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CASE REPORT

UROLITHIASIS

Symptomatic hilar renal artery aneurysm mimicking renal colic – a word of caution

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An adequate and timely diagnosis is crucial in the treatment of renal artery aneurysms during pregnancy since the risk of rupture and its catastrophic consequences are high. Clinical symptoms, laboratory results, and B-mode abdominal ultrasonography may mimic renal colic. In this report, a case of a pregnant 26-year-old woman with a large, symptomatic renal aneurysm is presented. The diagnostic pathway and the treatment are described. Potential pitfalls in the diagnosis are discussed.

Key Words: arterial aneurysm rupture of a kidney ‹› differential diagnosis ‹› vascular surgical procedures

A 26-year-old woman in the 8th week of gestation presented to the obstetric department with pain in the right flank. The pain radiated to the back. Her body temperature, blood pressure, and heart rate were normal. An abdominal ultrasound revealed a widening of the right renal pelvis up to 35 mm in diameter. Leucocytosis (11.46 x 10^3/ul) was found in the blood analysis and the urine analysis was normal. The patient was admitted with the initial diagnosis of renal colic. Despite the conservative management being initiated, the patient's complaints increased and muscular guarding occurred. The control abdominal ultrasound revealed an increase in the size of the previously described lesion up to 4.8 cm (Figure 1A). Color-doppler imaging performed at that moment revealed turbulent flow within the lesion, and a fluid collection within Gerota's fascia was found (Figure 1B). A consultation from vascular surgeon was urgently arranged.

Clinical presentation and the aneurysm localization required a detailed anatomic evaluation to consider a kidney-sparing aneurysm excision. A decision was made to perform Angio-CT (Computed Tomography Angiography) of the upper abdomen since it yielded sufficient anatomic details with minimal delay and emergency MRI (Magnetic Resonanse Imaging) was unavailable. The patient was thoroughly informed on possible negative consequences of irradiation and contrast injection including the danger to the fetus and gave fully informed consent. To decrease the radiation dose for the fetus, the scanned area was limited from the diaphragm to the umbilicus and the pelvis was shielded from radiation. CT confirmed the diagnosis of the aneurysm and the fluid collection around the right kidney (Figure 2A, 2B). The aneurysm was supplied by an approximately 4 mm apical branch of the renal artery. No thrombus was detected within the aneurysm sack. The patient was qualified for urgent, kidney-preserving aneurysm excision. She was informed about potential complications of the treatment also with regards to the health of the fetus.

A midline incision was made to gain adequate exposure of the aneurysm and secure access to the aorta and proximal part of the right renal artery in case of intraoperative bleeding. After Gerota's fascia was

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incised, a clear fluid collection surrounding the kidney with no signs of active bleeding was encountered. The hilum of the kidney and the aneurysm were exposed (Figure 2C). The aneurysm's wall was paper-thin with visible turbulent blood flow inside. The aneurysm feeding vessel was identified, ligated and cut off without renal artery clamping. Then the outflow vessel was identified. Since it was adjacent to large veins and the kidney parenchyma, in order to avoid bleeding, most of the aneurysm's wall was excised and the remaining part of the aneurysm was sutured using 4/0 polypropylene sutures (Figure 2D). Following the hemostasis, a suction drain was inserted and the abdomen was closed. The patient's recovery was uncomplicated. Sequential urea, creatinine and glomerular filtration rate (GFR) results were stable. The patient was released home on the 6th postoperative day. Unfortunately, three weeks after the procedure a spontaneous abortion occurred. The patient is under observation in the outpatient clinic.

DISCUSSION

Renal artery aneurysm (RAA) is uncommon. It affects 1 in 10000 inhabitants and accounts for 22% of all visceral artery aneurysms [1, 2]. In most cases, it is recognized incidentally without any clinical signs [3, 4]. Sometimes, it may be accompanied by flank or back pain, hypertension or hematuria. Although ruptures are rare in the general population, pregnant women are in danger since the mortality for the mother and the fetus is high (up to 56% and 78%, respectively). The standard threshold for intervention is the aneurysm diameter over 2 cm, however, even earlier interventions are recommended in pregnant women. Color-doppler ultrasound, angio-CT, MRI, and angiography are effective diagnostic measures [3, 4, 5].

RAA's pose a significant threat to the life of pregnant women since ruptures of even small aneurysms (below 2 cm in diameter) have been described. This requires special attention of the treating physician to sometimes unspecific and vague symptoms such as subcostal/ lumbar pain and hematuria. The patient in this report presented with symptoms suggesting renal colic. The general abdominal B-mode ultrasound without color-doppler imaging seemed to confirm this diagnosis. Only the vigilance of the obstetrician allowed timely diagnosis and intervention. Abdominal ultrasound is a very efficient method for the diagnosis of renal colic and is recommended as the first-line measure to confirm the diagnosis [6]. Moreover, radiographic methods are contraindicated in pregnancy unless absolutely indispensable. On the other hand, hilar RAA's are very rare and, without any thrombus within the aneurysm sack, the structure may be completely anechoic. Additionally, unlike aneurysms in the aorta or lower limb arteries, RAA's do not pulsate. Low-resistance flow in the renal artery and significant turbulences in the aneurysm sack might make the flow almost constant. Therefore, the lack of pulsation in the B-mode ultrasonography cannot be recognized as a lack of flow. Even at the time of operation, no pulsation in the aneurysm could be detected. After using color-doppler imaging the diagnosis was obvious. Using angio-CT in pregnancy might seem controversial, however, it was dictated by the severity of the symptoms and the determination to preserve the kidney of the mother. The fact that RAA's are bilateral in a quarter of patients was also taken into account and preserving the affected kidney was of paramount importance in this case. Angio-CT is a precise and fast method for evaluation of renal vasculature [7]. Without precise anatomic information, the aneurysm excision could end with a disas-

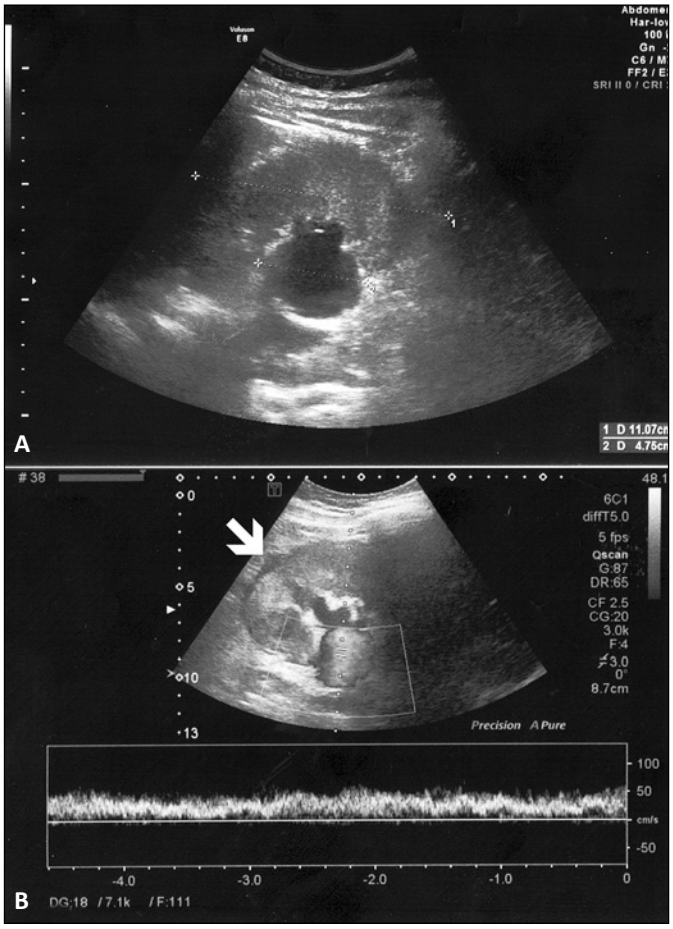

Figure 1. *Ultrasonographic images of the aneurysm:* **A.** *The aneurysm in the B-mode presentation,* **B.** *Color-doppler revealing the flow within the structure, the arrow indicates fluid within Gerota's fascia.*

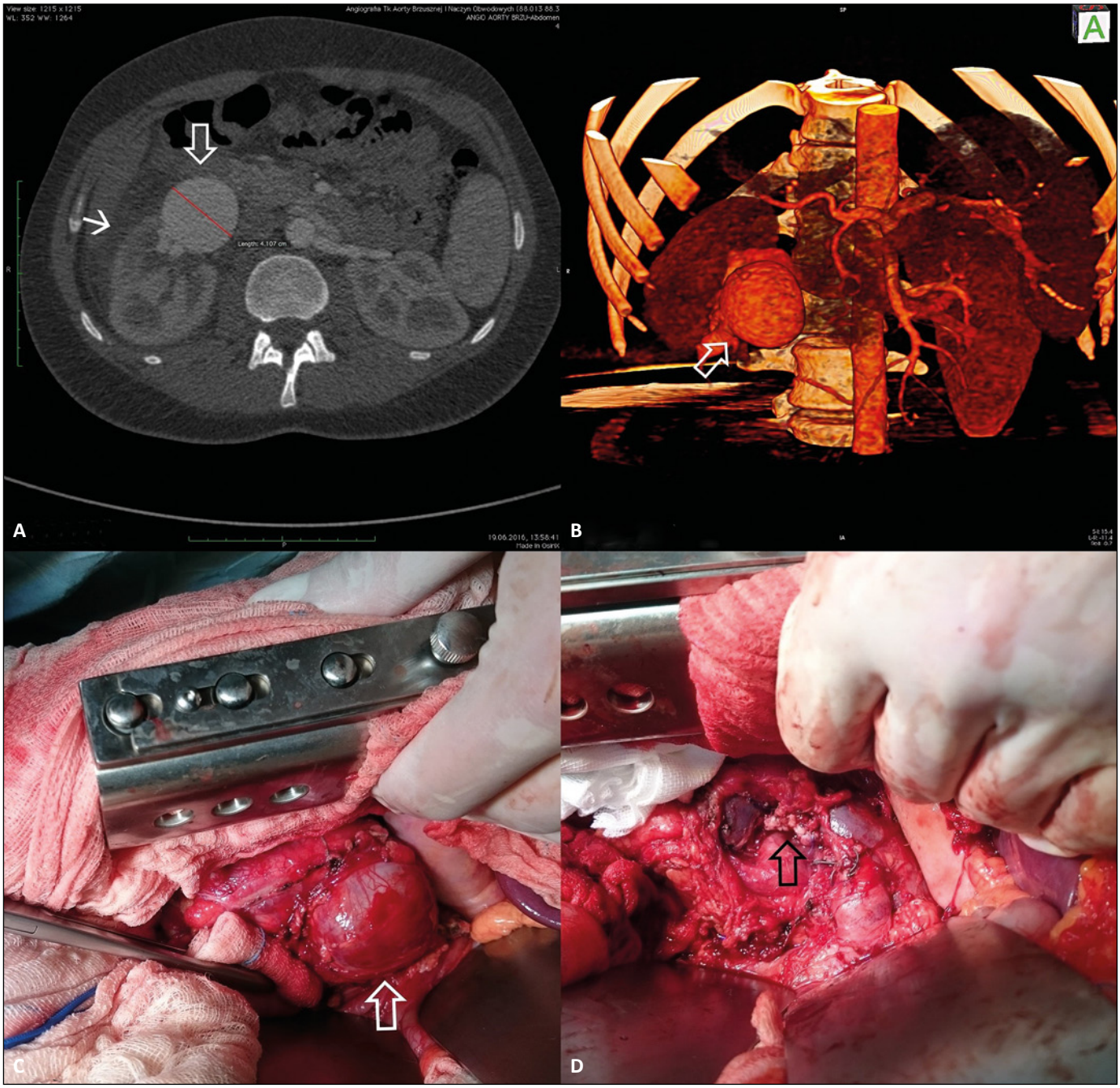

Figure 2. *Images of the aneurysm:* **A.** *Angio-CT (Computed Tomography Angiography) scan of the aneurysm (bold arrow). Fluid in Gerota's fascia (thin arrow).* **B.** *Three-dimensional reconstruction of the aneurysm (arrow).* **C.** *An intraoperative image of the exposed aneurysm (arrow).* **D.** *An intraoperative image following the excision of the aneurysm with visible polypropylene suture lines (arrow).*

ter. The safety of the woman, despite the risk to the fetus, was a priority.

CONCLUSIONS

RAA's located in the hilum pose a significant diagnostic challenge. Awareness of such location of the renal artery aneurysm is crucial for the correct and timely diagnosis. Anechoic structures in the kidneys of pregnant women should be evaluated using color-doppler ultrasound to exclude RAA.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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