

Endovascular Therapy

Annual Meeting 2016

Thursday 30th June – Friday 1st July Walton Hall, Warwickshire



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Annual Meeting 2016

Thursday 30th June – Friday 1st July Walton Hall, Warwickshire

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Thursday 30th June

09.00-09.40	Welcome & Rouleaux Club Symposium	Chairs Shiva Dindyal & Sam Byott	10.01	A systematic review of compliance with surveillance after Endovascular Aneurysm Repair (EVAR) M1 Grima 11 offus P Holt M Thompson A Karthikesalingam	
	Peripheral angioplasty training – what I need Shiva Dindyal	o sam byott		St George's Vascular Institute, London	
	Peripheral angioplasty training – what the surgeon can offer Jon Boyle		10.08	The role of simulation in Endovascular Aneurysm Repair (EVAR) training	
	Peripheral angioplasty training – what you should have Jonathan Hopkins			A Saratzis Department of Cardiovascular Sciences and Leicester NIHR	
	What is needed in a complete training curriculum Ian Chetter			Cardiovascular Biomedical Research Unit, Leicester University, Leicester	
	Panel discussion		10.15	Compliance with Surveillance following Endovascular Aortic Aneurysm Repair	
09.40-10.25	Abstract Session 1	Chairs		I Roy S Vallabhaneni On behalf of LiVES Liverpool Vascular & Endovascular Service	
	6 papers, 6 (4+2) minutes	Paul Hayes & Chris Twine	10 25-10 45	Society Sponsor – Cook	Chairs
09.40	LEAR – Long-term risk stratification for reintervention after EVAR with the Endurant device	10.25-1			Paul Hayes
	A Karthikesalingam A Vidal-Diez P Holt I Loftus MM Thompson St George's Vascular Institute, London			Endovascular solutions for challenging aortic problems and the importance of patient selection Bijan Modarai	& Chris Twine
09.47	Profile of secondary interventions after EVAR: How are they triggered and what are the implications for surveillance?			Role of Zilver PTX in My Practice Hany Zayed	
	Liverpool Vascular & Endovascular Service		10.45-11.10	Coffee	
09.54	Robotic-assisted Endovascular Aneurysm Repair: Comparison of Manual versus Robotic Techniques S Cheung ¹ R Rahman ¹ C Bicknell ^{1 2} D Stoyanov ³ P Chang ³		11.10-11.30	Quick Fire Three Way Debate	Chairs Matt Thompson
	M Li ¹ A Rolls ¹ L Desender ⁴ I Van Herzeele ⁴ M Hamady ² C Riga ^{1 2} ¹ Department of Surgery and Cancer, Imperial College London ² Imperial Vascular Unit, Imperial College Healthcare NHS Trust,			Angulated and/or short necked infrarenal AAA – the first line treatment should be conventional EVAR Hence Verhagen	& Mike Wyatt
	London ³ Centre for Medical Image Computing, University College London ⁴ Department of Thoracic and Vascular Surgery,			Angulated and/or short necks treated with standard stents need help for long term fixation – staples and Palmaz stents Jean-Paul de Vries	
	Ghent University Hospital, Belgium			Angulated and/or short necks aren't necks, land the device higher and utilise branched/fenestrated technology Kevin Mani	

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11.30-11.50	Guest Lecture	Chairs Matt Thompson	14.35-14.55
	The durability of EVAR: what have we learnt from the 15 year results of the EVAR-1 trial? Janet Powell	& Mike Wyatt	
11.50-12.05	The Paper That Changed My Practice Jean-Paul de Vries Kevin Mani	- Chairs Ian Loftus & Rob Sayers	
12.05-12.25	Guest Lecture	Chairs	14.55-16.00
	Chronic dissection aneurysmal disease treatment with fenestrated and branched stent grafts – short and long term results Eric Verhoeven	an Lortus & Rob Sayers	14.55
12.25-12.45	Society Sponsor – Endologix	<i>Chairs</i> Ian Loftus	15.02
	Forecasting the future Bob Mitchell, President, Endologix	& Rob Sayers	
12.45-12.50	Vascular and Endovascular Research Network	- Chairs Ian Loftus & Rob Sayers	15.09
	UK Vascular trainee research collaborative David Sidloff	_	15.16
12.50-14.00	Lunch	-	
14.00-14.20	Guest Lecture	<i>Chairs</i> Rachel Bell	
	Lessons from Registry based data (it's not all about trials) Kevin Mani	& Rao Vallabhaneni -	15.23
14.20-14.35	The Paper That Changed My Practice James Black III Lanfroi Graziani	Chairs Rachel Bell & Rao Vallabhaneni	

14.35-14.55	Society Sponsor – Gore	<i>Chairs</i> Bijan Modaraj
	Pathways for the management of uncomplicated Type B aortic dissection Matt Thompson	& Kevin Mani
	Tips and tricks for the management of Acute Aortic Syndrome Rachel Bell	
14.55-16.00	Abstract Session 2 9 papers, 6 (4 + 2) minutes	<i>Chairs</i> Bijan Modarai & Kevin Mani
14.55	Renal Function after Endovascular Aneurysm Sealing (EVAS) using the NELLIX aortic stent graft SS Bahia BA Ozdemir F Ahmed-Jushuf C Jenner JL De Bruin MM Thompson St George's Vascular Institute, London	
15.02	Endovascular management of Visceral Artery Aneurysms and Pseudo aneurysms Mr Viruthagiri Dr Wijesinghe Mr Kay Dr Duddy Mr Vohra <i>Queen Elizabeth Hospital, Birmingham</i>	
15.09	Endovascular aneurysm sealing with chimney grafts – outcomes from the first 50 cases at a single institution K Stenson J De Bruin I Loftus M Thompson St George's Vascular Institute, London	
15.16	Efficacy of relining previous endovascular aortic grafts using Endovascular Aneurysmal Sealing (EVAS) A Rehman ¹ M Karouki ¹ F Torella ¹ R McWilliams ² A England ³ R Fisher ¹ ¹ LiVES, Royal Liverpool University Hospital ² Interventional Radiology Department, Royal Liverpool University Hospital ³ Directorate of Radiography, University of Salford	
15.23	Hybrid repair of the arch and proximal descending thoracic aorta; factors affecting survival and aortic re-intervention G Martin C Riga R Gibbs M Jenkins M Hamady C Bicknell Department of Surgery and Cancer, Imperial College London & Imperial Vascular Unit, Imperial College Healthcare NHS Trust, London	

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	pathology B Patterson F D'abate D Oladukun A Karthikesalingam M Thompson P Holt St George's Vascular Institute, London	
15.37	Cerebral Embolic Protection in Thoracic Endovascular Aortic Repair (TEVAR) G Grover N Rudarakanchana A Perera M Jenkins M Hamady R Gibbs Department of Surgery and Cancer, Imperial College London & Imperial Vascular Unit, Imperial College Healthcare NHS Trust, London	
15.44	Impact of hospital volume on outcomes following treatment of thoracic aortic aneurysms and type-B dissections A Saratzis D Sidloff S Nduwayo M Bath RD Sayers M Bown Department of Cardiovascular Sciences and Leicester NIHR Cardiovascular Biomedical Research Unit, Leicester University, Leicester	
15.51	A comparison of quality of life in patients with thoracic aortic disease under surveillance and following Thoracic Endovascular Aortic Repair (TEVAR) A Perera N Rudarakanchana M Stoddart RG Gibbs T Athanasiou CD Bicknell Department of Surgery and Cancer, Imperial College London & Imperial Vascular Unit, Imperial College Healthcare NHS Trust, London	
16.00-16.25	Теа	
16.25-16.45	Quick Fire Debate	Chairs Mike lenkins
	I know the results of BASIL 2 already (that's why there is problems recruiting) – endo is superior <i>For:</i> Martin Malina	& Ray Ashleigh

Feasibility and accuracy of transthoracic duplex ultrasound

15.30

16.45-17.05	Society Sponsor – Medtronic	Chairs Mike Jonkins
	Developing a standard of care for EndoAnchors: from clinical evidence to use in daily practice	& Ray Ashleigh
	Clinical evidence to date – Global ANCHOR and UK experience Colin Bicknell	
	EndoAnchors in practice – Clinical application and techniques for success Matt Thompson	
17.05-17.25	Guest Lecture	<i>Chairs</i> Eric Verhoeven
	How can we rationalise aortic stent surveillance? Hence Verhagen 	& James Black
17.25-18:25	Aortic Prize Abstract Session 6 papers, 9 (6 + 3) minutes	Chairs Eric Verhoeven & James Black
17.25	Multicentre Post-EVAR Surveillance Evaluation Study (EVAR-SCREEN) A Karthikesalingam ¹ P Holt ¹ EVAR-SCREEN COLLABORATORS ² ¹ St George's Vascular Institute ² Aberdeen Royal Infirmary, Bristol Bath Weston Vascular Network, Edinburgh Royal Infirmary, Hull Royal Infirmary, University Hospitals of Leicester, Liverpool Vascular and Endovascular Service, St George's Vascular Institute, South Manchester Vascular Service	
17.35	Endovascular aortic repair is associated with activation of markers of radiation induced DNA damage in both operators and patients T EL-Sayed ¹ AS Patel ¹ P Saha ¹ O Lyons ¹ F Ludwinski ¹ R Bell ¹ S Patel ¹ T Donati ¹ H Zayed ¹ M Sallam ¹ CJ Wilkins ² M Tyrrell ¹ M Dialynas ¹ B Sandford ¹ S Abisi ¹ P Gkoutzios ³ S Black ¹ A Smith ¹ B Modarai ¹ ¹ Academic Department of Vascular Surgery, Cardiovascular Division, King's College London, BHF Centre of Research Excellence & NIHR Biomedical Research Centre at King's Health Partners, St Thomas' Hospital, London ³ Department of Interventional Radiology, St Thomas' Hospital, London	

Friday 1st July

	08.20-09.05	Abstract Session 3 6 papers, 6 (4 + 2) minutes	Chairs Dave Lewis & Hany Zaved
	08.20	Aneurysm CaRe – Pilot RCT of "Cardiac Rehabilitation vs. Standard Care" after Aortic Aneurysm Repair SS Bahia ¹ PJ Holt ¹ KK Ray ² MM Ussher ³ JD Poloniecki ¹ R Sharma ⁴ MJ Bown ⁵ RJ Hinchliffe ¹ MM Thompson ¹ A Karthikesalingam ¹ ¹ St George's Vascular Institute, London ² Department of Primary Care and Public Health, Imperial College London ³ Population Health Research Institute, St George's University London ⁴ Department of Cardiology, St George's London ⁵ Department of Cardiovascular Sciences and Vascular Surgery, University Hospitals Leicester	
	08.27	Social Deprivation and attendance for AAA screening: What are we missing? DA Sidloff A Saratzis RD Sayers MJ Bown University of Leicester, Department of Cardiovascular Sciences	
<i>Chairs</i> Fric Verhoeven	08.34	Operative strategies for emergency repair of ruptured AAA: The impact of the IMPROVE trial on practice in a tertiary UK centre T Barker ¹ R A Benson ¹ A S Jaipersad ¹ J R Asquith ² A D Pherwani ¹ ¹ Department of Vascular Surgery, University Hospital of North Midlands ² Department of Interventional Radiology, University Hospital of North Midlands	
j James Black	08.41	Pre-operative psychological wellbeing and quality of life in patients undergoing Aortic Aneurysm Repair; an important consideration for improving outcomes? S Balaji F Lynagh P Bourke J Powell C Riga A Pinto G Martin C Bicknell Department of Surgery and Cancer, Imperial College London & Imperial Vascular Unit, Imperial College Healthcare NHS Trust, London	

	BA Ozdemir S Sinha A Karthikesalingam JD Poloniecki A Vidal-Diez RJ Hinchliffe MM Thompson PJE Holt St George's Vascular Institute, St George's Hospital, London	
17.55	Endovascular repair for acute thoraco-abdominal aneurysms M Houlihan ¹ C Mascoli ² A Koutsoumpelis ¹ M Vezzosi ¹ M Claridge ¹ D Adam ¹ ¹ Birmingham Complex Aortic Team, Heartlands Hospital, Heart of England NHS Foundation Trust ² Vascular Surgery, S.Orsola-Malpighi Hospital, University of Bologna	
18.05	The Threshold for Aortic Aneurysm Repair and its Association with Aneurysm-Related Mortality: Lessons from International Discrepancies in Practice A Karthikesalingam ¹ P Soden ² P Holt ¹ A Vidal-Diez ¹ M Schermerhorn ² I Loftus ¹ MM Thompson ¹ ¹ St George's Vascular Institute ² BIDMC Vascular Center and Harvard University	
18.15	Outcomes are worse for RAAA patients who present at the weekend SS Xu C Parker PA Coughlin MS Gohel S Kreckler PD Hayes K Varty JR Boyle Cambridge University Hospitals NHS Trust	
18:25-18:35	Quick Fire Debate	<i>Chairs</i> Eric Verhoeven
	Vascular Surgical Training – the future is bright <i>For:</i> Mike Wyatt	& James Black

Failure to rescue and mortality from abdominal aortic aneurysm repair is associated with hospital staffing

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Against: Mike Jenkins

17.45

and volume

08.48	Cardiovascular risk-factor management in patients with		10.05-10.25	Vascular Society Session	Chairs Donald Adam
	Screening Programme A Saratzis D Sidloff RD Sayers MJ Bown			7 day working Mike Wyatt	& Patrick Coughlin
	Cardiovascular Biomedical Research Unit, Leicester University, Leicester			Vascular exam Rob Sayers	
08.55	Aortic Diameter in England: What is normal? DA Sidloff A Saratzis RD Sayers MJ Bown University of Leicester, Department of Cardiovascular Sciences			National Vascular Registry Ian Loftus	-
09.05-09.35	BSET Fellow Reports	Chairs	10.25-10.40	The Paper That Changed My Practice Hence Verhagen	<i>Chairs</i> Donald Adam
	Anne Burdess Dan Carradice	Mike Jenkins & Colin Bicknell		Eric Verhoeven	& Patrick Coughlin -
	Hosaam Nasr		10.40-11.05	Coffee	
	Travel Fellowship Report: International training in Venous Intervention		11.05-11.25	Guest Lecture	- Chairs John Hardman
09.35-09.55	Guest Lecture	Chairs		Retrograde recannalisation of below the knee vessels: techniques and outcomes Lanfroi Graziani	ଧି Jon Boyle
	Connective Tissue Disorders for Interventionist and Surgeon	Mike Jenkins & Colin Bicknell	11 25-12 30	Abstract Session 4	- Chairs
			11.20 12.00	9 papers, 6 (4 + 2) minutes	John Hardman
09.55-10.05	Gold Sponsor Presentation – Vascutek	<i>Chairs</i> Donald Adam	11.25	Predictors of Outcome following Complex Infra-Popliteal Revascularisation in Octogenarians and Nonagenarians	O Joh Boyle
	The Initial and 1 year results with Fenestrated Anaconda: 101 UK FEVAR cases Rob Williams	& Patrick Coughlin		with Critical Limb Ischaemia L Biasi ¹ SD Patel ¹ T Lea ¹ J Marjot ¹ L Boyles ¹ T Donati ¹ I Paraskevopoulos ² A Diamantopoulos ² K Katsanos ²	
				¹ Departmage ² JK DNes1 ² H Zayed ² ¹ Department of Vascular Surgery, Guy's and St Thomas' NHS Foundation Trust ² Department of Interventional Radiology, Guy's and St Thomas' NHS Foundation Trust ³ Department of Ageing and Health, Guy's and St Thomas' NHS Foundation Trust	

11.32	Outcomes of Hybrid revascularisaton of multi-level arterial disease in patients with critical limb ischaemia H Harris P Saha E Kilich L Chan A Kapila S Patel T Donati S Abisi M Sallam H Zayed Department of Vascular Surgery, Guy's and St Thomas' NHS Foundation Trust, London	12.14	A decade of patient safety (Datix) reporting in Elective Aortic intervention directs team training across the patient pathway AD Godfrey R Lear C Riga A Darzi CD Bicknell Department of Surgery and Cancer, Imperial College London & Imperial Vascular Unit, Imperial College Healthcare NHS Trust. London
11.39	Day Case EVAR: The Patient's View P Lion J Powell C Bicknell Department of Surgery and Cancer, Imperial College London & Imperial Vascular Unit, Imperial College Healthcare NHS Trust, London	12.21	Medium term results of endovascular treatment of TASC C and D aorto-iliac lesions J Silickas T Donati SD Patel L Biasi T Lea K Katsanos S Abisi H Zayed Guy's and St Thomas' NHS Foundation Trust
11.46	Feasibility and outcomes of local anaesthesia in ruptured endovascular aneurysm repair JL de Bruin ¹ JR Brownrigg ¹ R Mouton ² S Howell ² C Rodgers ² MM Thompson ¹ RJ Hinchliffe ¹ ¹ St. George's Vascular Institute, St George's Hospital, London ² VASGBI Research Committee and North Bristol NHS Trust (R.M.), University of Bristol (C.R.)	12.30-12.55	Introduced by Ian Loftus Chee Soong Memorial Lecture Vascular and endovascular surgery: a glimpse at where it will be in 10 years Frank Veith
11.53	Aortic volume and diameter before and after EVAR. A simple analysis of volume can help with clinical decision making in selected cases J Miller ¹ K Wang ² J Gordon-Smith ³ D Lewis ¹ ¹ Dept of Vascular & Endovascular Surgery, Royal Infirmary of Edinburgh ² University of Edinburgh ³ Department of Radiology, Royal Infirmary of Edinburgh	12.55-13.00 13.00-14.00	Presentation of Prizes and Close
12.00	12 years of fEVAR follow-up from a single UK centre I Roy A Millen S Jones R McWIlliams J Brennan R Fisher S Vallabhaneni Liverpool Vascular & Endovascular Service		
12.07	Robotic versus manual renal cannulation during FEVAR: A comparison of efficiency AE Rolls R Rahman CD Bicknell N Burfitt N Cheshire R Gibbs M Jenkins M Hamady C Riga Department of Surgery and Cancer, Imperial College London & Imperial Vascular Unit, Imperial College Healthcare NHS Trust, London		



Abstracts

Abstract Session 1

LEAR – Long-term risk stratification for reintervention after EVAR with the Endurant device

A Karthikesalingam A Vidal-Diez P Holt I Loftus MM Thompson St George's Vascular Institute

The key challenge for EVAR relates to device durability: particularly longterm surveillance to prevent rupture. Currently, surveillance performs poorly and existing risk models do not allow adjustment based on an integrated knowledge of pre-operative, intra-operative and post-operative data. This study developed device-specific personalised risk prediction for 5-year reintervention, incorporating information from pre-operative, intra-operative and post-operative phases of care.

The ENGAGE registry (Endurant Stent Graft Natural Selection Global Postmarket Registry) recruited patients undergoing EVAR at 79 centres in 30 countries. Re-interventions and endograft complications were recorded for four years after surgery. Pre-operative (aneurysm/patient characteristics), intra-operative (operative time, on-table endoleak or adjuncts) and post-operative data (1-year sac expansion data) were used to generate time-dependent Cox Proportional Hazards models, classifying patients at high-risk or low-risk for 4-year reintervention (for type 1/3 endoleak or sac expansion).

Independent predictors of reintervention included greater pre-operative neck angulation (HR 1.02, 95% CI 1.00-1.03), greater aneurysm diameter (HR 1.03, 95% CI 1.01-1.05) and shorter iliac seal zone (HR 0.98, 95% CI 0.97-0.99), intraoperative corrected type 1/3 endoleak (HR 5.05, 95% CI 2.34-11.10) or uncorrected type 2 endoleak (HR 3.22, 95% CI 1.43-7.04) and postoperative sac expansion during the first year after EVAR (HR 3.03, 95% CI 1.24-7.41). 4-year freedom from reintervention was 95.0% vs. 80.3% in low-risk vs. high-risk patients respectively (p<0.001).

The inclusion of pre-operative, intra-operative and post-operative data a device-specific risk model better delineates reintervention risk than existing models, and provides a realistic tool for modifying surveillance regimens after the first year's outpatient review.

Profile of secondary interventions after EVAR: How are they triggered and what are the implications for surveillance?

I Roy S Vallabhaneni On behalf of LiVES Liverpool Vascular & Endovascular Service

Despite improvements in device performance and changing views about indications for secondary intervention, all EVAR patients still require surveillance to trigger secondary interventions to prevent late failure.

We examined secondary interventions, indications and imaging modality that triggered interventions in relation to stent-grafts implanted after 2008 in one center. A total of 638 patients underwent standard EVAR between 2008 and 2015. Bi-planar radiography (AXR) and duplex ultrasound (DUS) was performed at 1 month and annually thereafter. CTA was routinely performed at one month.

553 patients undertook surveillance locally, median follow-up was 34 months (IQR 16-50 m). 1,382 completed patient-years of surveillance were analysed. Secondary interventions performed during this period were reviewed.

79 (14%) patients underwent 110 secondary interventions in this period. Interventions were planned procedures on 95 occasions of which 8 were triggered by symptomatic presentation while the remaining 87 were triggered by surveillance imaging (9 of whom did have symptoms on direct questioning but failed to self-present). The remaining 15 interventions were emergencies or treating complications of other interventions.

The primary modality of surveillance imaging that triggered intervention was AXR in 8 (9%), CTA in 24 (28%) and DUS in 65 (75%). In 20 (23%) patients the relevant complication was detected on two modalities during the same surveillance visit.

Surveillance remains as important as ever despite a change in the profile of complications and interventions. The value of Plain X-rays is evident from this analysis. Surveillance based on DUS and AXR, (promoting CTA when required) continues to be effective in detecting the need for intervention.

Robotic-assisted Endovascular Aneurysm Repair: Comparison of manual versus robotic techniques

S Cheung¹ R Rahman¹ C Bicknell¹² D Stoyanov³ P Chang³ M Li¹ A Rolls¹ L Desender⁴ I Van Herzeele⁴ M Hamady² C Riga¹² ¹Department of Surgery and Cancer, Imperial College London ²Imperial Vascular Unit, Imperial College Healthcare NHS Trust, London ³Centre for Medical Image Computing, University College London ⁴Department of Thoracic and Vascular Surgery, Ghent University Hospital, Belgium

Robotic technology represents an alternative to conventional manual catheter techniques. Our aim was to compare the endovascular catheter path-length (PL) for robotic versus manual contralateral gate cannulation during endovascular aneurysm repair (EVAR), using video motion analysis.

Fluoroscopic video recordings of 24 EVAR cases (14 robotic, 10 manual) performed by experienced operators (>50 procedures) were randomly selected from 4 leading European centres. Cases were comparable for demographics with no statistically significant differences in anatomical factors. Two trained assessors blinded to operator experience used a tracking software to calculate the true PL during contralateral gate cannulation for robotic versus manual approaches. For robotic cases, the aorto-iliac centreline distance was derived from pre-operative CT scans (OsiriX DICOM viewer) as proposed idealised PL. Efficiency ratios (ER) were therefore derived using the formula: ER = PL(cm)/Centreline(cm).

There was a high degree of inter-observer reliability (Cronbach's >0.99). Median robotic PL was significantly shorter: 35.7cm [IQR (30.8-51.0)] versus 74.1 cm [IQR (44.3-170.4)] for manual cannulation, p=0.019. For robotassisted EVAR cases, median aorto-iliac centreline was 24.7cm (22.2-28.2), generating a median ER of 1.6 (1.2-2.1). Within the robotic case cohort, when heavy reliance on guidewire manipulation occurred, a shorter efficiency ratio was observed, indicating a learning curve effect with robotic technology.

Robot-assisted EVAR is feasible with increased predictability and efficiency for contralateral gate cannulation compared with conventional manual catheter techniques. The advantages of this technology could be maximised by prioritizing robotic catheter shaping over habituated reliance on guide wire manipulation.

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A systematic review of compliance with surveillance after Endovascular Aneurysm Repair (EVAR)

MJ Grima I Loftus P Holt M Thompson A Karthikesalingam St George's Vascular Institute, London

Endograft surveillance following EVAR is universally recommended after EVAR, but evidence increasingly suggests that compliance with imaging protocols is poor. This systematic review aimed to quantify the published rate of compliance with surveillance after EVAR, and assess the evidence relating mortality or reintervention with compliance in postoperative imaging programmes.

A systematic review was performed to identify studies reporting compliance with surveillance after elective infrarenal EVAR. The inclusion criteria specified studies reporting compliance with a post-EVAR surveillance protocol, defined by attendance during a specified temporal window in which scanning data were available. The primary outcomes were all-cause mortality and endograft-related reintervention for compliant or non-compliant patients. Meta-analysis of proportions was performed.

Thirteen studies were identified, reporting 185,036 patient-years follow-up in 19 countries between 1996 and 2013. A meta-analysis of proportions demonstrated that compliance rate was 49.73% (95% C.I. of 44.73% to 54.72%) at a mean follow-up of 4.02 +/- 1.5 years after EVAR.

Two studies (12,321 patients) noted that re-intervention rates were significantly higher in patients who were compliant with surveillance, while 3 studies (626 patients) showed no difference in the rate of reintervention in compliant or non-compliant groups. No studies reported an association between compliance with surveillance and mortality.

Compliance with post-EVAR surveillance is concerning, and the evidence linking compliance with mortality or reintervention is inconsistent.

The role of simulation in Endovascular Aneurysm Repair (EVAR) training

T Calderbank MJ Bown RD Sayers D Sidloff RSM Davies A Saratzis Department of Cardiovascular Sciences and Leicester NIHR Cardiovascular Biomedical Research Unit, Leicester University, Leicester

Endovascular Aneurysm Repair (EVAR) requires a high-level of technicalcompetency to avoid device-related complications. Virtual reality simulation based training (SBT) may offer an alternative method of psychomotor skill acquisition; however, its role in EVAR training is undefined. This study aimed to: a) benchmark competency levels utilising EVAR SBT, and b) investigate the role of supervised SBT on trainees' performance.

EVAR procedure-related metrics were benchmarked by 6 experienced consultants using a Symbionix Angiomentor® EVAR-simulator. Sixteen vascular surgical trainees performing a comparable EVAR before and after structured simulation based training (SBT) (>=4 teaching sessions) were assessed utilising a modified Likert-scale score. These were benchmarked for comparison against the standard set by the consultant body.

Median procedural-time for consultants was 45 minutes (IQR:7.5). A significant improvement in trainee procedural-time following SBT was observed [median procedural time 77 minutes (IQR: 20.75) vs. 56 minutes (IQR: 7.00) (p<0.001)]. The mean (2SD) trainee Likert score pre- and post-SBT improved [16.6 (SD:1.455) vs. 28.63 (SD:2.986) (p<0.001)]. Fewer endoleaks were observed (p<0.0063) and trainees chose an appropriately-sized device more frequently following SBT.

This study suggests that EVAR-SBT should be considered as an adjunct to standard psychomotor skill teaching techniques for EVAR within the vascular surgery training curricula.

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Compliance with Surveillance following Endovascular Aortic Aneurysm Repair

I Roy S Vallabhaneni On behalf of LiVES Liverpool Vascular & Endovascular Service

Surveillance is considered essential after EVAR, but difficulties in achieving compliance have been commented upon as a significant barrier.

In our institution one whole-time-equivalent administrator manages the EVAR programme and surveillance. The administrator organises all appointments, coordinated for the same day whenever possible and contacts patients that fail to attend. Surveillance is transferred if they relocate and discontinued if they become too frail to have a secondary intervention. EVAR co-ordinator also ensures that significant findings are reviewed.

We performed a retrospective service review of compliance with surveillance following standard EVAR. All EVAR patients enrolled into our local surveillance programme after EVAR between 2008 and 2015 were included.

Of the 553 patients enrolled into surveillance, 130 (24%) died while on surveillance and 21(4%) were discharged due to frailty or relocation. The remaining continue to be invited for surveillance and have completed a total of 1382 patient surveillance-years with a median follow-up of 34 months (IQR 16-50 months). A total of 1930 surveillance visits were indicated during the period, of which 1795 were taken up representing a compliance with 93% of appointments. Only 34 (6%) patients were lost to follow-up, defined as missing their last two surveillance visits. Utilisation of plain film radiography was better than DUS or CTA, which were additionally affected by patient suitability (BMI & renal function).

Excellent compliance with EVAR surveillance is achievable within a large volume institution with dedicated administrative support. Poor compliance with surveillance, if noted, is a remediable problem.

Abstract Session 2

Renal Function after Endovascular Aneurysm Sealing (EVAS) using the NELLIX aortic stent graft

SS Bahia BA Ozdemir F Ahmed-Jushuf C Jenner JL De Bruin MM Thompson St George's Vascular Institute, London

Previous studies have reported that, after conventional EVAR, 18% of patients have a clinically significant deterioration in their renal function at 12 months. The aim of this study was to prospectively evaluate the trend in renal function for patients undergoing EVAS at one-year follow-up.

All patients undergoing EVAS in a single vascular surgery unit were evaluated during the period March 2013 to September 2014. 125 patients underwent EVAS during this period, 87 were included in the analyses after exclusion of emergency or non-infrarenal aneurysm repair.

All patients were followed up prospectively to at least 12 months with baseline renal function, renal function at discharge and renal function at 12 months prospectively recorded and evaluated.

Mean creatinine concentration (P< 0.0001), Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) values (P<0.001) and Modification of Diet in Renal Disease (MDRD) values (P=0.0002) differed statistically significantly between time points; all of these parameters had deteriorated at 12 months.

There was a statistically significant increase in creatinine concentration (p<0.0001), and a decrease in CKD-EPI (p=0.0042) and MDRD (p=0.002) compared to pre-operative values.

Creatinine increased by a mean of 11.5 mol/L resulting in a decrease in CKD-EPI of 4.57 ml/min per 1.72 m^2 and MDRD of 6.38 ml/min per 1.73 m^2 .

A shorter aortic neck length at the time of surgery was not associated with renal function deterioration.

There was a statistically significant deterioration in renal function at 12 months for patients undergoing EVAS, with a mean creatinine increase of 11.5 mol/L. There was no association with aortic neck length at the time of surgery.

Endovascular management of Visceral Artery Aneurysms and Pseudo aneurysms

Mr Viruthagiri Dr Wijesinghe Mr Kay Dr Duddy Mr Vohra Queen Elizabeth Hospital, Birmingham

Visceral artery aneurysms and pseudo aneurysms although uncommon can present with life threatening emergencies. They are being increasingly incidentally diagnosed due to widespread use of abdominal imaging. Endovascular management comprises either aneurysm exclusion using covered stents, or (aneurysm) occlusion using coils, glue, particles or a combination of these.

This is a retrospective study of 53 aneurysms treated in 50 patients between 2008 and 2015 in a single centre teaching hospital. All therapeutic procedures were performed in the interventional radiology suite. Electronic medical records were reviewed for demographic data and clinical variables.

Among the 50 patients, there were 29 males (58%) and 21 females (42%). 27 (51%) of the patients had pseudo aneurysms and 26 (49%) had aneurysms.

Anatomical distribution of the aneurysms included: 37 hepatic (70%), 12 splenic (23%), 1 coeliac, 1 superior mesenteric, 1 gastroduodenal and 1 transplant renal artery. 50% of patients had symptomatic aneurysms, of which 20 (80%) presented with rupture.

85% of patients underwent occlusion procedures and 15% exclusion procedures. Technical success was achieved in 48 (96%) of patients primarily. 5(10%) patients required subsequent intervention. 4 patients died within 30 days (8%), of which 3 had ruptured pseudoaneurysms following major abdominal operations. Overall 8 patients died in the follow up period.

Visceral artery aneurysms and pseudo aneurysms can be treated successfully with endovascular means both in the elective and emergency scenario. Majority of patients are suitable for occlusion procedures without significant organ ischemia. Patients who had ruptures carried a higher mortality.

Endovascular aneurysm sealing with chimney grafts – outcomes from the first 50 cases at a single institution

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Chimney grafts are stents that are placed parallel to an aortic stentgraft to maintain perfusion through vital aortic branches. When used in combination with conventional endovascular aneurysm repair (EVAR), there is a significant risk of type 1 endoleak due to "guttering". In combination with endovascular aneurysm sealing (EVAS), this risk is likely to be reduced due to the fact that the polymer within the endobags conforms to the shape of the chimney stents, whilst maintaining a proximal seal at the aneurysm neck. EVAS with chimney stents (ChEVAS) may therefore represent an alternative to fenestrated EVAR (FEVAR) for the treatment of juxtarenal abdominal aortic aneurysms (AAA).

Detailed pre-, peri- and postoperative data were collected prospectively for each patient undergoing the ChEVAS procedure.

Of the 50 patients, there were 9 women and 41 men. The mean age was 72 years. All patients had juxta- or suprarenal AAA or infrarenal AAAs with short, hostile necks unsuitable for treatment with conventional EVAR. 6 patients underwent ChEVAS to treat type 1a endoleaks following EVAR and 1 patient was treated for a type 1a endoleak following distal migration of an EVAS device. A mean of 1.58 chimney grafts were inserted in each ChEVAS procedure. Angiography at the end of the ChEVAS procedure demonstrated technical success in 98% of cases.

ChEVAS is an effective treatment for juxtarenal AAA, particularly for those patients with aneurysms unsuitable for FEVAR or those requiring urgent treatment. These data form part of the international, multicentre ASCEND registry, results from which will allow us to determine the long-term efficacy of this new approach.

Efficacy of Relining Previous Endovascular Aortic Grafts using Endovascular Aneurysmal Sealing (EVAS)

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EVAS is a novel technique for treating abdominal aortic aneurysms, but relining of previous EVAR to treat type 1a/b and 3b endoleaks remains unproven.

Retrospective single centre observational study performed between December 2013- 2015 included patients in whom previous EVAR had been relined with EVAS. Data collection included demographics, indications, operative details and clinical outcomes. Follow up included duplex and CTA at 30 days, 6, and 12 months. Primary outcomes were successful deployment and resolution of endoleak. Secondary outcomes included peri-operative complications and secondary interventions.

Seven patients, (6 males, mean age 82.5 years) underwent EVAS relining of previous EVAR for three suspected and 1 proven type IIIb endoleaks, and 3 confirmed type Ia endoleaks. In total 13 Nellix devices were successfully deployed (1 aorto-uni-iliac). All 3 type Ia endoleaks were eradicated using proximal extension through chimney EVAS (5 renal and 2 SMA vessels) with no target vessel loss. There were no peri-operative deaths. Four patients had complications including UTI, AKI, stroke (recovered) and groin AVF requiring surgical intervention. Early post-operative surveillance indicated all type Ia endoleaks remained treated (1-10 months); the proven type IIIb had a stable sac dimension at 1 year; but, of the 3 suspected type IIIb cases, 2 had continued sac expansion (10-12mm) and one remained static.

EVAS can safely and effectively reline previous EVAR stent grafts and may successfully treat type Ia and IIIb endoleaks. Chimney techniques may prove useful adjuncts however, type IIIb endoleak diagnosis remains challenging.

Hybrid repair of the arch and proximal descending thoracic aorta; factors affecting survival and aortic re-intervention

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Understanding factors which impact upon survival and aortic re-intervention after hybrid repair of aortic arch aneurysms is important to further refine the technique.

A prospective database analysis of 55 patients undergoing arch hybrid repair over 10-years was conducted. Patient demographics, pathological and procedural details, survival and re-intervention rates were collected. Multivariate logistic regression analysis identified factors associated with survival and aortic re-intervention

Mean follow-up was 74.6months, with one-year survival of 70%. Factors associated with an increased mortality at one year included pre-operative renal failure (OR 64.5 (95% CI 1.33-3141.31) p=0.036) and single-stage procedures (OR 23.4 (95% CI 1.23-447.36) p=0.036). Overall rate of aortic re-intervention was 18% at one year and 36% at five years. Factors associated with re-intervention at five years included a zone 0 landing zone (OR 12.258 (95% CI 1.10-136.07) p=0.041) and a zone 1 landing zone (OR 19.415(95% CI 1.86-202.19) p=0.013). Landing in zone 1 of the arch was associated with an increased risk of endograft related re-intervention (OR 15.47 (95% CI 1.10-217.91) p=0.042). Endograft related re-interventions in the entire group were: type 1a-5.7%; type 1b-11.4%; type 2-11.4% and type 3-3.8%.

Long term survival after hybrid repair of the arch is acceptable overall but significantly decreased in patient with renal failure. Consideration should be given whether to perform a single or staged procedure. Placing the endograft more proximally in the arch is associated with an increased risk of re-intervention for endograft specific and non-specific complications, however, there is not an increased risk of type 1a endoleak.

Feasibility and accuracy of transthoracic duplex ultrasound evaluation of distal arch and descending thoracic aortic pathology

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Duplex ultrasonography (DUS) is the preferred modality for screening and surveillance of abdominal aortic aneurysms. The limitations of this modality have to date limited its applicability in diagnosing or monitoring thoracic aortic pathology. This study investigates the utility of DUS in detecting thoracic aortic pathology and aimed to present a protocol for DUS in the thoracic aorta.

This was a prospective, case-control cohort study. Patients with CTconfirmed thoracic aortic pathology underwent DUS of the thoracic aorta, according to a novel protocol. A control group known to have no thoracic pathology also underwent DUS. The operator performing DUS was blinded to CT findings, and recorded the presence of pathology if this was directly visualised as well as the diameters. Cut-off points of 35mm and 40mm were compared.

19 subjects were identified; 19 cases 20 controls. All patients had a technically adequate assessment of the thoracic aorta (at least one view of the descending thoracic aorta). If a threshold of 40mm were used then 16/19 cases would have been recommended for definitive imaging and 2/20 controls. If a cut-off of 35mm was used then this became 19/19 cases and 6/20 controls. Sensitivity and specificity were 100% and 70% for a threshold of 35mm and 84% and 90% for a threshold of 40mm.

DUS has the potential to diagnose thoracic aortic pathology, and may have a role in surveillance for some patients in who CT scanning should be avoided. Further validation of this technique are required, although this study provides proof of concept.

Cerebral Embolic Protection in Thoracic Endovascular Aortic Repair (TEVAR)

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Stroke occurs in 2-10% and silent cerebral infarction (SCI) in 70% of patients undergoing thoracic endovascular aortic repair (TEVAR). SCI is associated with a 2-4-fold increase in risk of future stroke, dementia and cognitive decline.

The Sentinel Cerebral Protection System (SCPS) is a cerebral embolic filter device (CEPD) that protects the innominate and left common carotid artery during intervention.

This study investigates the feasibility and safety of using a CEPD in patients undergoing TEVAR.

Patients anatomically suitable underwent TEVAR with SCPS, together with intra-operative transcranial Doppler (TCD) of the middle cerebral arteries (MCA), pre- and post-operative diffusion weighted magnetic resonance imaging (DW-MRI), neurological examination and pre, post and 6- week neurocognitive testing to detect sub-clinical neurological deficit. Four patients, mean age 65yrs underwent TEVAR with SCPS. Proximal landing zones were 2,3. Atheroma grade of the aortic arch was 1,2.

TCD was performed and high intensity transient signals (HITS) were detected in 3 cases. Maximum HITs were detected during stent manipulation and deployment (76,62,36), contrast runs (25, 114, 69).

There were no post-operative strokes. Two patients had no new lesions on post-operative DW-MRI, 2 patients had new low volume SCI lesions. Female 1: 5 lesions, 15.2mm². Male 2: 3 lesions, 25.2mm². There was no neurocognitive decline postoperatively or at 6-weeks.

In comparison, previous unit data showed in 31 patients undergoing TEVAR and MRI without CEPD, cerebral infarction was detected in 81%: 68% SCI and clinical strokes 13% with median lesion volume 164mm² (IQR 108.64-1328.30mm²). There was an 88% neurocognitive decline in patients with SCIs.

This is the first study to report use of CEPD in TEVAR. It appears safe and feasible with encouraging early results.

Impact of hospital volume on outcomes following treatment of thoracic aortic aneurysms and type-B dissections

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The association between hospital-volume and outcomes in patients with descending thoracic aortic aneurysms (DTAAs) and type-B thoracic aortic dissections (TBAD) is unknown. We aimed to investigate this in a literature review and meta-analysis.

A systematic review of the literature was performed to identify studies reporting mortality and morbidity following repair (elective or emergency) of DTAA and/or TBAD using the Medline and Embase Databases (2000-2015). Hospital-volume was assessed based on number of patients treated per institution: low volume (1-5 cases per year), medium volume (6-10), high volume (>10). Primary outcome of interest was all-cause mortality during inpatient-stay and at 30-days.

84 series of non-dissecting DTAA or TBAD were included in data-synthesis (4,219 patients; mean-age: 62 years; males: 73.5%). For all patients (emergency and elective) undergoing DTAA-repair, in-hospital mortality was 8% [95% Confidence Interval (CI): 6-8%]. Results were not superior in high-volume centres (8% vs. 6% vs. 11% for high, medium and low-volume, respectively). Sub-analyses for emergency and elective-repairs showed no differences. For TBAD-repairs, in the combined-population (emergency and elective) results reached borderline significance (p=0.0475), favouring high volume centres (6% vs. 11% vs. 14%) but this association disappeared when emergency and elective-repairs were analysed separately. No meaningful long-term comparisons were possible due to lack of data.

No associations were detected between hospital-volume and subsequent mortality following DTAA or TBAD treatment. Data were heterogeneous and long-term results were scarcely reported. A well-designed longitudinal study of sufficient size is required to inform future strategies in this area.

A comparison of quality of life in patients with thoracic aortic disease under surveillance and following Thoracic Endovascular Aortic Repair (TEVAR)

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There is a need to understand health-related quality of life (HRQOL) in patients with descending thoracic aortic disease (dTAD) to assess patient-centred care. This study investigates HRQOL in dTAD patients undergoing surveillance or TEVAR

Short Form-36 (SF36), EuroQol and Hospital Anxiety and Depression Scale (HADS) were administered to 100 patients: 40 undergoing surveillance; 40 following TEVAR (median seven months post-operatively); 20 undergoing TEVAR prospectively (pre-operatively, post-operatively, and at follow-up).

There was no difference in SF36 physical (surveillance:median 49, (interquartile range 39-54) vs. post-TEVAR:45 (IQR 37-53);p=0.577) and mental scores (surveillance:54 (43-58) vs. post-TEVAR:52 43-58);p=0.711) between surveillance and post-TEVAR groups. There was no difference between the groups for HADS anxiety (surveillance:4 (2-7) vs. post-TEVAR:3 2-6);p=0.628) or depression scores (surveillance:2 (2-6) vs. post-TEVAR:3 2-5);p=0.934). In surveillance patients, age was associated with increased HADS anxiety (p=0.01). In post-TEVAR patients, age (p=0.001) and hypercholestrolaemia (p=0.001) were associated with poor SF36 physical scores. Re-intervention was a risk factor for post-operative anxiety in the prospective group (p=0.038) and for depression (p=0.02) in the post-TEVAR group. In the prospective group, SF36 physical scores were lower than population norm scores pre-operatively (p=0.002), post-operatively (p=0.000) and at follow-up (p=0.000).

Increased anxiety or depression levels while patients are under surveillance for dTAD may not be a valid concern. Undergoing TEVAR does not appear to decrease HRQOL compared to continued surveillance, although reintervention is associated with increased anxiety and depression. This information may aid clinicians in determining the optimum timing for intervention, particularly in relation to small thoracic aneurysms.

Aortic Prize Abstract Session

Multicentre Post-EVAR Surveillance Evaluation Study (EVAR-SCREEN)

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Surveillance imaging is considered mandatory after Endovascular Aneurysm Repair (EVAR) but many patients are lost to follow-up and the benefit of surveillance is poorly understood. This study aimed to define attendance at post-EVAR surveillance, rates of deliberate removal from surveillance, and the impact of non-compliance with surveillance on reintervention rate or mortality.

EVAR-SCREEN centres reported EVAR for non-ruptured infrarenal AAA from 1/1/2007 to 31/12/2010, censoring follow-up on 31/7/2014. The primary outcomes were re-intervention for endograft-related complication, AAA-related mortality or amputation, and all-cause mortality. Secondary outcomes included non-compliance with surveillance or deliberate withdrawal of the patient from the local surveillance protocol. Noncompliance was defined by an 18-month period in which no surveillance imaging was performed; and was reported using Kaplan-Meier analysis. Cox Proportional Hazards modelling was performed to identify predictors of poor compliance with surveillance.

1539 patients underwent EVAR in 10 EVAR-SCREEN centres. 5 years after surgery, 39.7% of patients (95% CI 37.2-42.5%) remained compliant with surveillance, while 21.4% (95% CI 18.8-23.9%) were deliberately removed from surveillance. Non-compliant patients were more likely to undergo reintervention (5-year freedom from reintervention 76.6% vs. 62.7% in compliant/non-compliant patients, p<0.001) but demonstrated equivalent all-cause mortality (5-year survival 65.6% vs 54.7%, p=0.505, log-rank test). Age (HR 1.027, 95% CI 1.003-1.052, p=0.026) and distance from hospital (HR 1.009, 95% CI 1.006-1.013, p<0.001) were independent predictors of non-compliance with surveillance.

The majority of patients are non-compliant with surveillance after EVAR. This is associated with greater re-intervention rate but not all-cause mortality.

Endovascular aortic repair is associated with activation of markers of radiation induced DNA damage in both operators and patients

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Standard dosimetry records cumulative radiation exposure in patients/ operators during endovascular aortic repair (EVAR) but does not inform the biological consequences of this exposure. The aim of this study was to measure biomarkers of radiation exposure during EVAR.

Lymphocyte counts and dose area product (DAP) were recorded in patients/ operators undergoing EVAR. Markers of DNA damage (c;H2AX and pATM) were measured peri-operatively in circulating lymphocytes during open, infrarenal (IEVAR) and complex (branched/fenestrated [BEVAR/FEVAR]) aortic repair. Inter-operator radiation sensitivity was determined by measuring c;H2AX/pATM in blood samples exposed to radiation (100-1000mGy).

The fall in patient lymphocyte count was greater after endovascular (n=118) compared with open repair (P<0.0001, n=35), with prolonged (~2-fold) count recovery after EVAR (P=0.007). There was ~5-fold increase in c;H2AX and pATM in patients immediately after IEVAR and BEVAR/FEVAR (P<0.005 for both;n=48), and in operators immediately after BEVAR/FEVAR (P<0.01 for both;n=14), but not IEVAR.

DAP correlated with c;H2AX rise (P<0.02) in patients after EVAR. The c;H2AX/pATM levels had normalised for all patients/operators after 24hrs. c;H2AX/pATM did not rise in either patients or operators after open surgery. Inter-operator (n=6) radiation sensitivity varied significantly (repeated measures 2way-ANOVA, P<0.007).

Our biodosimetry assays suggest DNA damage occurs in patients and operators after EVAR and may be more relevant for gauging the consequences of radiation exposure than standard dosimetry that currently dictates "safe" exposure levels. A better understanding of the processes that increase c;H2AX/pATM and their relation to the lifetime-attributable risk of cancer is important for both operator and patient safety.

Failure to rescue and mortality from abdominal aortic aneurysm repair is associated with hospital staffing and volume

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Failure-to-rescue (FTR) after complications, rather than the complications per say, drive surgical mortality. This study investigated if FTR underscores the variation in mortality of AAA repair patients and whether modifiable differences in trust structures are associated with FTR.

Elective or emergency AAA repair patients (2005-2010) were extracted from the English NHS Hospital Episode Statistics data warehouse (n=26841). Trusts in the risk adjusted top and bottom 20% of the Poisson distribution for 90-day death were classified as "highest" and "lowest" mortality. Complication and FTR rates were compared. Similarly trust level variables were compared between highest and lowest FTR categories, and tested for association with FTR.

FTR rates, but not complication rates, were significantly lower in Trusts with the lowest death rates after AAA repair. In multifactorial models, FTR rates after surgical complications were highest in the lowest tertile of AAA repair volume (Odds Ratio 1.264 [95% CI 1.038-1.540], p=0.0120) and consultant doctor staffing (1.350 [1.107-1.646], p=0.0031). FTR rates after medical complications were higher in the lowest tertile of AAA repair volume (1.618 [1.417-1.848], p<0.0001) and CT utilisation (1.227 [1.077-1.399], p=0.0022).

Death rates after elective and emergency AAA repair are more influenced by FTR rates than complications rates. FTR appeared to be affected by structural and process factors within hospitals that could provide targets for quality improvement. The volume of AAA repairs undertaken remains a significant determinant of outcome for both FTR and death rates.

Endovascular repair for acute thoracoabdominal aneurysms

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Open repair for acute thoraco-abdominal aneurysm (TAAA) is associated with high morbidity and mortality and is restricted to young fit patients. We report the outcome of endovascular repair (EVAR) for acute TAAA and assess the applicability of the T-Branch off-the-shelf (OTS) device for this group of patients.

Interrogation of a prospective database identified 39 patients (27 men; mean age: 72±8 years; 10 rupture, 29 symptomatic; 14 mycotic) who underwent EVAR for acute TAAA between September 2012 (our first nonelective T-Branch case) and November 2015. Mean aneurysm diameter was 80±20mm. Twenty patients had extent I-III and 19 had extent IV aneurysms. Median follow-up was 11 months.

Surgeon-modified fenestrated EVAR was used in 24 patients, two were treated with chimney/periscope EVAR, and 13 (33%) were suitable for T-Branch. A total of 127 target vessels (TV) were targeted for preservation (3.2/patient) and two occluded within 30-days. The 30-day mortality was 26%. Two patients developed paraplegia and both died. Actuarial survival at 12 and 24 months was 71% and 53%, respectively. Actuarial freedom from re-intervention at 12 and 24 months was 77% and 71%, respectively.

EVAR for acute TAAA is associated with acceptable early and mid-term results compared with open repair. Only one-third of acute TAAA patients were suitable for the T-Branch device. Further advances in device design are required to treat the majority of acute TAAA patients with OTS technology.

The Threshold for Aortic Aneurysm Repair and its Association with Aneurysm-Related Mortality: Lessons from International Discrepancies in Practice

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There remains considerable international variation in the threshold for abdominal aortic aneurysm (AAA) repair. This study examined whether differences in the prevalence or diameter for AAA repair might be associated with international discrepancy in AAA-related mortality.

Frequency data for intact AAA repair were extracted from English Hospital Episode Statistics and the USA Nationwide Inpatient Sample, 2005-12. AAA diameter at repair was extracted from the English National Vascular Registry (2014), and the USA National Surgical Quality Improvement Programme (2013). AAA-related mortality was determined from USA Center for Disease Control and English Office of National Statistics 2005-12. Prevalence for AAA of given diameter was extracted from the English National AAA Screening Programme 2009-14. International comparisons were performed after age/gender standardisation or conditional regression.

29,300 English patients underwent intact AAA repair compared to 278,921 USA patients from 2005-12. Intact AAA repair was significantly more common in the USA (OR 2.058; 95%CI 2.033-2.083; p<0.0001) and AAArelated mortality significantly more common in England (OR 3.596; 95% CI 3.549-3.644; p<0.0001). The mean diameter for repaired AAA was larger in England (6.37cm vs 5.83cm, p<0.001). English screening data revealed that AAAs at the mean diameter for repair in the USA were almost twice as prevalent as AAAs at the mean diameter for repair in England (48 vs 76 per 100,000).

A greater rate of AAA repair at lower mean diameter was associated with lower AAA-related mortality in the USA. The international discrepancy in AAA-related mortality is concerning, and potentially explicable by surgical activity.

Outcomes are worse for RAAA patients who present at the weekend

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It is widely debated whether hospital treatment at the weekends compared to weekdays is associated with poorer outcomes. Previous findings have shown that patients admitted during weekends are at increased risk of dying compared to weekday admissions. We specifically compared survival of patients with repair of ruptured abdominal aortic aneurysm on weekdays and weekends.

Between January 2006 and December 2015 241 patients underwent emergency endovascular or open repair of ruptured abdominal aortic aneurysms. Patients were divided into two groups by day of operation. Group 1 had weekday surgery and Group 2 underwent weekend operations, defined as intervention between Friday 5pm and Monday 9am. The 30-day mortality and longer-term survival were compared between the two groups.

The 30-day mortality of patients in Group 1 was less than those patients in Group 2, 20.1% and 31.1% respectively (p=0.06). The median long-term survival for Group 1 was statistically better at 581 days (IQR 78-1642 days) compared to 280 days (IQR 5-1447 days) for Group 2 (p=0.02).

Outcomes for RAAA appear to be worse for patients who present at weekends than for those who present in the week. The explanation for this difference is likely to be multifactorial and requires further study. Current arrangements for the emergency care of RAAA at weekends in the UK may be inadequate.

Abstract Session 3

Aneurysm CaRe – Pilot RCT of "Cardiac Rehabilitation vs. Standard Care" after Aortic Aneurysm Repair

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5-year survival after infrarenal AAA repair stands at only 69%; the majority of deaths are caused by heart attack or stroke, which can both be reduced by Cardiac Rehabilitation (CR) in patients with clinically manifest coronary artery disease. It is not known whether CR might benefit survivors of AAA repair, or whether CR is feasible or acceptable to these patients.

Aneurysm CaRe is a feasibility, pilot randomised controlled trial of CR versus Standard Care (SC) after AAA repair; the primary objective was to estimate enrolment to a trial of CR. Secondary outcomes included phenotypic markers of cardiovascular risk and smoking cessation. Patients discharged from two large vascular units after elective AAA repair were randomised to SC or enrolment into a CR programme with a protocolised approach to medical cardiovascular risk reduction.

139 patients were approached for consent; 77 were enrolled into the trial, 72 declined to participate in the study. Of the 77 enrolled patients, 33 were randomised to standard care and 34 to CR, giving an enrolment rate of 48% (95% CI, 39-56). The mean age of enrollees was 73.88 years (SC) versus 73.18 years (CR); 21.1% (SC) versus 23.5% (CR) of patients enrolled had previously had a myocardial infarction (MI). All patients were followed up to 6 months postoperatively.

This pilot feasibility has demonstrated the feasibility and acceptability of CR after AAA repair with 48% of patients consenting to enrolment; further work is required to develop a model for delivering secondary preventative measures that is acceptable to a wider number of these high-risk patients.

Social Deprivation and attendance for AAA screening: What are we missing?

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Social Deprivation is a multifactorial issue including health, wealth, education, exposure to crime and barriers to housing. Social Deprivation has previously been linked to health seeking behaviours therefore, we aimed to analyse the association of social deprivation with AAA prevalence and screening attendance in England.

Consent was gained to analyse the NHS abdominal aortic aneurysm screening cohort (2013-2014). Individual patient demographics were extracted from which deprivation scores were derived in all patients with census data. Mean index of multiple deprivation (IMD) scores were calculated and analysis of variance performed. IMD scores were ordered into quintiles and compared with screening outcomes.

Attendance for AAA screening was significantly associated with social deprivation (IMD) scores (P=0.0001). Men attending for screening found to have an AAA had higher mean IMD scores than those without AAA (21.0, 95%CI 20.4-21.5 vs 18.3, 95%CI 18.27-18.38). Men who declined screening (IMD 21.3, 95%CI 21.0-21.6), those who did not attend their appointment (IMD 24.1, 95%CI 24.1-25.2) and those who had died since being invited for screening (IMD 24.7, 95%CI 24.1-25.2) all had higher deprivation scores then those attending for screening. For each quintile increase in IMD scores, the prevalence of AAA increased (1.01%, 1.16%, 1.28%, 1.41%, 1.69%, P=0.0001).

Social deprivation is associated with non-attendance for aneurysm screening and an increase in aneurysm prevalence. Targeting men who do not attend may identify more men with aneurysms; however, they may benefit the least from screening due to competing mortality risks.

Operative strategies for emergency repair of ruptured AAA: The impact of the IMPROVE trial on practice in a tertiary UK centre

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The IMPROVE trial was designed to investigate the use of EVAR in the setting of ruptured AAA. Despite equivalent results for 30-day survival, evidence suggests the pattern of use of EVAR in the setting of rupture has changed in the post-IMPROVE era. This study investigated how practice and AAA related outcomes have changed in one high volume tertiary vascular centre.

Ruptures treated between January 2010-October 2015 were reviewed retrospectively for intervention type, age at time of surgery, gender, length of stay, post-operative survival and aneurysm specific mortality. Kaplan-Meier survival function and statistical comparisons were performed using SPSS v.20.

138 patients were operated on for ruptured AAA between these dates (mean age 77, range 51-97, M:F 17:3).

44 patients underwent surgery prior to IMPROVE, 12 patients as part of the trial, and 82 post-IMPROVE. Overall 30-day survival was 65%, significantly better for EVAR compared to OR (Open 56%, EVAR 80%. P=0.005). 30-day survival was similar between time-points. Pairwise comparisons confirmed increased uptake of EVAR for rupture in the period after IMPROVE (p=0.03). Significant differences were also noted for mean length of stay pre (13 days, 95% CI 8.91-17.45) and during IMPROVE (6.25 days, CI 2.74-9.76, p=0.03) and during and post-IMPROVE (18.76 days, CI 9.03-28.48, p=0.04).

Although IMPROVE didn't support use of general anaesthetic EVAR to improve 30-day survival, findings from our vascular centre demonstrate the influence IMPROVE has had on vascular decision-making. Longer length of stays may reflect improved 30-day survival associated with the increased use of EVAR in this centre.

Pre-operative psychological wellbeing and quality of life in patients undergoing Aortic Aneurysm Repair; an important consideration for improving outcomes?

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Social and psychological factors have been shown to have a significant impact on outcomes in major surgery but there is little literature on the psychological wellbeing of patients undergoing aneurysm repair and the potential impact on outcomes.

25 patients undergoing elective aortic aneurysm repair were assessed pre-operatively with the Hospital Anxiety Depression Scale (HADS) and Short Form 36 Quality of Life Questionnaire (SF36); validated assessments of quality of life and mental health. Patients were subsequently interviewed by a clinical psychologist using a Cognitive Behavioural Therapy (CBT) approach. Interviews were recorded and themes were subsequently extracted.

The average age of the cohort was 72.6 years (49-87), and 20/25 (80%) were male. Five patients were due to undergo open (20%) and 20 endovascular repair (80%). 9/25 (36%) were dependent on social care. Mean HADS-depression score was 4.5 (standard deviation 0-13) with 3/25 (12%) of patients scoring >8. Mean HADS-anxiety score was 5.83 (0-18) with 7/25 (28%) of patients scoring >8. On average patients reported low mental wellbeing scores on the SF36-49.75 (62.5). Interview themes comprised of feelings of anxiety and depression relating to both general life stresses and their health including their aneurysm.

Patients undergoing elective aneurysm repair have a significant burden of anxiety and perceived impairment to mental wellbeing. High levels of anxiety and depression may negatively impact outcomes. Addressing the mental well-being of patients prior to aneurysm repair may help improve outcomes, perhaps through a psychological pre-habilitation programme in aneurysm surgery.

Cardiovascular risk-factor management in patients with an abdominal aortic aneurysm (AAA) in the NHS AAA Screening Programme

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Patients with a small abdominal aortic aneurysm (AAA, diameter<55mm) are at significant risk of cardiovascular (CV) events, based on several studies. Several thousands of patients are diagnosed with a small AAA annually, since the nationwide implementation of the NHS AAA Screening Programme (NAAASP). This study aims to investigate whether CV-risk is adequately addressed in screening-units across the UK.

A nationwide online survey of NAAASP units was performed between December 2015-January 2016. This consisted of 10 questions; queries and incomplete data were assessed by contacting each unit separately.

Overall, 38 screening-units (84% national coverage) replied. All units perform an assessment of the patient's CV risk-factors, but none uses a standardized validated CV risk-score. Most units (68%) perform these assessments during the clinic-visit, when the patient is diagnosed with the AAA (face-to-face). 82% suggest an antiplatelet (63% Aspirin, 37% Clopidogrel), 87% a statin, and 52% anti-hypertensive treatment once diagnosis of AAA has been made. If a change to the patient's medication is decided, all units mail the general-practitioner (GP) but only 21% actually inform the patient. None actively monitor compliance with medication or NICE-guidance. 56% may refer to a smoking-cessation clinic and 89% offer lifestyle-modification advice, usually written (67%).

Practices vary significantly regarding CV risk-factor modification in UK screening-units for patients with small AAA. A uniform protocol based on best-quality evidence needs to be designed and implementation/feasibility needs to be tested in a subsequent study.

Aortic Diameter in England: What is normal?

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The definition of AAA is based on the diameter of the "normal" aorta. This study aimed to determine mean infra-renal aortic diameter (AD) in the NHS abdominal aortic aneurysm screening programme (NAAASP) by ethnicity and to test common definitions of AAA within each population.

Consent was gained to analyse the NAAASP cohort (2013-2014). Patient demographics and screening outcomes were extracted in patients with recorded Ethnicity and AD. Ethnicity was categorized using classifications from the UK Office of National Statistics. Prevalence (%) was calculated for each ethnic group using the following definitions of AAA; AD 50% greater than mean, AD greater than 2 standard deviations (SD) above mean and AD 3cm or more.

Mean AD was significantly different between ethnicities (P=0.0001). Mean AD in those who describe themselves as "White" was 1.8cm (0.37cm) compared to "Mixed" 1.76cm (0.37cm), "Black" 1.7cm (0.37cm), "Chinese" 1.66cm (0.26cm) and "Asian" 1.57cm (0.22cm). The prevalence of AAA using the current 3cm threshold was 1.36%, 1.59%, 0.73%, 0.20% and 0.24% in each of these groups respectively.

Using mean AD+50% to define an AAA altered the prevalence within each ethnicity to 1.94%, 1.59%, 0.99%, 1.63% and 0.61% which is higher than currently observed. Adjusting to mean AD+2SD changes the prevalence's to 2.30%, 2.89%, 2.00%, 2.67% and 1.64% which is again higher.

"Normal" aortic diameter and AAA prevalence differs by ethnicity. Targeted screening of high risk ethnic groups may reduce the cost of screening however further research is necessary to determine if a size threshold based definition detects all relevant disease in all groups.

Abstract Session 4

Predictors of outcome following Complex Infra-Popliteal Revascularisation in Octogenarians and Nonagenarians with Critical Limb Ischaemia

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The incidence of Critical Limb Ischaemia(CLI) is exponentially rising among our aging population. There is a paucity of scientific evidence on best management and predictors of clinical outcome following infra-popliteal (IP) revascularisation in elderly patients with CLI.

A prospectively collected database was analysed to identify consecutive octogenarians and nonagenarians who underwent IP revascularisation (bypass or angioplasty) for CLI(Rutherford4-6) in a single centre between 2010-2014. The primary endpoints were Overall-Survival(OS) and Amputation-Free-Survival(AFS) at 12-24 months. Secondary endpoints were primary, assisted-primary, secondary patency, freedom from Major-Adverse-Limb-Events(F-MALE), and Limb-Salvage(LS) rates by Kaplan-Meier analysis.

A total of 129 limbs in 120 patients were treated with IP bypass(n=42) and endovascular(n=87) revascularisation with a mean age of 85(±5)years (range80-96years). Perioperative mortality rate was 2%. OS and AFS were 68% and 62%, respectively at 12months; 54% and 46% at 24months. Analysed by treatment method, both OS and AFS were significantly better in the bypass-group(P<0.001). The overall primary, assisted-primary and secondary patency was 58%, 65% and 70%, respectively at 12months; 34%, 48% and 59% at 24months. There was no significant difference in primary patency(P=.66) and F-MALE(P=.86) between the bypass and endovascular group, though assisted-primary(P=.008) and secondary patency(P=.017) were better in the bypass group. LS was 89% at 12months and 84% at 24months, with no significant difference between the two modalities(P=0.24). Multivariate Cox-Regression identified low eGFR(P=.041;HR:0.98) and diabetes(P=.046;HR:0.58) as independent predictors of worse OS and AFS, respectively.

IP revascularisation (either endovascular or surgical) is feasible and effective in octogenarians and nonagenarians with CLI. Renal impairment and diabetes are predictors of poor outcome in this group of patients.

Outcomes of Hybrid revascularisaton of multilevel arterial disease in patients with critical limb ischaemia

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Hybrid revascularisation (HR) procedures combining open and endovascular techniques have been used to treat multilevel disease in patients with critical limb ischaemia (CLI). These techniques offer an alternative to complex or staged open revascularisation in this group of high-risk patients. The aim of this study was to examine outcomes following HR in patients with CLI.

Consecutive CLI patients treated by hybrid intervention at a single institution between 2012 and 2014 were analysed. All procedures were performed in a hybrid-operating suite to facilitate combined open and endovascular surgery at the same sitting. Postoperative outpatient duplex and clinical surveillance was conducted at 6weeks, 6months and yearly thereafter. The primary end-point was Amputation Free Survival (AFS) and secondary end-points were patency rates at 1 and 2 years.

164pts (34 female, median age 74yrs) with CLI classified as Fontaine IIb (n=62), Fontaine III (n=38) or Fontaine IV (n=64) were included, with 46pts (28%) treated as an emergency/urgent. 89pts required common femoral artery (CFA) endarterectomy combined with endovascular iliac intervention, 65pts had CFA endarterectomy combined with infra-inguinal endovascular reconstruction and 10pts had both supra- and infra-inguinal segments treated endovascularly together with open surgery. AFS was 98% and 96% at one and two years. Overall primary patency rates were 86% and 52% at 12mth and 24mths, with secondary patency, 90% and 56% at the same time points.

HR is feasible and safe in patients with CLI due to multi-level disease. Outcomes following HR are satisfactory with reasonable AFS even in this group of high-risk patients.

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Day Case EVAR: The Patient's View

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A move to a faster discharge from hospital after endovascular abdominal aortic aneurysm (EVAR) repair has been shown to be safe and cost effective in the small studies performed so far. However, little research has been done into the patient's perspective of this reduced inpatient stay. The aim of this study was to document pre-operative social circumstances and perceived health status, the patient's views on whether discharge within 24 hours would be feasible given the current provision of care and their view on what support would be needed if 23 hour discharge was routine.

A seven point questionnaire with both multiple choice and short answer questions was designed. Patients were identified by a search of hospital episode data showing those who had undergone EVAR in a set 24 month period. These patients were then called for a phone interview and invited to take part in the survey.

39 patients were interviewed. Of these, 22 reported they had a good functional capacity prior to their operation, lived independently but had a potential carer who could have been with them during the immediate post-operative period. However when questioned, only 3 of those patients felt they would have been able to go home on the first post-operative day.

A significant proportion of patients interviewed could potentially undergo EVAR with discharge within 24 hours. However, this would require a lot of work to change the mind-set of patients to prepare them for this early discharge.

Feasibility and outcomes of local anesthesia in ruptured endovascular aneurysm repair

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Previous retrospective studies and a post-hoc analysis of a large trial has shown a potential benefit in treating ruptured abdominal aortic aneurysms (rAAA) under local anesthesia (LA). The aim of this study is to assess feasibility and uptake of local anesthesia during endovascular treatment of rAAA in the United Kingdom.

We compared data from the National Vascular Registry for patients treated with EVAR for rAAA according to anaesthesia type. The primary outcome was 30-day mortality. Length of stay and postoperative complications were also evaluated.

During the study 267 patients with a rAAA were treated in 57 hospitals between January 2014 and January 2015, 16 hospitals did not offer treatment of ruptured aneurysms under local anesthesia. 122 patients (45.7%) underwent rEVAR under LA, 19 patients (7.1%) under regional anesthetic (RA) and 126 patients (47.2%) under general anesthesia (GA), baseline characteristics were similar amongst three groups and not significantly different. No statistically significant difference in 30-day mortality was observed between treatment groups. Mean Length of Stay (LOS) was not significantly different amongst the three groups; LA 12.8 days (95% CI 10.2-15.3) vs RA 14.3 days (95% CI 6.3-22.3) vs GA 13.1 days (95% CI 10.1-16.1), p-value 0.922.

Endovascular aneurysm repair under local anesthesia is feasible and safe with comparable 30-day mortality and outcomes when analyzing the prospectively collected data from the National Vascular Registry (NVR).

Aortic volume and diameter before and after EVAR. A simple analysis of volume can help with clinical decision making in selected cases

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Studies correlating aneurysm sac size, using different modalities, are limited. This study compares CT aneurysm volumetry to contemporaneous aneurysm diameter measurements on CT and US in patients undergoing EVAR.

Imaging for EVAR patients at a single centre (November 2011 – November 2014) were retrospectively reviewed. Analyses of pre-operative and three months post-operative scans were performed for each patient. AAA volume was measured from the slice immediately below the lowest renal artery to the slice at the aortic bifurcation. Transverse and anteroposterior images were obtained from the level of the suprarenal aorta above the graft to the distal external iliac arteries. Analyses were undertaken comparing CT volume pre and post op, CT volume versus diameter pre and post op and CT diameter versus US diameter. Kendall's Tau correlation, Bland Altman plots, limits of agreement and paired t-tests were used respectively.

62 patients were included. Mean pre and post operation diameters were 62.92mm (IQR 58mm-65mm) and 60.30mm (IQR 54mm-63mm). Mean pre and post operation volumes were 133.51ml (IQR 58ml-111ml) and 102.84ml (IQR 79ml-148ml). There was moderate correlation between CT diameter and CT volume post-op (Kendall's tau 0.59, p<0.001) Postoperation volume is significantly smaller than pre-operation volume (mean difference 32.0, 95% CI 17.9-46.0, p<0.001). Significantly higher diameters were recorded using CT compared to US (p<0.001).

AAA sac volume may provide a more accurate impression of the evolution of the aneurysm sac compared to maximum diameter.

12 years of fEVAR follow-up from a single UK centre

I Roy A Millen S Jones R McWIlliams J Brennan R Fisher S Vallabhaneni Liverpool Vascular & Endovascular Service

fEVAR is an established treatment of juxta & para-renal aortic aneurysms. The aim of this analysis is to assess long term outcomes from a single UK centre. We exclusively use the Cook Zenith Fenestrated device.

We performed an analysis of our prospectively maintained EVAR surveillance database augmented with matched data from our entries on the BSET GLOBALSTAR registry. Patients with any branched components or fenestrations as part of a thoracic aneurysm repair were excluded.

From 2003, 174 cases were performed until end 2015, all were included for analysis. Median; Follow-up was 34 months (IQR 18-75), Age was 76 years (IQR 70-79) & Aneurysm size was 59mm (IQR 59-70).

Combined Inpatient & 30 day mortality was 5.1%. Kaplan Myer analysis shows 1, 5 &10 year all-cause mortality to be 9%, 39% & 69% respectively. Reintervention free survival was 85%, 56% & 27% at 1, 5 & 10 years. 40 (23%) of patients required at least one reintervention in the analysed follow-up.

Target Vessel patency was 99%, 98% & 97% at 1, 5 & 10 years.

Long term survival following fEVAR remains poor, mainly due to co-morbid patients. Reinterventions are common but can maintain high target vessel perfusion rates. Catastrophic loss of target vessels are rare. Our outcomes are comparable to published international series and UK registry data.

Robotic versus manual renal cannulation during FEVAR: A comparison of efficiency

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Pre-clinical and early clinical experience with robotic catheter systems has highlighted potential advantages during complex endovascular manipulation. We aimed to assess the efficiency of robotic renal cannulation during fenestrated endovascular aortic repair (FEVAR) against conventional manual techniques.

Twenty-one consecutive FEVAR cases performed at a single institution were studied. Fifty-seven renal cannulations in total were assessed using fluoroscopic video-recordings and a novel motion tracking analysis software. Total catheter-tip path-length(PL) cannulation times were recorded by a single observer, and comparisons between robotic (n=25) versus manual (n=32) techniques were made using non-parametric statistical tests. Comparisons of renal vessel angulation and degree of ostial stenosis were performed between vessels cannulated using the differing techniques.

Overall, there were no significant differences in renal angulations or the degree of ostial stenosis between the two study groups. There were five successful manual to robotic conversions, and one robotic to manual conversion. Median PL for robotic cannulations was significantly shorter compared to the manual approach: 49.9 cm (IQR 31-93.9) versus 84.2 cm (42-191.4);(p = 0.044). No differences in cannulation times between robotic (6.38 min(3.6-13.3) and manual (4.8 min(2.35-11.47) manipulation strategies were seen (p = 0.27).

Robotic renal cannulation during FEVAR leads to significant reductions in PL with a narrow IQR, which reflects predictability and accuracy of navigation, crucial to avoid vessel injury and embolization. The conversion rate highlights how robotic assistance may benefit current complex endovascular interventions.

A decade of patient safety (Datix) reporting in Elective Aortic intervention directs team training across the patient pathway

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The National Reporting and Learning System has collated >6million patient safety reports 2003-2013. This study explores error reports involving elective aortic patients.

A systematic search using terms pertaining to aortic practice was performed. Independent researchers categorized reports according to failure and harm using WHO classification and modified medication error index. A standardised conceptual framework was applied to identify themes.

6,750 reports were retrieved of which 1180 were elective aortic-448 preoperative, 321 intraoperative, 411 postoperative. The dominant failure categories were Medical devices (21.1%), Clinical processes (20.8%) and Resource Management (19.5%)- agreement Kappa >0.7

939 events reached the patient, 361 causing harm (30.6%). Of the non-fatal harming events, 64.5% were attributed to process and device failures.

Harming clinical processes (114/361) were primarily procedure-failures (38.6%), including avoidable complications requiring re-interventionbleeding, thromboembolism or gastrointestinal obstruction. General management errors accounted for 32.5% of harmful processes including inadequate patient observations, failure to follow postoperative instructions and non-escalation of care.

Intraoperative mobile imaging failure/malfunction accounted for 22.1% of medical device errors (86/361). This resulted in 8 cancellations, another 4 persevered with >1hour delay each. Equipment unavailability caused harm in 19.8%, primarily in endovascular procedures.

Focused analysis of this national safety database identifies recurring harmful themes in elective aortic practice, suggesting that an effective team training programme must involve deliberate practice of all stages of the procedure using technology; focus on clinical processes for planned and unplanned procedural phases; be used to develop robust clinical protocols; and, provide a mechanism for learning from such events.

Medium term results of endovascular treatment of TASC C and D aorto-iliac lesions

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To evaluate the results of endovascular treatment for TASC C & D lesions and assess the impact of adjunctive procedures on the outcomes in a consecutive group of patients.

We analysed a prospectively maintained database of consecutive patients who underwent endovascular treatment for TASC II C and D aorto-iliac lesions from 2010 to 2014. Primary endpoints were target vessel patency, limb salvage (LS), amputation free survival (AFS) and freedom from major adverse limb events (MALE).

Overall 132 limbs, in 89 patients were treated. Indications for treatment were life-limiting claudication (n=36), rest pain (n=39) and tissue loss (n=14). Treated lesions were TASC C (n=21, 24%) and TASC D (n=68, 76%). Re-entry devices were used in 18% (n=16). Open adjunctive procedure consisted of femoral endarterectomy (n=60) and cross-over bypass (n=1).Technical success was 97%. Mean follow-up was 12 (range: 1-48) months. Primary, assisted primary and secondary patency rates at 1 year were 84%, 88%, and 95% respectively. LS and AFS at 1 year were 98%, 88% respectively. Freedom from MALE was 87% at 1 year. Peri-operative complications occurred in 14 (16%) patients and included: major adverse cardiovascular events (6%)(stroke n=3, MI n=1 and death n=1), vessel perforation (7%), intervention for surgical site infection (1%), renal failure (3%).

Endovascular treatment of TASC C and D aorto-iliac lesions is a viable option with satisfactory clinical outcomes and a high technical success rate.



Posters

Posters

Poster 1

Endovascular Treatment for Carotid Artery Dissections: A Systematic Review

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Poster 2

Patient perceptions regarding future fenestrated endovascular aneurysm repair (fEVAR) research

A Saratzis D Sidloff RD Sayers MJ Bown Department of Cardiovascular Sciences and Leicester NIHR Cardiovascular Biomedical Research Unit, Leicester University, Leicester

Poster 3

Endovascular team training simulation for behaviour orientated radiation safety

AD Godfrey R Lear C Pettengell CD Bicknell M Hamady C Riga Department of Surgery and Cancer, Imperial College London & Imperial Vascular Unit, Imperial College Healthcare NHS Trust, London

Poster 4

Endovenous mechanochemical ablation for the treatment of superficial venous insufficiency C Leung D Carradice IC Chetter *Academic Vascular Unit, Hull Royal Infirmary*

Poster 5

A Scottish experience of the GORE® EXCLUDER® iliac branch endoprosthesis for the management of aorto-iliac aneurysms

A Burdess¹ R Bhat¹ P Bachoo² DR Lewis³ F Lau⁴ M Ashcroft⁵ E Beveridge⁶ M Flett¹ ¹Ninewells Hospital, Dundee ²Aberdeen Royal Infirmary ³Edinburgh Royal Infirmary ⁴Hairmyres Hospital ⁵Raigmore Hospital Inverness ⁶Forth Valley Royal Hospital

Poster 6

The impact of endovascular revascularisation on coagulation, fibrinolysis, and platelet activity in lower limb ischaemia J Wolff H Rayt R Davies University Hospitals of Leicester

Poster 7

Clinical outcome after endovascular aneurysm sealing of abdominal aortic aneurysms (EVAS): a retrospective cohort study

MD Karouki Maria¹ MD Swaelens Charles² MD Iazzolino Luigi¹ Prof, FRCR, EBIR McWilliams Richard³ MD, FRCS Fisher K. Robert¹ PhD England Andrew⁴ MD, FRCS Torella Francesco¹ ¹LiVES Royal Liverpool University Hospital ²Brussels, Belgium ³Interventional Radiology Department Royal Liverpool University Hospital ⁴Directorate of Radiography University of Salford

Poster 8

Endovascular Aortic Staplers – a Systematic Review I Said A Vibhakar AL Tambyraja *Royal Infirmary of Edinburgh*

Poster 9

Post-implantation syndrome following endovascular aneurysm sealing for abdominal aortic aneurysm K Stenson N Patelis M Thompson St George's Vascular Institute, London

Poster 10

Iliac branch device and internal iliac artery preservation: reproducible technique and predictable outcome E Wilton H Zayed T Donati S Patel M Sallam R Bell B Modarai S Abisi Department of Vascular Surgery, St. Thomas' Hospital, London

Poster 11

Radiation exposure among vascular surgeons performing endovascular procedures A Mustafa D Lewis Royal Infirmary Edinburgh

Poster 12

A pain in the buttock: Iliac branch devices versus internal iliac artery embolization during elective infrarenal EVAR N Chinai¹ E Papworth² JE Coulston² P Eyers¹ T Ward¹ K Balasubramanium¹ AHR Stewart¹ IDH Hunter¹ ¹Somerset and North Devon Regional Vascular Centre, Musgrove Park Hospital, Taunton. ²Somerset and North Devon Regional Vascular Centre, Musgrove Park Hospital, Taunton

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Poster 13

Meta-analysis of outcomes following aneurysm repair in patients with synchronous intra-abdominal malignancy

R Kumar N Dattani O Asaad D Sidloff RD Sayers MJ Bown A Saratzis Department of Cardiovascular Sciences and Leicester NIHR Cardiovascular Biomedical Research Unit, Leicester University, Leicester

Poster 14

Supervised Exercise Programmes, Are they worth it? J Buxton G Owen E Bouch D Murray JV Smyth *Central Manchester University Hospitals Foundation Trust*

Poster 15

Medtronic Endurant Stent Graft system; a single UK Centre's 7 year experience KA Love GL McKevitt J.A Reid *RVH, Belfast Trust*

Poster 16

Vascular EndoAnchor For Proximal And Distal Fixation And Seal Of EVAR JF Rammell W Al-Jundi R Williams MG Wyatt

Northern Vascular Centre, Freeman Hospital, Newcastle Upon Tyne NHS Hospitals NHS Trust, Newcastle

Poster 17

The GORE EXCLUDER AAA Endoprosthesis: A 3-year single centre experience

FH Kent PD Chakravarty C MacLeod D Hildebrand P Bachoo Aberdeen Royal Infirmary

Poster 18

A retrospective cohort study evaluating a single tertiary vascular unit's initial experience with the novel Nellix Endovascular Aneurysm Sealing System compared to conventional EVAR and open aneurysm repair

A Fottinger¹ A Levynska¹ N Masson² P J Burns¹ D R Lewis¹ ¹Dept of Vascular & Endovascular Surgery, The Royal Infirmary of Edinburgh ²Department of Radiology, The Royal Infirmary of Edinburgh



Faculty

Faculty



James H. Black, III, M.D., FACS

Dr. Black is the Chief of Vascular Surgery and Endovascular Therapy at Johns Hopkins Hospital, and the David Goldfarb, MD Associate Professor of Surgery at Johns Hopkins University School of Medicine. He joined the surgical faculty of the Johns Hopkins Hospital in 2004 after completion of his Vascular Surgery Fellowship at the Massachusetts General Hospital. Dr. Black is an expert in the application of endovascular technology for

patients with aortic and vascular disease, and he has unique expertise in vascular reconstruction for connective tissue disorders. To the subject of aortic diseases, he has given invited lectures to the White House Medical Unit and the FDA section in charge of cardiovascular devices. His research interests include the molecular events underpinning the development of aortic catastrophe in both atherosclerotic and connective tissue disorders.



Jean-Paul P.M. de Vries has been Head of the department of Vascular Surgery of the St.Antonius Hospital Nieuwegein since August 2003. He is one of the founders of the Dutch Endovascular Alliance (DEALL), a multicentre Dutch research platform to perform dedicated (endo) vascular research. Multiple randomized and non-randomized clinical trials are currently running in the DEALL focusing on endovascular peripheral interventions. Most of these trials

focus on the added value of drug eluting techniques and scaffolds for aorto-crural obstructions. Another important subject of research is the Nellix Endosystem (in-vitro and in-vivo studies). He is in the frontiers of new developments in EVAR and EVAS (International training centre at the St.Antonius Hospital and international proctor for EVAR and EVAS) and minimal invasive interventions for peripheral arterial disease. He is the co-PI of the global ANCHOR trial (use of EndoAnchors to improve EVAR outcome). He has published more than 245 peer review manuscripts, 23 book chapters for international vascular textbooks, edited a textbook with focus on EVAR, and is a faculty member of multiple international vascular congresses.



Kevin Mani is associate professor of vascular surgery at Uppsala University, Sweden, and the scientific secretary of the Swedish Society for Vascular Surgery. Kevin leads an active research group focusing on pathophysiology, prevention and treatment of aortic disease. He is a member of the international vascular registry collaboration Vascunet, and has performed several national and international registrybased epidemiological studies on

management of aortic disease. Ever since his fellowship at St Thomas' hospital in London, he has a clinical fascination for endovascular repair of aortic pathology, and how to best deliver care to the complex group of patients with extensive aortic disease.



Lanfroi Graziani is Director of Interventional Cardiology at the Istituto Clinico Città di Brescia and S. Anna Hospital in Brescia, Italy. Since January 1984 he has started using endovascular coronary techniques in below-the-knee arteries, particularly in diabetics at risk of limb loss. A pioneer in BTK intervention, he was the first who described and published during the last fifteen years almost all the techniques currently used for leg and foot arteries

recanalization, including the pedal plantar loop technique. He performed most of procedures in the first two big series published in 2002 and 2005, showing the success of endovascular techniques for limb salvage in diabetic patients at risk of major amputation. For more than two decades he has performed coronary, peripheral and carotid interventions, mostly in diabetic and dialysis cases. His centre is known as the national referring centre for challenging and high-risk cases.

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Frank J. Veith, M.D., is Professor of Surgery, Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, Cleveland, OH and New York University Medical Center NY, NY. Additionally, Dr. Veith occupies The William J. von Liebig Chair in Vascular Surgery at the Cleveland Clinic Foundation.

As an internationally respected teacher, researcher, spokesperson, expert and pioneer in both the

areas of single lung transplantation and the diagnosis and treatment of peripheral vascular disease, Dr. Veith has lectured in over 40 countries. From 1974-1987, he was the Principal Investigator of three consecutive National Institutes of Health Program Project Grants for Experimental Lung Transplantation. In 1993, he received the National Institutes of Health Vascular Disease Academic Award.

Dr. Veith has authored or coauthored more than 1,000 original articles and chapters in prestigious medical journals, Particularly noteworthy are his pioneering contributions to limb-salvage surgery and more recently the rapidly developing field of endovascular grafting for traumatic, aneurysmal and occlusive arterial disease.

Dr. Veith hosts the annual international VEITH symposium, which explores current critical issues and controversies in the field of vascular disease management. VEITH symposium is acknowledged to be the finest postgraduate course for Vascular Surgery in the world, now in its 43rd year.



Hence JM Verhagen is a Professor and Chief of Vascular Surgery at the Erasmus Unive rsity Medical Centre in Rotterdam, Netherlands. He completed his medical degree in 1992 and defended his thesis entitled "Cell seeding on Vascular Grafts" in 1996, both at Utrecht University. During his vascular fellowship at The Royal Prince Alfred Hospital in Sydney, Australia, he developed a special interest in minimally invasive endovascular therapies and the endovascular treatment of aneurysms. In 2002 Dr Verhagen accepted a position as Associate Professor of Vascular Surgery held at the University Medical Centre in Utrecht. In 2007 he was appointed as Professor and Head of the Department of Vascular Surgery at Erasmus MC, University Medical Centre in Rotterdam. As an early adopted of advanced endovascular treatments, he has acquired an international reputation in this field. He has organised a large number of basic and advanced courses organized for EVAR and Tevar and is the founder of the Dutch course on peripheral percutaneous vascular interventions for vascular surgeons. Prof. Hence Verhagen has a specific interest in aortic intervention, including state-of-the-art endovascular techniques, in which he has extensive experience. Furthermore, his specific expertise includes dynamic imaging of aortic pathology, carotid surgery, chronic intestinal ischemia and peripheral vascular interventions.



Eric Verhoeven was born in Belgium in 1960. He received his MD degree at the University of Leuven (Belgium) in 1988. After graduating in General Surgery (Leuven, 1994) he moved to The Netherlands for a fellowship in Vascular Surgery at the University Medical Center Groningen, and accepted a position as Consultant Vascular Surgeon one year later. He set up an endovascular programme in cooperation with the surrounding peripheral hospitals. In 2005, he

completed his PhD entitled "Endovascular Aneurysm Repair: Results and exploration of new frontiers" at the University of Groningen. In November 2009, he accepted a position as chief of the department of Vascular and Endovascular Surgery in Nürnberg (Germany). In January 2011, he was awarded a guest-professorship of Surgery at the University of Lisbon, Portugal. In October 2011, he accepted a Professorship in Vascular Surgery at the University of Leuven, Belgium. In 2014, he became full professor in vascular surgery at the new Paracelsus Medical University of Nürnberg.

His main interest, both clinical and scientific, continues to be the treatment of complex aortic aneurysms with fenestrated and branched grafts, with now experience in more than 1000 cases. He presented results of his work in numerous congresses with more than 750 official presentations, and has published over 200 articles and book chapters.

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