



Case Report

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Beyond the Pelvis: Renal Arteriovenous Malformation as a Cause of Chronic Pelvic Discomfort

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Running Title Renal AVM and Pelvic Discomfort

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ABSTRACT

We present the case of a 32-year-old female who presented with chronic pelvic pain. On imaging, she was found to have a left renal arteriovenous malformation (AVM) and congested pelvic veins. This case underscores the importance of considering renal AVMs in the differential diagnosis of pelvic congestion syndrome (PCS) and highlights the utility of ultrasound (USG) and computed tomography (CT) in diagnosing this condition.

Introduction

Pelvic congestion syndrome (PCS) is a common cause of chronic pelvic pain in women, primarily due to varicosities in the pelvic veins [1]. Renal arteriovenous malformations (AVMs) are rare vascular abnormalities that can present with a variety of symptoms, depending on their location and size. When an AVM involves the renal vasculature, it can lead to both renal and pelvic venous congestion. This case report discusses a young female with chronic pelvic pain who was found to have a left renal AVM and pelvic vein congestion on ultrasound and CT imaging.

Case Presentation

A 32-year-old female presented to our surgical outpatient department with complaints of chronic pelvic pain, which had been ongoing for 6 months. The pain was dull and aching in nature, located primarily in the lower abdomen and pelvis. There was no significant past medical history, and her physical examination was unremarkable except for mild tenderness in the lower abdomen. Laboratory investigations, including blood counts and routine urine examination, were normal. The patient was evaluated with pelvic ultrasound (USG) and computed tomography (CT) scan to assess for underlying causes of her symptoms.

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1. Ultrasound (USG)

○ Pelvic imaging revealed enlarged, dilated vascular channels in both parametria (Figure 1) with venous flow on Doppler evaluation, consistent with pelvic congestion syndrome.

○ On the abdominal ultrasound, an anechoic lobulated structure was noted in the mid kidney with color flow on Doppler evaluation (Figure 2a,b), demonstrating abnormal high-flow vascularity suggestive of an AVM (Figure 2c). Additionally, the left gonadal vein was also seen dilated (Figure 3).

2. CT scan (with Contrast)

○ A multiphase contrast-enhanced CT scan of the abdomen and pelvis confirmed the presence of a left renal AVM. Arterial phase images demonstrated a vascular nidus with early opacification of the left renal vein (Figure 4).

○ The left gonadal vein was dilated with the pelvic veins being markedly distended, and venographic images revealed venous stasis and varicosities, which

are characteristic of PCS.(Figure 5)

The patient was diagnosed with a left renal arteriovenous malformation (AVM) complicated by pelvic congestion syndrome (PCS).

Discussion

Arteriovenous fistulas (AVF) or acquired renal AVMs are relatively rare lesions first described by Varela in 1928 [2]. Renal AVMs are rare, congenital or acquired vascular abnormalities characterised by direct connections between the renal artery and renal veins [3]. In almost 75% of instances, the aberrant connection between the arteries and veins in the renal vascular system develops following an iatrogenic injury (usually a biopsy), trauma, or tumour [5]. Of all AVM cases, congenital renal AVMs account for 27%. As distinct from the literature, we detected a renal AVM located in the left kidney; it is usually asymptomatic until the third or fourth decade. Although most renal AVMs are asymptomatic, they may present with haematuria, hypertension, or flank pain [4,5]. Our case presented with no symptoms other than pelvic

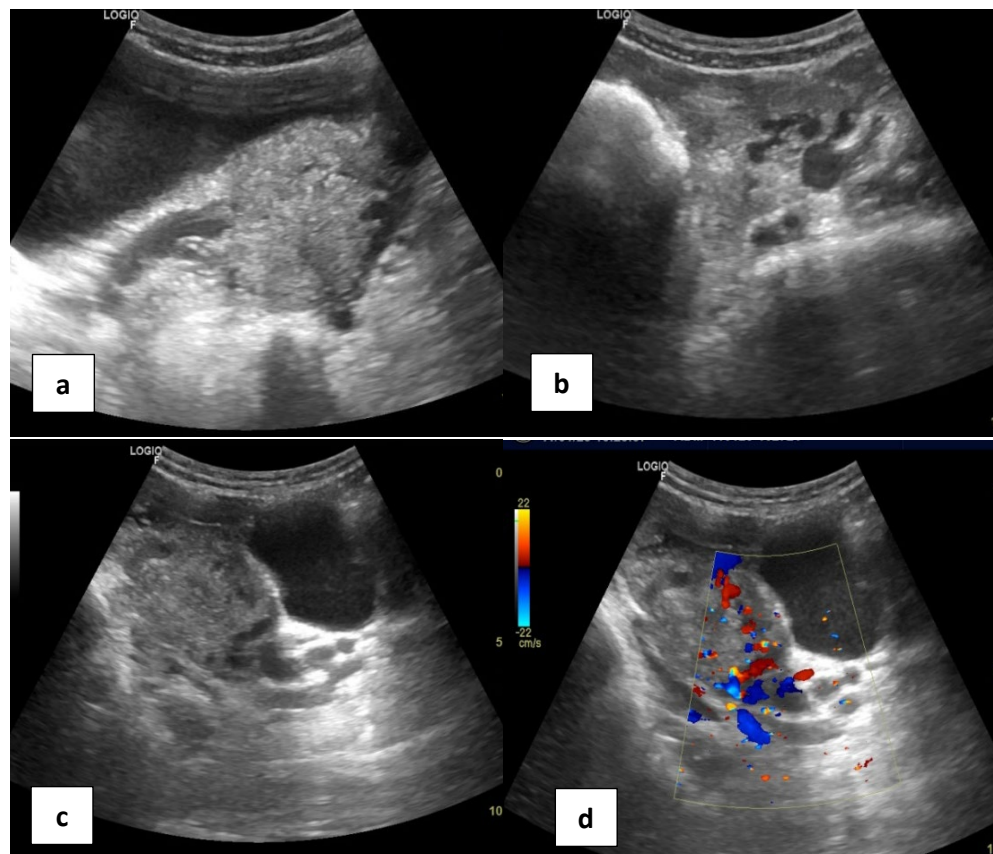


Fig. 1. a,b) Axial sections shows dilated vascular channels in parametrium c) Sagittal images in left parametrium showing similar findings d) Doppler evaluation showing flow in these channels.

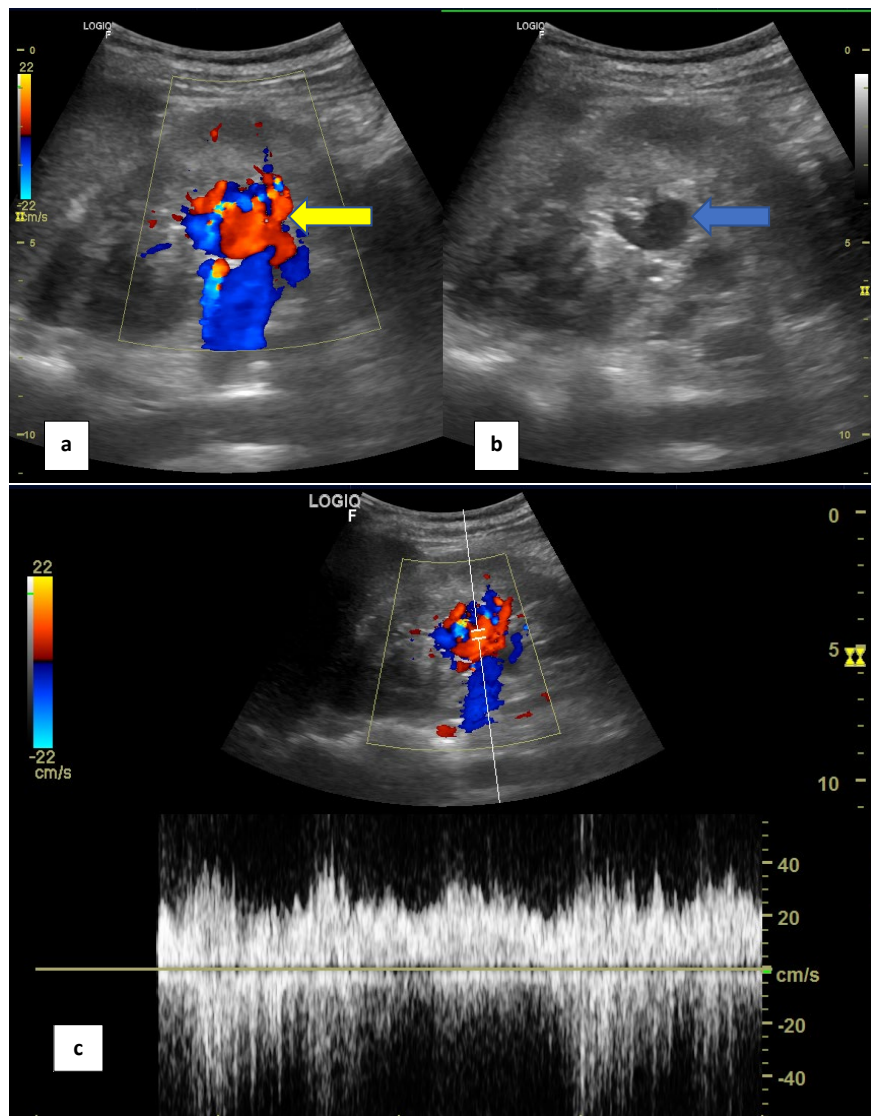


Fig. 2. a,b) Doppler evaluation and B mode scan showing an anechoic lobulated structure (blue arrow) located in the middle section of the left renal pelvic region with colour flow on doppler evaluation (yellow arrow) and c) lesion demonstrating abnormal high-flow vascularity suggesting the presence of an AVM.

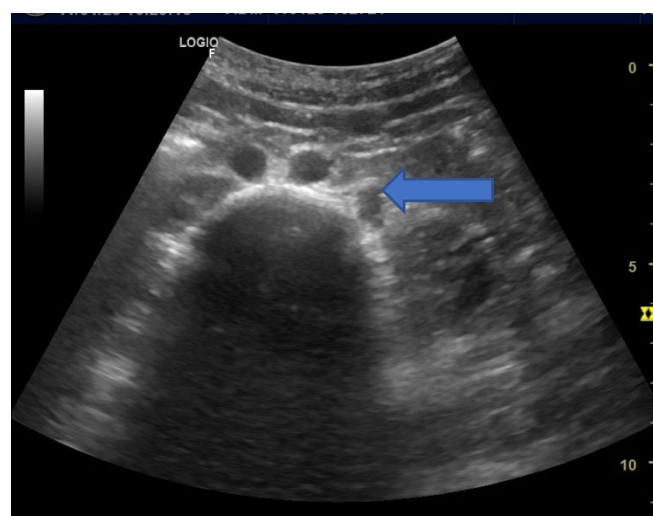


Fig. 3. Dilated left gonadal vein on B mode scan (arrow).

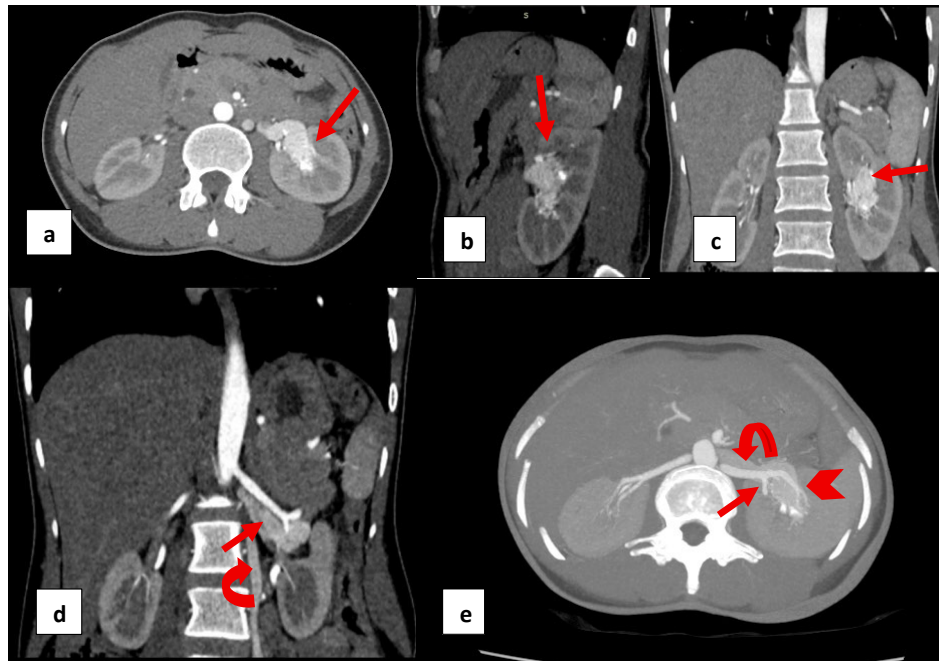


Fig. 4. (a) Axial, (b) sagittal and (c) coronal arterial phase CT images showing AVM (arrow) involving the left kidney with dilated and opacified left renal vein. d) Coronal image showing opacified left renal vein in arterial phase with dilated and opacified left gonadal vein (curved arrow) non opacified right renal vein. e) Axial MIP images showing left renal artery (arrow) with AVM (arrow head) involving the left kidney with a nidus and opacified left renal vein (curved arrow) in arterial phase.



Fig. 5. a,b) Axial and coronal venous phase CT images showing dilated tortuous veins in both parametrium, c) Coronal MIP images showing similar findings, d) sagittal MIP images showing dilated parametrial veins and left gonadal vein

pain. Pelvic congestion syndrome (PCS) is thought to result from chronic pelvic venous insufficiency, which can lead to the formation of varicose veins in the pelvic region. The left renal AVM in this patient likely contributed to the development of PCS by creating a high-flow state that overwhelmed the pelvic venous system. This highlights the importance of recognizing renal AVMs as a potential underlying cause of PCS. The gold standard for the diagnosis and 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 [5]. While DSA remains the gold standard in the diagnosis of renal AVM, it is not the first step because it is invasive.

Given the absence of hematuria, preserved renal function, and tolerable pelvic pain, a conservative management approach was adopted after multidisciplinary discussion involving the radiology and surgery teams. The patient was advised analgesics as required and was kept under close clinical follow-up.

The patient was followed up clinically at 3 months and 6 months. During follow-up, her pelvic pain remained stable without progression, and no new symptoms such as hematuria or flank pain developed. Renal function tests remained within normal limits.

A follow-up Doppler ultrasound performed at 6 months demonstrated persistent but stable findings of the left renal arteriovenous malformation, with no increase in pelvic venous dilatation. Given the stable clinical and imaging findings, continued conservative management with periodic follow-up was advised.

Conclusion

Renal arteriovenous malformations are rare but should be considered in patients with unexplained pelvic congestion. Imaging modalities such as ultrasound and CT are invaluable in the diagnosis of both renal AVMs and pelvic vein congestion. Early detection and appropriate management can lead to a favorable outcome and symptom resolution.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

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Conflict of Interests

The authors declare that they have no conflict of interest.

Informed Consent

The patient has consented to this manuscript.

Ethics Approval

This manuscript was carried out in consensus with our hospital guidelines

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