Giant Calcified Renal Artery Aneurysm: Traditional RX versus Three-Dimensional Computed Tomography

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ABSTRACT

A 65-year-old woman with no history of previous flank trauma, renal stone or upper urinary tract infections, presented for flank pain and left hydro-uretero-nephrosis seven days after hysterectomy. Percutaneous pielography revealed narrowing of the distal ureter, without endoureteral mass. The plain abdomen film incidentally showed a 3-cm calcified ring on the left renal shadow, which resulted external to the collecting system at pielography. A 3-dimensional-CT scan with angiographic reconstruction revealed a 3-cm calcified renal artery aneurysm. The vascular surgeon suggested a watchful waiting. The patient underwent ureteral reimplantation with ureteral stenting, allowing a complete recovery of iatrogenic stenosis two months postoperatively.

Keywords: Renal Artery Aneurysm; 3D-CT; Angiographic Reconstruction

1. Introduction

Renal artery aneurysms have been encountered with increasing frequency over the past decade. It is slightly more common in women than men and in the right than left renal artery [1]. Many cases are asymptomatic and found incidentally, and their occurrence has been recently increasing with the advancement of imaging techniques. Angiography is the gold standard in the diagnosis of renovascular injuries, and it has the additional advantage to possess the potential of therapeutic intervention [2]. Therefore, after any invasive urological procedure, CT angiography can be considered as the first choice for renal artery injury [3,4]. In the present case, we incidentally discovered a lesion of the left renal artery and we completed the diagnostic work-up with a 3D-CT scan.

2. Case Report

A 67-year-old woman was referred to the Department of Urology for left flank pain developed seven days after hysterectomy for uterine leiomyomatosis. The patient had no history of previous flank trauma, renal stone or upper urinary tract infections. Physical examination was unremarkable, with only minimal flank pain at Giordano manoeuvre; body temperature was 37°C, blood pressure was 120/75 mmHg. White cell count was within the limits (9 × 10⁹ white blood cells in a litre of blood); renal and liver functions were normal (creatinine 0.9 mg/dL, total bilirubin 0.8 mg/dL). A severe left hydrenephrosis was detected at ultrasound, with no sign of ureteral stones or masses. The plain abdomen film showed a 3-cm calcified ring on the left renal shadow (Figure 1(a)). Percutaneous pielography confirmed hydrenephrosis, and showed no relationship of the calcified mass with the collecting system (Figure 1(b)).

A 3-dimensional-CT scan revealed a 3-cm round hollow mass with calcified walls located in front of anterior renal surface. The lesion had no connection with renal pelvis (Figure 2(a)) but was firmly related with renal artery, and it was compatible with calcified renal artery aneurysm (Figure 2(b)). The patient was treated with an open access ureteral reimplantation performed on the suture of the previous surgical approach. A direct ureteral reimplantation on the upper bladder wall was performed, with psoas hitch and double J ureteral stenting. At the 1 month follow up visit there was a complete recovery of the obstruction. The vascular surgeon suggested a watchful waiting by monitoring blood pressure, renal function, and imaging every 6 months.

3. Discussion

Renal artery aneurysms (RAA) are rare, with an estimated incidence below 1%. Hypertension and fibro-muscular disease of the renal artery are the leading classes of
risk [5]. There is no significant difference in side presentation (right side in 43%, left in 36% and 21% bilateral). Aneurysm usually involve the main renal artery or the primary branches. Mean size at diagnosis ranges from 0.5 to 8 cm, with a mean diameter of 2.1 cm. Degenerative (arteriosclerosis, fibrodysplasia), inflammatory (arteritis) or traumatic diseases, including iatrogenic damages after kidney puncture [5], may cause RAA.

RAA can be classified into 4 categories: 1) true macroaneurysm; 2) aneurysmal dissections; 3) fusiform microaneurysmal dilations; and 4) microaneurysm resulting from arteritis [6]. They are usually asymptomatic and serum creatinine levels are mostly within normal range at diagnosis. Complications, including renovascular hypertension, renal embolization with infarction, thrombosis or dissection, and arteriovenous fistula, [5] are rarely reported.

4. Conclusion
The diagnosis has been recently increased by the spreading use of imaging techniques [7]. Conventional renal angiography represents the gold standard in the detection of renal aneurysms, though the spiral CT renal angiography.
Graphy with three dimensional reconstruction (3D-CT) adds the benefits of being quicker, more cost-effective, and non-invasive. Moreover, the use of 3D-CT workstation allows accurate treatment planning, especially for endovascular procedures [8].

Management options include observation, trans-catheter-occlusion or surgical intervention. The indications for surgery include: symptomatic or enlarging aneurysms, renal embolization, aneurysms in pregnant females or those considering pregnancy, renovascular hypertension, aneurysms >2.5 cm [9].

REFERENCES

Abbreviation and Acronym
Renal artery aneurysms (RAA) Units