, obesity, hypercortisolism, infection, chronic hydronephrosis, and renal calculus disease, with the latter being linked in 70% of instances [3]. It must be distinguished histologically from fatty tumors (lipomas and so on), which arise from embryonic remnants, as it is caused by an expansion of large adipocytes without invasion of the renal parenchyma [2,3].

Although the condition is frequently asymptomatic and is often diagnosed incidentally through imaging, some clinical signs, such as flank pain and fever, may be revealing and are generally brought on by the inflammatory response to a urinary tract infection or lithiasis [1,2,5].

In imaging, lipomatosis of the renal sinus induces a mass effect on the urinary pathways without necessarily causing compression or parenchymal atrophy, which distinguishes it from replacement lipomatosis of the kidney: excretory urography reveals a radiolucent sinus associated with infundibulum's stretching [1], and ultrasound reveals an expansion of the central sinus complex that is echogenic, with ovoid configuration. When sinus fat growth occurs in older people, it is physiological, and early lipomatosis might be mistaken for normal appearance [6].

Both CT and MRI show signs of lipomatosis; however, CT is more sensitive in identifying fatty tissue due to its low attenuation values [5] (ranging from −30 to −120 HU). In MRI, fat signal saturation sequences are helpful [7].

The most aggressive form of sinus lipomatosis, known as replacement lipomatosis of the kidney, is marked by significant cortical atrophy, hydronephrosis, and inflammatory manifestations. In this case, urography detects a renal excretion defect, or silent kidney, and lithiasis; cross-sectional imaging reveals a pseudo-tumor that extends to the perirenal space and may mistakenly represent a fatty neoplasia (lipoma, liposarcoma, or angiomyolipoma), although renal function is maintained in cases of renal neoplasia and there is no cortical atrophy or lithiasis [7].

The predominant differential diagnosis is xanthogranulomatous pyelonephritis, a condition marked by an inflammatory reaction resulting in the invasion of the renal parenchyma by macrophages following a stone occlusion. On CT scans, parenchymal atrophy, dilatation of the excretory cavity, and sometimes the hydro-aerial level in connection to pyonephrosis are apparent. In these circumstances, abscesses are commonly found and exhibit an attenuation value between −15 UH and +15 UH [7].

Conclusion

Renal sinus lipomatosis is an uncommon disorder frequently associated with calculus disease.

Imaging is required to confirm and distinguish this nonspecific clinical presentation from other infectious or neoplastic diseases.

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