Giant Renal Vein Aneurysm and Arteriovenous Fistula Secondary to Renal Artery Aneurysm

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Abstract
We report the case of a 26-year-old male who presented with an asymptomatic right-sided renal mass found during an ultrasound examination. Computed tomography (CT) and angiography confirmed the diagnosis of a venous aneurysm with a renal arteriovenous fistula (RAVF) arising from a renal artery aneurysm (RAA). The aneurysms were surgically resected and the RAVF was obliterated.

Development of a spontaneous RAVF and a renal vein aneurysm arising from a RAA is rare. Hypertension is the most common presenting symptom. Surgical repair remains the most appropriate treatment for RAAs. In some cases, such as in saccular aneurysms or fistulas arising from small branches of the renal artery, embolisation can be used.

Case Report
A 26-year-old male presented with an asymptomatic right renal mass. This was discovered during an abdominal ultrasound. Past medical history was non-contributory and physical examination and laboratory findings were unremarkable.

A duplex scan detected an RAVF with low-volume flow pattern. Multi-slice computed tomography (CT) angiographic reconstruction and digital angiography interpreted the first mass as a saccular aneurysm and the second mass as a VA (Figs. 1 and 2). The patient underwent surgical...
repair through a right trans-peritoneal approach by Kocher’s manoeuvre. The arterial aneurysm arose from the first upper segmental branch. The aneurysms were opened and resected. On inspection, a fistulous tract was observed inside. The treatment consisted of aneurysmorrhaphy with direct suturing of the communication and simple closure of the draining tributary. The postoperative course was uneventful, and the patient was discharged from the hospital on the fifth postoperative day. Histological examination revealed that one lesion was an arterial aneurysm with cystic medial degeneration and the other was a VA.

Discussion

RAFs are rare, and only about 200 cases have been reported. Acquired RAFs represent 75% of all RAFs, and iatrogenic injury is suspected in more than 70% of them. Non-iatrogenic, acquired RAFs are mostly related to renal malignancy or to fibromuscular dysplasia. RAAs affect less than 0.1% of the general population and are mostly related to medial layer degeneration.1

Renal VAs are an exceptional clinical entity. Perhaps, only 10 true renal VAs have been reported in the literature. Most renal VAs are idiopathic and are related to medial layer pathology. They can also be secondary to thrombosis, venous hypertension or RAF.2 Only six cases of a spontaneous RAF that developed from an RAA have been reported in the literature.3–5

Regarding RAF, the most frequent symptom is haematuria; hypertension and congestive heart failure (CHF) can also be present.1 In those cases of RAF originating from an RAA, hypertension and CHF signs were the most frequent clinical features. Rupture with massive haemorrhage is rare in isolated RAF; however, it can occur in almost 3% of RAAs.1

At present, multi-slice CT scan and magnetic resonance angiography (MRA) are the most important diagnostic modalities.6 CT scan as well as MRA three-dimensional (3D) reconstructions are very helpful in planning the treatment. Angiography remains an important tool and, in many cases, could offer a treatment opportunity.

In our diagnostic algorithm, angiography was performed in order to evaluate endovascular correction, but since it was not possible to identify the location of RAF to evaluate for possible endovascular intervention.

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In our diagnostic algorithm, angiography was performed in order to evaluate endovascular correction, but since it was not possible to identify the location of RAF communication, surgery became the best therapeutic option. Regarding RAA, surgery remains the first choice among treatments. As it occurred in our case, many saccular aneurysms can be repaired by simple suturing or aneurysmorrhaphy.3 Intra-parenchymal aneurysms, or those involving distal branches, often require a more complex reconstruction with or without ex vivo repair.9 We found three cases that were treated with a nephrectomy. All three cases had been reported before the modern vascular surgery era.

Endovascular techniques permit correction of RAFs.1,5–7 Nowadays, embolisation is the most widespread technique and is the treatment of choice for small RAFs.1,5 Large RAFs and those with rapid blood flow are at risk of causing
pulmonary embolism. In this situation, staged treatment or temporary cava filters may be helpful.\textsuperscript{6}

Endovascular techniques are promising and will probably become an ordinary option in the management of RAAs, as it has happened with RAVFs.\textsuperscript{5}

Conflict of Interest

The authors have no conflict of interest.

References


