A rare case of renal artery aneurysm - dawning of new treatment approach

Asyraf Mad Dan, Saiful Azli, Mohd Ghani Khairul-Asri, Arvind Vashdev Jagwani

Department of Urology, Hospital Serdang, Selangor, Department of Surgery, Fakulti Perubatan Dan Sains Kesihatan, University Putra Malaysia, Kuala Lumpur, Department of Urology, Hospital Pengajar Universiti Putra Malaysia, Serdang, Malaysia

Abstract

Renal artery aneurysms are a rare occurrence, with a prevalence of about <1%. The majority of patients are asymptomatic and are diagnosed through incidental findings on imaging. In very rare occurrences, the aneurysm can rupture and cause significant morbidity and even death.

Keywords: Aneurysm, renal artery, spontaneous rupture

INTRODUCTION

Spontaneous rupture of the kidney is a rare but well recognised surgical emergency. The two most common causes are renal carcinoma and angio‑myolipoma. In most of these cases, the resulting hematoma is confined to either the subcapsular or perinephric space. We describe a case of spontaneous renal rupture due to a pseudoaneurysm of a renal artery branch with massive intra‑abdominal haemorrhage that had been successfully embolized.

CASE REPORT

We report a 64‑year‑old man with multiple comorbidities who had just recently underwent a percutaneous coronary artery intervention. To add to his comorbidities is also the chronic kidney disease Grade V of which has been attributed to his lifestyle diseases of diabetes and hypertension of 15 years.

His symptoms started with loin to groin radiation of pain with associated vomiting at the heights of pain for about a day. A quick general examination and abdominal examination revealed that he was mildly pale with a huge mass at the left of the abdomen that he had not noticed in the pass. The mass measured grossly at 10 cm by 8 cm and does not move with respiration.

There was no associated trauma or injury prior to presentation to ED and patient no past history of invasive renal‑related procedure done.

While he was stable an urgent 4 phase computed tomography (CT) renal study was arranged which revealed an active contrast blush from the upper pole posterior branch of the left renal artery which has resulted in a huge perinephric hematoma measuring 6 cm × 8 cm × 15 cm (AP × W × CC) [Figure 1].

The case was referred to interventional radiologist for endovascular embolization. The left common femoral

Access this article online

Quick Response Code:
Website: www.urologyannals.com
DOI: 10.4103/ua.ua_65_21

How to cite this article: Dan AM, Azli S, Khairul-Asri MG, Jagwani AV. A rare case of renal artery aneurysm - dawning of new treatment approach. Urol Ann 2022;14:99-101.
artery was approached in an antegrade manner and the left renal artery was catheterized [Figure 2]. A superselective cannulation of the mid pole posterior branch was performed. The left posterior renal artery was coiled using a 5 mm × 5 mm and 3 mm × 3 mm coil and immediate hemostasis was seen on the live video [Figure 3].

The patient recovered well and discharged 2 days after the procedure.

**DISCUSSION**

Renal artery aneurysm (RAA) is described as an enlarged segment of the renal artery that surpasses twice the diameter of a typical renal artery. It is uncommon, occurring in approximately 0.09% of the general population.[1] RAA was first described by Rouppe[2] back in the 17th century. Most of the time cases like this were encounter as incidental findings during imaging. In one large series, 55 percent of patients presented incidentally.[3] Nowadays with more frequent advanced imaging such as magnetic resonance imaging (MRI), CT, and angiography for other diseases, the rate of RAA detection significantly increase. The aneurysm can be further divided into true or false (pseudo) aneurysms. A true aneurysm is a balloon-like dilatation of the vessel wall, whereas false aneurysm developed from tissues surrounding the arteries.[4,5]

The causes of RAA have been reported to be from iatrogenic injury and blunt abdominal trauma. Iatrogenic injury occurs commonly from surgical intervention such as partial nephrectomy, percutaneous nephrolithotomy, renal biopsy, ureteroscopy with laser lithotripsy, and post renal transplant.[6‑10] Multiple risk factors for RAA including hypertension, fibromuscular disease, especially in women, concomitant atherosclerosis disease and concomitant other aneurysm diseases.[3]

Consequently, the radiography evidence that can be seen is the presence of ring-like calcification on plain abdominal X-ray should raise suspicion of RAA as this sign present in approximately 50% of the cases.[11] Other than basic plain abdominal X-ray, other imaging modalities can be used including duplex ultrasound, CT scan, MRI angiography, and arteriography. In our case, the CT study with contrast was performed after clinical suspicion of palpable left renal mass.

In the case of spontaneous ruptured RAA, overall risk of ruptured RAA appears to be low. In one case series, looking at 252 sample participants, only 3 out of 252 (1.2%) had ruptured RAA. Those participants were under conservative monitoring group.[3] Risk of ruptured RAA increase with pregnancy, larger diameter
aneurysm, and aneurysm secondary to inflammatory etiology.\cite{12,13} Therefore, the risk of ruptured RAA is very low in contrary to old belief when imaging was not widely available, and the patient presented with symptomatic ruptured RAA.\cite{14}

Management of RAA will be determined by several factors. Indication for intervention including aneurysm >3 cm, renovascular hypertension with lateralizing renin values, symptomatic aneurysm, aneurysm size expansion, renal embolization, and pregnancy.\cite{15,16} RAA embolization is known to be more limited and precise in terms of anatomical demarcation compare to invasive surgical intervention. This also will benefit the patient in terms of kidney preserving thus leaving functional kidney tissue. Besides the indication stated above, RRA may be treated conservatively with regular blood pressure, renal function monitoring, and annual renal duplex ultrasonography.\cite{17}

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported 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
I would to express my thanks and acknowledge the efforts of all the authors of this article.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

REFERENCES
1. Stanley JC, Rhodes EL, Gewertz BL, Chang CY, Walter JF, Fry WJ. Renal artery aneurysms. Significance of macroaneurysms exclusive of dissections and fibrohydysplastic mural dilations. Arch Surg 1975;110:1327‑33.
2. Rouppe D. Renal artery aneurysm. Nov Acta Phys Med Acad Nat Curios 1770:476.
3. Henke PK, Cardneau JD, Welling TH 3rd, Upchurch GR Jr., Wakefield TW, Jacobs LA, et al. Renal artery aneurysms: A 35-year clinical experience with 252 aneurysms in 168 patients. Ann Surg 2001;234:454‑62.
4. Bakir AA, Patel SK, Schwartz MM, Lewis EJ. Isolated dissecting aneurysm of the renal artery. Am Heart J 1978;96:92‑6.
5. Cerny JC, Chang CY, Fry WJ. Renal artery aneurysms. Arch Surg 1968;96:653‑63.
6. Yamaçake KG, Lucon M, Lucon AM, Mesquita JL, Srougi M. Renal artery pseudoaneurysm after blunt renal trauma: Report on three cases and review of the literature. Sao Paulo Med J 2013;131:356‑62.
7. Jain S, Nyirenda T, Yates J, Munver R. Incidence of renal artery pseudoaneurysm following open and minimally invasive partial nephrectomy: A systematic review and comparative analysis. J Urol 2013;189:1643‑8.
8. Amoros Torres A, Palmero Martí JL, Ramirez Backhaus M, Ferrer Puchol MD, Pastor Lence JC, Benedicto Redón A. Intrarenal pseudoaneurysm after percutaneous nephrolithotomy. Renal angiography and selective embolization. Arch Esp Urol 2013;66:317‑20.
9. Yang HK, Koh ES, Shin SJ and Chung S. Incidental renal artery pseudoaneurysm after percutaneous native renal biopsy. BJM Case Rep 2013:84; pii: hcr2012006537. doi: 10.1136/bcr‑2012‑006537.
10. Al‑Wahaibi KN, Aquil S, Al‑Sukaiti R, Al‑Riyami D and Al‑Busaidi Q. Ruptured renal artery pseudoaneurysm with percutaneous Renal transplant: A case report and literature review. Oman Med J 2010;25:306‑10.
11. Dergany A, Novick A. Renovascular hypertension and ischemic nephropathy. In: Wein A, editors. Campbell‑Walsh Urology. PA: Saunders; 2012. p. 1078‑80.
12. Tham G, Ekeland I, Herrlin K, Lindstedt EL, Olin T, Bergentz SE. Renal artery aneurysms. Natural history and prognosis. Ann Surg 1983;197:348‑52.
13. Ufberg JW, McNeil B, Swisher L. Ruptured renal artery aneurysm: An uncommon cause of acute abdominal pain. J Emerg Med 2003;25:35‑85.
14. Chaer RA, Abularrage CJ, Coleman DM, Eslami MH, Kashyap VS, Rockman C, et al. The Society for Vascular Surgery clinical practice guidelines on the management of visceral aneurysms. J Vasc Surg 2020;72:38‑398.
15. Halloub Z, Buerger T, Grote R, Meyer F. Selective embolization of a renal artery aneurysm. Vasa 2000;29:285‑7.
16. Augustin G, Kilis T, Kello N, Ivkovic V. Ruptured renal artery aneurysm in pregnancy and puerperium: Literature review of 53 cases. Arch Gyneceol Obstet 2019;299:923‑31.
17. Wayne EJ, Edwards MS, Stafford JM, Hansen KJ, Corriere MA. Anatomic characteristics and natural history of renal artery aneurysms during longitudinal imaging surveillance. J Vasc Surg 2014;60:448‑52.