

## An anomaly of inferior vena cava: A rare case report

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### Abstract

A double Inferior Vena cava (IVC) was observed during routine dissection of the posterior abdominal wall in a middle aged male cadaver. The left IVC was formed at the Junction of left external and internal iliac veins. It ascended upwards medial to left psoas major and at the level of second Lumbar vertebra, opened into left renal vein. The IVC is a retro peritoneal structure whose location and integrity is very important for the surgeons. The vast variability of the overall rare congenital anomalies of the IVC were mostly detected by different imaging modalities. The embryogenesis of the inferior vena cava is a complicated process involving development, regression, anastomoses and replacement of three pairs of venous channels, posterior cardinal, subcardinal and supracardinal veins, resulting in numerous but rare anomalies.

**Key words:** inferior vena cava; double; variations

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The IVC is formed by the union of right and left common iliac veins on the right anterior surface of fifth lumbar vertebra and conveys the venous blood to the right atrium from all parts of the body below the diaphragm<sup>1</sup>. The formation of IVC takes place approximately 2.5cm to the right of the median plane, inferior to the bifurcation of the abdominal aorta and posterior to the proximal part of the right common iliac artery. It ascends upward on the right sides of the bodies of the lumbar vertebrae and on right psoas major to the right of the aorta. It enters the thorax through the caval foramina in the central tendon of diaphragm. The abdominal part of IVC is about 20 cm in length<sup>2</sup>. The embryogenesis of the inferior vena cava is a complicated process involving development, regression, anastomosis and replacement of three pairs of venous channels posterior cardinal, subcardinal and supracardinal<sup>3</sup>. This complexity of embryogenesis of the IVC which accounts for the great diversity in its anomalies<sup>4</sup>. Among the most common anomalies, incidence are 0.69% in left sided IVC, 1.03% in double IVC, and 0.08% in azygos continuation<sup>5</sup>. The knowledge of anomalies of IVC are important in both diagnostic

and operative purposes. The modern techniques like CT scan and MRI has helped the doctors to diagnose its variations.

### Case report

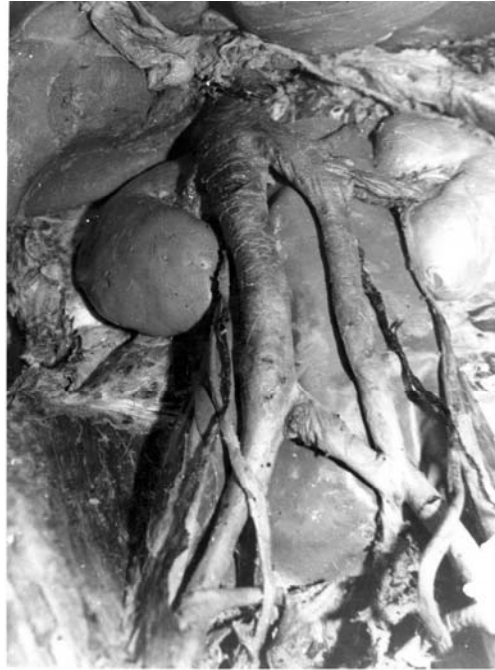
A case of double IVC was observed during routine dissection of abdominal region in a 45 year old male cadaver. Both sided external and internal iliac veins joined to form common iliac veins in a usual manner. These common iliac veins joined to form IVC at the level of fifth Lumbar vertebra. The right IVC was normal in position with its normal course and tributaries. The abdominal part of right IVC was 20 cm in length and 1.5 cm in diameter. The Left IVC began at the site of the formation of left common iliac vein (Fig.1&2). It was 0.8cm in diameter and 12cm in length. It ascended upwards medial to left psoas major and opened in to left renal vein. Before its opening in to renal vein, it received left testicular vein. The left renal vein received its normal tributaries and then crossed the body of second lumbar vertebra and opened in to right IVC in front of the Aorta.

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**Fig 1:** Photograph showing double inferior vena cava



### **Discussion**

The anomalies of the IVC are not infrequent, are consequences of its complicated mode of development during which three parallel channels, Posterior cardinal, supracardinal and subcardinal veins develop bilaterally and form various communications. The infra renal portion of the IVC is formed largely by the supracardinal vein of the right side, Supracardinal and subcardinal communications and subcardinal veins<sup>6</sup>. Left and double IVC are among the most frequent anomalies<sup>4</sup>. But there are only few cases reported of IVC duplication. The supernumerary left-placed vena cava originates in the pelvis from a common iliac vein and receives ipsilateral lumbar and renal veins<sup>7</sup>.

In our present case, persistence of cardinal system which should have been disappeared, on the left side in such a fashion that the infra renal portion of IVC was doubled. Double IVC in which both the channels are well developed has been estimated to occur only in 2 to 3 %<sup>8</sup>.

The vast variability of the overall rare congenital anomalies of the IVC is mostly detected through different imaging modalities. These variations cannot be classed as pathological findings, and should not be confused with lymphomas and has to differ from secondary collateral venous pathways<sup>9</sup>. Knowledge of caval anomalies can prevent misinterpretation of mediastinal masses, iliac occlusion with venous collaterals, or Para vertebral lymph node

enlargement. A duplicated IVC can be distinguished from para-aortic lymphadenopathy either by recognition of renal vein drainage or through intravenous contrast enhancement of the venae cavae<sup>10</sup>. A good scanning knowledge of the IVC and its abnormalities appears necessary, either to prevent any mistaken interpretation or to specify a pathological element with regard to a vascular exploration<sup>11</sup>.

Not only radiologist but also surgeons dealing with these regions must also be familiar about these anomalies. A high index of suspicion on the part of the surgeon is required to prevent inadvertent injury to these anomalous veins and to avoid significant hemorrhage during retroperitoneal surgery<sup>12,13,14</sup>. Detailed knowledge of these anomalies is crucial for IVC filter placement, spermatic vein embolization, and adrenal or renal venous sampling<sup>15</sup>. Anomalies of the inferior vena cava and renal veins occur infrequently but if unidentified can lead to significant morbidity during surgical exploration<sup>16</sup>.

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