

# Endovascular Aneurysm Repair with Suprarenal versus Infrarenal Fixation: A Controlled Study of Renal Effects

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## **Purpose**

While suprarenal fixation of endografts is of benefit in a number of situations during endovascular aneurysm repair (EVAR), the safety with regards to renal effects remains uncertain. Published studies have yielded conflicting results. To date there has been no controlled study of the topic, with most reports relying upon single center experiences using heterogeneous patient populations and devices from different manufacturers. The purpose of this analysis was to evaluate the effect of suprarenal fixation on renal function by comparing homogeneous patient populations, receiving EVAR grafts from a single manufacturer which are identical in design and delivery method, except for utilizing either suprarenal or infrarenal fixation.

## **Methods**

In the setting of two pivotal US Food and Drug Administration trials, 283 patients underwent EVAR with the Powerlink bifurcated graft. The trials' inclusion and exclusion criteria and grafts were identical except for fixation scheme: either suprarenal (SR) or infrarenal (IR). Clinical, laboratory and computed tomographic (CT) data were retrospectively reviewed. Comparison of preoperative, perioperative (1–7 days), and postoperative (> 7 days) alterations in serum creatinine (SCr), creatinine clearance (CrCl), and blood pressure was performed. Renal adverse events were determined by CT and clinical chart review, and included renal infarction, renal artery stenosis, either progressive or requiring renal stent placement, and renal artery occlusion.

## **Results**

Patient characteristics for both groups were well matched. Both SR and IR groups demonstrated a significant increase in SCr and a decrease in CrCl over time. Comparing SR and IR cohorts, however, showed no significant difference in SCr or CrCl between groups during any time period. There were no differences in postoperative renal impairment (IR 10.2% and SR 7.6%,  $p = .634$ ) or the need for hemodialysis (IR 0.7% and SR 0%,  $p = 1.00$ ). Although both groups had significant improvements in systolic and diastolic blood pressure during the initial hospitalization, blood pressure returned to preoperative baseline levels during follow-up. No difference was detected between the SR and IR cohorts in systolic or diastolic blood pressure at any time period studied. There was no significant difference in the number of renal adverse events detected by CT between the IR (10) and SR (3) groups (6.8% and 3.8%, respectively,  $p = .550$ ).

## **Conclusions**

Suprarenal fixation does not lead to a significant increase in acute renal events, renal impairment, or alteration in blood pressure in comparison to infrarenal fixation. Patients undergoing aneurysm repair with devices utilizing either suprarenal or infrarenal fixation develop progressive renal dysfunction over time. Further studies are needed to determine the long-term effects of SR fixation on renal function and progression of renal artery stenosis.