CASE REPORT

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Arteriovenous Malformation Which Causes Pelvic Congestion and Mimicking Renal Cyst

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ABSTRACT Renal arteriovenous malformations (AVM) are abnormal connections between the arteries and veins through a nidus in the renal vascular system. Renal AVMs can be confused with various renal pathologies such as hydronephrosis, kidney tumors and cysts. The exact etiology of pelvic congestion syndrome is probably multifactorial. Renal AVMs are one of the rare causes. In this article, a case of left renal AVM that causes venous congestion in the left parauterine region diagnosed with Doppler ultrasonography and computer tomography images is presented.

Keywords: Renal arteriovenous malformations; renal cyst; pelvic congestion syndrome; ultrasonography; tomography

Renal arteriovenous malformations (AVM) are abnormal links between the renal arterial and venous structures.[1] They can occur either congenitally or later instead of afterwards.[2] Hematuria is the most common clinical profile in approximately 75% of cases.[3] Clinical symptoms vary depending on the size of the AVM.[4] Renal AVMs have been shown to imitate various renal pathologies such as hydronephrosis, kidney tumors and cysts.[5] Pelvic congestion syndrome (PCS) is defined as chronic pelvic pain associated with perineal or vulvar varicose veins resulting from occlusion or reflux of gonadal, gluteal or periuterine vessels.[6] We aimed to present our case, evaluated in radiology service due to chronic left flank pain, diagnosed with left pelvic congestion syndrome caused by rare left pelvic renal AVM, with b-mode US (Ultrasonography), Doppler ultrasonography (US) and contrast-enhanced computed tomography (CT) (along with radiological findings).

CASE REPORT

A 49-year-old female patient who was admitted for chronic left flank and left pelvic pain was evaluated in our radiology unit. There was no chronic and familial genetic disease in her history. No renal trauma, previous surgical or interventional procedures or no history of alcohol and smoking was detected when her habits were questioned in her anamnesis. No pathological findings were detected in the physical examination and laboratory tests. In the abdominal US examination, in the left kidney, a cystic lesion approximately 3x2.5 cm in size, with lobular anechoic feature, well-limited contour, located in the middle section of the renal pelvic region (Figure 1), and color filling in the cystic lesion defined in the Doppler US, and the arterial and venous flow were detected by the power Doppler. In the pelvic region, adjacent to the left side of the uterus, dilated tubular cystic images, converging one another, reaching a diameter of 8 mm in the widest part, were monitored and the venous flow was detected in these cystic structures during the Doppler performed (Figure 2). In the same time, during the single phase CT which was performed in order to diagnose the patient, dilated renal venous structures (Figure 1) displaying contrast filling

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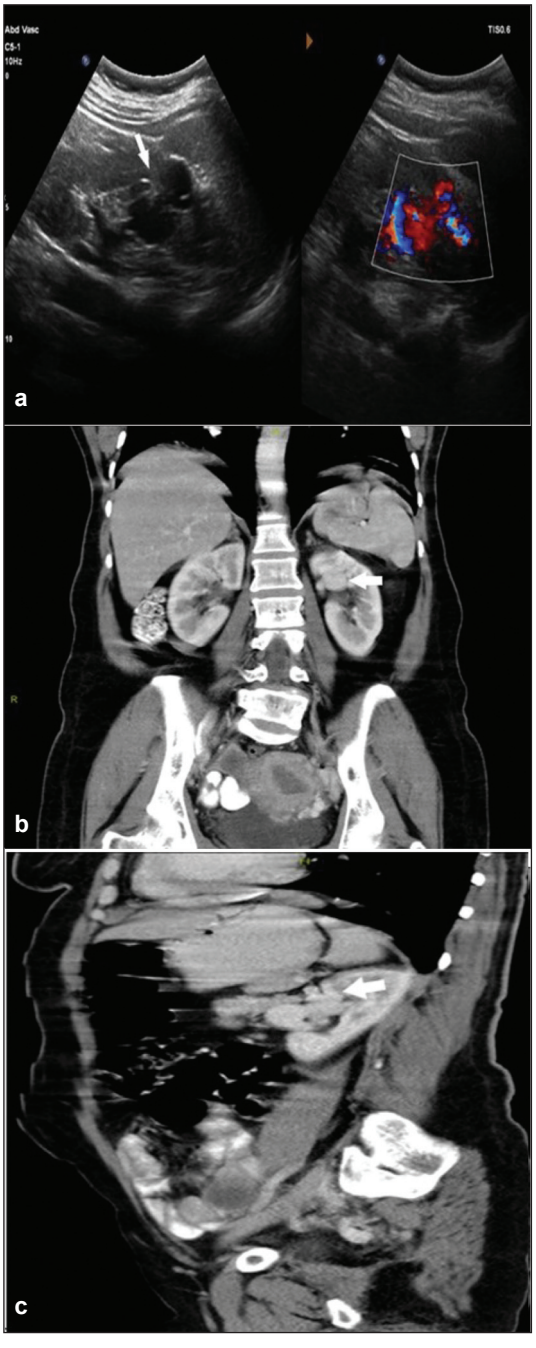

FIGURE 1: a. B mod and color Doppler US renal AVM (white arrow) with pelvic location, **b.** Coronal, **c.** Sagittal left pelvic renal AVM (white arrow) in CT sections with contrast.

3x2.5 cm in size in the left kidney were found and dilated left renal vein was flowing into the vena cava inferior (Figure 2). On the left side of the uterus, dilated venous structures (Figure 2) and dilated ovarian vein, reaching the diameter of 7 mm in dilated turtuous, extending towards the renal vein from this region, were seen (Figure 2). The patient was suggested MR and angiography, but the patient did not accept the shots and treatment, and left our hospital.

Permission was obtained from the patient to use her data and images for scientific purposes. Informed consent was obtained from the patient to use her data and images for scientific purposes.

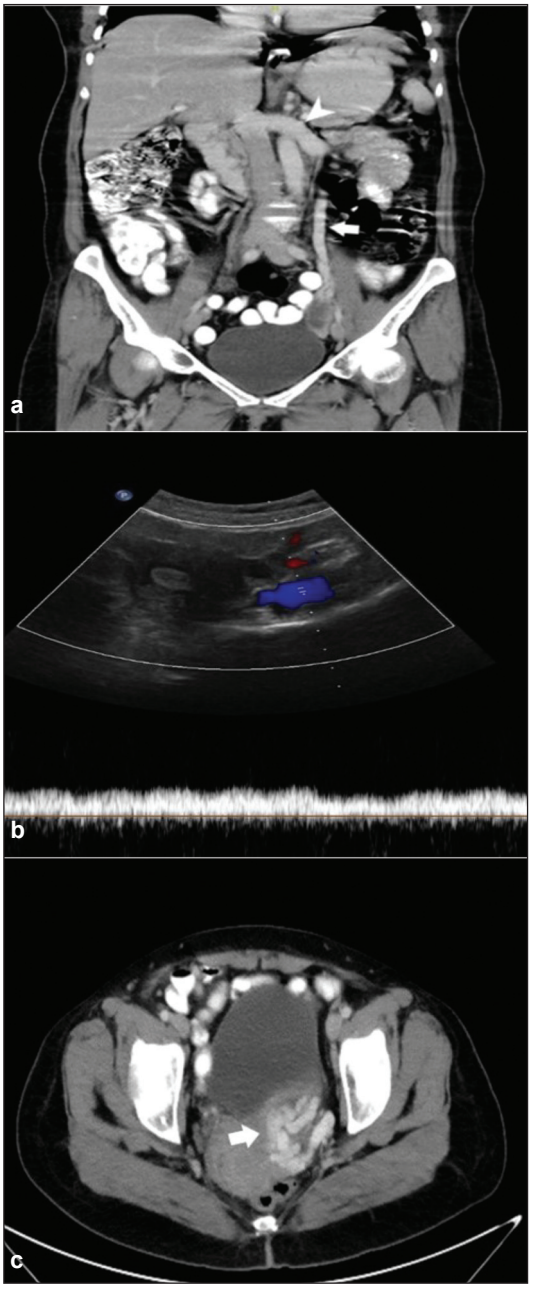

FIGURE 2: a. Dilated left ovarian vein (white arrow) and dilated left renal vein (white arrow head) in coronal contrast CT section **b.** Dilated venous structures in the left parauterine region in color Doppler US **c.** Left parauterine dilated venous structures (white arrow) in axial contrast CT section.

DISCUSSION

Arteriovenous fistulas (AVF) or acquired Renal AVMs are relatively rare lesions first described by Varela in 1928.[7] The abnormal link between the arteries and veins in the renal vascular system occurs subsequently in approximately %75 of cases after an iatrogenic injury (most commonly biopsy), trauma and tumor.[3] Congenital renal AVMs constitute %27 of all AVM cases. These lesions are mostly in the right kidney, almost always unilateral. As distinct from the literature, we detected a renal AVM located in the left side. It is usually asymptomatic until the third or fourth decade. The most common symptom is hematuria, side or back pain, and hypertension.[5] In our case, no symptoms other than chronic left flank and left pelvic pain were detected. In the literature we examined, there is a right renal AVM case that mimics many lesions such as renal cell carcinoma, hydronephrosis and parapelvic cyst, and there is no case of, which is accompanied by pelvic congestion and located on the left side.[2,5,8] Pelvic congestion syndrome is the cause of undiagnosed chronic pelvic pain due to the difficult detection of varicosity and ovarian vein reflux in a supine patient.[6] The exact etiology of the pelvic congestion syndrome remains uncertain and it is possibly multifactorial. Rarely, it may develop secondary to regional venous overload due to pelvic venous congestion, congenital venous and arteriovenous malformations, cirrhosis, retroaortic left renal vein, tumor thrombosis of the inferior vena cava, portal vein thrombosis, and renal cell carcinoma with left renal vein thrombosis.[9] Our case is renal AVM, which is a rare cause of pelvic congestion syndrome. Color Doppler US is used as the first step in the diagnosis in some centers.[4] In our case, color filling and arteriovenous chaotic flow were detected in the same area in the Dopplers performed in the region where cystic lesions were detected in the US. In our patient's pelvic region, there were dilated vascular structures with venous flow in the parauterine area located on the same side. CT is a useful imaging method for the evaluation.[3] In order to be beneficial to our patient, we detected dilated tortuose vascular structures showing contrast filling in the region defined in the CT images taken on the same side, dilated left renal vein on the same side, and dilatory turtuous structures showing contrast filling in the parauterine area on the same side. Non-contrast, arterial, nephrographic and pyelographic phase CT urography is the standard first-line imaging modality in the presence of gross hematuria in most centers.[4] In magnetic resonance imaging (MRI), renal AVM appears as a signal void area on T2-weighted images. Due to radiation, MRI may be indicated instead of CT in young patients.[3] MRI and MR angiography may be noninvasive and useful imaging methods in diagnosis, but they are more time consuming and costly than CT angiography.[4] The gold standard for the diagnosis/characterization of Renal AVMs is digital-subtraction angiography (DSA), which provides the opportunity to dynamically evaluate the lesion, anatomically identify the nutrient branches and plan the treatment.[3] While DSA remains the gold standard in the diagnosis of renal AVM, it is not the first step because it is invasive. Minimally invasive percutaneous transarterial embolization therapy is the first step in renal AVM treatment.[4] Our patient did not accept other recommended imaging methods and treatment. Our aim in this case that we wanted to emphasize that renal AVM is a rare cause of pelvic congestion syndrome, considering that a cystic lesion in B mod US may be a vascular malformation and concurrently performed color Doppler US procedure may be beneficial to the diagnosis.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Pınar Gündoğan Bozdağ;* ***Design:*** *Pınar Gündoğan Bozdağ, Muammer Akyol;* ***Control/Supervision:*** *Pınar Gündoğan Bozdağ;* ***Data Collection and/or Processing:*** *Muammer Akyol;* ***Analysis and/or Interpretation:*** *Pınar Gündoğan Bozdağ, Muammer Akyol;* ***Literature Review:*** *Pınar Gündoğan Bozdağ;* ***Writing the Article:*** *Pınar Gündoğan Bozdağ.*

REFERENCES

1. Cura M, Elmerhi F, Suri R, Bugnone A, Dalsaso T. Vascular malformations and arteriovenous fistulas of the kidney. Acta Radiol. 2010;51(2):144-9. [Crossref] [PubMed]
2. Kıraç M, Polat F, Yeşil S, Biri H. A congenital renal arteriovenous malformation mimicking renal cell carcinoma: case report. Turkiye Klinikleri J Med Sci. 2012;32(3):846-9. [Crossref]
3. Hatzidakis A, Rossi M, Mamoulakis C, Kehagias E, Orgera G, Krokidis M, et al. Management of renal arteriovenous malformations: a pictorial review. Insights Imaging. 2014;5(4):523-30. [Crossref] [PubMed] [PMC]
4. Dames EL, Guat L, Tay KH. Congenital renal arteriovenous malformation presenting with gross hematuria after a routine jog: a case report. J Med Case Rep. 2014;8:65. [Crossref] [PubMed] [PMC]
5. Chean CS, Kuah JY, Stopa M, Asquith J, Golash A, George C. Renal arteriovenous malformation mimicking hydronephrosis hidden danger. BJR Case Rep. 2019;5(4):20190034. [Crossref] [PubMed]
6. O'Brien MT, Gillespie DL. Diagnosis and treatment of the pelvic congestion syndrome. J Vasc Surg Venous Lymphat Disord. 2015;3(1):96-106. [Crossref] [PubMed]
7. Li PC, Zhang JY, Xiu YY, Liu S, Xia JG, Shi HB, et al. Varicocele due to renal arteriovenous malformation mimicking a renal tumor: a case report. J Med Case Rep. 2018;12(1):2. [Crossref] [PubMed] [PMC]
8. Mishal J, Leibovici O, Bregman L, London D, Yoffe B, Sherer Y. Huge renal arteriovenous malformation mimicking a simple para-pelvic cyst. Urol Int. 2001;66(1):49-50. [Crossref] [PubMed]
9. Borghi C, Dell'Atti L. Pelvic congestion syndrome: the current state of the literature. Arch Gynecol Obstet. 2016;293(2):291-301. [Crossref] [PubMed]