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Diagnostic Imaging

Inferior vena cava filter placement in a left IVC and drainage into duplicated SVC via hemiazygous continuation

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ABSTRACT

Left-sided inferior vena cava (IVC) is the second most common anatomical anomaly of the IVC. We report a drainage pattern of the left IVC into a left duplicated superior vena cava (SVC) diagnosed during IVC filter placement consultation. The patient was a 66-year-old man with symptomatic hematuria caused by bladder cancer diagnosed with IVC thrombus and a left IVC found on a staging computed tomography urogram. The patient underwent computed tomography pulmonary angiogram, which ruled out pulmonary embolism, but demonstrated hemiazygous continuation of the left IVC above the diaphragm to meet a persistent left SVC (prevalence approximately 0.3%-0.5%) (Kim et al. 1995) [1] emptying into the right atrium via the coronary sinus. We report a novel drainage pattern of the left IVC into a duplicated left SVC via hemiazygous continuation.

Introduction

Inferior vena cava (IVC) anomalies are infrequent but of high importance to recognize because of the frequency of request of IVC filter placement. Although rare, left-sided IVC typically drains into the left renal vein with continuation into the right IVC, or via azygous drainage into the superior vena cava (SVC). We report a novel drainage pathway that has not been described in the literature: left-sided IVC with drainage into a duplicated left SVC and subsequent drainage into the right atrium via the coronary sinus.

Case report

A 66-year-old man presented with hematuria from a newly diagnosed bladder cancer, and on staging computed tomography (CT), he was found to have deep venous thrombosis in the left common femoral vein (CFV), as well as nonocclusive IVC thrombus (Fig. 1). The CT also demonstrated a left IVC (Fig. 2A-C). Because the patient had symptomatic hematuria and in preparation of the transurethral bladder resection of tumor procedure, the patient was not a candidate for anticoagulation and an IVC filter placement was requested. To rule out

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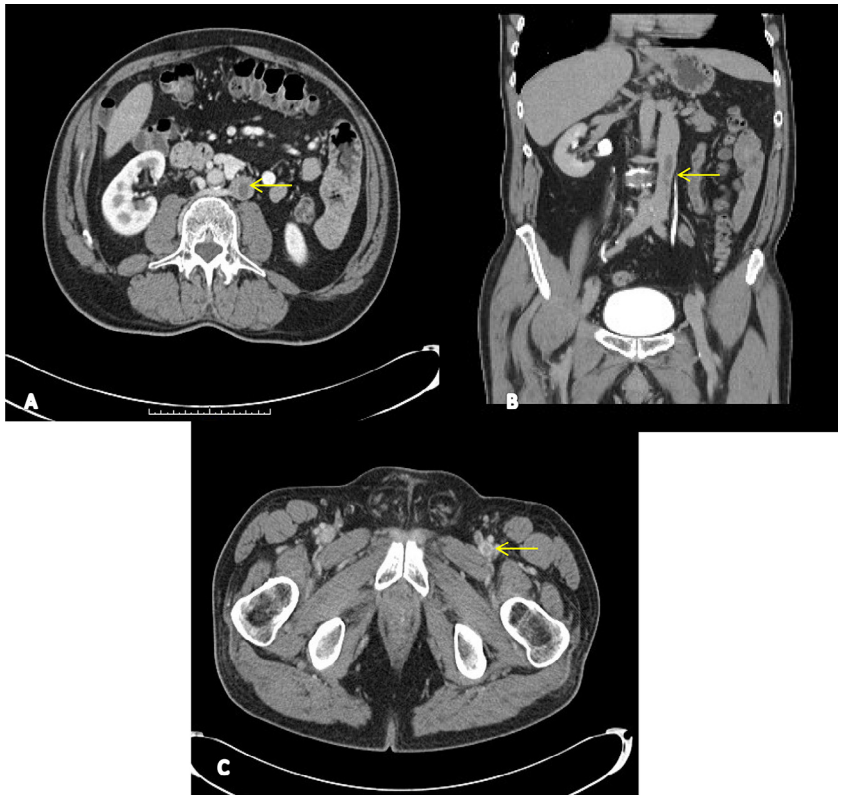

Fig. 1 – (A) Axial and (B) coronal computed tomography images depict thrombus in the infrarenal inferior vena cava and (C) the left femoral vein (yellow arrows).

pulmonary embolism (PE), the patient also had a CT pulmonary angiogram performed, which demonstrated the drainage pathway of the left IVC. Namely, there was hemiazygous continuation of the IVC connecting to a persistent left SVC with drainage into the right atrium via the coronary sinus (Figs. 2D-F and 3). At our institution the preferred venous access for IVC filter placement is from a right internal jugular (IJ) approach because of shorter bed rest, better control of the venous access

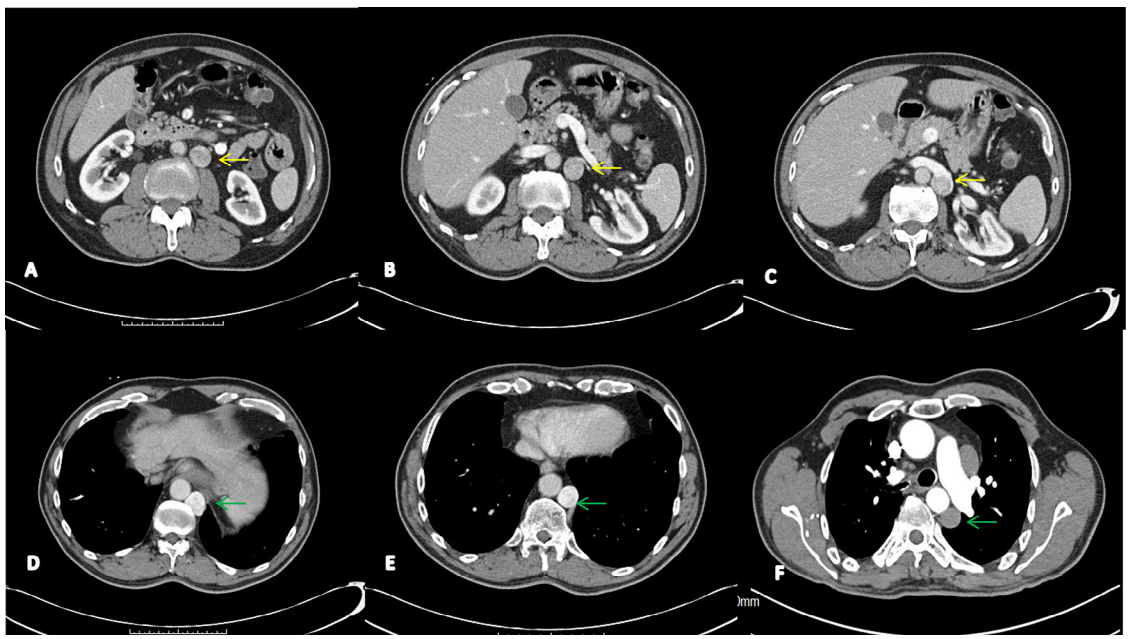

Fig. 2 – (A-C) Left inferior vena cava ascending from the abdomen (yellow arrows). (D-F) Continuation cephalad into a hyphertrophic hemiazygous vein (green arrows).