

# Renal Artery Aneurysm at a Nigerian Tertiary Centre: Case Report and Review of Literature.

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## Abstract

Renal artery aneurysms are rare urologic conditions, with rupture being the most feared complication. We discuss the management of two women with this disease at our center. The first was a 58-year-old woman who presented with torrential hematuria and hemodynamic compromise. Abdominal computed tomography (CT) angiography revealed a left renal artery aneurysm, and she had emergency nephrectomy. The second was a 40-year-old woman with recurrent flank pain of 2 years duration. Serial CT scans showed a calcified renal aneurysm remaining stable over this period. She was managed nonoperatively, with serial follow-up imaging to determine if future intervention is warranted. We conclude on the need for adequate evaluation and imaging to promptly diagnose renal artery aneurysms, and that care should be individualized.

**Keywords:** Aneurysm, angiography, artery, nephrectomy, renal, rupture

## INTRODUCTION

A renal artery aneurysm describes a dilated portion of the renal artery, whose diameter exceeds twice the diameter of the normal artery (usually between 5 and 6 mm).<sup>[1]</sup> The renal artery is usually between 4 and 6 cm in length and about 5–6 mm in diameter. It is a relatively rare urologic condition and is more common in middle-aged females.<sup>[2]</sup> The incidence is about 0.09% of the general population, and about 0.01% of large autopsy series, though among patients who are imaged for renovascular hypertension, the incidence could be much higher (about 1%).<sup>[3]</sup> Presentation could be asymptomatic or symptomatic (pain, hypertension, or hematuria). Aneurysmal rupture is a possibly lethal complication.<sup>[4]</sup> Renal aneurysms could be extraparenchymal (saccular-most common, fusiform, or dissecting) or intraparenchymal; true (caused by fibromuscular dysplasia and Ehlers-Danlos syndrome) or false (caused by trauma, dissection, endovascular procedures, or infection) aneurysms; calcified or noncalcified, and shown to be slightly more common on the right.<sup>[5]</sup>

Management is based on symptomatology, hemodynamic status, aneurysm size, and available facilities.<sup>[6]</sup> Noted factors with a low risk of rupture include the male gender, postmenopausal women, calcified aneurysm, and

fusiform aneurysms. It is generally agreed that aneurysms that are >2 cm, symptomatic or enlarging aneurysms, should be treated.<sup>[1]</sup> Besides nonoperative approach with interval imaging, endovascular methods include coil embolization, liquid embolization (ethylene vinyl alcohol), as well as polytetrafluoroethylene stent grafts. While coil embolization is feasible for both extraparenchymal and intraparenchymal (segmental) arteries, stent grafts are mostly for extraparenchymal vessels as they are limited by arterial divisions/bifurcations.<sup>[5]</sup> Open procedure includes tangential excision with either primary repair or patch angioplasty, vascular bypass, extracorporeal repair, and autotransplantation, as well as simple nephrectomy in ruptured hemodynamically unstable cases.<sup>[7,8]</sup> We report the management of two women with renal artery aneurysms at our center. Appropriate consent was sought from them prior to reporting these cases.

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**How to cite this article:** Babalola RN, Ikuero SO, Omisano OA, Abolarinwa AA. Renal artery aneurysm at a Nigerian tertiary centre: Case report and review of literature. *Niger J Med* 2020;29:517-9.

**Submitted:** 08-May-2020 **Revised:** 27-May-2020

**Accepted:** 06-Jun-2020 **Published:** 18-Sep-2020

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Website:  
www.njmonline.org

DOI:  
10.4103/NJM.NJM\_66\_20

## CASE REPORTS

### Case 1

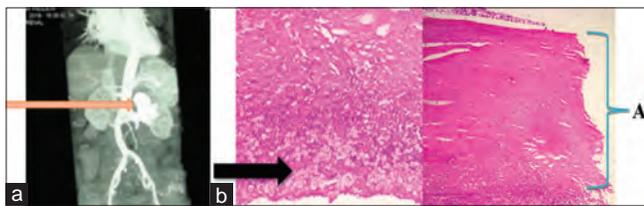
A 58-year-old female teacher was admitted in our hospital with intermittent painless, total hematuria of 3 days, associated with the passage of clots and dizziness. She was a known hypertensive of 4 years. She was admitted for resuscitation, and within 24 h of admission, had 2 other episodes of torrential hematuria, with a precipitous drop in hematocrit (from 35% to 18%, despite transfusions), and was in hypovolemic shock. A computed tomography (CT) angiogram done revealed a renal artery aneurysm extending into the upper pole segmental artery [Figure 1a]. The right kidney was essentially normal. At surgery, a tortuous, dilated, pulsatile renal artery measuring about 5 cm in diameter, and involving the upper pole segmental artery was found, and she had a simple nephrectomy. The decision for a simple nephrectomy was made on account of the torrential bleeding into the collecting system, with significant gross hematuria and shock; also considering she had a normal contralateral kidney. She was discharged afterward as her hemodynamic status normalized. Histopathology revealed sections of the renal artery narrowed by an eccentric plaque and a final histopathologic diagnosis of a ruptured left renal artery aneurysm with marked arteriolosclerosis was made [Figure 1b].

### Case 2

A 40-year-old trader, known hypertensive, presented at the urology clinic with recurrent right flank pain of 2 years duration. There was no flank swelling, hematuria, or weight loss. Examination showed a healthy-looking woman who had no abdominal tenderness. An initial CT scan done a year after symptoms began showed dilatation of the right renal artery measuring 1.8 cm by 1.6 cm, with a peripheral calcification [Figure 2a]. A CT angiogram was done at repeat presentation about a year after, and this confirmed a calcified right renal aneurysm, measuring 1.65 cm by 1.52 cm [Figure 2b]. Following discussion with the patient, a nonoperative approach was taken, with serial assessment with imaging, in order to determine the need for intervention if it became necessary.

## DISCUSSION

These case reports discuss the clinical presentation of two patients with an apparently rare urologic condition, to

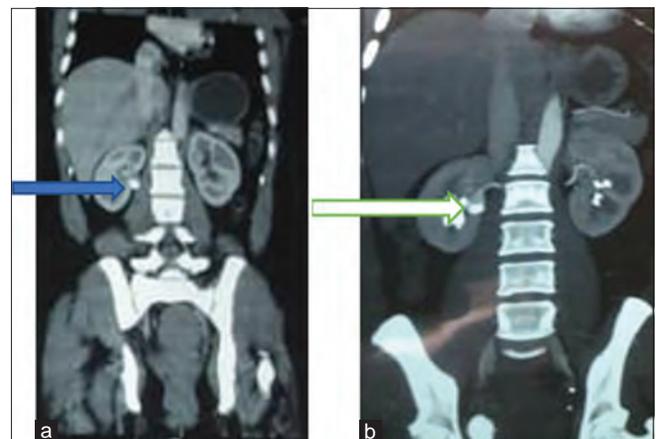


**Figure 1:** (a) The computed tomography angiogram of the first patient. The red arrow shows the dilated renal artery with the intrarenal extension. (b) Histopathology of the renal artery in the first patient, showing foam cells indicative of arteriosclerosis (dark arrow), inflammatory cells, and medial-to-adventitial fibrosis (A)

highlight the appropriate choice of investigation based on a high index of suspicion and the individualized approach to management. The two patients were females between 40 and 60 years, the peak age and more common gender for this condition.<sup>[5,9]</sup> Both were also hypertensives, and it is thought that twisting and kinking of the renal artery from its dilatation, microembolization from the aneurysm to the distal circulation, or a concomitant renal artery stenosis, might cause co-existing hypertension.<sup>[2]</sup>

The first patient was a middle-aged woman who presented with hematuria massive enough to compromise her hemodynamic status. While most renal malignancies are vascular and hyperdense on CT, the homogeneity of this mass, its direct communication with the renal artery (rather than the renal vein or inferior vena cava), and the absence of enlarged paraaortic lymph nodes prompted further evaluation with an angiography, which then confirmed the radiologic diagnosis of an aneurysm [Figure 1a]. Here, a ruptured aneurysm was suspected and an emergency nephrectomy was done. This is the prudent approach to secure hemostasis and prevent mortality from this condition.<sup>[8]</sup> The size of the aneurysm in this woman (5 cm) on preoperative CT angiogram was also another strong indication for intervention. The large intrarenal extension of this aneurysm into the upper pole segmental artery in this patient also obviated open angioplasty,<sup>[5]</sup> which would have been a viable option in an extrarenal aneurysm in a stable patient not bleeding.

The second patient was a younger woman with episodic flank pain. She had an extrarenal aneurysm measuring 1.6 cm, which had remained stable over time on interval imaging. While some authors advocate endovascular repairs in this group, such facilities are still unavailable in our setting. Furthermore, the long-term risk of renal insufficiency from a warm ischemic time during angioplasty or even open repairs,<sup>[5]</sup> has to be balanced with the long-term benefits of renal angioplasty in the setting of an aneurysm, specifically the benefit of preventing a



**Figure 2:** (a) Previous computed tomography urogram showing a hyperdense calcified lesion at the renal hilum (blue arrow). (b) Subsequent computed tomography angiogram of the same patient a year later. White arrows show the dilated and calcified portion of the right renal artery

rupture. Indeed, Klausner *et al.*<sup>[6]</sup> monitored 33 asymptomatic patients for about 3 years, and none had rupture or mortality. The infrequent nature of the patient's symptoms and the presence of calcification in the dilated segment (known to confer protection against rupture),<sup>[2,10]</sup> informed the decision to manage her nonoperatively. Intervention may be indicated if repeat imaging shows an enlarging aneurysm, or if she has worsening symptoms.

## CONCLUSION

This case reports have highlighted the possible presentations of renal artery aneurysm in our setting. It has also shown the need for a high index of suspicion for renal aneurysms, especially in hypertensive females with severe hematuria. Prompt accurate diagnosis is necessary to offer patients individualized care.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. The patients have given their consent for their images and other clinical information to be obtained in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

## Acknowledgment

The authors acknowledge our colleagues in the Urology Unit, the Radiology and Histopathology Departments for their support with in-patient care and reporting of the images.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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