SHORT REPORT

Renal Artery Aneurysms: Careful Investigation is Critical

M.G.A. Norwood a, M.K. Salem a,*, G. Markose b, A.R. Naylor a

a Department of Vascular Surgery, University Hospitals of Leicester NHS Trust, Leicester LE1 5WW, UK
b Department of Vascular Radiology, University Hospitals of Leicester NHS Trust, Leicester LE1 5WW, UK

Submitted 29 January 2009; accepted 19 May 2009

KEYWORDS
Renal artery aneurysm; Fibromuscular dysplasia; Polyarteritis nodosa

Abstract
We describe a case of a 36-year-old female patient who was investigated for renal artery aneurysms with angiography. Co-existing aneurysms within the mesenteric circulation were also noted, and a diagnosis of polyarteritis nodosa was made. Investigating patients with renal artery aneurysms using magnetic resonance imaging alone may miss cases of polyarteritis nodosa: a serious and potentially treatable condition.

Introduction
Aneurysms of the renal arteries are uncommon. We describe such a case, and highlight the important investigative steps in such a patient.

Case report
A 36-year-old female smoker with a past medical history of angina presented to a District General Hospital with a four-month history of malaise, anorexia, weight loss (2.5 kg) and persistent hypertension (BP 170/104). Initial clinical and vascular examination was normal other than a bruit over the left renal artery. A magnetic resonance angiogram (MRA) was requested to investigate renal artery stenosis as a cause of the hypertension. The MRA revealed an 8 mm saccular aneurysm arising from the left renal artery and a further 8 mm saccular aneurysm arising from an artery supplying the upper pole of the right kidney (Fig. 1). In addition, both renal arteries were described as exhibiting a ‘string of beads’ figuration, suggestive of fibromuscular dysplasia (FMD). The patient was subsequently referred to our vascular unit with a suspected diagnosis of FMD, for an opinion as to whether any form of intervention was required. Given her young age and cardiac history, a diagnosis of polyarteritis nodosa (PAN) was suspected. After consultation with the patient, a mesenteric and renal angiogram was performed (Fig. 2) which demonstrated multiple intrahepatic, intrasplenic, renal and visceral aneurysms, in
keeping with a diagnosis of PAN. Her renal function, liver function and full blood count were all normal, and a vasculitic screen was negative for anti-nuclear antibody, anti-smooth muscle antibody, mitochondrial antibody, liver and kidney microsomal antibody and parietal cell antibody. The patient was subsequently referred to the rheumatology clinic and commenced on oral steroids and cyclophosphamide as treatment for PAN.

Discussion

Aneurysms of the renal arteries are unusual, and often occur as a result of an underlying pathology, commonly FMD or systemic vasculitis including PAN. FMD and PAN are both rare diseases, and are not commonly encountered in a general vascular surgery practice. However, they are important diseases to be aware of as their approach to treatment differs widely.

FMD is a generalised, non-inflammatory, systemic disease of unknown aetiology that may affect arteries in any part of the body, but mainly affects the renal and carotid arteries of middle-aged women. It has two main subgroups: namely intimal fibroplasia and medial fibroplasia, the latter being most common. Histologically, thickened fibromuscular ridges alternate with areas of marked mural thinning which can lead to aneurysm formation. The majority of cases are treated conservatively, with intervention (radiological or surgical) reserved for complications such as symptomatic renal artery stenosis.

PAN is a systemic, necrotising vasculitis that affects small and medium-sized arteries. Its annual incidence is estimated as 8 per million in the UK, and is more common in men. Histologically it is characterised by transmural necrotising inflammatory lesions of the arterial wall, which often involve branch points and lead to aneurysm formation. Symptoms include fever, malaise and loss of weight. Unlike FMH, PAN can be treated, usually with steroids and cyclophosphamide.

The majority of patients with renal artery aneurysms are asymptomatic, but some may develop renovascular hypertension. Rupture is unlikely, and most surgeons would advocate expectant treatment unless the aneurysm was larger than 2 cm or causing renal compromise. In all cases of renal artery aneurysm, the approach to management should be twofold: firstly to exclude any underlying cause that may be amenable to medically therapy (e.g. PAN), and secondly to treat any renal compromise. In order optimise patient management, adequate investigations should be performed to illicit the underlying cause.

Hekali et al6 analysed 156 patients in whom the indication of mesenteric angiography was a clinical suspicion of arteritis. 17 patients were found to have PAN and 21 others presented with disorders with multiple aneurysms. In this group angiography had a sensitivity of 89% and a specificity of 90% for the diagnosis of PAN. Patients with PAN were also found to have significantly more renal infarcts than other patients. In another series of 28 patients7 presenting with renal artery aneurysms over a 2-decade period confirmed by selective renal angiography, the aetiology of the aneurysms included atherosclerosis (75%), fibromuscular disease (21%), and Ehlos–Danlos syndrome (4%). In these patients 39% were discovered incidentally, 39% after investigation for hypertension, and 22% for investigation of abdominal pain. Only 7% had symptoms directly attributable to the aneurysm.
We would suggest that any patient presenting with renal artery aneurysms and a suspicion of systemic vasculitis should undergo a full vasculitic screen and highly selective angiography of the renal and visceral arterial beds.8

In conclusion, this case demonstrates an important lesson. Single MRA imaging would have incorrectly diagnosed FMD, missing a far more serious condition of PAN. PAN is known to have a significant attributable mortality if left untreated, and therefore every effort should be made to identify and treat this condition.

Conflict of Interest

Not applicable.

Funding

Not applicable.

References