An extremely rare case of an incidentally detected renal vein aneurysm and review of literature

Dilliraj Prabakar, Nupur Bit, Thiruvengadam Vidyasagaran, Joesph Amalorpavanathan, Narayanan Sritharan, Kalyanaraman Elancheralathan

Department of Vascular Surgery, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India

Abstract

Congenital renal vein aneurysms are a truncular type of venous malformation and are believed to be the outcome of defective development during the later stage of embryogenesis while the venous trunk is being formed. There have been 9 case reports so far. Here, we add the report of a patient who was incidentally detected to have a renal vein aneurysm on computed tomography angiogram. In addition, this is the first description of inferior vena cava thrombosis associated with a thrombosed saccular aneurysm of the renal vein.

Case Report

A 29-year old Asian male underwent pre-employment medical screening and was detected to have inferior vena cava (IVC) thrombosis on ultrasound abdomen. He was asymptomatic and had no co-morbid illnesses. His physical examination was unremarkable. There was no varicocoele. Basic blood laboratory investigations were all normal. Serum virology markers were negative. His procoagulant workup was negative. Contrast-enhanced computed tomography (CT) abdomen revealed a thrombosed saccular venous aneurysm of size 3.9x3.7 cm arising from the mid-segment of the left renal vein (Figure 1). Retrohepatic IVC was thrombosed; infrahepatic IVC, common iliac and external iliac vein were dilated. Since he was asymptomatic and the renal vein aneurysm was already thrombosed, it was decided to manage him conservatively. At follow up 1-year later, he remains asymptomatic and the aneurysm has maintained the same size. Our radiology colleagues contributed CT angiogram images of another patient with renal vein aneurysm (Figure 2). However, his clinical details could not be retrieved.

Discussion and Conclusions

Primary venous aneurysms are an uncommon entity. Aneurysms involving the popliteal, jugular, superior vena cava, intracranial, and axillary veins have been described. However, involvement of visceral veins is considered rare. Nevertheless now due to the easy availability of advanced diagnostic methodologies, an increasing number of asymptomatic venous aneurysms are being detected and their management debated. The potential complications of these untreated venous aneurysms are rupture, thrombosis and pressure effects on adjacent structures.[1] The risk of pulmonary embolism also cannot be ignored.

In a systematic review, Sfyroeras *et al.* identified 93 reports, including 176 patients with 198 visceral venous aneurysms.[1] Portal venous system (3%) was found to be the commonest site of involvement, often associated with cirrhosis and portal hypertension. The extremely high operative risk precludes their surgical management. Complete thrombosis occurred in 24 (13.6%) and non-occlusive thrombus was found in 6 patients. Four of the visceral aneurysms ruptured (2.2%), one of them during the postpartum period. Two of these four ruptures were splenic vein aneurysms, one intrahepatic and one aneurysm of the right portal vein. The authors concluded that those who present with rupture or thrombosis warrant surgical intervention.

Renal vein aneurysms are rare. Syfroeras *et al.* discovered only 6 case-reports.[1-7] The ages of the patients ranged from 33 to 73 years. Five were male and 3 had abdominal pain. The remaining 3 were discovered incidentally or during laparotomy. In 4 cases, the aneurysm was located in the left renal vein. Aneurysm diameter ranged from 4 to 5.5 cm. Three patients were operated; aneurysm resection and reconstruction of the renal vein (two) and nephrectomy (one). There was no report of aneurysm rupture or associated IVC thrombosis. A MEDLINE search revealed an additional 3 cases which were published after the review by Syfroeras.[1] In 2007, Chung *et al.* described a venous aneurysm which was discovered on pathological evaluation after laparoscopic resection of a 3 cm retroperitoneal mass at the junction of the left para-aortic and perirenal hilar regions.[8] Another 3.5×3.1 cm saccular lesion was described on duplex and magnetic resonance imaging in a 36-year old Taiwanese woman by Lin *et al.* in 2010. The patient opted for conservative management and had no complications till follow up at 18 months.[9]

In the latest report in 2011, Rao *et al.* have described a similar left renal vein aneurysm detected incidentally during a laparoscopic radical nephrectomy in a 66-year old male with a 5 cm right upper pole renal mass.[10]

It is interesting to note that these lesions are usually asymptomatic and the left renal vein is most often involved, which has been attributed to its more complicated embryologic development.[1,2,11]

Visceral venous aneurysms can hypothetically result in thrombosis, rupture, pressure effects and thromboembolism.[1] However, there is no published report of a renal vein aneurysm presenting with either of these complications. There have been reports of pulmonary embolism arising from popliteal vein aneurysms. Spontaneous or intraoperative inadvertent rupture is a possibility and may result in massive bleeding and difficulties in surgical repair.

True renal vein aneurysms are related to congenital weakness of the venous wall because of lack of development of media. Irace *et al.* describe that in a true aneurysm the venous wall is quite thin because of marked medial atrophy, with loss of elastic fibers and inconspicuous intima, whereas the histology in a renal varix shows both hypertrophy and thinning of the media with fibrous thickening.[7]

Our two cases add to the slowly expanding list of renal vein aneurysms (Table 1). Our case is probably unique in that the IVC thrombosis could have been due to embolism or progression of thrombus from the renal vein aneurysm. The aneurysm also subsequently thrombosed, presumably due to obstructed outflow. It could also be debated that both the thrombosis of the cava and the renal vein may have occurred simultaneously due to a common etiology. Moreover, the thrombosis of the aneurysm may have occurred independently of an obstructive flow. It lends credence to the theory that visceral vein aneurysms require

Correspondence: Nupur Bit, Department of Vascular Surgery, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India.
E-mail: nupur.bit@gmail.com

Key words: renal vein aneurysm, inferior vena cava thrombosis.

Received for publication: 15 November 2012.
Revision received: 21 January 2013.
Accepted for publication: 22 January 2013.

Veins and Lymphatics 2012; 1:e11
doi:10.4081/vl.2012.e11

Table 1. Renal vein aneurysms in literature.

Author	Year of publication	Age	Gender	Side involved	Presentation	Size	Treatment
Irace *et al.*[7]	1994	n.r.	Male	Left	Incidental during aortobifemoral	n.r.	Lateral clamping, resection and direct repair
Kabaalio lu *et al.*[5]	1997	54	Male	Left	Abdominal pain	5×4×3 cm	not mentioned
Krinsky *et al.*[6]	1997	n.r.	Male	Right	Abdominal pain	n.r.	n.r.
Khader *et al.*[4]	1999	40	Male	Left	Abdominal pain	n.r.	n.r.
Val-Bernal *et al.*[3]	2000	33	Male	Right	Right back pain, abdominal pain, hematuria, weight loss	5.5 cm	Nephrectomy for suspected
Yoneyama *et al.*[2]	2003	57	Female	Left	Asymptomatic	4 cm	Nil
Chung *et al.*[8]	2007	n.r.	n.r.	Left	On pathology	3 cm	Resected laparoscopically as retroperitoneal mass
Lin *et al.*[9]	2010	36	Female	Left circum-aortic	Incidental on duplex abdomen	3.5×3.1×2.5 cm	Nil
Rao *et al.*[10]	2011	66	Male	Right	Incidental during lap nephrectomy	5 cm	Resection, primary IVC repair

n.r., not reported; IVC, inferior vena cava.

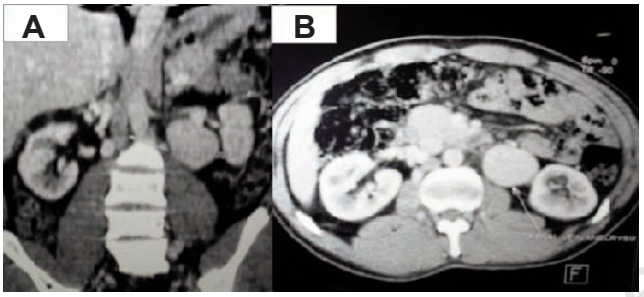

Figure 1. Patient 1. A) Coronal view of computed tomography (CT) angiogram showing a thrombosed saccular aneurysm arising from the left renal vein and inferior vena cava thrombosis. B) Axial view of CT angiogram of the same patient.

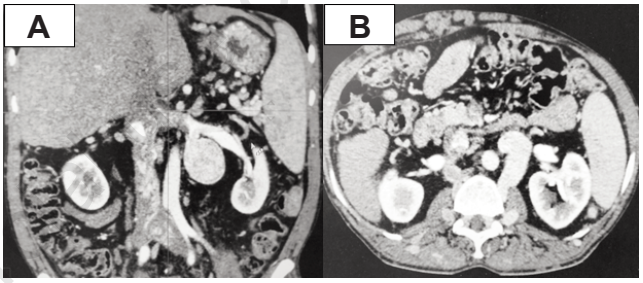

Figure 2. Patient 2. A) Coronal view of computed tomography (CT) angiogram showing a saccular aneurysm arising from the left renal vein. B) Axial view of CT angiogram of the same patient (images provided by our Radiology Department).

intervention to prevent future complications. However, since our patient has remained asymptomatic on conservative management, watchful waiting maybe advocated for thrombosed venous aneurysms.

Conclusions

Renal vein aneurysms are being detected more often now due to advancements in imaging methodologies. They are potentially at risk of thrombosis, rupture, pressure effects on adjacent structures and pulmonary embolism. Management has to be individualized to the patient. The patient should be carefully monitored for embolism to IVC and pulmonary vasculature. A thrombosed renal vein aneurysm maybe managed conservatively.

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