◆LETTERS TO THE EDITORS ◆

Endovascular Thrombectomy of a Renal Artery Chimney Stent-Graft Using the Solitaire Recanalization Device

To the Editors:

The chimney graft technique is gaining popularity as an alternative endovascular treatment for juxtarenal aneurysms not suitable for standard or fenestrated endovascular aneurysm repair (EVAR).[1–6] Despite excellent technical success,[1,3–6] limited data are available regarding the long-term effectiveness of the technique, particularly in terms of chimney stent occlusion. This complication may have catastrophic consequences and represents a challenge for any endovascular approach, requiring in most the cases an open surgical bypass to restore vessel patency. Donas et al.[1] used open thrombectomy to treat a renal chimney graft thrombosis. We encountered a symptomatic acute thrombosis of a renal chimney stent-graft, which we successfully treated with endovascular thrombectomy using a recanalization device that, in a recent article in the *JEVT*, proved useful in treating acute popliteal thrombosis.[7]

The 77-year-old man with multiple comorbidities and a 10-year-old Vanguard aortic endograft was successfully treated for a 55-mm juxtarenal aortic aneurysm and endograft migration (Fig. 1A). Two proximal aortic cuffs [Endurant (Medtronic Cardiovascular, Santa Rosa, CA, USA) and Zenith Low Profile (Cook Medical, Bloomington, IN, USA)] were positioned across the aneurysmal segment, and a 6×59-mm covered balloon-expandable stent (Advanta V12; Atrium Medical Corporation, Hudson, NH, USA) was placed using the chimney technique in the left renal artery via a combined axillary and femoral artery access. The postoperative course was uneventful, and the patient was discharged on dual antiplatelet therapy; 1-month imaging showed complete exclusion of the aneurysm and patency of the chimney stent (Fig.1B). Two months later, after discontinuing the antiplatelet therapy, the patient presented with acute onset of left flank pain for the preceding 12 hours and oliguria. Laboratory tests showed an increase in serum creatinine to 4.1 mg/dL, suggesting an acute ischemic kidney injury. Urgent imaging revealed complete occlusion of the chimney stent, without signs of stent kinking or stenosis (Fig. 1C). Computed tomography (CT) showed reconstitution of the renal artery at the distal end of the stent, with parenchyma contrast medium uptake in the

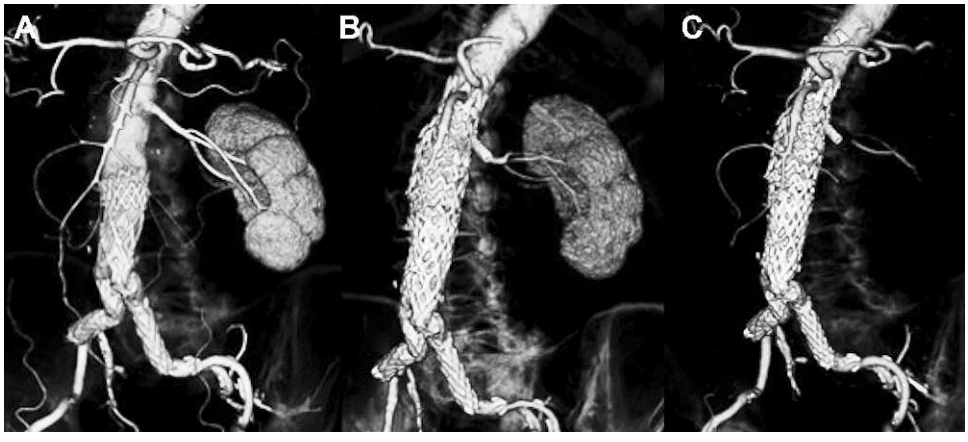

Figure 1 ◆ Three-dimensional CT scan reconstructions before (**A**) and after (**B**) EVAR with left renal chimney stent-graft for juxtarenal aortic aneurysm; (**C**) 3-month CT scan showing renal chimney stent occlusion.

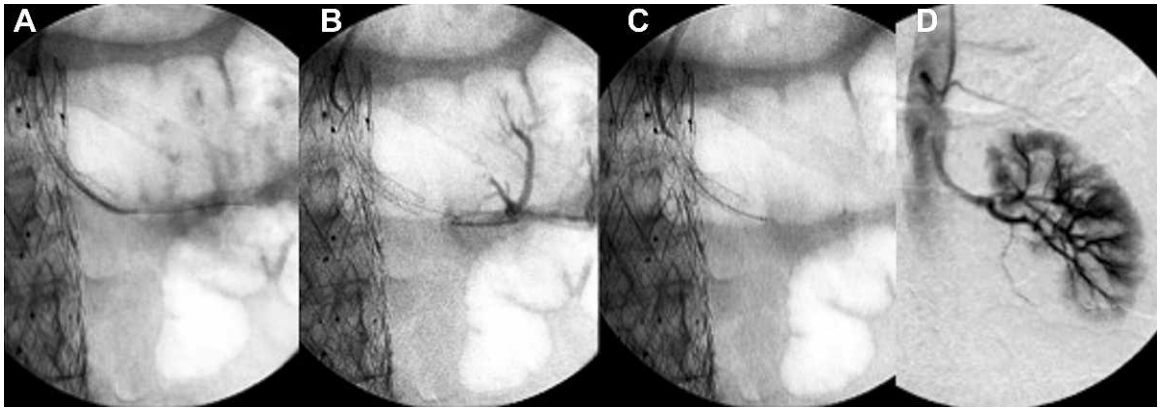

Figure 2 ◆ Endovascular thrombectomy using the Solitaire FR Recanalization Device: (**A**) guidewire advancement through the occluded stent, (**B**) Solitaire Device deployment distal to the thrombus, and (**C**) retrieval into the Flexor sheath. (**D**) Complete flow restoration, normal patency of the stent, and renal reperfusion.

late venous phase, indicating the presence of vital parenchyma.

A recanalization procedure (Fig. 2) was carried out in the operating room under local anesthesia and mild sedation. After intra-arterial injection of 5000 units of unfractionated heparin, a 7-F, 55-cm-long ANL Flexor sheath (Cook Medical) was advanced proximally to the chimney stent through a surgical left axillary access, which is routine practice for all our axillary artery access sites regardless of the sheath size for safer and quicker hemostasis. A 0.018-inch guidewire (V18 Control; Boston Scientific, Natick, MA, USA), supported by a 5-F cobra C2 catheter, was gently pushed through the stent into the patent distal renal artery. Through a 0.021-inch Rebar microcatheter (ev3/Covidien, Mansfield, MA, USA), a 6×30-mm Solitaire FR Recanalization Device (ev3/Covidien) was delivered into the thrombus and carefully withdrawn within the microcatheter, which was in turn retrieved into the 7-F sheath under continuous aspiration to prevent distal thrombus dislodgment. After a second passage, the thrombus was completely retrieved, with flow restoration, normal stent patency, and renal reperfusion. The procedure was completed with relining of the covered stent using a 6×40-mm self-expanding Protege Everflex stent (ev3/Covidien) to improve the adaptability and flexibility at the distal end of the covered stent (self-expanding nitinol stents perform better at this level compared to stainless steel balloon-expandable models). Protective continuous venovenous hemofiltration was maintained for the first 36 hours despite spontaneous diuresis. After an initial period of creatinine increase, the patient completely recovered and was discharge on the 16th postoperative day with a normal creatinine level. Six-month duplex examination showed patency of the chimney stent with normal kidney perfusion.

Our case suggests that the Solitaire stent, designed for use in the intracranial vessels to treat acute ischemic stroke, may be safely used for endovascular visceral artery thrombectomy when immediate flow restoration is required.

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