Objective: To assess renal perfusion in false-lumen originating renal arteries following stenting during complicated type B aortic dissection (TBAD) repair.

Methods: Fifteen patients underwent TEVAR for complicated TBAD with adjunctive renal artery stenting to renal arteries that arose from the false lumen from 2014–2016. All TEVARs were performed with the use of IVUS. Renal stenting was performed using IVUS as a guide with covered stents extending from the true lumen into the renal artery proper. Renal perfusion was assessed by gray Hounsfield unit (HU) mapping on admission CTA and follow-up CTA with measurements made in the renal parenchyma. The difference in renal parenchymal HUs was then calculated between the true-lumen kidney and the false-lumen kidney. This controlled for variables impacting contrast diffusion in patients such as cardiac output or image acquisition timing.

Results: Average time from admission to TEVAR was 5.5 days. Prior to TEVAR, admission CTA showed the average difference between parenchymal uptake in the false-lumen kidney and the true-lumen kidney was 50.7 HU. Among all patients, the average density in the renal parenchyma of the false-lumen originating kidney was 206.61 HU, whereas in the kidney coming off the true lumen the average parenchymal density was 259.4 HU. After TEVAR and renal stenting, CTA demonstrated that the average difference between parenchymal uptake in the false-lumen kidney and the true-lumen kidney was reduced to 12.9 HU (p=0.02). In fact, the average density in the renal parenchyma of the false-lumen originating kidney was now higher (271.9 HU) than that of the kidneys coming off the true lumen (250.4 HU). Stents to the false-lumen originating renal artery demonstrated 100% patency. Follow up ranged from 2 to 35 months with typical initial post-TEVAR CTA averaging 4 months.

Conclusions: We demonstrated that stenting of the false lumen originating kidney in complicated TBAD leads to a statistically significant improvement in iodinated contrast uptake. In addition, these stents remain patent through follow-up. Thus, stenting of the false-lumen originating renal artery may be important to long-term renal function.

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