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Case Report

Double Inferior Vena Cava: A Case Report

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Abstract

Double inferior vena cava is a congenital abnormality that is present from birth. The condition is asymptomatic and usually diagnosed incidentally either on imaging study for some other medical reasons or during surgeries in the retro peritoneum like RPLND. People who are diagnosed to have double inferior vena cava does not need any treatment, however caution is needed when surgeries are performed in such patients to avoid any additional injury.

Keywords: Inferior vena cava; Ovarian mass; Cytoreductive surgery; RPLND

Introduction

Overall prevalence of double inferior vena cava in general population is 0.2% to 3% [1]. This congenital variation is caused by an unusual embryological development of the inferior vena cava [2,3]. The condition is asymptomatic and usually diagnosed incidentally either on imaging studies for some other medical reasons or during surgeries in the retro peritoneum like RPLND. People who are diagnosed to have double inferior vena cava does not need any special treatment, however caution is needed when surgeries are performed in such patients to avoid any additional injury. People with double inferior vena cava who develop blood clot or have any episode of pulmonary embolism may need two IVC filters to prevent further complications [4,5]. On cross sectional imaging double IVC can be mistaken with a retroperitoneal mass or paravertebral lymph-node enlargement [6]. Lack of knowledge of these variations might result in a misinterpretation of the radiologic images of double IVC, leading to surgical errors such as bleeding during RPLND. This anatomical variation is also important during whole organ transplantation or radical nephrectomy.

Case Presentation

We present a case of double inferior vena cava in a 47 years old postmenopausal married female with 3 living issues. Patient had no medical comorbidities and has no significant family history. Patient presented to our OPD with chief complaints of increasing abdominal distension for a period of 8 months. On abdominal examination there was a large approximately 10 cm × 15 cm mass arising from pelvis. Patient was admitted and was evaluated. CECT whole abdomen was done which was suggestive of right ovarian mass of 15 cm × 15 cm with multiple enlarged periarotic, paracaval and pelvic lymph nodes with omental thickening and minimal ascitis. CECT could not pick the finding of double IVC. Liver and spleen was grossly normal. CA 125 levels were grossly raised. Patient was diagnosed as a case of stage 3 ovarian malignancy. Patient was planned for cytoreductive surgery with RPLND. Cytoreductive surgery (Hysterectomy with B/L salpingo-oopherectomy with omentectomy& peritoneal excision) was done *via* a midline laparotomy incision. This was followed by RPLND. During RPLND double inferior vena cava was noticed one on either side of abdominal aorta (Figure 1).

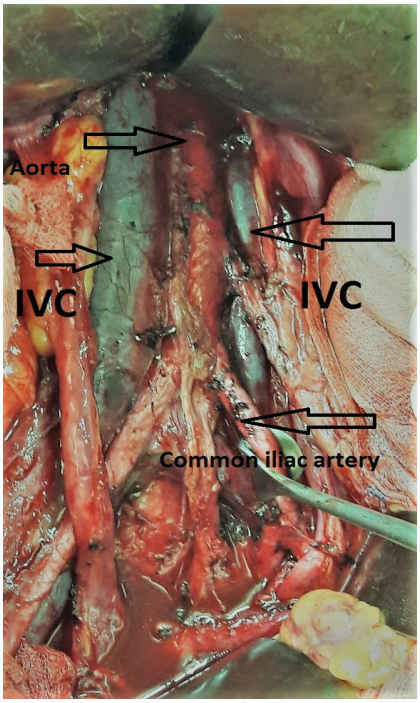

Figure 1: Inferior Vena Cava (IVC).

Discussion

Double inferior is not a common entity. It is usually encountered during cross-sectional imaging for some other medical condition. Intra-operatively this condition is found in 0.2% and 0.6% of patients [7]. The normal IVC is composed of four segments: hepatic, suprarenal, renal, and infra-renal. Embryological development of IVC begins at the 6th week of gestation and involves 3 pairs of primitive veins (posterior cardinal, subcardinal, and supracardinal veins) that appear and regress shaping the final IVC. The posterior cardinal veins appear and remain in the pelvis as the common iliac veins, the right supracardinal vein persists to form the infrarenal IVC, and the right

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subcardinal vein persists to develop into the suprarenal segment by formation of the subcardinal-hepatic anastomosis while the left subcardinal vein and the left supracardinalvein regress completely [1,7,8]. The renal segment develops from the anastomosis between the subcardinal and supracardinal veins while the hepatic segment derives from the right vitelline vein.

Any developmental deviation from the above process determines at least 14 different anatomic anomalies of the IVC. Bass et al. [1] reported, major anomalies are double IVC (with a prevalence of 0.2% to 3%), left IVC (0.2% to 0.5%), retroaortic left renal vein (2.1%), circumaortic left renal vein (8.7%), and absence of the hepatic segment of the IVC with azygos continuation of the IVC (0.6% of cases). Recognition of this anomaly is clinically relevant during retroperitoneal surgery or vascular interventional procedures so as to avoid recurrent pulmonary embolism following placement of an IVC filter [9]. Particular caution is needed in planning cardiopulmonary bypass, in catheterizing the heart, and in the differential diagnosis of right-sided para-tracheal mass and paravertebral lymphadenopathy in patients with this variation [10].

In addition, it is necessary for radiologists to prevent misinterpretation of aberrant vessels as paravertebral lymph node enlargement. Multi-detector CT technique is the preferred method for imaging the congenital vascular anomalies of IVC since it is less costly, less invasive than conventional angiography, fast, easily applicable, and reliable in terms of identification of thoraco-abdominal vascular structures.

Conclusion

Double inferior vena cava is an uncommon congenital variant. Awareness of this variation is clinically relevant to surgeons frequently operating in retroperitoneal areas and interventional cardiologists to avoid additional injuries. In addition radiological awareness is as much important to avoid any diagnostic error.

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