

Successful Treatment of a Large Renal Artery Aneurysm with Successful Endovascular Stent Graft

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Clinical Image

A 53-year-old female with history of active tobacco smoking and Sjogrens syndrome presented with refractory hypertension. Workup for refractory hypertension included CT Angiography (CTA) of the renal arteries to exclude renal artery stenosis. CTA showed a 13 mm saccular left renal artery aneurysm with fibromuscular dysplasia. Selective renal angiography confirmed fibromuscular dysplasia with beading of the mid segment of the left main renal artery followed by a large saccular aneurysm (Figure 1). Since the aneurysm was confined to the main left renal artery without involvement of any secondary or tertiary renal branch arteries, percutaneous vascular intervention of the saccular aneurysm was advised with a covered stent graft to exclude the aneurysm and prevent risk of future fatal intrabdominal hemorrhage.



Figure 1: Pre image.

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The patient underwent intervention with the covered stent graft in the cardiac catheterization laboratory. Using the modified Seldinger technique, femoral arterial access was obtained, and a 6-French sheath was placed. The sheath was upsized to a 7-French Pinnacle Destination sheath (Terumo, Somerset, NJ). Through this destination sheath an IMA (Internal Mammary Artery) diagnostic catheter was used to cannulate the left renal artery. Selective angiography was performed to outline the anatomic landmarks of the left main and branch renal arteries and laying out the aneurysm in an un-foreshortened view.

Percutaneous vascular intervention of the aneurysm was then carried out using the technique outlined below. Heparin was administered to achieve a therapeutic Activated Clotting Time (ACT). Anticipating the need to have a stiff wire to deliver the stiff stent graft into the renal artery, a Spartacore 0.014" guidewire (Abbott, Plymouth, MN) was used with an attempt to cross the lesion. However, the Spartacore guidewire was not successful in negotiating the tortuosity of the vessel. The lesion in the left renal artery was then crossed with a softer balance 0.014" guidewire (Abbott, Plymouth, MN). The balance guidewire was exchanged over a TrailBlazer 0.018" catheter (Medtronic, Plymouth, MN) to the Spartacore guidewire. Over the Spartacore guidewire, a TrailBlazer 0.035" catheter was delivered and then used to carry out exchange of the Spartacore guidewire to the Amplatz Super Stiff 0.035" guidewire (Boston Scientific, Quincy, MA). Once the Amplatz Super stiff guidewire was in a secure distal branch location, the IMA catheter was delivered past the aneurysm into a branch renal artery. Over this IMA catheter, the 7-French pinnacle destination sheath was then telescoped into the renal artery past the aneurysm. The IMA catheter was then removed, maintaining the destination sheath in the same secure position past the aneurysm. Next, through the destination sheath, a Gore Viabahn (Gore, Flagstaff, AZ) balloon expandable 7 mm × 29 mm endovascular stent graft (endoprosthesis) was delivered over the Amplatz Super Stiff guidewire. The destination sheath was pulled back to allow the whole length of the stent to be exposed. After confirming coverage of the entire length of the aneurysm with the undeployed stent graft by angiography, the stent graft was then deployed at 11 atmospheres. Angiography showed full sealing of the aneurysm by the stent graft with excellent angiographic result, without any endoleak into the aneurysm sac (Figure 2). There was brisk antegrade flow in the renal artery with preservation of all the branch renal arteries. The arterial sheath was taken out and hemostasis achieved with manual pressure after protamine administration. She was discharged home the same day on dual antiplatelet therapy with aspirin and clopidogrel.



Figure 2: Post image.

Conclusions

Renal artery aneurysms can be treated with endovascular stent graft Gore endoprosthesis, obviating the need for surgery. Techniques to allow successful delivery of the stent graft are highlighted in this case report. These include the techniques of crossing the lesion with a gentle (Balance) guidewire, exchanging these to a progressively stiff wires and telescoping the catheter and destination sheath past the aneurysm to allow successful delivery of a stiff stent graft system into the lesion site to allow coverage of the aneurysm with the stent graft.