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Endovascular Treatment Of A Left Renal Artery Saccular Aneurysm By Covered Stent : A Case Report

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Abstract
A 72-year-old female patient with a history of hypertension presented with left lumbar pain. Imaging revealed a large saccular aneurysm of the left renal artery. After radiological confirmation and multidisciplinary consultation, treatment with a covered stent was chosen, ensuring complete exclusion of the aneurysm and preserving renal blood flow.
Post-procedural evolution was marked by disappearance of pain and stabilization of renal function.
This case illustrates the safety and efficacy of endovascular treatment of renal aneurysms using covered stents in elderly patients. According to the literature, this minimally invasive technique, selected based on aneurysm morphology and patient condition, allows reliable aneurysm exclusion, low complication risk, and excellent long-term functional outcomes.

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I. Introduction :

Renal artery aneurysms (RAAs) are a rare pathology with a prevalence estimated between 0.1% and 1% in the general population, often discovered incidentally during imaging workups for abdominal pain or resistant hypertension.

They are mostly clinically silent but may manifest as lumbar pain, hematuria, worsening hypertension, or rarely, rupture, which can be life-threatening.

Therapeutic management has evolved over the last two decades, with endovascular treatment progressively replacing conventional open surgery. Among endovascular techniques, covered stent placement ("stent-graft") allows aneurysm exclusion while maintaining renal artery patency, reducing postoperative morbidity and the risk of renal ischemia. Current guidelines favor this option for symptomatic, large (>2 cm), wide-neck aneurysms, or in patients at high operative risk.

The literature reports high technical success rates, rapid recovery, and low complication risks, especially in elderly or polymedicated patients.

II. Clinical Observation :

We report the case of a 72-year-old female patient, followed for hypertension for several years, treated with dual therapy (ACE inhibitor and calcium channel blocker), with acceptable blood pressure control.

She consulted for the onset of persistent left lumbar pain, which led to an abdominal ultrasound. The ultrasound revealed an abnormal vascular mass at the left renal hilum, suggesting a large saccular aneurysm of the renal artery. The workup was completed with a CT angiography, confirming the presence of a saccular aneurysm of the left renal artery measuring 3.5 cm in diameter, with a wide neck, effacing the upper renal contour without extension into the segmental branches. A renal arteriography was performed to better visualize the aneurysm morphology and to exclude any bilateral involvement.

Figure 1: Angiography showing the saccular aneurysm of the renal artery

After multidisciplinary consultation involving a cardiologist and a vascular surgeon, the treatment options considered were selective embolization, placement of a covered stent, or open surgery. Given the significant risk of renal ischemia with embolization and the high morbidity of surgery for this patient, the choice was made to place a covered stent.

The procedure was performed under local anesthesia, with insertion of a guidewire into the renal artery followed by deployment of the covered stent.This approach is supported in the literature as an effective, minimally invasive option that preserves renal perfusion while excluding the aneurysm, especially in patients with higher surgical risks.

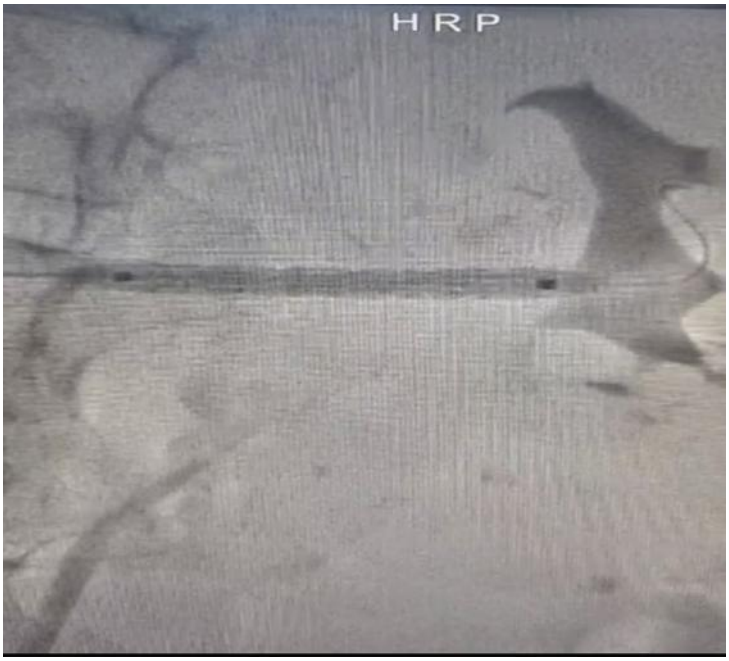

Figure 2: Placement of a covered stent in the renal artery

Post-procedure control by arteriography showed complete exclusion of the aneurysm and patency of the distal artery. The clinical course was marked by disappearance of lumbar pain, stabilization of renal function, and absence of immediate complications.

Figure 3: Post-procedure control showing exclusion of the aneurysm

III. Discussion :

There are several decision criteria for treating a renal artery aneurysm: size (>2 cm), symptomatology (pain, hematuria, worsening hypertension), aneurysm characteristics (saccular shape, wide neck), rupture risk, and patient history [1][2].

Saccular aneurysms have a higher risk of spontaneous rupture and therefore constitute a surgical or endovascular indication upon discovery[1] [5]. Covered stent treatment has shown superiority over embolization in cases of a single aneurysm on the main trunk or a major segmental branch, ensuring complete exclusion of the aneurysmal sac while maintaining adequate renal perfusion[2] [3] [5].

Auriol et al. report a technical success rate over 95% and low operative morbidity in a series of 19 consecutive cases[2]. Henry et al. confirm the efficacy of multilayer stents in excluding intra-aneurysmal flow, especially indicated for wide or morphologically complex necks[3].

The French National Authority for Health (HAS) and French guidelines also favor covered stents as a first-line treatment for symptomatic renal artery aneurysms, particularly in elderly patients and those with comorbidities[5] [7].

Treatment selection remains patient-specific, depending on aneurysm morphology, location, degree of renal parenchyma involvement, residual renal function, and overall patient condition[6] [7].

Embolization, though feasible, is reserved for very specific cases such as aneurysms on secondary branches or young patients without significant renal risk[2] [6], due to risks of renal ischemia, non-target embolization, or parenchymal infarction.

Open surgery, long considered the reference for renal aneurysms, remains indicated for complex anatomies inaccessible to catheterization or involving multiple segmental branches. However, operative risks (nephrectomy, renal insufficiency, hemorrhagic complications) make it a last resort, especially in elderly patients[1] [2] [7].

In the presented case, covered stent placement allowed exclusion of the aneurysmal sac without loss of renal function and rapid clinical recovery. Literature results align with this case, highlighting the safety and efficacy of the technique when well-indicated.

Post-procedure follow-up relies on regular imaging to detect potential leaks or secondary occlusions, risks that remain low with modern stents[2][3][7].

Finally, recommendations emphasize the necessity of multidisciplinary consensus for each individualized management plan[5] [7].

IV. Conclusion :

Endovascular treatment of saccular renal artery aneurysms with covered stents is the preferred therapeutic modality, offering excellent technical success, enhanced safety, and preservation of renal function. Treatment selection and follow-up must be personalized and supported by multidisciplinary collaboration.

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