The Annals of Clinical and Analytical Medicine
Case Report

A rare case of interrupted inferior vena cava with azygos continuation

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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 superior vena cava (SVC) 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

DOI:10.4328/ACAM.5950 Received: 28.06.2018 Accepted: 01.08.2018 Publihed Online: 02.08.2018 Printed: 01.07.2019 Ann Clin Anal Med 2019;10(4): 510-2
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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. Vascular anomalies of IVC are not common and are often recognized incidentally during radiological and surgical procedures. The incidence is reported to be 0.6% [1]. In the absence of cardiac abnormalities, the incidence of the variations or anomalies of IVC has been reported to be 0.3% in the normal 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 outpatient clinic with chest pain. THe was completely healty with no chronic disease history. The physical examination was normal. Chest x-ray showed mediastinal widening with enlargement of azygos arch and right hilus (Figure 1). On contrast-enhanced computed tomography (CT) images, a right sided azygos vein and an enlarged IVC with no hepatic segment was observed. The hepatic veins were pouring in right atrium. Additionally, the azygos vein was prominently dilated. There was no obvious abnormality in the hemiazygos vein (Figure2-3-4). Informed consent form was received from the patient.

Discussion

The IVC is one of the largest vein in the body. It is responsible for the venous drainage of the abdomen. It ascends through the abdominal and then the thoracic cavity and finally drains into the right atrium. Embryogenesis of IVC comprises complex relations with other abdominal and thoracic structures. These unknown conditions lead to the development of IVC anomalies. The anatomical variations are usually discovered incidentally as clinically silent. But in some cases collateral vessels provide physiological compensation for venous circulation and they present with deep venous thrombosis, atypical lower back pain, recurrent venous thromboembolism and hematoma [2]. IVC formation during embryogenesis occurs at 4-8 weeks of gestation. IVC is the result of several anastomoses made by three group of embryological veins: the supracardinal, the posterior and the

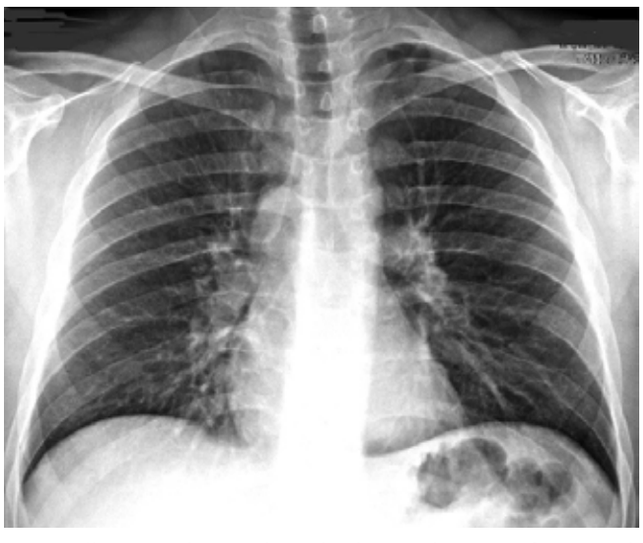

Figure 1. Chest x-ray shows mediastinal widening, enlargement of azygos arch and right hilus.

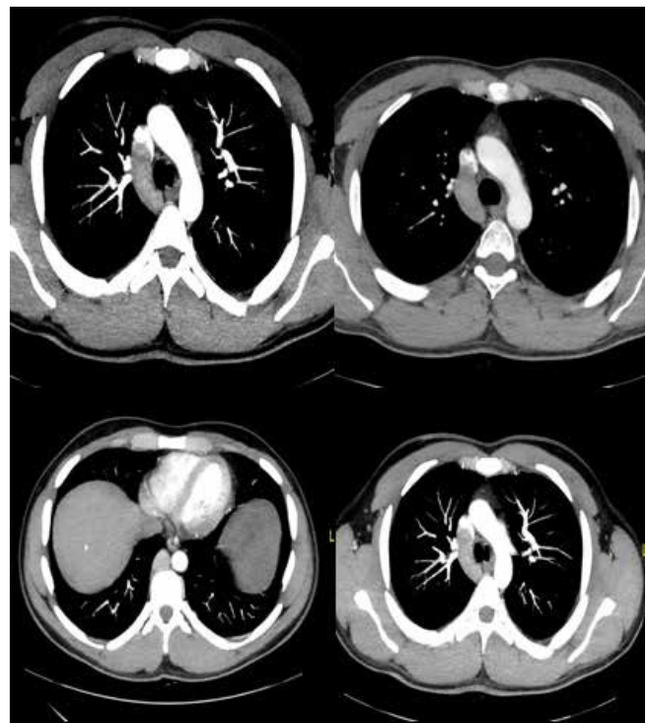

Figure 2. The axial enhanced CT images show, enlarged azygos vein descending aorta on the right side and draining into the vena cava superior.

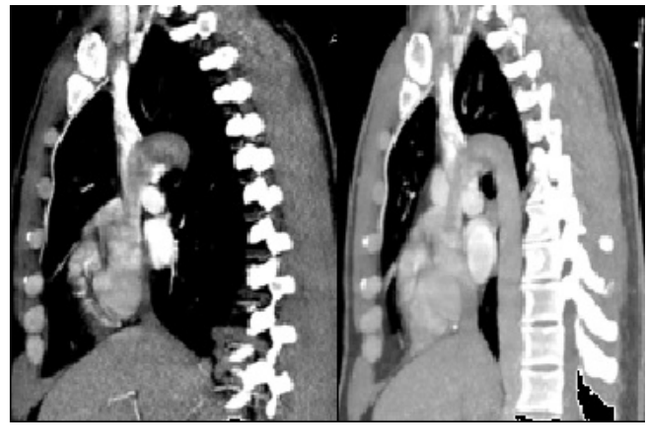

Figure 3. The sagittal enhanced CT view show, enlarged azygos vein, descending on the right side of the aorta and drain into the vena cava superior. The hepatic segment is not detected and hepatic veins directly drain into the right atrium.

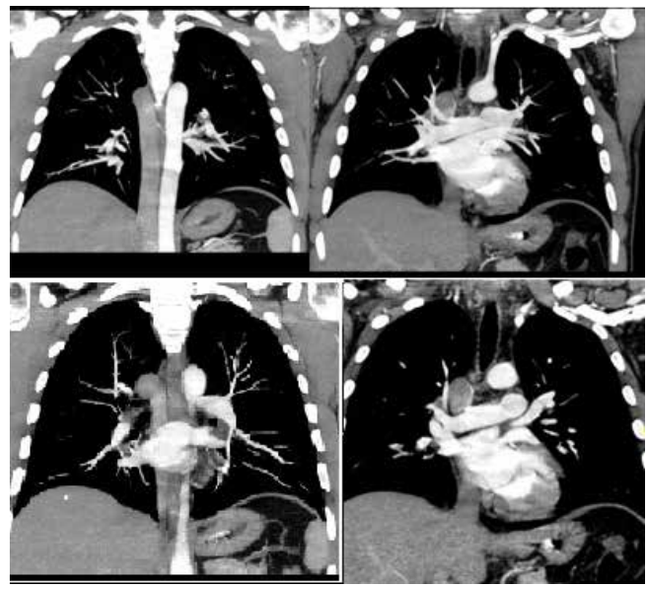

Figure 4. The coronal enhanced CT view show, enlarged azygos vein descending aorta on the right side and drain in to the vena cava superior. Vena cava inferior hepatic segment is not detected and hepatic veins directly draining into the right atrium.

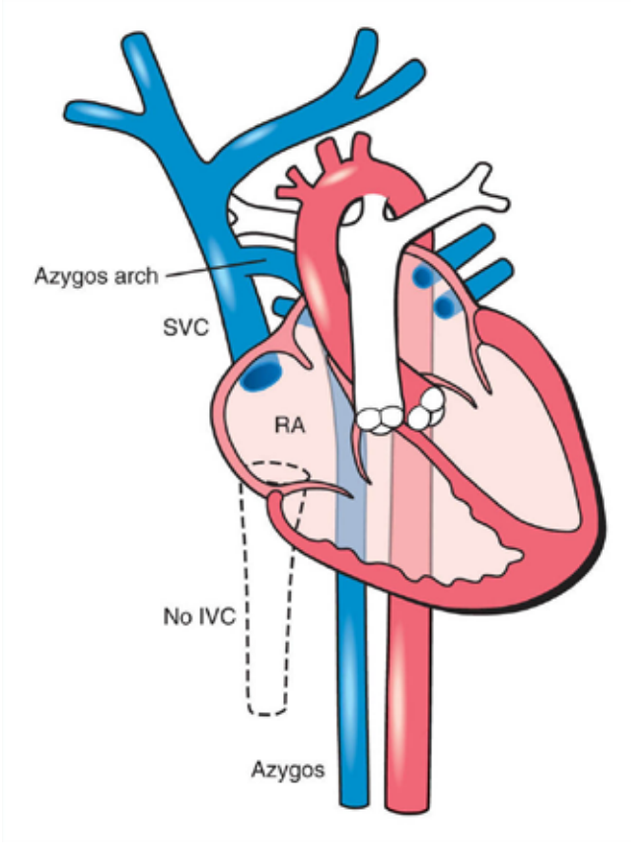

Figure 5. Schematic drawing of an interrupted IVC (dashed lines) with an azygos vein continuation.

subcardinal [3]. During this complex formation, many variations may develop due to various step changes. The most common 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 of hepatic and prerenal parts of the IVC results in the infrahepatic hypoplasia or interruption type azygos continuation and compensatory enlargement [6]. IVC continues with azygos vein into the thorax then the azygos vein merges with the SVC 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 with 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 ascends through the anterolateral surface of the thoracic vertebrae and arches ventral to right major bronchus at T5–6 and pours in SVC and uncommonly, 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 may be confused with a right sided paratracheal adenopathy and mediastinal mass [11-12].

Conclusion

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

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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How to cite this article:
Özçelik N, Kara BY, Özyurt S, Özdemir O, Şahin Ü. A rare case of interrupted inferior vena cava with azygos continuation. Ann Clin Anal Med 2019;10(4): 510-2.