Symptomatic congenital saccular aneurysm of the inferior vena cava associated with a circumaortic left renal vein

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Congenital saccular aneurysms of the inferior vena cava (IVC) are extremely rare, with 23 cases reported so far. We present a case of a 55-year-old woman with an acute episode of back pain that mimicked aortic dissection. Computed tomography ruled out aortic dissection but demonstrated a saccular aneurysm of the infrarenal IVC and a circumaortic left renal vein. The saccular aneurysm was excised, and the postoperative anatomopathologic examination revealed that it was congenital in nature. Surprisingly, preoperative symptoms of recurrent palpitations, dyspnea, and positional abdominal discomfort resolved after resection. This is the first reported case of a symptomatic congenital saccular aneurysm of the IVC with an associated circumaortic left renal vein. (J Vasc Surg Cases 2015;1:9-12.)

The development of the inferior vena cava (IVC) takes place at 6 to 8 weeks of gestation through a complex mechanism that begins with formation of three pairs of embryonic veins (posterior cardinal, subcardinal, and supracardinal veins). These veins initially interconnect and then partially regress to eventually form the definitive IVC, in addition to the entire venous network of the thorax, abdomen, and pelvis.[1] Any point in this sequence constitutes a potential area of malformation. However, the same complex network invariably substitutes some form of venous flow through an alternative route.

Unlike arterial aneurysms, the term "venous aneurysm" lacks a precise definition in the literature. Some reports suggest that the normal diameter of the infrarenal IVC in adults ranges from 1.5 to 3.7 cm when measured by computed tomography (CT) scan.[2] Any fusiform dilatation larger than this diameter on CT is regarded as an IVC aneurysm (IVCA). Saccular aneurysms, on the other hand, are different. According to the Gradman and Steinberg classification,[3] type 4 IVCAs (miscellaneous) encompass all saccular aneurysms, regardless of their location or association with congenital anomalies. It is important to note that this classification was proposed in 1993 based on review of only 13 cases.

We conducted an extensive PubMed literature search using the keywords inferior vena cava, congenital, aneurysm, saccular, and symptomatic. To the best of our knowledge and based on this systematic search of all published reports, only 30 cases of nontraumatic IVCAs have been reported.[4]

In this report, we describe a rare case of a congenital saccular IVCA in a 55-year-old woman with acute back pain and a background history of recurrent chest pain, shortness of breath, and palpitations. This IVCA was associated with a circumaortic left renal vein (CLRV), another rare anomaly. Written informed consent was obtained from the patient for publication of this case report and accompanying images. To the best of our knowledge, this is the first reported case of saccular aneurysm of the IVC associated with a CLRV.

CASE REPORT

A 55-year-old woman presented to the emergency department with a 3-hour history of severe back pain radiating to the chest. The pain was followed by a syncopal episode lasting 2 minutes with prodrome. She gave no history of cardiac disease or any syncopal attack, except for recurrent mild shortness of breath, palpitations, and chest pain, which she attributed to normal stresses of life. Her background history included type 2 diabetes mellitus, dyslipidemia, depression, and polycystic ovarian syndrome.

The patient's heart rate, blood pressure, and respiratory rate were all within normal reference ranges, and the results of chest and abdominal examinations were normal, except for mild abdominal tenderness. The results of blood investigations were within normal reference ranges except for mild transaminasemia (aspartate transaminase, 200 U/L; alanine transaminase, 120 U/L), which reverted to normal within a few days.

Results of CT brain, echocardiogram, and 24-hour Holter monitoring were normal. An abdominal ultrasound assessment suggested an intimal flap in the abdominal aorta concerning for

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Author conflict of interest: none.

Additional material for this article may be found online at www.jvascsurgcases.org.

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The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

2352-667X

http://dx.doi.org/10.1016/j.jvsc.2014.09.003

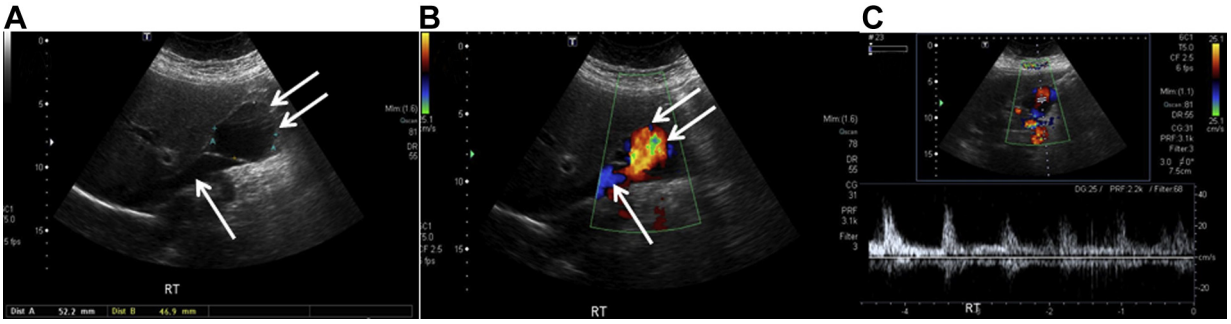

Fig 1. Abdominal ultrasound **(A)** B-mode imaging and **(B)** color-flow imaging demonstrates a vascular structure anterior to the aorta and inferior vena cava (IVC). **C,** Duplex demonstrates a "ying-yang" appearance on Doppler flow. The *single arrow* points to the IVC, and the *double arrows* point to the IVC aneurysm (IVCA).

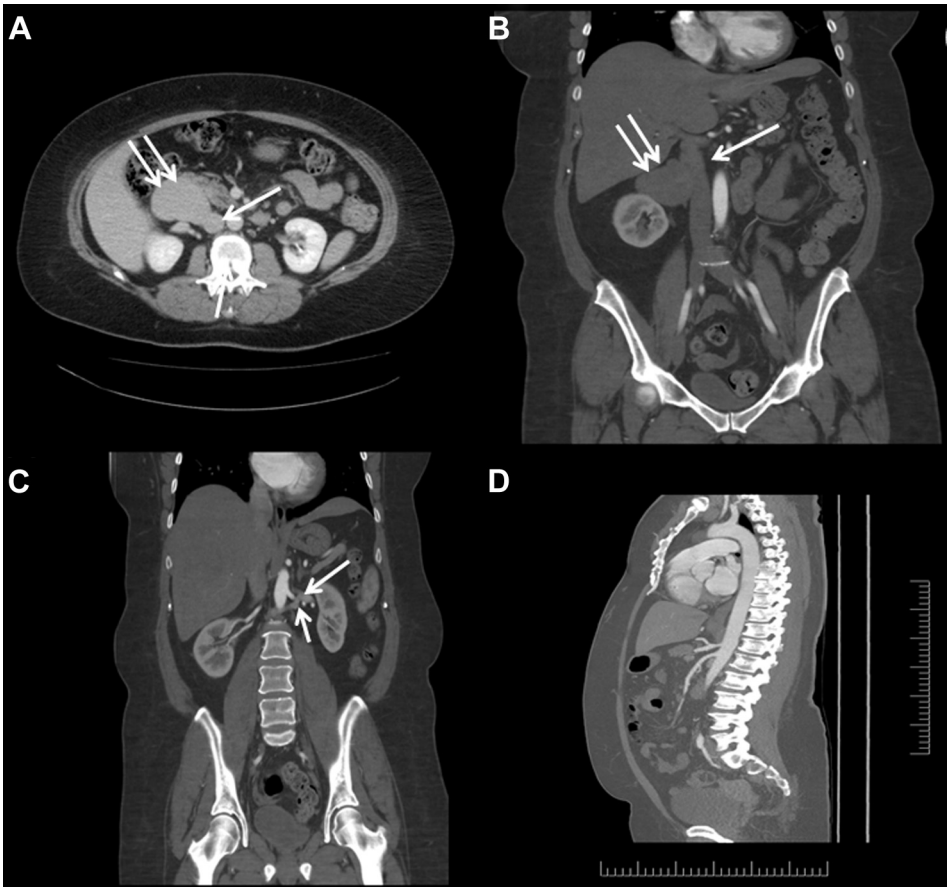

Fig 2. Abdominal computed tomography (CT) scan (venous phase) in **(A)** axial and **(B)** coronal views demonstrates a saccular inferior vena cava (IVC) aneurysm (IVCA). The *single arrow* points to the IVC and the *double arrow* points to the IVCA. The images show **(C)** the circumaortic left renal vein (CLRV) between the two *single arrows* and **(D)** a sagittal section of the thoracoabdominal aorta with no dissection.

aortic dissection and also described a vascular structure adjacent to the infrahepatic IVC, likely representing an aneurysm (Fig 1). Interestingly, thorax, abdomen, and pelvis CTs ruled out aortic dissection, but reported an "outpouching" from the lateral aspect of the IVC just below the right renal vein measuring 6.3 × 4.9 cm (Fig 2).

Because her back pain resolved and she remained stable over the days after admission, the patient was discharged with a follow-up CT scan in 8 weeks. Although no structural changes were demonstrated on the repeat CT scan, the patient reported recurrence of her symptoms of chest pain, shortness of breath, and palpitations and was anxious to have the aneurysm excised.