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Case Report

Duplication of inferior vena cava in a case of ovarian carcinoma

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ARTICLE INFO

Article history:
Received 22 May 2014
Accepted 30 October 2014
Available online 18 November 2014

Keywords:
Vena cava
Duplication
Ovarian cancer

ABSTRACT

Duplication of IVC is a rare, usually clinically silent anomaly and detected during cadaveric dissection or during investigation done for other purposes. The preoperative diagnosis is essential to avoid the complications during surgery. The development of IVC is a complex process. Here we present a case of IVC duplication, which initially missed in imaging study, detected at the time of retroperitoneal lymphadenectomy, in a case of ovarian cancer. The patient is completed the adjuvant treatment and on follow up doing well.

1. Clinical history

A 51 years postmenopausal lady presented with abdominal swelling, noticed since last one week. There was no medical history of interest. On examination per abdomen, distension with ascites was present, no mass was palpable. A mass in left parametrium was felt per vaginally. Contrast enhanced computed tomography (CECT) of abdomen was suggestive of left adnexal mass with omental thickening. Ultrasonography (USG) guided fine needle aspiration cytology (FNAC) was suggestive of carcinoma (possibly high grade serous carcinoma). CA-125 was 4182.4 U/ml. And the patient was diagnosed as carcinoma ovary. She received 4 cycles of neo-adjuvant chemotherapy, Paclitaxel 260 mg with Carboplatin 560 mg, and then underwent interval cytoreduction surgery. The surgery was optimal cytoreduction comprising of supracolic omentectomy, total abdominal hysterectomy, bilateral salpingo-oophorectomy, bilateral pelvic and para-aortic lymph node dissection. Intra-operatively duplication of inferior vena cava (IVC) was detected (Fig. 1). Both the common iliac veins continued as IVC, and were present on either side of abdominal aorta, left IVC joined to right one with a pre-aortic trunk at a suprarenal position. Both IVC's caliber was nearly the same along with the pre-aortic trunk. The reviewed CECT abdomen showed duplication of IVC. Patient was discharged uneventfully, completed the adjuvant chemotherapy and after three months of follow up, doing well.

2. Discussion

Duplication of IVC is rare and usually a clinically silent venous anomaly.[1,2] It is one of the most common anomalies affecting the inferior vena cava (IVC), next to transposition (left sided), and has a reported incidence of 0.2–3% in the general population.[2–4] Most commonly, it is discovered at autopsy or incidentally on abdominal imaging done for some other

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http://dx.doi.org/10.1016/j.jasi.2014.10.003

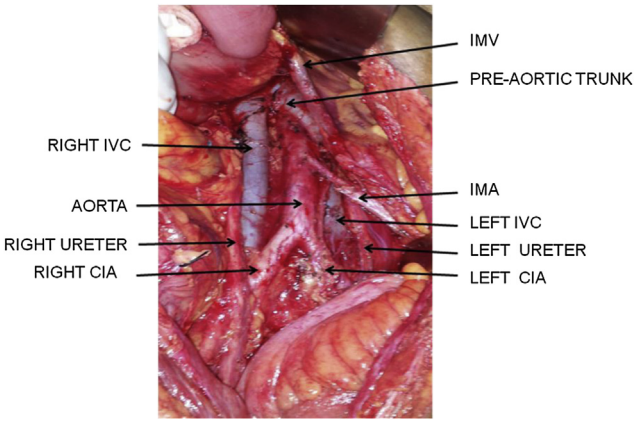

Fig. 1 – Duplication of IVC; IMV– Inferior mesenteric vein, IMA – Inferior mesenteric artery, IVC – Inferior vena cava, CIA – Common iliac artery.

purpose.[1,3] But in our case initially it was missed by imaging and found during para-aortic lymph node dissection.

Embryogenesis of IVC is a complex process, begins at the sixth week and is completed by the tenth week of gestation.[2,3,5]

There are two prominent theories of IVC formation. The first theory is the most common. According to this theory first to appear are the posterior cardinal veins, all but their most distal portion regresses and forms the iliac bifurcation. Next, the subcardinal veins form anteromedial to the posterior cardinal veins, the right subcardinal forms the suprarenal IVC while its left counterpart regresses. Lastly, the supracardinal veins develop dorsal to the subcardinal veins, with the right vein forming the infrarenal IVC while the left vein regresses. Failure of regression of any of the three left venous counterparts is thought to be responsible for congenital abnormalities of the vena cava. In the case of duplication of the IVC, the persistence of the left supracardinal vein is thought to be the cause.[2,4,6,7] The basic difference in the second theory, the sacrocardinal theory, is that the basic role of the supracardinal veins is constricted to the formation of the azygos and hemiazygos veins, whereas the formation of the IVC is attributed to a new pair of veins that are the last to appear, and they are called sacrocardinal veins.[7]

IVC duplication is classified as incomplete or complete bilateral duplication. The latter is further divided into three types: major, minor and asymmetric types. Type I or major duplication, as in our case, comprises of two bilaterally symmetrical and approximately of the same caliber trunks and a pre-aortic trunk of the same caliber. In this type, the left and the right IVCs are just near the lateral border of the aorta. Type II or minor type comprises of two bilaterally symmetrical and approximately of the same caliber trunks, but is smaller in comparison to the pre-aortic trunk. In this type the prominent venous trunk is the pre-aortic trunk. Type III or asymmetric type comprises of small left IVC, larger right IVC and even larger pre-aortic trunk or small left IVC, larger pre-aortic trunk and even larger right IVC. In this type the prominent vessel is either the right IVC or the pre-aortic trunk.[7]

It may create diagnostic problems where it may be misinterpreted radiologically as a saccular aortic aneurysm, lymphadenopathy, left pyelo-ureteric dilatation, retroperitoneal cysts or loops of small bowel leading to unnecessary interventions and morbidity.[2,3,8] The double IVC can be inadvertently injured or ligated during retroperitoneal surgery,[3] and can lead to crippling ipsilateral leg swelling. This can happen if it is mistakenly ligated during a nephrectomy for transplantation or other purposes.[1]

The knowledge of anatomy of IVC and its variations are very essential for the surgeon performing renal and retroperitoneal surgical procedures for avoiding catastrophic complications of inadvertent injury or ligation of the IVC.

Conflicts of interest

All authors have none to declare.

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