CASE REPORT

Anomalous channels draining the internal iliac veins: embryological and clinical significance

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Abstract

During a routine cadaver dissection, we have encountered an anomalous formation of inferior vena cava and abnormal channels communicating the two internal iliac veins with the inferior vena cava in a 67 year old male cadaver. The said channels which had a caliber of 5 mm on the left side and 15 mm on the right arose at a distance of 26 mm on the left and 35 mm on the right from the internal iliac vein termination. Both the said channels moved medially and joined one another and formed a common stem (Cs) which finally terminated at the junction of the termination of right iliac vein into the inferior vena cava. The lumen of the terminal part had a diameter of 18 mm and it was 20 mm in length. Anomalies of the inferior vena cava and renal veins occur infrequently but if unidentified can lead to significant morbidity during surgical exploration. An understanding of the embryologic development of the vena cava and its tributaries is necessary to understand the genesis of these sometimes complex anomalies and their accompanying anatomic variants.

Keywords: inferior vena cava, internal iliac veins, anomalous communication, retroperitoneal surgeries.

Introduction

The inferior vena cava (IVC) conveys blood to the right atrium from all the structures below the diaphragm. It is formed by the junction of the common iliac veins anterior to the fifth lumbar vertebral body, a little to its right [1].

Anomalies of the IVC and its tributaries have been known to anatomists since 1793, when Abernethy J [2] described a congenital mesocaval shunt and azygos continuation of the IVC in a 10-month-old infant with polysplenia and dextrocardia. Transposition of the inferior vena cava, duplication of the inferior vena cava, circumaortic renal collar, and retroaortic renal vein constitute the four most common major venous anomalies occurring in the retroperitoneum [3].

Other anomalies of the vessel like preaortic iliac vein confluence and agenesis of the IVC with hypertrophy of the azygos vein have been described [4, 5].

According to the embryological development three main groups of IVC variants have been classified: agenesis of the suprarenal IVC, anomalies of the pars renalis and anomalies of the infrarenal IVC [6].

We herewith report a case of an anomalous formation of the IVC and an abnormal communication between the two internal iliac veins and the IVC, not mentioned before in literature, to the best of our knowledge.

Material and methods

During a routine cadaver dissection at the Department of Anatomy, Kasturba Medical College, Mangalore, we have come across a case of an anomalous formation of inferior vena cava and abnormal channels communicating between the internal iliac veins and the inferior vena cava in a 67-year-old male cadaver.

Results

The IVC was formed by the union of three channels, two common iliac veins and an extra vein which in turn was formed by the two anomalous channels draining the internal iliac veins (Figure 1).

The said channels which had a caliber of 5 mm on the left side and 15 mm on the right arose at a distance of 26 mm on the left and 35 mm on the right from the internal iliac vein termination. Both the said channels moved medially and joined one another and formed a common stem (Cs) which finally terminated at the junction of the termination of right iliac vein into the inferior vena cava. The lumen of the terminal part had a diameter of 18 mm and it was 20 mm in length.

Discussions

The inferior vena cava (IVC) is a retroperitoneal key structure whose location and integrity must be checked in every scan. Anomalies of the inferior vena cava and renal veins occur infrequently but if unidentified can lead to significant morbidity during surgical exploration. An understanding of the embryologic development of the vena cava and its tributaries is necessary to understand the genesis of these sometimes complex anomalies and their accompanying anatomic variants [7].
Figure 1 – Superior view of the male pelvis after removal of all the viscera:
A – abdominal aorta; IVC – inferior vena cava; Cs – common stem;
Ac – abnormal channels draining the two internal iliac veins;
E – external iliac vein; I – internal iliac vein
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. Preoperative assessment and intraoperative awareness are important to prevent unexpected venous injuries.

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 [8].

Detailed knowledge of these anomalies is crucial for IVC filter placement, spermatic vein embolization, and adrenal or renal venous sampling [9].

References


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Received: February 7th, 2007

Accepted: April 15th, 2007