İleri Sağ Renal Ven Hipoplazisine Eşlik Eden Anormal Venöz Drenaj

Abnormal Venous Drainage of Right Kidney with Severe Hypoplasia of Renal Vein

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ÖZ

Renal venöz sistem sınıflandırmasına yönelik çok sayıda çalışma yapılmasına karşın, anormal venöz drenaj yolakları ile ilgili literatürde yeterli bilgi mevcut değildir. Biz bu vakada, asemptomatik hematürisi olan hastada sağ böbreğe ait anormal venöz drenaj tanımladık. Yapılan ultrasonografi ve bilgisayarlı tomografi incelemelerinde, inferior vena kava drenajının dışında, sağ böbreğe ait anormal venöz yolağın asendan lomber pleksusa drene olduğu saptandı. Renal ven anomalileri oldukça nadirdir ve sıklıkla başka endikasyonlar için yapılan tetkiklerde rastlantısal olarak saptanır. Bu tip anomalilerin varlığı, değişik girişimsel işlemlerde göz önünde bulundurulmalıdır. Gözden kaçması durumunda, bu tip değişik anomali veya varyasyonlar ciddi komplikasyonlara, hatta ölüme neden olabilir.

Anahtar Kelimeler: *Anormal venöz drenaj, hematüri, böbrek*

ABSTRACT

Although several studies were performed for the classification of renal venous system, abnormal venous drainage pathways were so few mentioned in literature. In this case, we identified abnormal venous drainage of the right kidney in a patient with asymptomatic hematuria. Herein, we present a very rare case of a patient with asymptomatic hematuria who had an abnormal venous drainage of right kidney. Performed ultrasonography and computed tomography exams revealed an abnormal venous pathway outside the renal hilum of right kidney draining to lumbar venous plexus, unlike inferior vena cava. Anomalies of renal veins are relatively rare, usually detected during routine examinations performed for other indications. Be aware of such anomalies is important in several interventional procedures. If it is overlooked, these anomalies or variations may lead to significant complications or death.

Keywords: *Abnormal venous drainage, hematuria, kidney*

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INTRODUCTION

Normal venous drainage of each kidney proceeds through a single vein that drains into the inferior vena cava (IVC). The renal veins are formed near the hilum (1). Modern surgical and radiological techniques dictate a reappraisal and definition of the renal venous anatomy. In this regard, the role of the primary tributaries of the renal vein and relationship with the branches of the renal artery are important. Various authors have attempted to classify the patterns of drainage of the renal veins since it is well known that these drainage patterns are extremely variable (2).

Anomalies of renal veins are relatively rare, and usually detected during routine examinations performed for other indications. Several renal vein anomalies including circumaortic, retroaortic, and rarely supernumerary renal veins have been documented in the literature (3). We aimed to report an extremely rare case with an abnormal venous drainage of the right kidney originated outside the hilum that was not mentioned previously.

CASE REPORT

A 59-year-old man without any complaint, has been followed up for hematuria that was incidentally detected at the urine test at June 2015. Although laboratory tests (hemogram, biochemistry, and serology) obtained between the dates of June 2015 and February 2018 were normal, two positive hematuria was present in all urine tests. Renal function tests were as follows; BUN (Blood Urea Nitrogen): 18 mg/dl, creatinine: 0,81 mg/dl and eGFR (glomerular filtration rate): 107 mL/min. Urinary system ultrasonography (US) was performed for identifying the etiology of hematuria. US showed a cortical elongated anechoic cystic structure originating from the lateral side of the midportion of the right kidney. Related cyst showed continuity in the pararenal fat space with a long-running tortuose structure. At color Doppler US, cystic lesion showed venous flow pattern (Figure 1a,b).

There was no detectable color-coding or flow sampling related to the native right renal vein at the hilum. US also revealed diffuse ectatic anechoic cystic structures filled the renal medulla. Left renal vein was normal. For identifying the venous system of the right kidney, intravenous contrast enhanced computed tomography (CT) examination was planned. At CT exam, there was an abnormal venous pathway traversing the renal parenchyma, and draining to the ascending lumbar venous plexus after a tortuous course in the pararenal fat space. Right renal vein at the hilum was seen as a band-like structure with a vague contrast filling. (Figure 2a-c,3).

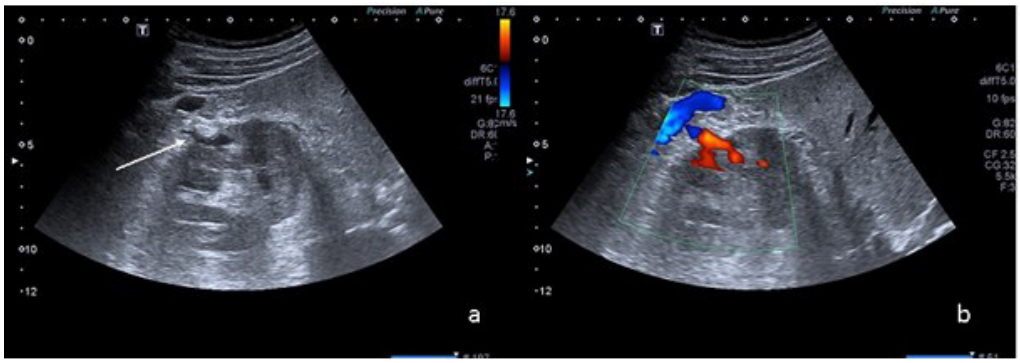

Figure 1. Grey-scale sonography (a) shows tortuous cystic structure (arrow) passing through the renal parenchyma and coursing in the pararenal fat space, compatible with a vessel at Doppler US (b).

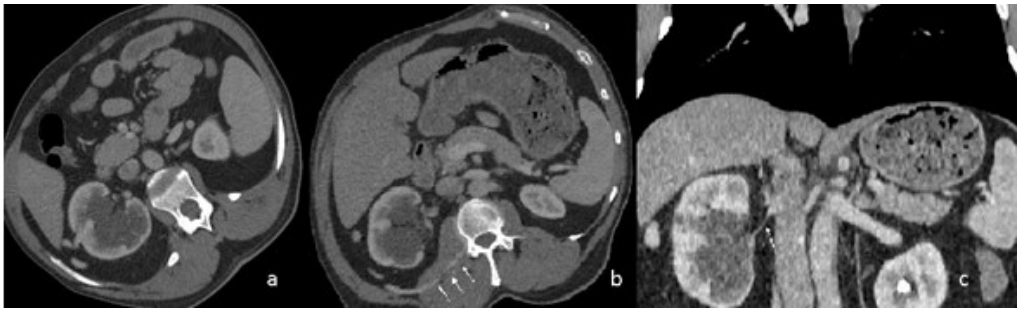

Figure 2. Axial contrast-enhanced CT images (a,b) show an abnormal renal vein, originated at the midportion of right kidney on the anti-hilar side, coursing in the pararenal fat space, and draining to lumbar venous plexus (arrows). (c). Coronal reformatted CT image shows band-like right renal vein (arrow) with a normal vein on the left.

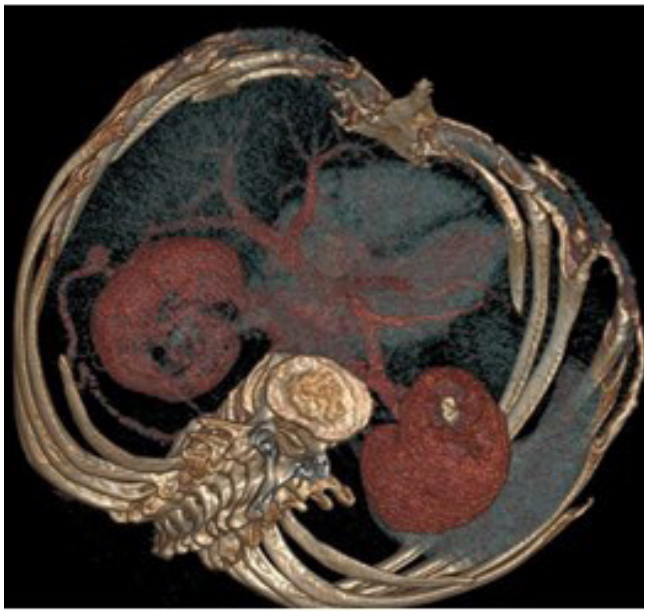

Figure 3. 3D CT angiogram shows the abnormal venous drainage of the right kidney.

CT also showed cystic structures with a density of 6 Hounsfield Unit filling the renal medulla without any contrast enhancement or filling at venous/excretion phases that can be a part of hereditary or nonhereditary renal cystic diseases. Cortical parenchyma of the right kidney was normal at gray-scale US and contrast-enhanced CT images, and it may exclude any previous renal vein thrombosis. An abnormal venous drainage of the right kidney with severe hypoplasia of renal vein was diagnosed.

DISCUSSION

Congenital venous abnormalities and variations in the retroperitoneal space are relatively infrequent (4). In general, patients with renal vein anomalies are asymptomatic, but rarely they may present with a blunt pain, intermittent hematuria, and/or varicocele. They are usually detected incidentally during a routine work-up. The advent of multi-detector CT increased the detection rate and improved the assessment experience of anatomic variations (5). Satyapal made a classification of the drainage patterns of the renal veins, and defined the intra-renal and collateral venous drainage patterns (6). It was concluded that intra-renal venous architecture is nonsegmental and non-lobar. Extensive venous collaterals centering on the left renal vein exist. These collateral pathways are constituted by the renal-lumbar-azygos-vertebral axis. The infrarenal pathway is predominantly via the ascending lumbar veins and vertebral plexuses. The suprarenal pathway is via the azygos-vertebral axis. The capsular and peri-ureteric venules provide an intra/extra renal communication (7).

Nutcracker syndrome and retroaortic renal vein are well known hematuria-associated venous abnormalities. It has been postulated that the mechanism that produces hematuria is an increase in renal vein pressure, which may cause minute rupture of thin-walled veins into the collecting system (8).

Preoperative knowledge of such variants is important in several angiographic procedures. Awareness of these anomalies is also crucial in retroperitoneal surgeries. If it is overlooked, these variations may lead to significant complications or death during abdominopelvic surgeries (9). In our case, asymptomatic hematuria was present and patient had no history of previous surgery or any trauma. Mechanism of hematuria in this case can be explained as similar to Nutcracker syndrome or retroaortic vein.

Renal veins develop from postcardinal, subcardinal and supracardinal sets of veins by the beginning of the sixth week of development and they surround the dorsal aorta as a circum-aortic renal venous collar. Normally the dorsal portion of the circumaortic collar degenerates leaving the ventral portion to persist as the left renal vein. The right renal vein therefore develops from the right subcardinal vein and from any of the anastomosis between the right subcardinal and the right posterior cardinal vein (10). In normal anatomy, the anterior and posterior divisions of renal veins receive blood from the anterior and posterior portions of the kidneys, respectively. The two divisions then unite to form a single renal vein that drains directly into the IVC at a right angle on either side (1). In the present case, right renal vein could not be identified with Doppler US, and seen as a band-like structure draining to IVC at contrast enhanced CT. In literature, most of the cases with venous anomaly were about left renal vein and its abnormal drainage patterns to the IVC. In our case, severe hypoplasia of right renal vein was seen with an abnormal antihilar-sided venous drainage into the lumbar venous plexus, unlike previous cases which had drainage into the IVC.

CONCLUSION

Anomalies of renal veins are relatively rare, usually detected during routine examinations performed for other indications. US and contrast-enhanced CT exams prior to any interventional procedure performed for retroperitoneal area (such as kidney) can be life-saving with raising the diagnostic rate of vascular abnormalities.

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

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