Acute kidney injury predicts mortality after endovascular aortic repair

J.R. Boyle *
Cambridge Vascular Unit, Cambridge University Hospitals, Cambridge, UK

The article by Martin-Gonzalez et al.1 reports a large series of fenestrated and branched endografts with excellent clinical outcomes and a 30-day mortality of only 6.2% in this complex patient group. The high incidence of acute kidney injury (AKI) in this series of 29% is perhaps the most significant finding. AKI in vascular surgical patients is associated with significantly higher 30-day and 1-year mortality rates.2,3 This study further corroborates the association between AKI and renal replacement therapy with postoperative mortality. There is increasing evidence that renal injury after standard infrarenal EVAR is common and under-reported.4 Furthermore, AKI following EVAR ruptured aneurysm is also associated with short and longer-term mortality.5

One of the problems with the reporting of renal injury after AAA repair is the lack of consensus on how it is best recorded. The authors in addition to renal volume have reported estimated glomerular filtration rate (eGFR) and used the RIFLE (Risk, Injury, Failure, Loss, and End-stage) classification to define the incidence of acute renal failure. The Aneurysm Renal Injury Score (ARISe) a modification of RIFLE specifically aimed at classifying renal dysfunction after EVAR has the potential to standardize reporting in this patient group.6

The significance of the 14.8% reduction in renal volume at 3-year follow-up is unclear. These patients are elderly with significant co-morbidity and a deterioration of renal function over time would be anticipated. Unfortunately, because of the retrospective nature of this study there is no matched control group to compare the FEVAR and BEVAR patients with, and therefore the reader is unable to draw robust conclusions about the significance of this finding.

Furthermore, the usefulness of renal volume as measured on CT is likely to be limited in clinical practice. There has been a move away from CT surveillance7 because of concerns about both radiation and repetitive contrast-induced renal injury.8 The question arises: How much of the reduction in renal volume and eGFR reported in this study were related to CT induced CIN during follow-up? Data from the contemporary meta-analysis also suggests a significant reduction in creatinine clearance after standard EVAR at 1 year.4 Teasing out the separate influences of the primary intervention, subsequent reinterventions, follow-up protocols, and factors unrelated to EVAR on longer-term renal dysfunction require further investigation.

This recognition of both procedure-related acute renal injury and the deterioration in renal function over time are important, because without identification of the patient at risk opportunities to mitigate the renal injury will be missed. Patients undergoing BEVAR and FEVAR are at high risk of AKI in the perioperative period, and protocols that include withdrawal of nephrotoxic drugs, saline pre-hydration, minimizing renal artery instrumentation, and strategies to limit contrast dose should be employed.

It is unlikely that renal volume will have a useful role in monitoring renal function over time, which is recognized by the authors; however, eGFR trends in this population warrant further study. Therapeutic strategies aimed at mitigating AKI also warrant further investigation, as these are likely to reduce both short- and long-term mortality. Standardized reporting of acute renal injury after endovascular aneurysm surgery is vital in order to compare populations and investigate new therapeutic avenues.9

REFERENCES