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Renal Artery Aneurysm Presenting with Ring Shaped Calcification and Microscopic Haematuria

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Authors' contributions

This work was carried out in collaboration among all authors. Author MCA did formal analysis and was a major contributor in writing original draft and conceptualization. Author AS played a key role in manuscript development, data curation and writing - original draft. Author GCB carried out the imaging studies and interpreted the radiological findings. Author YS helped in the proof reading and revision of the article, author AG helped in acquisition, analysis and was a contributor in writing the manuscript. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Calcified renal artery saccular aneurysm produces ring calcification in the renal area which may be mistaken as a renal calculus. Attempting Percutaneous nephrolithotomy or extracorporeal shockwave lithotripsy without prior angiography may result in a life-threatening aneurysmal rupture.

Keywords: Calcified renal artery aneurysm; haematuria, ring calcification; renal calcification; renal calculus.

ABBREVIATIONS

RAA : Renal Artery Aneurysm
PCS : Pelvicalyceal system
USG : Ultrasonography
CTA : Computed tomography Angiography

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MRA : Magnetic Resonance Angiography
ESWL : Extracorporeal shock Wave Lithtripsy
PCNL : Percutaneous Nephrolithotomy

1. INTRODUCTION

Renal artery aneurysm is an uncommon disease [1], most often asymptomatic and may manifest clinically with microscopic haematuria, raised blood pressure or sometimes with flank pain [2] or rarely gross haematuria [3]. When calcified, these can mimic a renal calculus on ultrasonography (USG) or Xray KUB. We are reporting one such case with review of the literature.

2. CASE REPORT

A 56-year-old non-smoker male with known hypertension for 5 years presented with pain in abdomen with microscopic haematuria. He had no palpable mass. His serum urea and creatinine were within normal limits. His urine culture was sterile and cytology was negative. USG suggested a right renal calculus. Intravenous urography showed a ring-shaped shadow in the right renal area with normal visualisation of both kidneys (Fig. 1).

CT renal Angiography suggested <2 cm saccular aneurysm from the anterior division of right renal artery with no distal stenosis, he was referred to the cardiology department for endovascular stenting.

3. DISCUSSION

The incidence of renal artery aneurysm (RAA) is estimated to be around 0.09 – 0.3%. Four types of RAA have been described in the literature: saccular, fusiform, dissecting and intra-renal [4]; with the saccular type accounting for >75%. The saccular shape has a low prevalence of symptoms [5].

Ring-like shadow can also be produced by matrix calculi with surrounding calcification. Other differential diagnosis of radiodensity in the renal area includes renal calculus, ingested tablet or capsule, calcified mesenteric lymph node, calcified blood vessels, an ossified tip of 12th rib, calcification in adrenal or renal mass, tuberculosis kidney. The shadow may be in the pelvicalyceal system, renal parenchyma or outside the kidney. Common causes of cortical nephrocalcinosis are renal cortical necrosis, chronic glomerulonephritis, oxalosis, renal transplant rejection, chronic hypercalcemia or AIDS-associated infections whereas hyperparathyroidism, renal tubular acidosis, medullary sponge kidney usually cause medullary nephrocalcinosis.

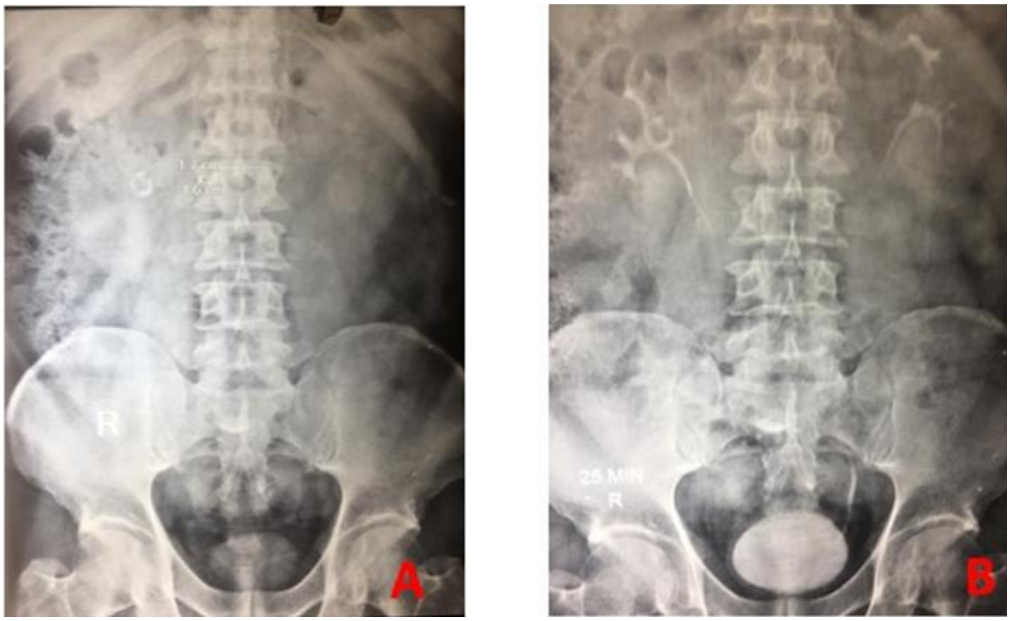

Fig. 1. A) Plain Xray KUB showing "ring-like" calcification in right renal area B) IVU showing bilateral normally functioning kidneys with ring-like calcification opposed to the right renal pelvis

Fig. 2. CT angiography showing saccular renal artery aneurysm on the right side

Some studies have shown that about 55% of such patients have no obvious symptoms and about 40% of patients have associated hypertension. Other symptoms include flank pain or haematuria, rarely these may rupture into the pelvicalyceal system (PCS) and present with grievous gross haematuria. Because of its atypical symptoms, this disease is difficult to be detected, and it is usually diagnosed accidentally while examining other diseases by cross sectional imaging.

Hypertension in these cases is presumably the result of embolization of thrombus from aneurysm causing renal ischemia. Most of these are in the 4th or 5th decade. It is more common in females and on the right side. However, the majority of the renal artery aneurysms are of smaller diameter (<2 cm). So, most of them don't require any intervention and remain silent clinically. Doppler ultrasound, CT angiography (CTA), or MR Angiography (MRA) is often used in the detection of renal aneurysms.

A ring-like calcification in the renal area in X-ray KUB should raise alarm as it could be renal artery aneurysm. Often these are incidentally detected while investigating a case of haematuria or hypertension. Calcification in RAA is seen in 50% cases. Selective angiography is diagnostic. CTA or MRA may be done to establish the diagnosis. Subjecting such a patient without angiography to Extracorporeal shockwave lithotripsy (ESWL)/ Percutaneous nephrolithotomy (PCNL), iatrogenic rupture of RAA could be catastrophic.

Most of the RAA are small and asymptomatic. RAA more than 2 cm, uncontrolled hypertension, pregnancy, absent calcification are factors associated with more chances of rupture [6]. Most of them are non-calcified and therefore not picked up on plain X-ray. Endovascular stenting is the therapeutic modality of choice and has excellent results in both elective or emergency presentations. [7].

Contraindications of endovascular treatment are Large size and multiplicity. In these cases, open approach is required and even sometimes, nephrectomy may be justified [8].

4. CONCLUSION

Any unusual radiodensity in the renal area not suggestive of calculus should be investigated

further to exclude RAA by cross sectional imaging or angiography to exclude any RAA.

CONSENT

Patient consent was duly obtained before working on this manuscript.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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