

Repeated contrast medium application after endovascular aneurysm repair and not the type of endograft fixation seems to have deleterious effect on the renal function

Daphne Elisabeth Gray, MD,^a Markus Eisenack, MD,^b Michael Gawenda, MD,^a Giovanni Torsello, MD,^{b,c} Payman Majd, MD,^a Jan Brunkwall, MD,^a Nani Osada, PhD,^d and Konstantinos P. Donas, MD,^c *Cologne and Münster, Germany*

ABSTRACT

Objective: The influence of endovascular aneurysm repair (EVAR) on renal function is of high concern. The question whether stent graft fixation type plays a significant role in renal outcome after EVAR is still debated. However, other factors, such as repeated contrast medium exposure, should also be considered.

Methods: We performed a two-center, stratified-cohort case control study to evaluate the influence of last-generation abdominal endografts with suprarenal (SR) vs infrarenal (IR) fixation on renal function.

Results: From a total of 276 patients, 134 were treated with IR fixation (group A) and 142 with SR fixation (group B) stent grafts. There was no significant difference in intraoperative contrast medium use (mean 120.0 mL group A vs 104.8 mL; $P = .087$) between the two cohorts. Overall, 11.2% of the patients (31/276) showed a relevant decline ($\geq 20\%$) of estimated glomerular filtration rate (eGFR) postoperative and 11.5% (31/269) after 12 months. Furthermore, 19/134 (14.2%) patients in group A and 12/142 (8.5%) patients in group B showed a postoperative decrease of eGFR $\geq 20\%$ ($P = .132$). Comparing the 12-month follow up, there was also no significant difference between the two groups (group A, $n = 18/134$; group B, $n = 13/135$; $P = .329$). Patients with only one contrast-enhanced computed tomography scan postoperatively (4/102; 3.9%) showed significant less renal deterioration after 12 months compared with the rest of the study collectively (27/166; 16.9%; $P = .002$). Comparing IR vs SR fixation in these patients, there was no significant difference between the two groups. One patient (1/35; 2.9%) with IR fixation (group A) and 3/67 (4.5%) with SR fixation (group B) showed a decline in eGFR values of $\geq 20\%$ after 12 months ($P = 1.0$).

Conclusions: Our study showed no significant difference in renal impairment between SR and IR fixation in EVAR for IR abdominal aortic aneurysm. However, significantly more renal deterioration was observed in patients with increased postoperative contrast medium expose. Therefore, alternatives such as contrast-enhanced duplex ultrasound or magnetic resonance imaging for EVAR surveillance should be considered. (J Vasc Surg 2016;■:1-6.)

Renal impairment is one of the major concerns in endovascular aneurysm repair (EVAR).¹⁻³ A meta-analysis by Karthikesalingam et al⁴ showed that renal deterioration after EVAR is common and underreported in the literature.

The impact of infrarenal (IR) or suprarenal (SR) fixation of abdominal endografts on renal function has been debated, and there has been no prospective randomised trial comparing the two options. Although the SR

landing zone may be of advantage to avoid migration, the crossing of the renal ostium with bare metal stents raises the theoretical risk for renal infarction or deterioration.

A recently published review of the available literature by Miller et al⁵ showed no significant difference in renal function for either type of endograft fixation but emphasizes several limitations in their analysis. The majority of the included studies used first-generation stent grafts.^{6,7} The study populations were usually small with heterogeneous measurements of renal function and inconsistent follow-up.^{7,8} Other factors influencing renal impairment, such as the intraoperative and follow-up use of contrast medium, were missing in several of the included studies.⁵

To overcome the limitations of the current literature, a two-arm case control study was conducted to evaluate the influence of last-generation abdominal endografts with SR vs IR fixation on renal function.

METHODS

Patients included in the study were treated in two high-volume European vascular centers with advanced experience with EVAR for IR abdominal aortic aneurysms

From the Clinic of Vascular and Endovascular Surgery, University Clinic of Cologne, Cologne^a; and the Clinic of Vascular and Endovascular Surgery,^b Department of Vascular and Endovascular Surgery, St. Franziskus Hospital,^c and Department of Medical Informatics,^d University of Münster, Münster.

Author conflict of interest: none.

Correspondence: Daphne Elisabeth Gray, MD, Clinic of Vascular and Endovascular Surgery, University Clinic of Cologne, Kerpener Str. 62, Cologne 50937, Germany (e-mail: daphne.gray@uk-koeln.de).

The editors and reviewers of this article have no relevant financial relationships to disclose per the JVS policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

0741-5214

Copyright © 2016 by the Society for Vascular Surgery. Published by Elsevier Inc.

<http://dx.doi.org/10.1016/j.jvs.2016.05.088>

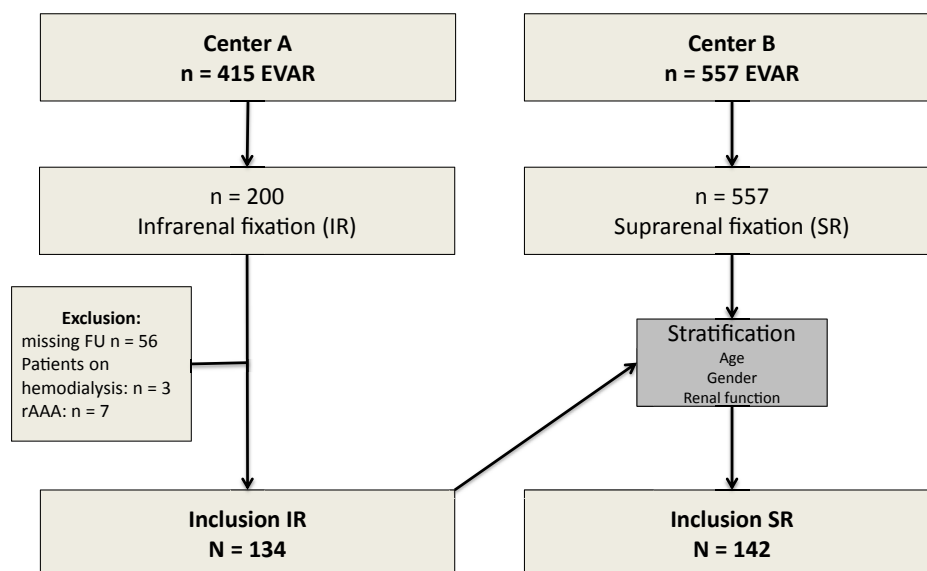


Fig. Patient recruitment from center A and B with stratification of the cohorts.

(AAAs). To have comparable samples, we included only cases treated accordingly to the instructions for use (IFU) of the stent graft manufacturers. Patients were treated with the last generation stent grafts.

Between 2005 and 2013, 415 patients were treated with EVAR for IR AAA in center A. Indication for treatment with either IR or SR fixation was based on IR neck anatomy. SR fixation was used mainly for patients with short (<18 mm) or wide IR neck morphology or patients with thrombus in the IR neck in over 50% of the circumference. From those 415 patients, 200 (48.2%) were treated by abdominal devices with IR fixation using either the Excluder (W. L. Gore and Associates, Flagstaff, Ariz) or the Anaconda (Vascutek, Glasgow, United Kingdom) stent graft. Exclusion criteria were patients with end-stage renal insufficiency requiring dialysis ($n = 3$), EVAR of symptomatic/ruptured AAAs ($n = 7$), and patients with an incomplete 1-year follow up (no estimated glomerular filtration rates [eGFR] available) ($n = 56$). All patients in center A with IR fixation were treated according to the manufacture's IFU regarding neck anatomy (neck length ≥ 15 mm for IR fixation and ≥ 10 mm for SR fixation). No patient had any significant (>50%) renal artery stenosis. Thus, 134 patients from center A were enrolled in the study. Out of those, 109 patients were treated with the Excluder and 25 with the Anaconda stent graft.

In center B, all IR AAAs ($n = 557$) were treated with stent grafts with SR fixation such as the Endurant II (Medtronic, Santa Rosa, Calif). Patients from center B treated within the IFU for the Endurant II stent graft were matched to the cohort of center A using stratification for demographics (age and sex) and preoperative renal function to create a homogenous study cohort. To have similar preoperative and postoperative renal protection

protocols between the two centers, only patients treated after 2012 were stratified from center B. After stratification, 142 patients from center B were included in the study (Fig). Because of the retrospective nature of the study and anonymization of the data, no informed consent of the patients was required according to our Institutional Review Board.

Statistical analysis was done using IBM SPSS Statistics software for Windows release 22 (SPSS Inc, Chicago, Ill). As the samples were normally distributed (using Kolmogorov-Smirnov test), the parametric tests were used. Differences of continuous variables between two study groups were proven using independent samples t -test and within the groups using pair samples t -test. The χ^2 test following Pearson and the exact Fisher test were used to compare the relationships between two categoric variables. A P value of $< .05$ was considered statistically significant.

Evaluation of renal function. We assessed the preoperative, the postoperative (highest postoperative measured level until hospital discharge), and the 12-month follow-up serum creatinine levels. Twelve-month follow-up serum creatinine level was assessed at follow-up visit prior to the scheduled computed tomography (CT) scan. Serum creatinine was measured in each clinic's laboratory; unit for serum creatinine was mg/dL in both laboratories. Using the Chronic Kidney Disease Epidemiology Collaboration formula, the preoperative, postoperative, and 12-month follow-up eGFRs were calculated to estimate the renal function. In addition, we evaluated the intraoperatively used amount of contrast medium as well the postoperative application of contrast medium during postoperative CT scans and interventions using contrast medium in the 12-month follow-up. Regarding

Download English Version:

<https://daneshyari.com/en/article/5617534>

Download Persian Version:

<https://daneshyari.com/article/5617534>

[Daneshyari.com](https://daneshyari.com)