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Case Report

Renal Vein Aneurysm: Diagnosis with Color Doppler Sonography

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Renal vein aneurysms are extremely rare. They are usually congenital, asymptomatic, and found incidentally. To our knowledge, only three cases have been described in the literature [1–3]. We report a left renal vein (LRV) aneurysm revealed by color Doppler sonography.

Case Report

A 54-year-old man with vague left-upper-quadrant abdominal pain of a few months' duration was referred to our institution for abdominal sonography, which revealed a 5 × 4 × 3 cm anechoic mass to the left of the abdominal aorta at the level of the LRV. Color Doppler sonography showed the mass to be an LRV aneurysm with slow venous flow (Fig. 1A). The proximal and distal parts of the LRV were of normal caliber. Spectral Doppler analysis showed normal flow. IV contrast–enhanced CT showed the adjacent structures and the kidneys to be normal (Fig. 1B).

Digital subtraction angiography with selective catheterization of the left renal artery and vein showed a typical aneurysm sac. On digital subtraction angiography, we also excluded a varix, the nutcracker phenomenon, and variants such as a distended LRV (Figs. 1C and 1D). Thus, we used digital subtraction angiography to confirm that the LRV aneurysm was an isolated vascular abnormality.

Discussion

Renal vein aneurysms are so rare that they are not even mentioned in most of the major textbooks. To our knowledge, only three cases have been reported in the literature, all appearing in the last decade and all reported by nonradiologists. All cases were found incidentally. Two of these cases were detected during abdominal sonography, and the other was detected during aortofemoral bypass surgery. Two patients were men; one, a woman. They were 61, 19, and 26 years old, respectively. All cases involved the LRV, possibly because the embryologic development of the LRV is more complicated than that of the right renal vein. None of the three reported cases included color Doppler sonographic findings; therefore, we thought that confirmation with angiography was essential. In our case, color Doppler sonography revealed the venous nature of the aneurysm with barely detectable, slow venous flow in the central part of the vein.

Angiography was obtained to exclude associated vascular malformations, especially at the renal hilum, a region that is usually obscured by bowel gas.

Although in our case the findings on color Doppler sonography, CT, and digital subtraction angiography unequivocally revealed the LRV aneurysm, differential diagnosis may include idiopathic renal vein distention, the nutcracker phenomenon, renal vein varices, and pseudocystic or cystic lesions of renal or pancreatic origin. Also, abdominal aortic aneurysms with a fistula to the LRV, renal artery aneurysms, and arteriovenous malformations may be confused with renal vein aneurysms [4]. However, color Doppler sonography with spectral analysis would allow differentiation among these entities. In addition, when the aneurysm is thrombosed, it may simulate an enlarged lymph node, a solid tumor, or a thrombosed vein with secondary distention.

A distended LRV has been reported as a normal anatomic variant [5]. Likewise, the nutcracker phenomenon has been described as compression of the LRV between the aorta and the superior mesenteric artery [5]. The significance of this phenomenon and whether it creates a pressure gradient between the two parts of the LRV are not yet clear. Additionally, two case reports described marked renal vein dilatations seen in patients with renal cell carcinoma and a renal arteriovenous fistula [6, 7]. In such patients, unlike patients with an aneurysm, the renal vein can be diffusely enlarged.

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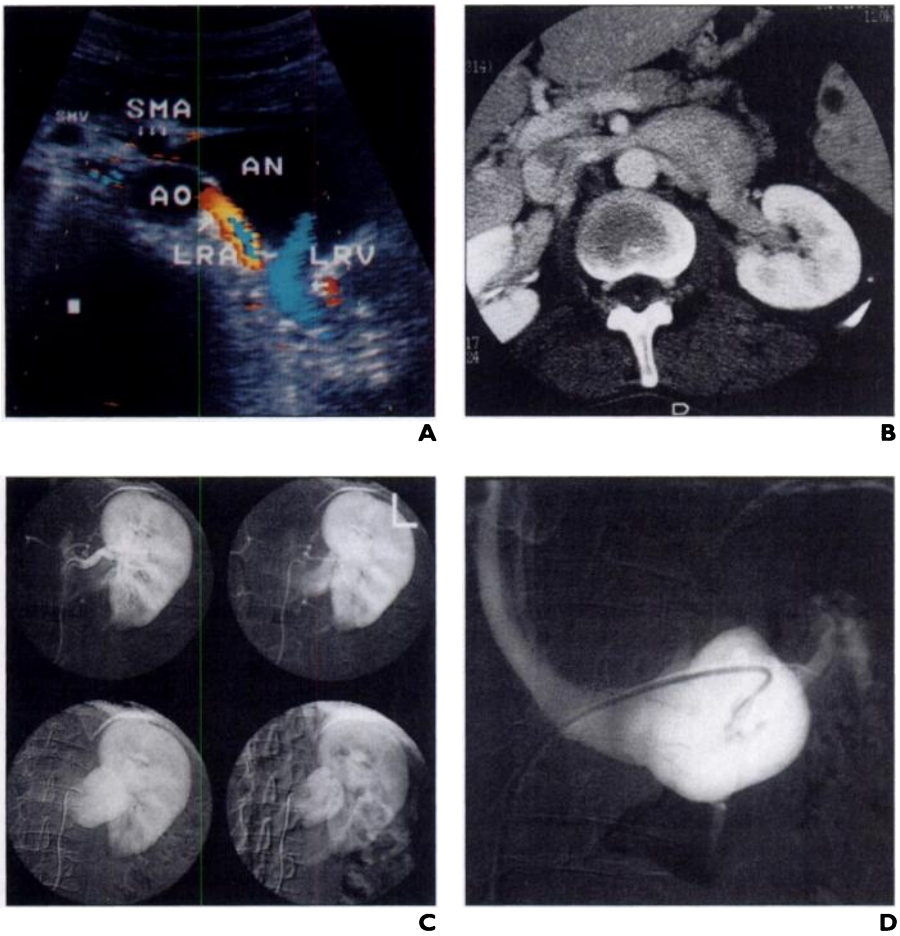


Fig. 1.—54-year-old man with left upper abdominal pain, referred for sonography.
A, Color Doppler sonogram shows that left renal vein (LRV) empties into aneurysm (AN) with diminishing flow velocity. On right, mass is continuous with distal part of LRV. AO = aorta, LRA = left renal artery, SMA = superior mesenteric artery, SMV = superior mesenteric vein.
B, Contrast-enhanced CT scan of LRV aneurysm shows surrounding organs as normal.
C and **D**, Venous phase of selective renal arteriography (**C**) and selective renal venography (**D**) reveal LRV aneurysm.

Idiopathic renal vein varices, especially solitary ones, should also be considered in the differential diagnosis. Such varices are usually smaller and are not typically saccular [8]. With careful color Doppler sonography, cystic or pseudocystic renal or pancreatic lesions should pose no diagnostic difficulty because they show no inner flow, unless a fistulous LRV communication is present.

In conclusion, LRV aneurysms should be considered in the differential diagnosis of incidental anechoic masses adjacent to the LRV. Color Doppler sonography should be used for the diagnosis.

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