MEDICINE AND PHARMACY

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ENDOVASCULAR REPAIR OF DOUBLE RENAL ARTERY ANEURYSM IN A PATIENT WITH POLYCYSTIC KIDNEY

Abstract. *Renal Artery Aneurysms (RAA) are a rare vascular entity with an incidence of 0.1% in the general population. Despite having an extremely high mortality associated with thrombus formation and RAA rupture, no consensus currently exists as to when intervention is needed, and which types of intervention are most appropriate for RAA. The following is particularly true for double or multiple RAA in high-risk and frail patients, although these factors are not included in the currently used Runderback classification system. We report the case of a 55-year-old patient with a history of polycystic kidney disease and hepatic haemangioma who was admitted to the hospital with asymptomatic renal artery aneurysm. Selective angiography revealed two aneurysms, both of which were 10 mm at the trunk of the left kidney. The patient was treated by selective embolization of the aneurysms and discharged four days after an uneventful postoperative period with normal renal function. Double RAA should especially be approached with caution due to the statistically higher risk of rupture, especially in similar cases to the described patient where the aneurysms are in such close proximity. The choice of RAA treatment should also consider the comorbidities of the patient. An endovascular approach has been successful in our case and the patient recovered excellently with improvement of her hypertension.*

Introduction

Renal artery aneurysm (RAA) represents a rare vascular entity with an estimated incidence of 0.1% in the general population which increases to ~1% in abdominal aortic angiography scans. [1] Whilst RAA has numerous etiologies, commonly it is associated with fibrodysplasia, atherosclerosis, trauma, mycotic

origin, Ehlers-Danlos syndrome, Marfan syndrome, Takayasu disease, Behcet's disease, and Rechlinghausen's neurofibromatosis. [2]

While investigation for RAA may be prompted by the patient presenting with haematuria, hypertension, or flank pain, RAA tends to be mostly an incidental radiological finding with growing incidence due to the increased use of MRI and CT with angiography scans. Although RAA-related mortality is up to 10% and both open surgical and percutaneous techniques are available, indications for intervention are still unclear. [3] Underlying vascular and renal conditions, as is in the case following, might modify the progression of RAAs and pose an elevated risk of poor outcomes if left untreated. Here, we present the case of a patient with double RAA and concomitant polycystic kidney disease and hepatic hemangioma.

Case Presentation

A 55-year old woman with a history of polycystic kidney disease and hepatic hemangioma was admitted to the hospital with asymptomatic RAAs, which had been incidentally detected on abdominal ultrasound previously and confirmed by CT angiography (Table 1). Selective angiography revealed two aneurysms, both of which were 10 mm at the trunk of the left kidney. They were diagnosed as a Rundback type 1 RAA, which are suitable for endovascular intervention. She was therefore treated by selective embolization of the aneurysms (Figure 1) and discharged four days after an uneventful postoperative period with normal renal function.

Table 1

Patient characteristics

Sex	Female
Age	55
Side	Left
Size	10 mm, 10 mm
Symptoms	None
GFR	85 ml/min
BP	180/110 mm Hg
Additional	Hypertension. Left kidney polycystosis. Hepatic hemangioma.

BP = blood pressure; GFR = glomerular filtration rate

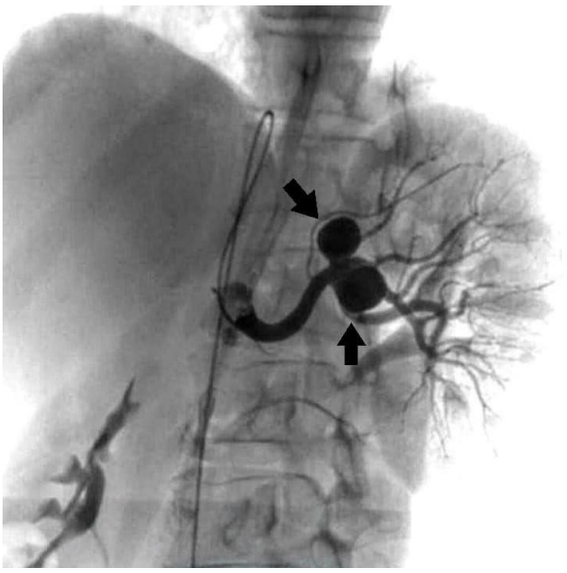

Fig. 1. **Double renal artery aneurysm**

Discussion

RAA is a rare disorder characterized by distension of the renal artery, which can predispose for thrombus formation and rupture. The occurrence of multiple RAAs in the general population is even rarer, and constitutes about 18% of all RAAs. [3] No consensus currently exists as to when intervention is needed and which types of intervention are most appropriate for RAA.

Generally, indications to intervene on RAA have been based on the likelihood of the aneurysm to rupture, which has an extremely high mortality rate of up to 80%. [4] High-risk patients with the need for intervention are identified based on the diameter of the RAA being greater than 2cm, increased tendency to enlarge, and the presence of symptoms. [5, 6] Moreover, women who are or intend on becoming pregnant, alongside patients with RAA associated with renovascular hypertension, have been indicated for treatment due to increased abdominal pressure and vascular changes. [5,6]

Although the literature has suggested 2cm as the threshold for intervention, ruptures of smaller RAAs have been reported, highlighting the importance of careful interventional consideration. [7] Double RAA should especially be approached with caution due to the statistically higher risk of rupture which comes from the multiple aneurysms, especially in similar cases to the aforementioned patient where the aneurysms are in such close proximity.

Based on the treatment options available for RAA, Runderback et al. suggested an angiographic classification system. [8] Type 1 RAAs have been suggested for stent-grafts or stent/balloon-assisted coil embolization as they constitute saccular RAAs arising from the main renal artery trunk or a proximal segmental artery. Type 2 are fusiform and found in similar locations to type 1 and have been indicated for open surgical treatment. [8] Suggestions relating to the type of treatment to offer patients presenting with double or multiple RAA is lacking. The endovascular approach in our case has been reported successful with no postoperative complication. Although data regarding the long term efficacy of endovascular treatment of RAA is lacking, short term data has demonstrated improvement of both hypertension and renal dysfunction. [9]

The choice of treatment for RAA should also consider the comorbidities of the patient. Frail and high-risk individuals might be best suited for endovascular treatment because of the high invasiveness and post-operative risk carried by open surgery. The underlying comorbidity might as well predispose the patient for the development and potentially a faster progression of aneurysms. This is particularly true in polycystic kidney disease, such as in our patient, as a clearly elevated risk of aneurysmal formation has been demonstrated in other studies. [10] Our patient also presented with hepatic haemangioma, another vascular condition. The occurrence of RAA at the background of other vascular conditions that can elevate the risk of RAA progression and associated complications might, therefore, warrant earlier intervention and closer follow-ups.

In conclusion, we presented the case of a 55-year-old woman who underwent endovascular repair of a double RAA and was treated with coil embolization. The patient was known with polycystic kidney disease, which might have predisposed her for the development of aneurysms. The patient recovered excellently with improvement of her hypertension.

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