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IMAGES IN NEPHROLOGY

Left-sided inferior vena cava with nutcracker syndrome

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Abstract
Left-sided inferior vena cava (IVC) is a rare malformation of IVC. We report an 11-year-old boy with hematuria and left lower back pain due to compression of the left-sided IVC between the aorta and the superior mesenteric artery. Ultrasonography and magnetic resonance imaging clearly revealed this anatomic anomaly.

Keywords Left-sided inferior vena cava · Nutcracker syndrome · Hematuria

An 11-year-old boy was admitted to hospital with intermittent gross hematuria and left lower back pain. His height was 160.4 cm and his weight was 43.0 kg. Urinalysis identified hematuria (> 100 red blood cells per high-power field), but no proteinuria. Abdominal ultrasonography revealed that the infrarenal segment of the inferior vena cava (IVC) was positioned on the left side (Fig. 1a). After collecting blood from the left renal vein, the left-sided IVC crossed the midline and was compressed while passing between the aorta and the superior mesenteric artery (SMA) (Fig. 1b). The anteroposterior diameters of the left-sided IVC at the dilated caudal portion and at the narrowest portion were 12.2 mm

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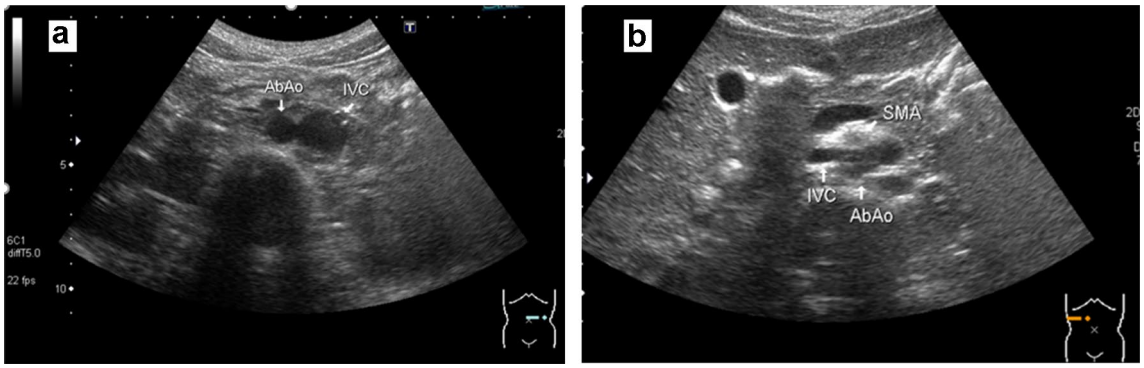

Fig. 1 Abdominal ultrasonography. **a** The inferior vena cava (IVC) was found on the left side together with the abdominal aorta. **b** The IVC was compressed between the superior mesenteric artery and the abdominal aorta while crossing the midline

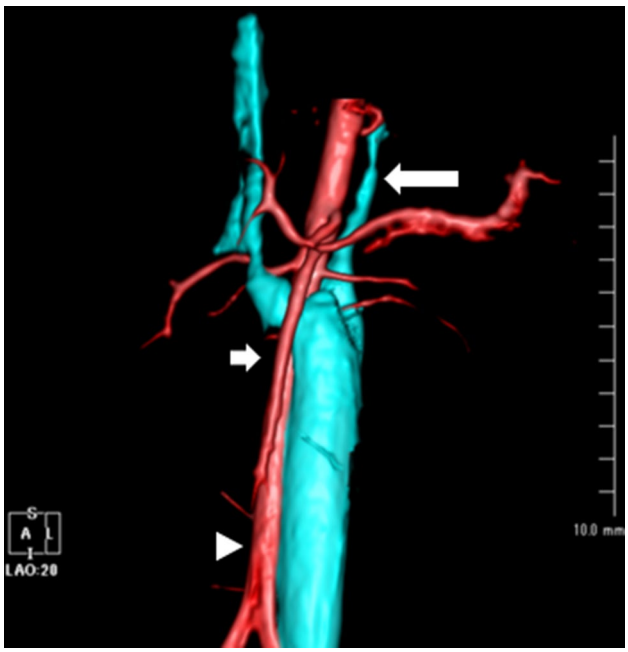

Fig. 2 Coronal reconstructed magnetic resonance angiography. The left-sided IVC crossed the midline with compression between the superior mesenteric artery (short arrow) and the aorta (arrowhead). A collateral vessel (long arrow) ran upwards from the caudal portion of the left-sided IVC

and 1.7 mm, respectively. The angle between the SMA and the aorta was measured at 24°. Magnetic resonance angiography showed that a collateral vessel ran upwards from the dilated caudal left-sided IVC (Fig. 2). Taken together, these imaging and clinical findings are indicative of nutcracker syndrome with left-sided IVC.

The prevalence of left-sided IVC is estimated 0.2–0.5% [1]. This condition is the result of persistence of the left supracardinal vein with regression of the right supracardinal vein [2].

Compliance with ethical standards

Conflict of interest The authors have declared that no conflict of interest exists.

Research involving human and/or animal rights This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent Informed consent was obtained from all individual participants included in the study.

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