A rare case of interrupted inferior vena cava with azygos continuation

Neslihan Özçelik1, Bilge Yılmaz Kara1, Songül Özyurt1, Oğuzhan Özdemir2, Ünal Şahin1
1Department of Chest Diseases, 2Department of Radiology, Recep Tayyip Erdoğan University, Rize, Turkey

Abstract
The identification of vascular pathologies of the mediastinum is very important for the prevention of complications during the interventional procedure. A rare developmental anomaly of Inferior Vena Cava (IVC): the interrupted IVC continues with azygos vein in thorax. And then, the azygos vein merges with the vena cava (VC) superior and pours into the right atrium. The incidence is reported to be 0.6%. It is a crucial application to distinguish the enlarged azygos vein from the right paratracheal mass and lymph node radiologically and clinically.

Keywords
Vena Cava Inferior; Azygos; Variation
Introduction

The IVC is a single vessel that is located in the right side of abdominal aorta. If disorder occurs during embryogenesis, it can cause congenital anomalies of the IVC. But IVC vascular anomalies are not common and are often recognized incidentally during radiological and surgical procedures. The incidence is reported to be 0.6% [1]. Without abnormal cardiac comorbidity, the anomalies and variations of the IVC anatomy have resulted as approximately 0.3% of the population [2]. We hereby present an asymptomatic case of IVC with azygos continuation without cardiac comorbidity.

Case Report

A 29-year-old male patient was admitted to our polyclinic with chest pain. The patient had never been examined by a doctor before. The physical examination of patient was normal. Chest x-ray showed mediastinal widening, enlargement of azygos arch and right hilus (Figure 1). On CT images of the patient, who underwent contrast-enhanced lung computerized tomography (CT) imaging, the IVC showed no IV hepatic segment, right-sided azygos vein and enlarged IVC. The hepatic veins were pouring in right atrium. Additionally, the azygos vein was prominently dilated. There was no obvious abnormality in the hemiazygos vein (Figure 2-3-4). Informed consent form was received from the patient.

Discussion

The IVC is one of the largest veins in the body. It is responsible for venous circulation in abdomen, lower and pours into right atrium. Embryogenesis of IVC comprises complex relations with other abdominal and thoracic structures. These conditions lead to the development of IVC anomalies. The anatomical variations are usually discovered casually as clinically silent. But in some cases collateral vessels provide physiological compensation for venous circulation and they implicated with deep venous thrombosis, atypical lower back pain, recurrent venous thromboembolism and hematoma [2]. IVC embryogenesis occurs at 4-8 weeks of gestation. IVC is the result of several anastomoses made by three groups of embryological veins as the supracardinal, the posterior and the subcardinal [3]. During this complex formation, many variations may develop due to various step changes.
Figure 5. Schematic drawing of an interrupted IVC (dashed lines) with an azygos vein continuation.

The commonest anomalies include: duplication, transposition, interruption and left renal veins that is located in a retro or circumaortic region [4-5]. Another IVC anomaly is interruption type with azygos continuation. Abnormal fusion between hepatic and prerenal parts of the IVC results in the infrahepatic hypoplasia or interruption type with azygos continuation and compensatory enlargement [6]. IVC continues with azygos vein into the thorax then the azygos vein merges with the SVC superior and pours to the right atrium (Figure 5). The incidence of this condition was reported as 0.6% [7] in correlation with congenital heart disease, polysplenia and rarely with asplenia [8]. Generally, 0.3% of the population is faced to anomalies and variations of IVC with no cardiac comorbidity [3-4]. Our patient did not have any additional pathology

Normally, the azygos vein locates on the intersection of right vena lumbalis ascendens and right vena subcostalis that passes in the thorax along the aortic hiatus. It arises through the anterolateral surface of the thoracic vertebrae and arches ventral to right major bronchus at T5–6 and pours in SVC and uncom-monly, into the right brachiocephalic vein, right subclavian vein, intrapericardial SVC or right atrium [9–10]. The enlarged azygos vein can be defined as mediastinal enlargement on chest radiography and as interpreted on right-sided paratracheal adenopathy and mediastinal mass [11–12].

Conclusion

It is important to recognize and confirm this abnormal conditions with radiologic tools for the purpose of preventing complications ie. hemorrhage, before performing invasive procedures.