Case 14576

Endovascular treatment of incidental renal artery aneurysm
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Section: Interventional radiology
Area of Interest: Abdomen Vascular Interventional vascular
Procedure: Contrast agent-intravenous
Procedure: Computer Applications-3D
Procedure: Catheters
Procedure: Embolisation
Imaging Technique: CT
Imaging Technique: Image manipulation / Reconstruction
Imaging Technique: Catheter arteriography
Special Focus: Aneurysms Case Type: Clinical Cases
Authors: Nersesyan N, Rengel-Ruiz M, Guijarro-Rosaleny J, Sanchis-Garcia JM, Piñana-Plaza C, Bosca-Ramon A.
Patient: 65 years, female

Clinical History:

A 65-year-old male patient with a history of hypertension, diabetes mellitus, COPD and moderate grade mitral regurgitation, presented for follow-up study of pulmonary nodules.

Imaging Findings:

Contrast-enhanced CT was performed and an incidental small rounded 28 mm lesion was detected at the level of the left renal hilum, compatible with saccular aneurysm arising from the left main renal artery (MRA). (Fig. 1) 3D Reconstructed images were obtained demonstrating an aneurysm arising from the branching point of the left renal artery. (Fig. 2) Given the size of the aneurysm and the hilar location, endovascular treatment was recommended as a preventive measure for possible rupture. Diagnostic DSA shows the aneurysm arising from the branching point of the left MRA. The renal vasculaization can be seen as being mostly dependent of the inferior branch (Fig. 3). Endovascular treatment with coil embolization of the superior branch and placement of covered stent in MRA was performed. Post-procedural images demonstrate cessation of flow within the aneurysm and patency of the inferior branches (Fig. 4).

Discussion:

Renal artery aneurysms (RAA) are the second most common visceral artery aneurysms, and have been observed in up to 1% of renal arteriographic procedures. RAA are mostly saccular, non-calcified and with tendency to localize on the bifurcation of the MRA. [1] Associated diseases and risk factors include female sex, hypertension fibromuscular dysplasia, vasculitis, trauma, and degenerative causes. [2]

In our case, due to the aneurysmal size and the requirement of preserving the arterial perfusion, covered stent was
regarded as the main mean of excluding the aneurysm from the circulation. While the aneurysm had a diameter of 28 mm, the probability of post-stent thrombosis was considered low. [2] Owing to the origin of the aneurysm in the MRA bifurcation and the arterial flow being mostly dependent on the inferior branch, coils were placed in its superior branch. The patient's evaluation was favourable afterwards.

Symptomatic RAA may clinically manifest with rupture, thrombosis or embolism, however, most cases are described as incidental findings in asymptomatic patients. [3] Although the patient's age, gender, the severity of hypertension, anticipated pregnancy and anatomic features are all factors to be considered, the main factor for the surgical treatment remains the size greater than 1.5 cm. [4]

CT angiography is postulated as the optimal examination for RAA, owing to the ability to detect additional visceral artery aneurysms. [5] For RAAs measuring less than 1.5 cm surveillance imaging every 1 or 2 years should be considered, which might be performed with Doppler ultrasound. [6]

The goal of the endovascular treatment is to achieve isolation of the aneurysm from the arterial circulation. [2] Occlusion of collaterals with coils or covered stent placement might be beneficial in cases where arterial vascularization should be preserved. [7]

Some considerations should be taken before deciding on surgical treatment, regarding the anatomy of the renal vasculature: [8]
- The right renal artery is often longer and originates superior to the left renal artery.
- There are five arterial segments of the kidney, mainly apical, superior, middle, inferior and posterior segments.
- The MRA also supplies branches to the adrenal glands and the ureters.
- Accessory renal arteries may be present arising directly from the aorta or iliac arteries. [9]

The mortality rate in RAA ruptures is 10%, which might increase to 50% with pregnancy. [2] Thus, regardless of the chosen treatment, follow-up studies are required to ensure that there is no reperfusion of the RAA. [1]

Differential Diagnosis List: Renal artery aneurysm, Renal artery aneurysm, Simple renal cyst

Final Diagnosis: Renal artery aneurysm

References:


Description: Axial CT in arterial phase shows a focal dilatation of the renal artery presenting the same enhancement as the aorta, compatible with left renal artery aneurysm. Origin: Nerses Nersesyan. Department of Radiology, Hospital Clínico Universitario de Valencia, Valencia, Spain.
**Description:** Axial CT in arterial phase shows a focal dilatation of the renal artery presenting the same enhancement as the aorta, compatible with left renal artery aneurysm. **Origin:** Nerses Nersesyan. Department of Radiology, Hospital Clínic Universitario de Valencia, Valencia, Spain.
Description: Coronal CT in arterial phase shows left renal artery aneurysm. Origin: Nerses Nersesyan. Department of Radiology, Hospital Clínico Universitario de Valencia, Valencia, Spain.
Description: 3D Reconstructed image of the left renal artery aneurysm and abdominal vasculature.
Description: Anterior view of 3D Reconstructed image of both kidneys with renal vasculature, where the left renal artery aneurysm can be observed. Origin: Nerses Nersesyan. Department of Radiology, Hospital Clinico Universitario de Valencia, Valencia, Spain.
Description: Posterior view of 3D Reconstructed image of both kidneys with renal vasculature, where the saccular aneurysm can be seen arising from the branching point of the left renal artery. Origin: Nerses Nersesyan. Department of Radiology, Hospital Clinico Universitario de Valencia, Valencia, Spain.
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Description: Posterosuperior view of 3D Reconstructed image of both kidneys with renal vasculature, where the saccular aneurysm can be seen arising from the branching point of the left renal artery.

Description: The angiogram shows the aneurysm arising from the branching point of the left main renal artery (MRA). Origin: Nerses Nersesyan. Department of Radiology, Hospital Clínico Universitario de Valencia, Valencia, Spain.
Description: The angiogram shows renal parenchymal vascularization arising from the upper branch of the aneurysm. Origin: Nerses Nersesyan. Department of Radiology, Hospital Clínico Universitario de Valencia, Valencia, Spain.
**Description:** The angiogram shows renal parenchymal vascularization arising from the lower branch of the aneurysm. **Origin:** Nerses Nersesyan. Department of Radiology, Hospital Clínico Universitario de Valencia, Valencia, Spain.
Description: Arteriogram demonstrates an aneurysm originating at the bifurcation of the left MRA and coil placement in its superior branch.
**Description:** Arteriogram demonstrates an aneurysm originating at the bifurcation of the left MRA and coil placement in its superior branch and preservation of the flow inferiorly. **Origin:** Nerses Nersesyan. Department of Radiology, Hospital Clínico Universitario de Valencia, Valencia, Spain.
Description: Arteriogram demonstrates an aneurysm originating at the bifurcation of the left MRA and coil placement in its superior branch and preservation of the flow inferiorly. Covered stent was placed in the MRA extending distally. Origin: Nerses Nersesyan. Department of Radiology, Hospital Clínico Universitario de Valencia, Valencia, Spain.
Description: Arteriogram shows that the aneurysm has been excluded from the circulation. Origin: Nerses Nersesyan. Department of Radiology, Hospital Clínico Universitario de Valencia, Valencia, Spain.