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Case Report

An uncommon encounter during temporary pacemaker implantation – A double inferior vena cava

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ABSTRACT

Double inferior vena cavae (IVC) is a congenital variation caused by an unusual embryological development of the IVC. We report an incidental finding of infrarenal double IVC in a 70-year-old female.

1. Case report

A 70-year-old female presented with dyspnea, chest pain, and an episode of near syncope since 10 days. Her general and systemic examinations were normal with pulse 50 min^{-1} and blood pressure 150/90 mmHg. ECG showed complete heart block with atrioventricular dissociation. Doppler echocardiography revealed concentric hypertrophy of left ventricle. Patient was planned for temporary pacemaker insertion with coronary angiography through right femoral approach. During procedure, pacemaker lead could not be negotiated through inferior vena cava (IVC). Judkin's right catheter could be passed through IVC into right atrium. A temporary pacemaker was inserted through right subclavian vein. Computed tomography abdominal angiography was done and double inferior vena cavae with left-sided IVC ending at left renal vein and joining right IVC crossing anterior to aorta with constriction at right and left junctures was noted (Fig. 1). Later a permanent pacemaker was implanted through left subclavian approach.

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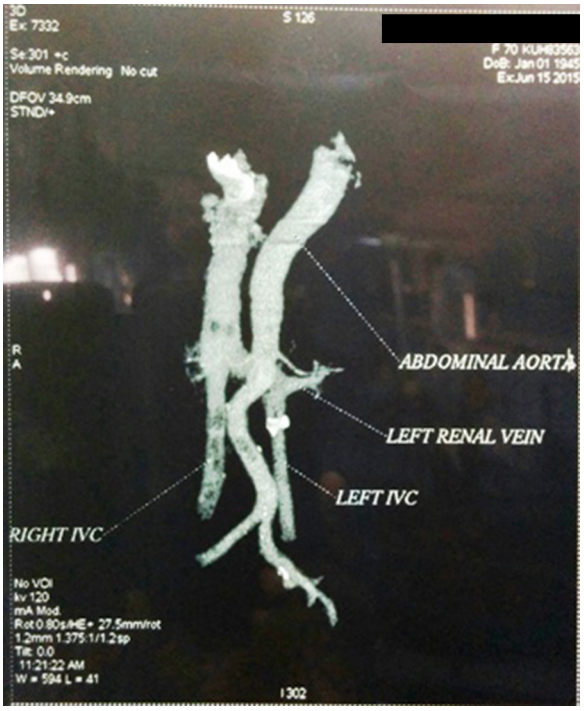

Fig. 1 – CT angiography showing a double IVC with left-sided IVC ending at renal vein and joining right IVC crossing anterior to aorta with constriction at right and left junctures.

The normal IVC is a unilateral, right-sided system consisting of four components developed from three paired venous systems viz., postcardinal veins, subcardinal veins and supracardinal veins: (1) the infrarenal segment from the right supracardinal vein; (2) the renal segment from the right supracardinal and postcardinal anastomoses; (3) the suprarenal segment from the right subcardinal vein, and (4) the hepatic segment from the vitelline vein. Double IVC results from the failure of regression of the left supracardinal vein.[1] Anomalies in the IVC occur in 0.3% of otherwise healthy individuals. The most commonly described anomalies of IVC include circumaortic left renal vein (1.6–14%), azygous or hemiazygous continuation of IVC (0.6%), retroaortic left renal vein (3.2%), double IVC (0.2–3%), and isolated left-sided IVC (0.2–0.5%).

Difficulties during invasive procedures like right heart catheterization, electrophysiological studies, cardiopulmonary bypass surgery, femoral vein catheter advancement, IVC filter placement, and temporary pacing through the transfemoral[2] route are accidental encounters. In our case also it is an accidental encounter while passing the pacemaker wire. The angulation at the junction of right and left vena cavae and sudden decrease in the caliber of IVC may be the reason for difficulty in negotiating pacemaker wire. Complete or partial thrombosis and thromboembolic events have been reported. An increased incidence of thrombus formation in double IVC is probably due to constriction while crossing aorta. Clinical outcome of double IVC is good if recognized before invasive procedures, otherwise complications can be fatal.

2. Conclusion

Knowledge of caval anomalies can prevent misinterpretation of iliac occlusion with venous collaterals or paravertebral lymph-node enlargement, difficulty during procedures, risk of thrombosis, and life-threatening hemorrhage during abdominal surgeries.

Conflicts of interest

The authors have none to declare.

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