

## EDITORIAL

## Progressive Guidance on the Modern Management of Abdominal Aorto-iliac Artery Aneurysms

The European Society for Vascular Surgery (ESVS) guidelines on the management of abdominal aorto-iliac artery aneurysms, published in this issue of *EJVES*, are essential reading for the vascular practitioner.<sup>1</sup> Comprehensive recommendations that demonstrate a balanced insight into the rapid pace of technological innovation are outlined based on contemporary evidence. The writing committee comprised 16 European experts in the management of aortic diseases, most of whom run a cutting edge clinical aortic practice at their home institutions. The document, representing a major update since the ESVS last drafted guidelines in this area eight years ago,<sup>2</sup> was compiled with input from 23 ESVS Guidelines Committee members and independent external reviewers based in Europe, America, Asia, and Australia.

Endovascular aneurysm repair (EVAR) should be considered as the treatment of choice for elective patients presenting with anatomically suitable infrarenal aneurysms (Recommendation 60; Class IIa, Level B). This is in agreement with the Society for Vascular Surgery (SVS) guidelines published last year,<sup>3</sup> and considers data from high quality registries and case series that reflect modern day practice. The ESVS committee notes that randomised controlled trials (RCTs) comparing open aortic repair (OAR) with EVAR for elective infrarenal aneurysms are partly outdated and interpretation of their findings should take into account the fact that endograft design, case selection/planning, and the management of patients after surgery have changed significantly since these trials were instigated. It is notable that the ESVS and SVS guidance to perform EVAR in preference to OAR in suitable patients differs from that made by the NICE committee which recently advised (a draft circulation at the time of writing) that EVAR should not be offered for elective treatment of aortic aneurysms and is only effective for ruptured abdominal aortic aneurysms.<sup>4</sup> Data from three contemporary RCTs (IMPROVE, ECAR, and AJAX) demonstrating superiority of EVAR compared with OAR for ruptured infrarenal aortic aneurysms led the ESVS committee to make a similar recommendation for an EVAR first strategy in this scenario (Recommendation 74; Class I, Level B). The fact that they consider EVAR as first choice for both elective and emergency aneurysm repair represents a coherent strategy, as accrual of experience and expertise in the elective setting is surely a prerequisite for optimal outcomes in the emergency setting. Local anaesthesia

should be considered as the anaesthetic modality of choice for EVAR for ruptured abdominal aneurysms whenever tolerated by the patient (Recommendation 67; Class IIa, Level B).

The ESVS guidance recognises that EVAR is not the panacea and that the need for ongoing surveillance and re-intervention means that elective EVAR may not be a durable solution in young, fit patients with a longer life expectancy. Consequently, open aneurysm repair should be considered in this cohort of patients (Recommendation 61; Class IIa, Level B). This balanced conclusion considers OAR and EVAR as complementary, the authors emphasising the fact that it is unacceptable for a centre to undertake treatment of aortic patients without the ability to offer the same expertise in both modalities. A strong recommendation (Recommendation 3; Class IIa, Level C) is made that aortic surgery should only be considered in centres with a minimum volume of 30 cases/year (OAR and EVAR). This number is, interestingly, lower than the 50 cases/year recommended by Moll et al. in the 2011 guidelines.<sup>2</sup> Clear recommendations are not made regarding the minimum standard of imaging equipment required to perform EVAR, in spite of the fact that this can potentially have a significant impact on the success of the procedure and also influence factors such as radiation exposure to the patient and operator. Perhaps this is a reflection of the paucity of objective data presently available to address this topic.

The guidelines advise closer scrutiny of new endograft platforms including, for example, lower profile devices and novel treatment concepts such as aneurysm sealing with polymer filled endobags (EVAS) before they are accepted into routine clinical practice. The authors suggest that the current minimum requirements for clinical certification are not sufficiently rigorous. Outcomes related to new iterations of endografts should be recorded in long-term prospective registries ensuring complete follow up (Recommendation 57; Class I, Level C). For new concepts that propose a paradigm shift in the approach to the treatment of aneurysms, it is recommended that these are thoroughly evaluated in studies approved by research ethics committees, restricting adoption into clinical practice until their safety and efficacy is proven (Recommendation 58; Class III, Level C). A prudent recommendation given the plethora of new solutions marketed and reflecting lessons learnt from the rapid, generic adoption of novel technology such as EVAS, where most device failures seem to be occurring 2 years after implantation.<sup>5</sup>

Reviewing more than a decade of multicentre data demonstrating safety and durability of fenestrated endografting, the committee concluded that the technology is now mature and should be considered as the treatment of choice for elective juxtarenal aneurysms when feasible (Recommendation 96; Class IIa, Level C). Parallel endografting may be considered as a bailout/emergency alternative to the fenestrated technique, ideally with a maximum of two target vessels incorporated in the repair (Recommendation 97; Class IIb, Level C). These pragmatic conclusions, in contrast with those made by NICE recently suggesting that there is no evidence for the efficacy of fenestrated or parallel stenting technology, reflect the large global experience accrued with these techniques and the fact that it would be difficult to find equipoise to randomise many of the patients considered for complex endografts to OAR as part of an RCT. The authors point out that these recommendations are predilected on performing these complex repairs in specialised high volume centres (Recommendation 94; Class I, Level C) that not only obtain optimal results with endovascular repair but also have the necessary expertise to offer OAR in instances when using the former treatment modality is not the ideal solution.

The guidelines are the first to be drafted with input from a group of patient representatives. Mention is also made of the fact that, to date, patient reported outcomes have not been prioritised in the majority of studies evaluating treatments. As both EVAR and OAR become safer, aneurysm specific assessment tools measuring quality of life and satisfaction after treatment become important adjuncts to morbidity and mortality for determining the benefits of one treatment method as opposed to the other. In fact, it is likely that in the near future not only will our methods for data capture change but that machine learning and artificial intelligence (AI) will revolutionise our approach to aortic data analysis, allowing stronger conclusions to be drawn from large datasets. The onus is on us as practitioners to establish global data sharing platforms, despite ever tightening sharing regulations, to allow advanced analysis techniques to improve patient selection, risk scoring, treatment planning, intra-operative guidance, and follow up regimens. The next iteration of the ESVS aneurysm guidelines may well be compiled with the aid of machine learning and AI techniques.

Research that informs biological mechanisms governing aortic aneurysm formation and progression promises to revolutionise the management of this disease. Biomarkers coupled with functional imaging that herald rapid progression of the aneurysm, for example, would be a powerful tool for understanding the risk of rupture prior to repair.

After treatment, this type of assessment could be used to tailor follow up frequency and determine the likely need for re-intervention. Such predictive tools, combined with intelligent analysis of large clinical datasets, may produce objective and clinically relevant risk scoring systems that currently do not exist (Recommendation 70; Class III, Level B). Discovery of novel therapeutic compounds that prevent aneurysm progression would be invaluable for circumventing the need for operative intervention but also for arresting ongoing degeneration after both EVAR and OAR, reducing the need for repeated interventions. Finally, one would hope that with emerging data indicating a risk associated with radiation exposure to both patient and operator, research and innovation will force a paradigm shift in how we perform endovascular repair, perhaps circumventing the use of Xray guidance altogether.

The ESVS aneurysm guidelines represent an expert synthesis of data currently available, recognising that technological advances have made EVAR a safe and effective treatment for aortic aneurysms but tempered with the advice that preserving the option to perform OAR in some patients is essential for the optimal treatment of this pathology. The guidelines committee should be commended for producing an important document that is likely to be widely referred to and to have a significant impact on clinical practice.

## REFERENCES

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