ONE CASE OF THE DOUBLE INFERIOR VENAE CAVAE FOUND IN A JAPANESE MAN

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Abstract : One case of the double inferior venae cavae was found in a 74-year-old man during ordinary dissection practice at Nara Medical University School of Medicine in 2005. The persistent left inferior vena cava was a similar size as the right inferior vena cava. The interiliac vein connected between the left and right inferior venae cavae. According to the classification of Takemoto et al. (1978), the present case belonged to type II-b-3.

Key words : double inferior venae cavae, anomaly of inferior vena cava, vein, human

INTRODUCTION

Because of the complexity of the developmental stages, the inferior vena cava (IVC) may undergo a large number of congenital anomalies[1]. There are many reports of an anomalous IVC by dissection[2-15] or clinical examination[16-20].

One case of the double inferior venae cavae (IVCe) was found in a male cadaver during ordinary dissection practice at Nara Medical University in 2005. The present article describes the findings of the double IVCe in the male cadaver.

FINDINGS

One case of the double IVCe was found in a 74-year-old man who died of myocardial infarction.

Figure 1 shows an anterior view of the abdominal cavity. The left external and internal iliac veins were joined at the level of the second sacral vertebra and ran upward on the left side of the lumbar spine. The diameter of the left IVC was 19 mm at the origin where the interiliac vein was connected, and was 25 mm at the point where it received the left renal vein. The left IVC was 20.2 cm long from the origin up to the confluence of the left and right IVCe. The left testicular vein (diameter of 5 mm), left renal vein (diameter of 13 mm), and left suprarenal vein (diameter of 8 mm) emptied into the left IVC (Fig. 2).

The right external and internal iliac veins were joined at the level of the first sacral vertebra and ran upward on the right side of the lumbar spine. The diameter of the right

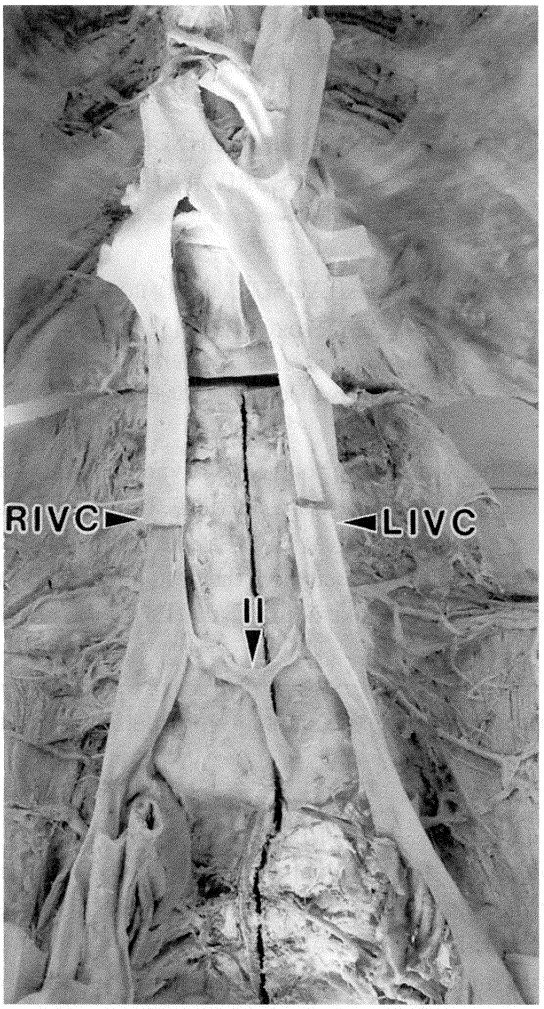

Fig. 1. Anterior view of the abdominal cavity. II = Interiliac vein, LIVC = Left inferior vena cava, and RIVC = Right inferior vena cava.

IVC was 21 mm at the origin where the interiliac vein was connected, and was 19 mm at the point where it received the right renal vein. The right IVC was 16.3 cm long from the origin up to the confluence of the left and right IVCe. The right renal vein emptied into the right IVC. The right suprarenal vein could not be dissected.

The ordinary IVC (diameter of 23 mm) was formed by the union of the left and right IVCe at the level of the first lumbar vertebra. The interiliac vein (diameter of 5 mm) connected between the left and right IVCe at the level of the intervertebral disk between the fourth and the fifth lumbar vertebrae and was 4.2 cm long. The median sacral vein (diameter of 4 mm) drained into the middle point of the interiliac vein. The course of the interiliac and median sacral veins was similar to a Y-shape.

The left and right ascending lumbar veins originated from the left and right internal iliac

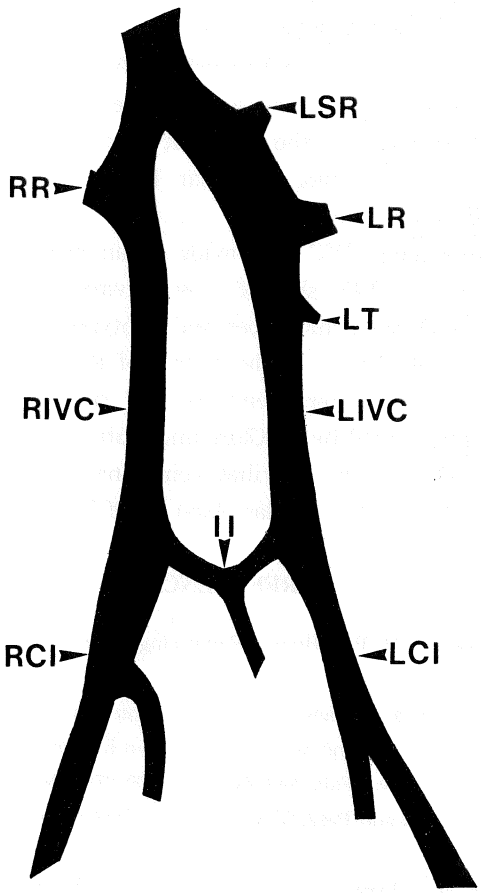

Fig. 2. Tracing of the veins in the abdominal cavity. II = Interiliac vein, LCI = Left common iliac vein, LIVC = Left inferior vena cava, LR = Left renal vein, LSR = Left suprarenal vein, LT = Left testicular vein, RCI = Right common iliac vein, RIVC = Right inferior vena cava, and RR = Right renal vein.

veins, respectively. The hemiazygos vein entered the azygos vein at the level of the tenth thoracic vertebra and the azygos vein entered the superior vena cava at the level of the fourth thoracic vertebra. The diameter of the azygos vein was 14 mm at the terminal site.

DISCUSSION

There are many reports of an anomalous IVC by dissection[2-15] or clinical examination[16-20]. The anomalous IVC included the double IVCe, the left-sided IVC, and the IVC with azygos continuation.

Ueda et al.[16] examined anomalies of the IVC in 874 patients by computed tomography

without the use of invasive technique and reported that the incidence was 1.03% in the double IVCe, 0.69% in the left-sided IVC, and 0.08% in the IVC with azygos continuation. A similar incidence of the double IVCe was reported by Adachi[2] (1.4%) and Arai[3] (1.1%).

According to Hamilton et al.[1], in the early stages of development, primitive IVC is symmetrical, existing on each side of the thoracolumbar line vein (supracardinal vein). In the normal development, the left thoracolumbar line vein disappears and the right one persists to give rise to the definitive IVC.

A classification of anomalous IVC was made in an attempt to connect them with the normal IVC. As the double IVCe showed a wide variation in its postrenal portion, the anomalies of the IVC were divided into types and subtypes, based on both the width of the left and right IVCe and the direction of the course of the interiliac vein[2,9,21]. The present case is classified into type BC (persistence of the right and left supracardinal veins), according to the criterion described by McClure and Butler[21]. As the persistent left IVC is a similar size as the right IVC and the interiliac vein connects between them, the present case belongs to type II-b-3, according to the classification of Takemoto et al.[9].

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