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Case Report / Olgu Sunumu

A very rare renal venous anomaly: Accessory polar left renal vein

Çok nadir bir renal venöz anomaly: Aksesuar polar sol renal ven

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ABSTRACT

A 49-year-old female patient with hypertension was admitted with an intraabdominal murmur and referred for multidetector computed tomography angiography for suspected renal artery stenosis. Her medical history, clinical examination, serum biochemistry, and ultrasound examination findings showed no pathological findings of diabetes mellitus or any other disease. Axial and coronal reformatted multidetector computed tomography angiography revealed a dilated accessory polar renal vein which drained the venous circulation of the left lower pole into the inferior vena cava at midline. In conclusion, multidetector computed tomography angiography plays a progressively substantial role in the assessment of renal vascularity. Vascular surgeons and urologists should be a thorough knowledge of renal vascular variations.

Keywords: Accessory renal vein, multidetector computed tomography, polar renal vein, transplant surgery, venous anomaly.

ÖZ

Hipertansif 49 yaşında kadın hasta, abdominal üfürüm ile başvurdu ve renal arter darlığı şüphesi ile çokkesitli bilgisayarlı tomografi anjiyografiye yönlendirildi. Öykü, klinik muayene, serum biyokimya ve ultrason tetkiki bulguları diabetes mellitus ya da başka bir hastalık açısından bulgular göstermiyordu. Aksiyal ve koronal çokkesitli bilgisayarlı tomografi anjiyografi reformat görüntülerde, sol böbrek alt polün venöz dolaşımını orta hatta inferior vena kavaya drene eden dilate aksesuar polar renal ven izlendi. Sonuç olarak, çokkesitli bilgisayarlı tomografi anjiyografi böbrek vaskülaritesini değerlendirmede giderek artan bir role sahiptir. Vasküler cerrahların ve ürologların böbreğin vasküler varyasyonları hakkında detaylı bilgi sahibi olması gereklidir.

Anahtar sözcükler: Aksesuar renal ven, çok kesitli bilgisayarlı tomografi, polar renal ven, transplant ameliyatı, venöz anomali.

In clinical anatomy, renal venous system has been less studied than its arterial counterpart. Renal vein variations are usually overlooked by radiologists. These variations usually indicate the type and course of the operation, particularly for vascular surgery.

Preoperative description of venous anatomy using multidetector computed tomography (MDCT) angiography is useful to evaluate the arterial anatomy. Recent anatomical studies on renal vascular variations have shown that renal venous anatomical variations are relatively small, compared to arteries.[1,2]

To the best of our knowledge, renal venous anatomic anomaly with an accessory renal vein has only been reported in one report in the literature.[3] Although the definition of accessory renal artery is widely used, the definition of accessory renal vein is little known by radiologists and clinicians. However, recognition of this variation is particularly important in surgical procedures, such as vascular and general surgery.

Herein, we describe the MDCT angiographic features of a very rare venous anatomic anomaly of the left kidney with an accessory renal vein from left renal

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inferior pole which was related to the lower pole of the kidney rather than the renal hilus. We believe that our report would provide a significant contribution to the current literature.

CASE REPORT

A 49-year-old female patient with hypertension was admitted with an intraabdominal murmur and referred for MDCT angiography for suspected renal artery stenosis. Her medical history and clinical examination revealed no pathological findings of diabetes mellitus or any other disease. Complete blood count and all serum biochemistry were within normal limits. Ultrasound showed no structural anatomic abnormality of the urinary tract. Axial, coronal, and three-dimensional reformatted examinations demonstrated a dilated accessory polar renal vein which drained the venous circulation of the left lower pole into the inferior vena cava (IVC) at midline (Figures 1, 2, and 3). The drainage site of left renal vein to the IVC was just opposite to the drainage site of right renal vein, but the drainage site of the accessory left renal vein to the IVC was just proximal to bifurcation of the common iliac veins, 8 cm below the drainage site of the left renal vein. The main parent left renal vein was in its normal position. Both kidneys, ventral, and dorsal branches were draining into the IVC directly. No renal vein variation or supernumerary vein was observed in the right kidney. Renal arteries of both kidneys originated from their

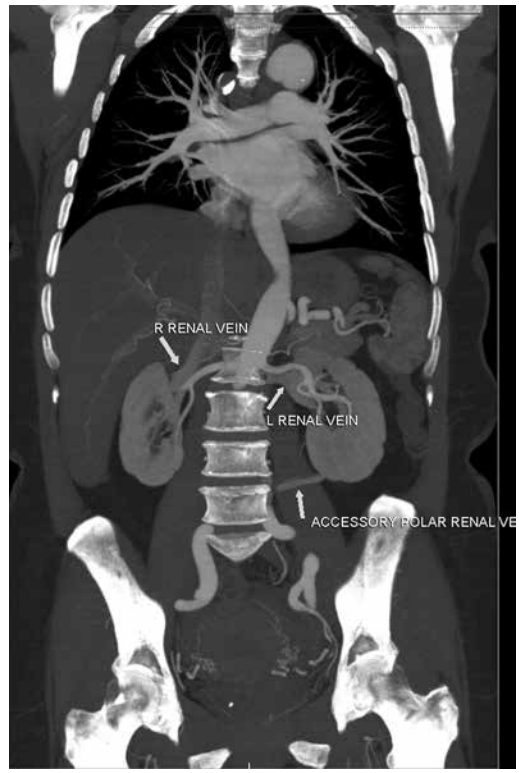

Figure 2. Coronal reformatted computed tomography image showing an accessory renal vein draining the left lower pole, while left main renal vein was localized in its normal position (large arrow).

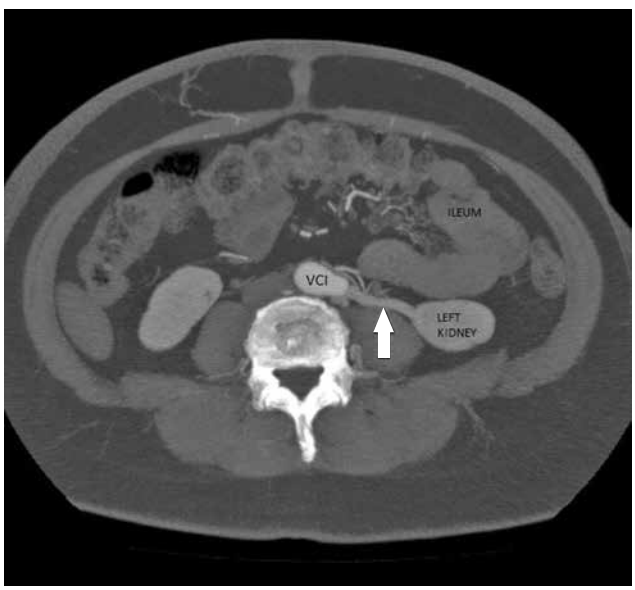

Figure 1. The arterial phase of the axial computed tomography showing an accessory left renal vein (white arrow), lumbar, and anterior external venous plexus drainage.

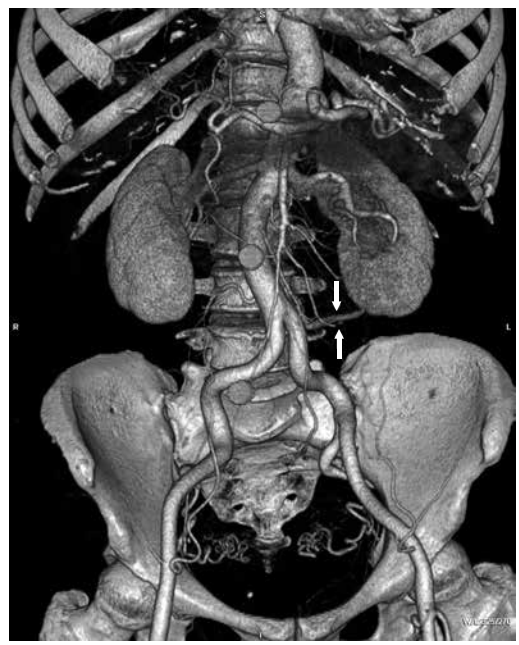

Figure 3. Three-dimensional volume rendering computed tomography image showing an accessory renal vein draining the left lower pole (white arrows).

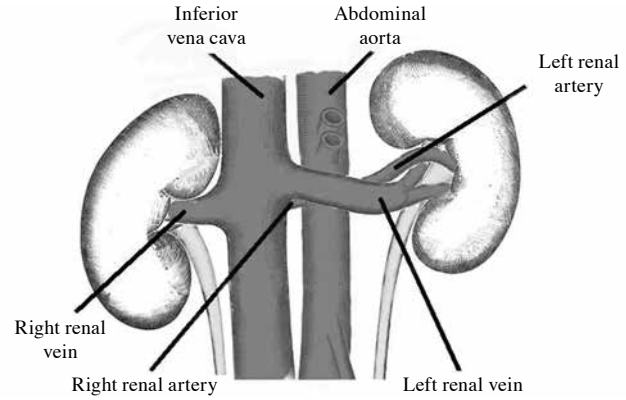

Figure 4. Illustration of normal renal vascularity.

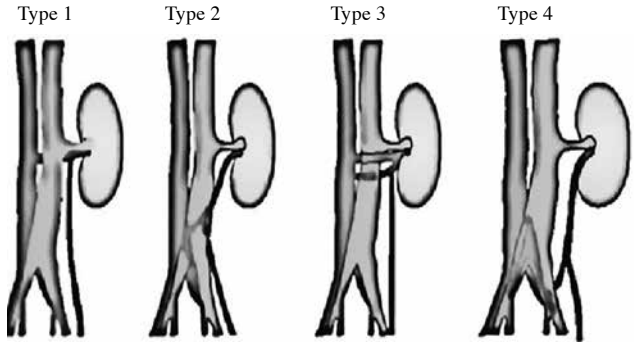

Figure 5. Types of left renal vein anomalies. Type 1 retroaortic left renal vein, type 2 retroaortic left renal vein, type 3 circumaortic left renal vein, and type 4 renal vein joining left common iliac vein.

normal position and no renal artery variation was observed. The widths of ureters were normal and no double collecting system was observed. The hypertension of the patient was considered as essential HT because of the normal renal artery vascular structures in MDCT. After medical treatment, the patient's blood pressure was within normal limits and no additional treatment was required for the incidentally detected venous anomaly.

DISCUSSION

In clinical anatomy, the renal venous system has been under studied than the arterial system. Renal veins are formed by the confluence of two or three renal parenchymal veins in the renal sinus.[4] At the eighth week of embryological development, the symmetrical cardinal veins on both sides form the IVC on the right side. Initially, renal veins are on the ventral and dorsal plane, although they join into a single vessel formation later (Figure 4).[5] When these branches fail to join and persist, accessory and additional veins are formed.

Any accessory vessel originating from the kidney and draining independently into the IVC is considered a normal variation and such vessels are termed as additional renal veins, and classified as type 3.[6,7] The drainage patterns and variations of the renal veins have been well-documented in previous reports (Figure 5).[3,7,8-12] Additional renal veins are more common on the right side than the left side.[6] In our case, in contrast to all cases described in the literature, a left-sided accessory polar renal vein was observed which was related to the lower pole of the kidney rather than the renal hilus. Gupta et al.[9] reported an incidence of 33% for a right-sided additional renal vein and 3.3% for a left-sided additional renal vein.

Renal vein variations, which are usually overlooked by radiologists, are often demonstrated by venography or cadaveric dissections. In our case, the right and left main renal veins drain into the IVC in their normal localizations, whereas the left-sided accessory or additional renal vein drains into the IVC proximally to bifurcation of common iliac veins 8 cm below the drainage site of the left renal vein. Based on our literature search, we were able to find only one publication of anatomic variation of accessory polar vein draining the left pole of the left kidney.[3]

Renal vascular variations are clinically silent and, thus, often remain unnoticed. They are usually diagnosed incidentally during surgery or autopsy. Of note, MDCT angiography plays a progressively substantial role in the assessment of the renal vascularity.[4,10-15] This technique is a less invasive imaging modality which provides a more rapid, effective, and definitive visualization of many anatomical variations of the kidney vessels. Recognition of the renal venous morphology also affects the type and course of the operation. The importance of familiarity with the renal artery variations has been gradually increasing not only for successful vascular surgeries, but also other types of surgery and radiological examinations. Similarly, recognizing renal venous system anomalies provides comfort for surgeons prior to interventional and surgical operations, such as nephrectomy and vena cava filter placement.

In conclusion, renal vein variations often remain unnoticed, as they are clinically silent. Vascular surgeons and urologists should have a thorough knowledge of renal vascular variations.

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