

Arteriovenous malformation with a renal mass: A rare association

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ABSTRACT

Renal arteriovenous malformation can be rarely associated with a renal mass. A vigilant approach and careful planning is required to tackle both the pathologies in form of preoperative coil embolization followed by a minimally invasive radical nephrectomy.

A 57-year-old woman presented with gross, total, painless hematuria associated with vermiform clots for the past 10 days. She underwent ureteroscopic examination which revealed clots in the left ureter and was referred to us. On examination, she was pale and had tachycardia. Her hemoglobin level was 6 g/dL, platelet count was 150,000/ μ L, and the serum creatinine level was 1.1 mg/dL. There was no history of trauma or interventions on the kidneys in the past. After initial resuscitation, computed tomography (CT) revealed a large left renal arteriovenous malformation (AVM) measuring 9 cm \times 3.6 cm with a small left lower polar mass (4 cm \times 3 cm) with central degeneration [Figure 1]. The renal vein showed enhancement in the early arterial phase. She underwent preoperative digital subtraction angiography (DSA) and embolization in view of vascular malformation [Figure 2]. On arteriography, the renal vein and inferior vena cava opacified before renal parenchymal enhancement, which confirmed the presence of AVM [Figure 1a]. Options of open versus laparoscopic nephrectomy were discussed with the patient in view of anticipated difficult hilar dissection; however, the patient opted for laparoscopic nephrectomy. Left laparoscopic radical nephrectomy was performed [Figure 3a].

Intraoperatively, there was increased vascularity at the hilum with a number of small branches entering the kidney directly from the aorta and a large aneurysm was seen at the junction of the gonadal and the renal vein which required careful dissection to avoid a catastrophic bleed. Postoperative period was uneventful. Histopathology revealed clear cell

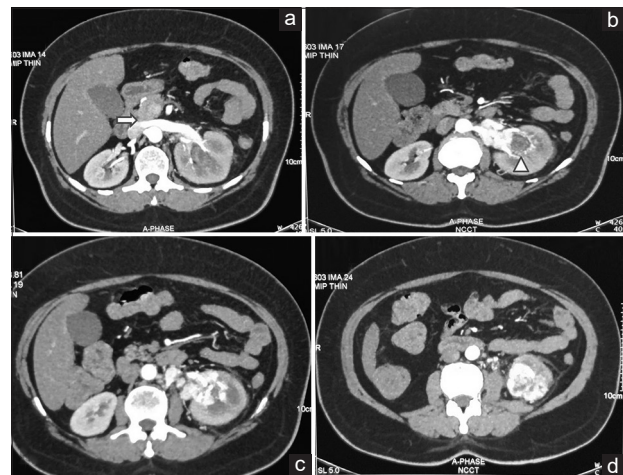



Figure 1: (a) Enhancing renal vein during early arterial phase (arrow). (b) Small renal mass and large renal arteriovenous malformation (arrowhead). (c and d) Arteriovenous malformation inside the kidney

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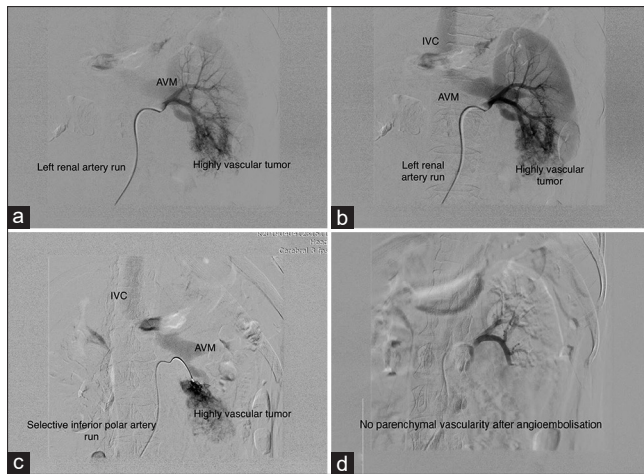


Figure 2: (a-d) Sequential images of preoperative angioembolization of the artery supplying the renal mass

renal cell carcinoma (RCC) of Fuhrman Grade 4 [Figure 3b]. She was asymptomatic at 2 months follow-up and is planned for CT at 3 months.

Renal vascular malformations known as AVM are aberrant communications between renal arterial and venous systems.^[1,2] The majority of renal vascular abnormalities are arteriovenous fistulas, with AVMs occurring in <1% of the general population.^[3] In RCC, their pathogenesis can be explained by the abnormality of von Hippel-Lindau gene, which leads to enhanced expression of angiogenesis promoting growth factors.^[1] Renal AVMs can masquerade renal malignancy on CT imaging.^[1] In our patient, the renal mass was small (4 cm) as compared to the AVM (9 cm). Enhancement of the renal vein and inferior vena cava in the cortical phase is the telltale sign of renal AVM, especially if the mass is located in the medulla. sometimes, there may be an enlargement of the feeding artery as well. Magnetic resonance imaging (MRI) shows a well-marginated signal void on T2-weighted image and an early enhancement with gadolinium administration and may be advantageous in patients allergic to iodine-based contrast. DSA and MRI are helpful for correct diagnosis and can guide preoperative

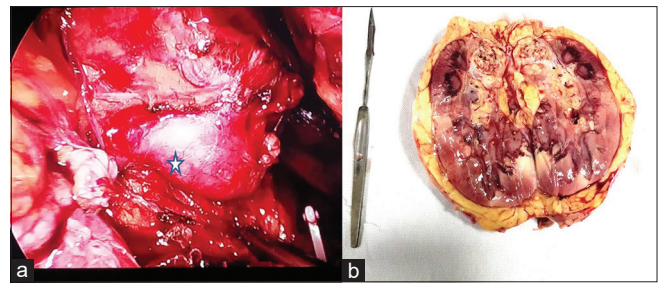


Figure 3: (a) Large aneurysm at the junction of gonadal vein and renal vein. (b) Cut section of gross specimen showing the small renal mass at the lower pole

angioembolization. Preoperative angioembolization is necessary and helps in offering minimal invasive surgery to the patient. Despite preoperative angioembolization, operating team must be vigilant as a number of large vessels/aneurysm may be encountered during the surgery.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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