

Angiography of Azygos Continuation of Inferior Vena Cava with Polysplenia

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ABSTRACT

This report demonstrates an angiography of azygos continuation of inferior vena cava with polysplenia. In this patient computed tomography with contrast enhancement, magnetic resonance angiography of the thorax with TOF technique and angiography of IVC by seldinger technique with entering right main femoral vein was performed. It was exhibited azygos continuation of IVC, polysplenia and hepatic veins which connected to the right atrium. Congenital malformations of IVC are rare. Patients are usually asymptomatic and this developmental anomaly is detected incidentally during abdominal surgery or radiologic evaluation. The recognition of this congenital venous anomaly is important for the cardiopulmonary bypass or palliative systemic venous-pulmonary artery shunt surgery, IVC filter placement and cardiologist especially for conditions such as venous thromboembolism.

Key words: Inferior vena cava, computed tomography, azygos continuation, congenital venous anomaly

Anjiografide Azigos Devamlılığı Gösteren Inferior Vena Kava ve Polispleni Birlikteliği

ÖZET

Bu olguda polispleni birlikteliğinde inferior vena kavanın azigos devamlılığı anjiyografik olarak gösterilmektedir. Hastaya kontrastlı toraks bilgisayarlı tomografisi, TOF tekniği ile toraks manyetik rezonans incelemesi ve sağ ana femoral venden Seldinger tekniği ile girilerek İVC anjiyografisi yapıldı. İVC'nin azigos devamlılığı, polispleni ve hepatic venlerin sağ atriuma boşaldığı görüldü. İVC'nin konjenital malformasyonları nadirdir. Hastalar genellikle asemptomatiktir ve bu gelişimsel anomali insidental olarak abdominal cerrahide veya radyolojik değerlendirmede saptanır. Bu konjenital venöz anomalinin tanımlanması kardiopulmoner bypass veya palyatif sistemik venöz-pulmoner arter şant cerrahisi, İVC filtresi yerleştirilmesi ve venöz tromboembolizm gibi durumlarda özellikle kardiologlar için önemlidir.

Anahtar kelimeler: Inferior vena kava, bilgisayarlı tomografi, azigos devamlılığı, konjenital venöz anomali

INTRODUCTION

Congenital malformations of the inferior vena cava (IVC) are rare. Patients are usually asymptomatic and this developmental anomaly is detected incidentally during abdominal surgery or radiologic evaluation (1,2). The embryonic event is theorized to be failure to form the right subcardinal-hepatic anastomosis, with resulting atrophy of the right subcardinal vein. Consequently, blood is shunted from the suprasubcardinal anastomosis through the retrocrural azygos vein, which is partially derived from the thoracic segment of the right supracardinal

vein (3). The azygos vein joins the superior vena cava at the normal location in the right paratracheal space. The hepatic segment is ordinarily not truly absent; rather, it drains directly into the right atrium (4). Many authors have published different series or reports about congenital malformations of the inferior vena cava. This report demonstrates an angiography of azygos continuation of inferior vena cava with polysplenia.

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Received: 02.11.2010, Accepted: 20.12.2010

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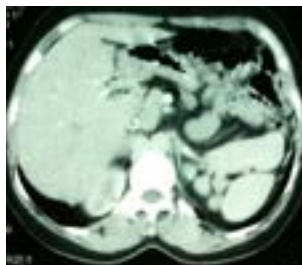


Figure 1. Enlarged azygos vein and polysplenia

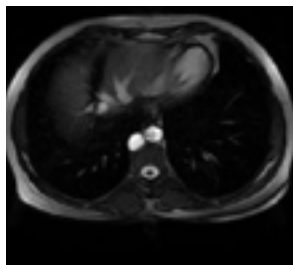


Figure 2. IVC drained into the SVC and hepatic veins were directly connected to the right atrium



Figure 3. IVC drained into the SVC

CASE

For evaluation of dyspnea in a 44-year-old female, computed tomography with contrast enhancement was performed and demonstrated an enlarged azygos vein and polysplenia (Figure 1). Magnetic resonance angiography of the thorax with TOF technique was performed and the IVC with azygos vein continuation could be demonstrated. Additionally IVC drained into the superior vena cava (SVC) and hepatic veins were directly connected to the right atrium (Figure 2). The angiography of IVC was performed successfully by seldinger technique with entering right main femoral vein. The intrahepatic IVC was hypoplastic and angiography certified the findings of magnetic resonance angiography (Figure 3).

DISCUSSION

IVC with azygos vein continuation is rare, with a prevalence of 0.6% of the general population. The IVC is normal below the level of renal vein but has no hepatic segment (5, 6). The IVC drains into the SVC and eventually into the right atrium through the enlarged azygos vein system. The hepatic veins are directly connected to the right atrium (5). Because of the agenesis of the hepatic segment of the IVC, the blood circulation in the caudal segment reaches the azygos vein system through persistent right supracardinal vein (3). Myabara (7) et al found similarly the absence of the hepatic segment of the IVC in autopsy. The relationship of IVC with azygos vein may coexist with polysplenia syndrome (5,8-10). Interruption of the inferior vena cava with azygos continuation is present in at least 65% of the patients suf-

fering from left atrial isomerism (polysplenia syndrome) (11). The typical radiologic features azygos continuation are well known and documented (3,10-15). Geley et al found azygos continuation of the IVC in 11 patients underwent abdominal sonography (16). Additionally Esposito, Capua et al described double IVC with azygos vein continuation (12,13). Mihmanlı et al found azygos continuation of IVC in ultrasound (15). The recognition of this congenital venous anomaly is important for the cardiopulmonary bypass or palliative systemic venous-pulmonary artery shunt surgery, IVC filter placement and cardiologist especially for conditions such as venous thromboembolism.

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