Endovascular Aneurysm Sealing (EVAS) with off-label use of chimneys (ChEVAS) offer a novel alternative to FEVAR in treating complex AAA. Both ChEVAS & FEVAR are complex endovascular interventions and have limitations associated with anatomical suitability. We undertook a comparison of how planned ChEVAS & FEVAR interventions varied in the same patient cohort.

An analysis of consecutive patients who underwent FEVAR in our institution, between 2013-15, was undertaken. Pre-operative CT angiograms were anonymised and sent to two experienced ChEVAS planners who were blinded to the purpose of the study. They agreed upon a suitable EVAS/ChEVAS plan. The primary outcome was the percentage of the FEVAR patients who were anatomically suitable for EVAS/ChEVAS. The secondary outcomes were a comparison of: seal zones, number of target vessels and device cost.

60 patients, 54 male with median age 76.3 years (IQR 71.7-79.7) and aneurysm diameter 62.0mm (IQR 59.3-69.0) were included. An EVAS based intervention was possible in 56 (93%). The median seal zone was significantly more distal in EVAS/ChEVAS vs FEVAR (Median Zone 8 vs Zone 7, Z=-6.650, p<0.001). Less target Vessels were involved by EVAS/ChEVAS vs FEVAR (Median 2 vs 3, Z=5.908, p<0.001). The cost of the EVAS/ChEVAS device was 66% of the FEVAR device.

EVAS/ChEVAS is anatomically applicable to the majority (93%) of patients undergoing FEVAR in our institution. The seal zone was more distal and fewer target vessels were involved in the planned EVAS/ChEVAS intervention than the actual FEVAR repair. Planned device cost was lower for EVAS/ChEVAS.

Seal zone or target vessel number should not be used as surrogates of aortic anatomy when comparing outcomes of EVAS & FEVAR techniques.
Midterm Results Following Repair of Short Neck and Juxtarenal Aortic Aneurysms with the Fenestrated Anaconda Endograft
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The fenestrated Anaconda endograft (Vascutek) has showed promising results for the treatment of short-neck or juxtarenal aneurysms. The aim of this study was to present the midterm results from a regional vascular centre and compare outcomes following two and three-fenestrated repairs.

Data from patients treated with the fenestrated Anaconda endograft between 2011 and 2016 were analysed.

62 patients (median age 78yrs [range 63-89], 82.3% male) underwent repair with a total of 167 fenestrations incorporated into one-fenestrated (n=4 [6.1%]), two (n=19 [30%]), three (n=31 [50%]) and four (n=8 [12.9%]) fenestrated devices. Median follow-up was 35 months with 1, 2 and 5 year survival rates of 91%, 82% and 62% respectively. Primary patency of the renal, SMA, coeliac and iliac arteries were 97.5%, 97.5%, 87.5% and 98.4% respectively and re-intervention rates were 3.3%, 2.5%, 0% and 4.8% respectively.

The 30 day mortality for two and three-fenestrated repair was 1/19 and 3/31 respectively (P=NS). 39% of patients undergoing two-fenestrated repair had a decline in renal function compared with 36% of three-fenestrated cases (P=NS); of these, the decline was 28% and 23% respectively (P=NS).

High target vessel patency and low re-intervention rates contribute to encouraging overall midterm results using the Anaconda device. The incidence and rate of decline in renal function in patients undergoing two or three-fenestrated repairs is similar. These data support the continued used of two-fenestrated repairs using this device as a durable option in a proportion of patients with potentially favourable 30 day mortality.
Endograft infection after endovascular aneurysm repair: A systematic review and meta-analysis
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Endovascular repair (EVAR) is currently the predominant treatment for abdominal aortic aneurysms. Stent graft infection is a rare but potentially lethal complication after EVAR. Our objective was to undertake a systematic literature review and analyze the evidence on the management and outcomes of endograft infection after EVAR.

Electronic database (PubMed/MEDLINE, CENTRAL) and bibliographic reference lists were searched using free text and controlled vocabulary searches to identify studies reporting cases of endograft infection. The methodological quality of the selected studies was assessed using the Newcastle-Ottawa scale. Our review conformed to the PRISMA standards.

Sixteen articles reporting a total of 329 patients were identified fulfilling the inclusion criteria. The incidence of graft infection after EVAR was 0.6%. The time from implantation to diagnosis ranged from 1 to 128 months (mean 26 months). 96% of the patients underwent surgical explantation of the infected endograft; 13 patients (4%) received supportive treatment only. Aortic replacement with a prosthetic graft was performed in 40% of patients, whereas cryopreserved allografts and autologous grafts were used in 23% and 11% of patients, respectively. 40% of the patients had emergency surgery; the rest underwent an urgent or elective procedure. Perioperative mortality was 24.7%. 30-day/in-hospital mortality for patients treated conservatively was 63.3%. Mortality for patients treated with surgical explantation was 44.6%, and for patients receiving conservative treatment was 58.6%.

Complete surgical explantation of the infected endograft seems to be the optimal management in selected patients. Supportive medical treatment without surgical intervention has a significant associated mortality.
Survival after infrarenal EVAR. Experience of 387 EVAR patients with and without adverse post-operative surveillance findings
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Recent long-term outcomes from early EVAR trials have reported a significant rise in delayed mortality possibly due to delayed graft complications. The aim of this study was to determine the long term survival of patients undergoing infrarenal EVAR in a single centre and the significance of adverse surveillance findings and re-interventions on patient survival.

All patients undergoing infrarenal EVAR from 2008-2016 were identified. EVAR related adverse post-operative surveillance findings (endoleaks, graft occlusion, stenosis, cranial migration and infection), re-interventions and treatment strategies were reviewed. Mortality data and patient survival were compared using Kaplan Meier analysis.

387 patients undergoing EVAR were reviewed. Median age at procedure was 76yrs (IQR = 69.8-81.2). 9.5% of patients had a significant adverse finding requiring re-intervention (37/387), 27/52 interventions were undertaken for endoleaks with the remainder for graft occlusion (13), graft stenosis (9), graft infection (1), cranial migration (1) and fistula (1).

Survival of patients with any adverse surveillance finding was not significantly different to patients without adverse findings (p=0.118) with a trend to improved survival in patients with adverse findings. A similar trend was noted in patients undergoing re-intervention with once again no significant survival advantage in either group (p=0.126).

This data represents a large series from a single centre. Endoleaks and other adverse surveillance findings were common, with approximately 10% of patients undergoing re-intervention. Adverse surveillance findings and re-intervention has not however detrimentally affected survival to date. Ongoing long-term surveillance remains necessary.
Biplanar radiography used in EVAR surveillance varies in rotation and projection even when conducted to standardised protocols. This is further exacerbated by the limitation inherent to side by side visual comparison of sequential films. These limitations compromise the sensitivity of the technique and necessitate large movements/changes in stent-grafts to confidently diagnose migration and other complications.

We developed a protocol using commercially available medical software (i2K Retina, DualAlign) to create automated alignment of serial radiographs which compensate for variations in magnification and angulation. Aligned images are displayed serially in the same frame for ease of visual comparison. Optimum settings were developed to allow: 1) The largest proportion of sequential radiographs to be automatically registered and aligned, and 2) To achieve the smallest variation in alignment of reference landmark, as defined by pixel coordinates of the four corners of L1 vertebral body.

This was tested on 119 sets of AP and LAT radiographs of 18 patients. 110 (92%) AP and 83 (70%) LAT radiographs could be registered and aligned. Changes in in bone morphology, most commonly due to a wedge fracture of the lumbar spine, were noted in 39 out of the 45 unaligned radiographs.

Aligned radiographs showed low variance of L1 alignment with the SD of positional alignment being only 41 pixels for AP radiographs and 63 pixels for LAT radiographs.

Automatic registration and alignment of plain radiographic images in EVAR surveillance is possible. This could improve the sensitivity and utility of plain radiography in detecting stent-graft migration and distortion.
Minimally Invasive Fistula Salvage: The Success of Endovascular Interventions
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Currently arteriovenous fistulas carry a primary failure rate of up to 40%. Research has suggested that early intervention in failing fistulas improves patency and successful use of fistulas. In this paper we have assessed the outcome of early salvage using endovascular techniques in a single centre.

A retrospective study of digital records in a single centre was performed from 1st January 2014 until 31st January 2017. Data recorded included date of procedure, site, complications, salvage procedure and its success as measured by successful dialysis via fistula within 6 months without further intervention.

108 procedures in 78 patients were identified. The fistula site included 49 (45%) brachiocphalic, 49 (45%) radiocephalic, 9 (8%) brachiobasilic and 1 leg graft. The complications observed included 62 cases of insufficient flow or inadequate clearance (57%), 12 needling difficulties (11%), 11 poor maturation (10%), 9 thrombosis/occlusion (8%), 8 aneurysm formation (7%), 4 arm swelling (3.7%), 1 steal (0.9%) and 1 bleeding (0.9%). The median time to first intervention was 14 months.

Overall success rate for fistula salvage was 72%. 83% of patients undergoing central vein plasty (10/12 patients), 74% peripheral vein plasty (44/59), 71% juxta-anastamotic plasty (20/28), 100% arterial plasty and 0% thrombolysis (0/5).

Endovascular fistula salvage can give good results with 72% of otherwise insufficient or unusable fistulas successfully salvaged. Angioplasty of identified stenotic lesions showed good results, particularly in arterial stenosis. Thrombolysis in this small series was unsuccessful in all cases. Patients with occlusive complications may be better served with surgical intervention.