

Retroaortic Left Renal Vein with Double Right Renal Vein in a Renal Transplant Donor: Original Image

Renal Transplant Donöründe Retroaortik Sol Renal Vene Eşlik Eden Çift Sağ Renal Ven Olgusu

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ABSTRACT Because renal veins may have different variational patterns such as supernumerary veins, double veins, and accessory veins to avoid potential complications during surgery of renal donor candidates it is important to know for sure the renal vascular anatomy. For this purpose beside some other modalities such as color Doppler ultrasonography, magnetic resonance, and renal venography, multidetector computed tomography can be used. In this report, we presented multidetector computed tomography findings of a case with bilateral renal venous variation. These were retroaortic renal vein on the left and double renal vein on the right. With this paper we aimed to call attention to the importance of knowledge of renal venous vascular anatomy for operation planning.

Key Words: Renal vein, kidney transplantation

ÖZET Renal venler; birden fazla renal ven, çift renal ven ve aksesuar renal venler gibi farklı varyasyonel paternler gösterebileceğinden böbrek verici adaylarında operasyon sırasında ortaya çıkabilecek olası komplikasyonların önlenmesi için renal vasküler anatominin bilinmesi önemlidir. Bu amaç için renkli Doppler ultrasonografi, manyetik rezonans ve renal venografi gibi birkaç başka modalite yanında çok kesitli bilgisayarlı tomografi kullanılabilir. Bu yazıda iki taraflı renal venöz varyasyon belirlediğimiz renal verici aday olgumuzun çok kesitli bilgisayarlı tomografi bulgularını sunduk. Olgumuzda sol tarafta retroaortik renal ven ve sağ tarafta çift renal ven söz konusu idi. Bu sunum ile renal venöz vasküler anatominin bilinmesinin operasyon planlamasındaki önemine dikkat çekmeyi amaçladık.

Anahtar Kelimeler: Renal ven, böbrek transplantasyonu

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Renal veins may show different variations. To be aware of these patterns is of great importance for operation success and preventing complications. In the evaluation of the renal veins, multidetector computed tomography (MDCT) is a reliable and noninvasive tool for diagnosing renal vein anomalies. In this report, a complex anomaly of retroaortic left renal vein with double right renal vein in a renal transplant donor has been presented.

A 42-year-old man, who is candidate for renal donation, was referred to our department for pretransplant evaluation by MDCT angiography.

MDCT was performed on a 16-MDCT scanner (Aquilion, Toshiba Medical Systems, Tokyo, Japan). The scans were obtained with a 16×0.5-mm collimation, 1.0-mm slice thickness, 1.0-mm reconstruction interval, 120 kVp, 125 mAs, and 0.5-s rotation speed. Iodinated contrast material (110 ml Omnipaque; Amersham Health, Cork, Ireland) was injected through the antecubital vein at a rate of 4.0 ml/s. Late arterial and early venous phase volumetric data sets were acquired at 30 and 65 s, respectively, from the start of the intravenous injection of the contrast material. All image data were reconstructed with the body soft-tissue algorithm. The area scanned was from above the kidneys to just below the common iliac arteries on the late arterial phase images and from above the kidneys to the top of the iliac crests on the early venous phase images. Reconstructed images were then transferred to a processing workstation for further analysis with specialized software (Vitrea 2; Vital Images, Inc., Minneapolis, Minn., USA). In addition to traditional axial images, multiplanar reconstructions (MPR), maximum-intensity projection (MIP), and three-dimensional volume-rendering (3D VR) images were used to assess renal vein anomalies. Contrast enhanced MDCT angiography showed no abnormal or variational renal artery but left retroaortic renal vein and double right renal vein (Figures 1, 2).

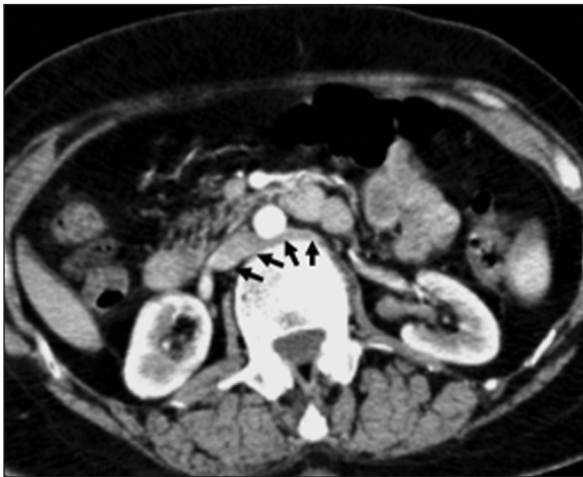


FIGURE 1: Axial contrast enhanced MDCT angiographic imaging shows left retroaortic renal vein (arrows).

DISCUSSION

Renal veins may have various patterns: supernumerary veins, double veins and accessory veins. Anomalies of the right renal vein are not as common as those of the left renal vein because the left vein is longer and has a more complex embryogenesis. Thorough knowledge of renal vein anomalies is essential for prevention of hemorrhage, nephrectomy, and complications that may even result in death during retroperitoneal surgery. In addition, to perform complication-free surgery, knowledge of the anatomy and congenital anomalies of this area is important due to the restricted view at laparoscopic nephrectomy.¹ Retroaortic and circumaortic left renal veins are generally isolated anomalies, without an associated caval abnormality. In our patient, however, both the left and right vein associated anomalies were present concomitantly. To the best of our knowledge, this is the first case with such an anomaly ever described.

In the evaluation of the renal veins, imaging methods such as color Doppler ultrasonography, computed tomography angiography, magnetic resonance, and renal venography have been used.² MDCT is a reliable and noninvasive tool used in diagnosing renal vein anomalies, and according to Laugharne et al, the imaging potential of multidetector CT angiography is very high for evaluation

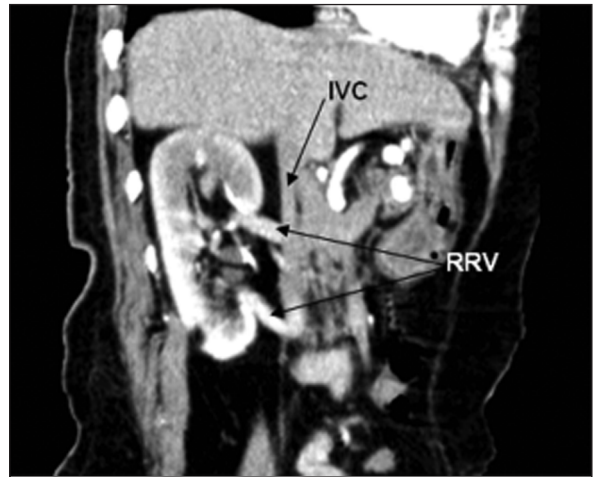


FIGURE 2: Coronal contrast enhanced MDCT angiographic imaging shows double right renal vein. IVC: Inferior vena cava, RRV: Right renal veins.

of renal vascular anomalies.³ Catheter angiography can identify the anomalous origin of the renal vein, but the 2-dimensional display of the conventional angiography course of the anomalous vein and the relationship to the adjacent structures can be difficult to determine and conventional angiography is an invasive procedure. Conventional catheter angiography does not provide any depth information and is thus unable to provide the exact 3D course of the anomalous vein.⁴ Courses of the vascular anomalies can be reliably observed through contrast-enhanced MDCT. Multidetector computed tomography, which is a

noninvasive method, provides a high-quality and accurate modality to detect and diagnose vascular variations.⁵

Awareness of potential anomalies of the renal vein, the length and course of which are particularly very important for laparoscopic nephrectomy, is of great importance. Preoperational detection of a complex anomaly such as the left retroaortic vein accompanying the right renal vein, as was in our patient, will contribute into operational planning. MDCT should be the choice of imaging modality in the evaluation of such cases because of its accurate and noninvasive imaging capability.

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