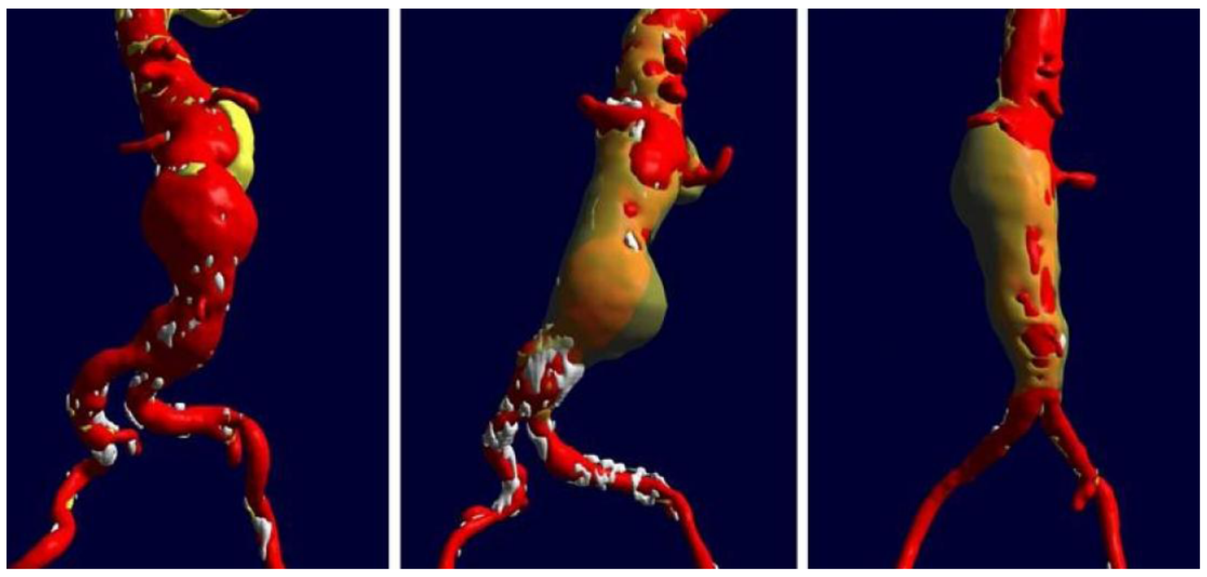
Fenestrated Endovascular Abdominal Aortic Aneurysm (AAA) Repair (fEVAR) and Renal Function

Athanasios Saratzis[1], Pantelis Sarafidis[2], Robert Sayers[3], Matthew Bown[3], [1]Leicester University, Cardiovascular Sciences, Leicester, UNITED KINGDOM, [2]Aristotle University of Thessaloniki, Nephrology, Thessaloniki, GREECE, [3]Leicester University, Department of Cardiovascular Sciences, Leicester, UNITED KINGDOM.

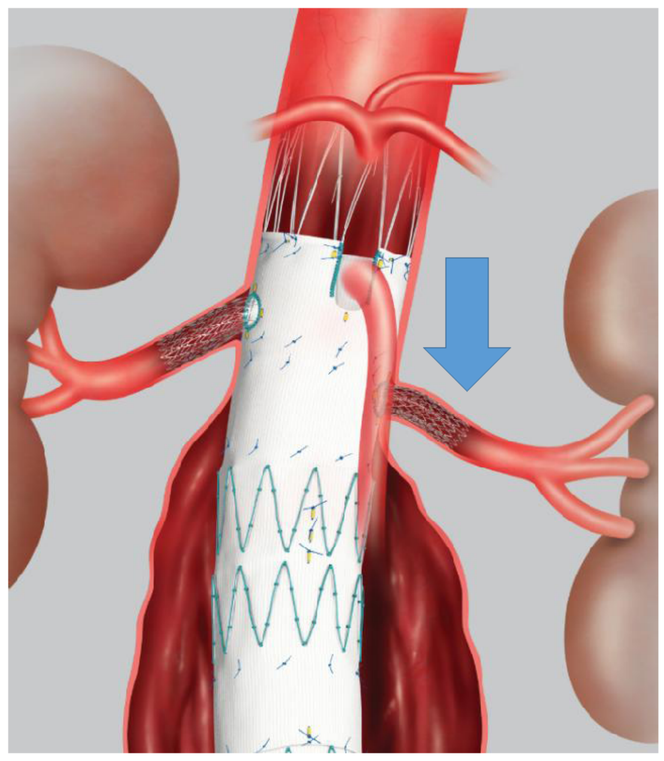
Background: fEVAR has recently been introduced as a new means of endovascular treatment of complex AAAs. However, it can potentially lead to a significant drop in renal function, which has not been adequately investigated.



Juxtarenal and pararenal AAAs which do not allow deployment of classic EVAR devices and would necessitate open surgery

fEVAR involves selective cannulation and stenting of renal and visceral arteries, allowing the treatment of complex AAAs (juxtarenal and pararenal AAAs) with endovascular means.

Compared to EVAR, operating time and use of contrast are increased, therefore kidney damage is potentially significant



Methods: A cohort study & a meta-analysis were performed. 58 patients undergoing elective fEVAR [7 females (12%), age: 75±7 years, AAA size: 6.6±1.4cm] were included (cohort study). These were case-matched (age, sex, smoking, diabetes, baseline eGFR) with patients undergoing elective infrarenal EVAR and open repair (OAR). eGFR (CKD-EPI formula) was compared at 30 days, 1 year, and latest follow-up. A systematic literature-review identified studies that had estimated GFR after fEVAR and meta-analysis was performed; an eGFR drop exceeding 30% at one year was the main endpoint.

Change in mean eGFR during the 20 months of follow-up

		Baseline	Discharge	1 year	End of follow-up
eGFR	fEVAR	78±8	74±9	71±12	74±10
	EVAR	80±16	78±8	76±8	76±7
	OAR	79±8	80±16	72±14	73±14

Results from the 3 papers identified reporting eGFRs after fEVAR

Reference	Year	N of fEVARs	Age (years)	Females	AAA diameter (mm)	eGFR Baseline	>30% eGFR within 30 days	>30% eGFR at 1 year
Kristmundsson[17]	2014	54	Median: 72, IQ range: 68-76	15%	Median: 60, IQ range: 53-66	Median: 60, range: 46-79	19 (35%)	7 (13%)
Haddad[18]	2005	72	Mean: 75	18%	Mean: 62	Mean: 77.5, SD: 31	24 (33%)	3 (4%)
Oderich[19]	2014	67	Mean: 74, SD: 8	19%	Mean: 60; SD: 10	Not available	0	5 (7%)
LEICESTER (this study)	2014	58	Mean: 75; SD: 7	12%	Mean: 67; SD: 14	Mean: 78, SD: 8	7 (12%)	4 (7%)
Total		251	-	-	--	-	**50 (20%)**	**19 (7.6%)**

Conclusions: fEVAR leads to a 7 unit drop in eGFR 1 year after the repair, significantly more than EVAR but similar to OAR. The pooled proportion of patients dropping their eGFR>30% in the review (251 patients) was 7.6%, 1 year after fEVAR. This significant impact on renal function needs to be taken into account when planning fEVAR, especially in younger patients.

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