Novel Modified Iliac Artery Stent Graft with Side Branch Extension Facilitating Kidney Transplant in Severe Aortoiliac Occlusive Disease

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Objective:

Introduction: Severe iliac artery calcification often disqualifies patients with end-stage renal disease (ESRD) from kidney transplantation. This report presents an innovative approach using a physician-modified stent graft with side branch extension (SBE) to enable kidney transplantation in patients with heavily calcified iliac arteries.

Methods:

Technique: A 69-year-old African American female with ESRD secondary to hypertension, on hemodialysis for eight years, was deemed ineligible for kidney transplant due to severe bilateral iliac artery calcifications identified on non-contrast computed tomography (CT) scan (**Fig 1a**). Given the patient s comorbidities and the severity of the calcifications, a minimally invasive approach was preferred. A physician-modified stent graft with SBE was created using a 9x56 mm stent graft, modified with a fenestration and a sewn 6mm PTFE graft (**Fig 1b-d**). Then the patient successfully underwent right femoral endarterectomy with patch angioplasty and deployment of the physician-modified stent graft under fluoroscopic guidance into the external iliac artery. She was discharged on postoperative day one without complications. Four months later, the patient received a kidney transplant. Intraoperatively, following right external iliac exposure, the SBE was exposed and externalized, and the renal artery was anastomosed to the PTFE side branch (**Fig 2**). Postoperatively, duplex ultrasound revealed patent vasculature, and the patient was discharged on postoperative day six with a creatinine level of 1.31 mg/dL and an eGFR of 44 ml/min/BSA.

Results:

Conclusion:

Conclusion: This case highlights the feasibility of using a physician-modified stent graft with SBE to facilitate kidney transplantation in patients with severe iliac artery calcifications. This minimally invasive technique may expand kidney transplant candidacy and reduce morbidity compared to traditional open vascular reconstructions. Further studies are warranted to validate the efficacy and safety of this approach.

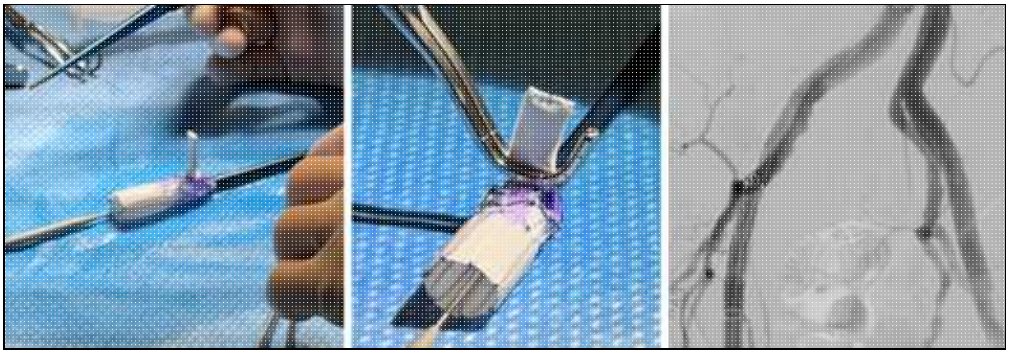

Fig 1 1a) Circumferential iliac artery calcification, 1b) Implanted stent graft (9mm wide x 56mm long) prior to sheathing and implant, 1c) Implanted stent g

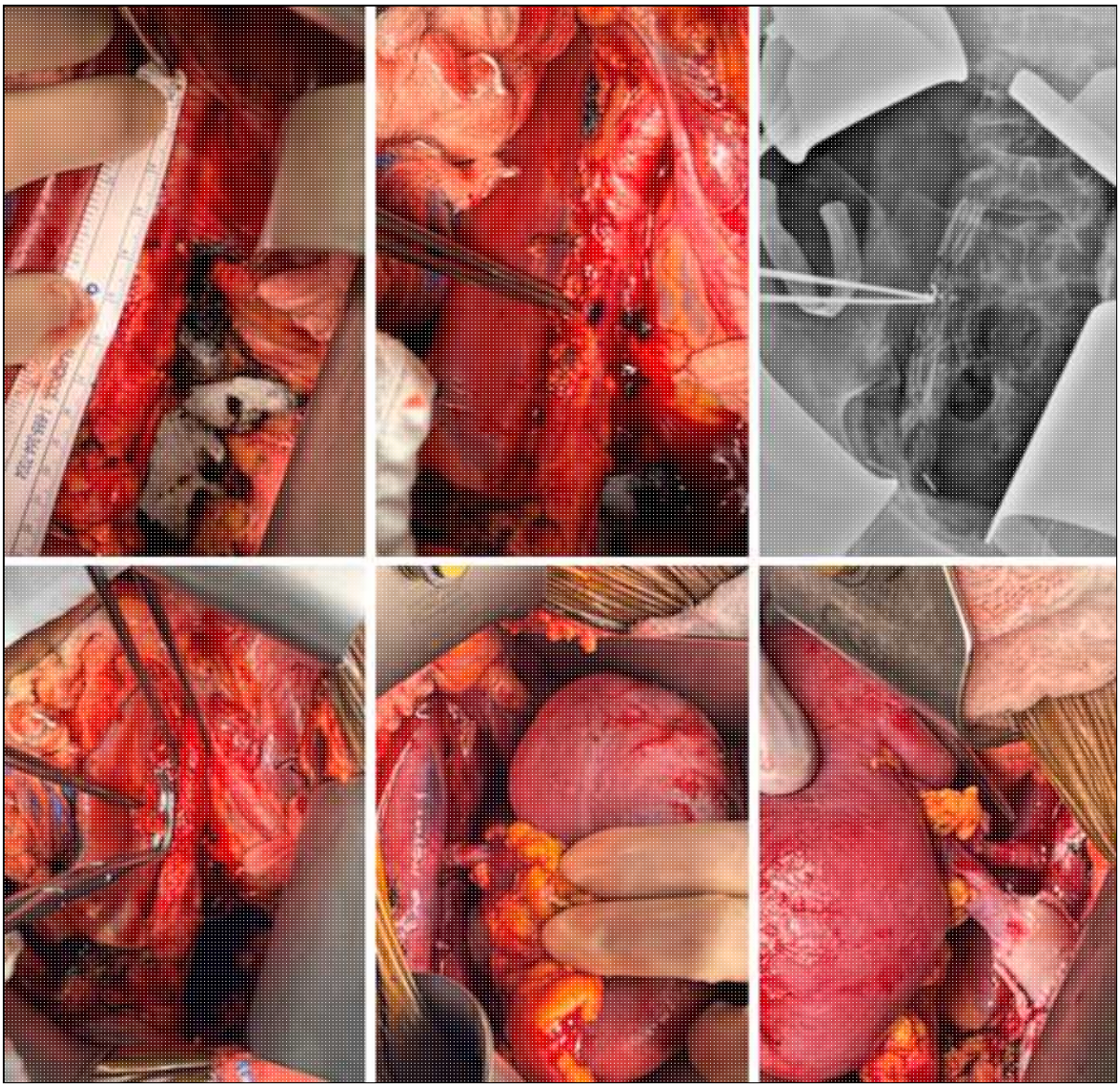

Fig 2 2a) Localization of the side branch using a measuring tape, 2b & 2c) Confirmation of the side branch localization utilizing gold fiducial marker and c