GENERAL UROLOGY
Case Report

Right varicocele secondary to left-sided inferior vena cava with a retro-aortic left renal vein and azygos continuation

Ali Hamidi Madani[1], Gholamreza Mokhtari[1], Ali Babaei Jandaghi[2], Mojtaba Teimoori[1]

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ABSTRACT

Varicocele represents the main cause of male infertility. Right-sided varicocele is rare and can be due to renal malignancy or a venous abnormality. The most common anomaly of the inferior vena cava (IVC) is interruption of IVC with azygos continuation, which is recognized as an uncommon congenital anomaly. The prevalence of the interruption of IVC is less than 0.3% in the healthy population. We describe the case of a 26-year-old man who had right varicocele because of a right-sided IVC with a retro-aortic left renal vein and azygos continuation. The right and left IVCs received the right and left common iliac veins, respectively, and the left renal vein crossed posteriorly to the aorta and joined the right IVC. The right IVC continued cephalad as the azygos vein within the retrocrural space. Isolated right-sided varicoceles are uncommon, but practitioners should be aware of such a condition. In case of a venous anomaly, clinicians should aware of the association with other important clinical presentations.

Keywords: Hemiazygos vein; interrupted inferior vena cava; varicocele.

ORCID IDs of the authors:
A.H.M. 0000-0003-0160-5805;
G.M. 0000-0002-2125-9244;
A.B.J. 0000-0002-7643-2964;
M.T. 0000-0002-7090-9282

[1]Urology Research Center, Razi Hospital, Guilan University of Medical Sciences, Guilan, Iran

[2]Department of Radiology, Poursina Hospital, Guilan University of Medical Sciences, Guilan, Iran

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Correspondence:
Ali Hamidi Madani
E-mail:
mojtaba_teimoori@yahoo.com

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Introduction

Varicocele is present in 15% of healthy men and in 40% of men with infertility. In addition to male infertility, it can cause testicular pain and can be treated with varicocelectomy,[1] which may improve fertility. Isolated right-sided varicocele is rare and can be due to renal malignancy or a venous abnormality.[2] Its detection is important, as it can be helpful to describe the anatomical presentation for further percutaneous varicocelectomy. An interrupted inferior vena cava (IVC) and an IVC with azygos or hemiazygos continuation are very rare anomalies of the IVC.[3] To our knowledge, right-sided varicocele with azygos continuation has been rarely reported in the literature. We describe the case of a 26-year-old man who had right varicocele because of left-sided IVC with hemiazygos continuation.

Case presentation

A 26-year-old man presented to our urology clinic with right scrotal pain. The patient was examined in the standing, and supine positions, and we detected right grade 3 varicocele. Ultrasonography replace the sonography was ordered for further assessment of scrotal pain, and the ultrasonography confirmed the diagnosis of varicocele. Sonography was performed in the radiology department with the patient in the supine position. Normal arterial flow was present within the testicles. No solid masses were seen within or outside the testes. Both testes had a normal shape and size. The patient did not complain because of a cosmetic reason or infertility. The chest radiography was normal, and all assessed tumor markers were within normal limits.

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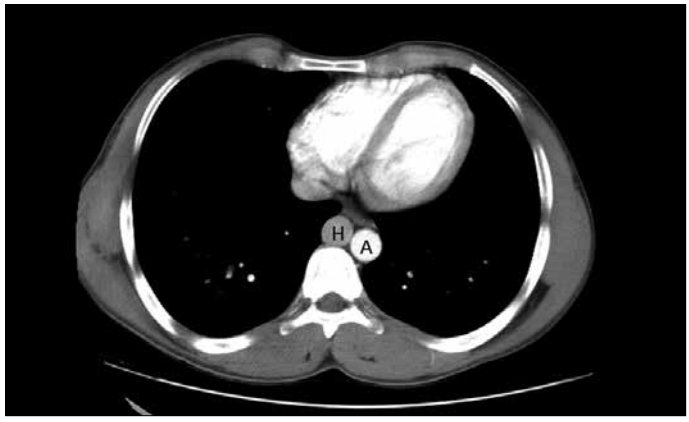

Figure 1.Abdominal axial computed tomography (CT) examination of the patient. This abdominal CT image shows hemiazygos continuation (H) beside the aorta (A)

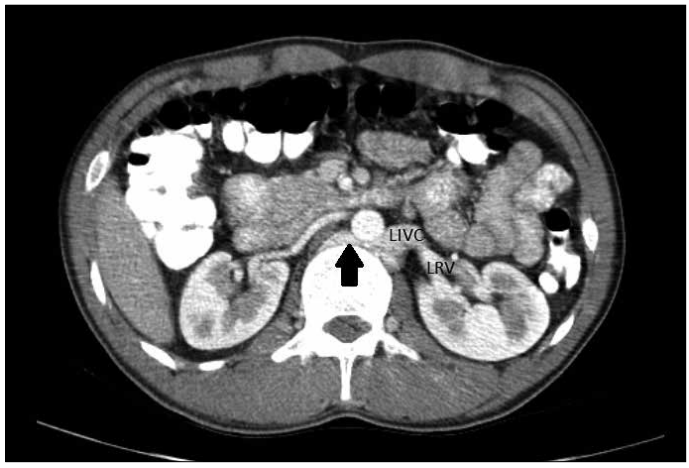

Figure 2. Abdominal axial computed tomography (CT) examination of the patient. This abdominal CT image shows that the left renal vein (LRV) drains into the left inferior vena cava (IVC) (LIVC) and then crosses the aorta from behind to (black arrow) join the right IVC

For further assessment, abdominal spiral computed tomography (CT) with and without intravenous contrast media was performed because we suspected retroperitoneal lymphadenopathy. On the CT scan, we found no visualization of the intrahepatic portion of the IVC with reconstitution of flow above and below the liver (Figure 1). The right and left common iliac veins joined to the right and left IVCs, respectively. The right and left IVCs ascended laterally and received the renal veins. The left renal vein drained into the left IVC and then crossed posteriorly to the aorta and joined the right IVC (Figure 2). The right IVC received the right renal veins and continued cephalad as the azygos vein within the retrocrural space (Figures 2 and 3).

This finding confirmed the diagnosis of congenital interruption of the IVC with azygos or hemiazygos continuation. An interrupted

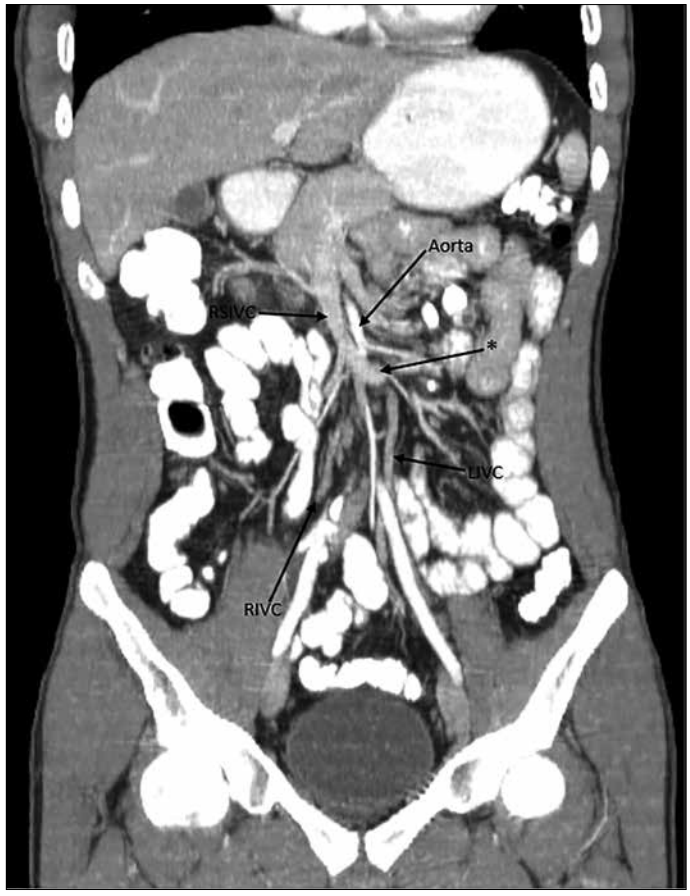

Figure 3. Abdominal coronal computed tomography (CT) examination of the patient. This abdominal CT image shows that the left inferior vena cava (IVC) (LIVC), right IVC (RIVC), and the left renal vein drain into the left IVC (marked by*) and then crosses the aorta from behind and joins the right IVC (RSIVC)

IVC warrants a careful investigation for other linked anomalies, mainly cardiac ones. Considering that a cardiac anomaly is associated with hemiazygos continuation, cardiac echocardiography was conducted which confirmed that the patient had an atrial septal defect. Since a low Factor VII[4] level is found in some patients with hemiazygos continuation, the Factor VII level was assessed, and it was normal. Color Doppler sonography was conducted to rule out venous thrombosis because of the patient's higher risk of thrombosis. The patient was admitted to the hospital, and right open inguinal varicocelectomy was performed. We found a normal anatomy, and two dilated veins were ligated. At the last visit one month later, the patient reported that his pain was relieved.

Discussion

Isolated right-sided varicoceles are a matter of scrutiny since they are uncommon and usually are a result of a pathological condition that affects the IVC, such as retroperitoneal tumors

and congenital venous drainage abnormalities.[5] However, isolated right-sided varicoceles often have a predictable anatomic presentation, and describing this variation may be helpful in performing the percutaneous procedure to treat varicocele.[6]

To our knowledge, right-sided varicocele due to a right-sided IVC with azygos continuation is rarely reported in the literature. We found two articles; in the first one Koen et al.[2] discusses abnormal bilateral drainage of testicular veins, whereas the other article is a case report by Salerno et al.[1] that describes two-sided varicocele as the sole presentation of azygos or hemiazygos continuation with an anomalous intrahepatic connection. Different venous anomalies cause right-sided varicocele, such as anomalous origin of the gonadal veins reported by Barber et al.[3] Cases of duplicated IVC were reported by Chaturvedi et al.[5] and Wilms et al.[7] Thus, there is no similar report to ours until now in the literature.

Infrahepatic IVC interruption with azygos continuation has rarely been reported in the literature. Its prevalence is supposedly less than 0.3% in the healthy population.[8] Further anomalies are also rare, such as a retro-aortic left renal vein, which has an estimated prevalence of 2.1%, and double IVC, with an estimated prevalence less than 3%.[9]

This congenital, and extremely rare abnormality develops because of persistence of the right and left supracardinal veins.[10,11] The left renal vein may drain into the left IVC and then cross over aorta and join the right IVC. Considerable asymmetry in the sizes of IVCs has been reported.[12] Double IVC causes the IVC to end under the hepatic vein. Total venous flow proximal to this connection was made by the dilated azygos vein, which eventually emptied into the superior vena cava through an enlarged azygos arch.[13]

Inferior vena cava dysplasia is uncommon, and many IVC abnormalities manifest incidentally. Although this diagnosis usually has no serious significance, it can be associated with some important clinical presentations, as in our patient. Recurrent deep vein thrombosis of the lower limbs or cardiac abnormality characterized with anatomical pathologies, and dysrhythmia[5] may manifest with IVC interruption and should be evaluated and treated.

In urological practice, isolated right-sided varicoceles are uncommon, and a careful examination is required because an important pathology can cause this situation. In the case of a venous anomaly, clinicians should be aware of associations with other important clinical presentations.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

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