

## PANEL DISCUSSION

# Long-Term EVAR Follow-Up: Acknowledging and Embracing the Challenge

Profs. Powell and Bastos Gonçalves discuss barriers to achieving consistent long-term follow-up, what has been learned about stratified follow-up after EVAR and how guidelines have addressed this need, the optimal approach to appreciating long-term patient needs, exploring patient-centered outcomes, and how to better engage patients postprocedure.



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**Prof. Bastos Gonçalves, you recently coauthored an editorial in *European Journal of Vascular and Endovascular Surgery* addressing the perennial challenge that no matter which post-endovascular aneurysm repair (EVAR) strategy is adopted, large proportions of patients are lost to follow-up.<sup>1</sup> Noting that different anatomies, repairs, and patients may each require unique follow-up plans, is there a universally adoptable standard that should be attained at minimum?**

**Prof. Bastos Gonçalves:** Follow-up after EVAR has occupied the minds of clinicians and researchers for decades. The reason for this is that we all recognize an increased risk of complications after EVAR when com-

pared to open surgical repair. Therefore, the logical deduction is that regular imaging follow-up may reveal these complications before they produce symptoms, allowing for preemptive treatment. Unfortunately, this deduction has proven to be unsatisfactory in real life. Keeping up with image surveillance protocols is complicated for institutions and patients, and there is a high rate of noncompliance. Furthermore, there are also practical demonstrations that secondary interventions occur most frequently when symptoms arise (irrespective of compliance with image surveillance) and, most importantly, that no survival benefit is present for compliant patients, despite a much higher secondary intervention rate. We need to do better than simply stating that follow-up is necessary—we must find ways to make it effective.

Having said this, I firmly believe there is still a role for imaging follow-up after EVAR. One crucial examination for any patient, irrespective of anatomic risk, is the early postoperative CTA scan (or noncontrast CT complemented by duplex ultrasound). The reasoning behind this is that early imaging can show us how effective the procedure was at excluding the aneurysm from circulation—in other words, if we achieved sufficient sealing zones both proximally and distally, all components were adequately positioned and engaged, and verify that no endoleaks are present. I am also convinced that progression of disease plays an important part in late or very late complications and may explain the findings of increased aneurysm-related mortality in patients surviving > 10 or 15 years after the original operation. Therefore, even

in low-risk patients, lifelong examinations are probably necessary. This last point is supported by very little evidence and represents an area of research that should be explored.

**Follow-up adherence is multifactorial, with some drop-off causes emanating from the patient and others perhaps tracing to the bandwidth and capabilities of the operating centers. In your experience, what are the most significant barriers to achieving consistent long-term follow-up after EVAR?**

**Prof. Powell:** This is a challenging question and a matter of continuing debate and research. We do not know whether long-term follow-up is needed for all patients, and we do not know whether a simpler follow-up regimen (eg, after the first year measuring sac diameters only with ultrasonography) is sufficient. If patients do not understand the benefits and risks of long-term follow-up, they are likely to be less compliant. They should be informed about the need for post-EVAR surveillance in the shared decision-making process before aneurysm repair, but adequate shared decision-making occurs in less than half of cases. So, the first important barrier to consistent long-term follow-up is adequate shared decision-making before abdominal aortic aneurysm (AAA) repair. The second barrier to consistent long-term follow-up is the lack of evidence from prospective studies (ie, duplex assessment vs CT of sac diameter or even no surveillance vs surveillance). Therefore, all current guidelines are weak.

**Prof. Bastos Gonçalves:** The reasons for noncompliance (approximately half of all patients in population-based or registry studies) are seldom reported in the literature and may result in both negative and positive bias, the extent of which we cannot know. Not all noncompliance results from a patient's decision. For example, doctors are more likely to relax follow-up in patients they consider to be at very low risk of complications. Patients at high risk of complications but unfit for further procedures because of a general deterioration in health or dementia could also be discharged from follow-up and be considered noncompliant. Other factors are highly dependent on the setting, financing, accessibility of health care, and cultural and geographic factors. There is no simple answer to the reasons behind noncompliance, and they are most likely very diverse. Whatever the reasons, there is room for improvement.

**As a follow-up, Prof. Bastos Gonçalves, in your ongoing work with the European Society for**

**Vascular Surgery (ESVS) guideline committee, what has been learned about stratified follow-up after EVAR? How has your understanding of this need evolved in recent years, and how do the guidelines address this?**

**Prof. Bastos Gonçalves:** Guideline development is a strict process and rigidly follows the evidence available at any given moment. We are currently working on the update of the ESVS guidelines on AAA management, which will address this and other relevant issues. However, it is always up to researchers to produce the evidence on which guidelines can be based, and this is clearly an area where more evidence is necessary. Interestingly, the current ESVS guidelines (published in 2019) suggested a risk-stratified protocol (which was not a recommendation but rather a hypothesis based on recommendations),<sup>2</sup> which has been tested by different researchers with satisfactory results. This adds weight to the benefit and safety of a risk-stratified follow-up, at least in the first 5 years after EVAR.

**Prof. Powell, what is the best approach to appreciating long-term patient needs, including aneurysm-related as well as other circumstances potentially affecting follow-up, with an eye toward how to select the therapy best suited to them?**

**Prof. Powell:** The best approach is to talk to patients before aneurysm repair, letting them know all the treatment options and how follow-up varies with treatment choice. Talk to patients to find out what their views, values, and preferences are. We need to be mindful that older patients view the future as the next few years, whereas younger patients have more concerns for the longer term. Although clinicians report information such as survival, complications, and loss to follow-up, patients are much more concerned about functional outcomes, and amputation after distal arterial complications is the most feared, although rare, complication of EVAR.

**How might patient-centered outcomes be better incorporated into future EVAR trials and registries? What are the key unknowns in patient-centered outcomes, and how might their exploration be practically explored?**

**Prof. Powell:** In Europe, we (Anders Wanhainen, Matthew Machin, Isabelle van Herzele, and others) are working on developing a core outcome set for reporting the outcomes of elective AAA repair. A core outcome set tries to accommodate the needs of all stakeholders: patients, caretakers, doctors, nurses, other health care workers, health care providers, and industry.

Through a process of focus groups, followed by a Delphi consensus process, we hope to identify a set of six to 12 core outcomes that should be evaluated. These steps might be the easier part, because patients and others may vote for outcomes that we do not really know how to measure yet.

**Prof. Bastos Gonçalves:** Patient-centered outcomes have been limited in previous trials and registries, but a culture of better understanding the concerns of and what matters to patients is gaining momentum in medicine in general and in vascular surgery in particular. When treating asymptomatic disease such as elective aneurysms or asymptomatic carotid artery disease, there is an added dimension that makes these topics particularly sensitive. I support that patient-centered outcomes should be part of the “standard” for trials and also included in national, regional, or institutional registries. These patient-centered outcomes should be an additional focus to, rather than a replacement for, traditional outcomes, which still hold important merits (eg, for quality improvement).

#### **What is the ideal role of individual clinicians and their centers in longitudinal research and follow-up study after EVAR and thoracic endovascular aortic repair?**

**Prof. Powell:** They should recognize that uncertainty exists regarding optimal follow-up after endovascular procedures and be willing to engage in prospective studies and trials to obtain better evidence.

**Prof. Bastos Gonçalves:** It’s very challenging to produce good-quality longitudinal data on this subject, which is the reason for this gap in knowledge. A randomized trial comparing surveillance strategies after EVAR would require hundreds (if not thousands) of patients followed for long periods, and results would always be limited by the time lag. We may have to settle for observational evidence, but to improve the quality of such data, we must promote and improve our capacity to register and aggregate data.

#### **Prof. Powell, as someone engaged in evaluating endovascular repair from the landmark EVAR-1 trial period through to the present day, you have seen the procedure evolve via tech-**

#### **nologic enhancements, clinical expertise, and improved imaging. During this time, which is also marked globally by advances in telecommunications, has patient follow-up improved? If so, in what ways?**

**Prof. Powell:** Unfortunately, patient follow-up probably has not improved very much other than the switch from CT scan to duplex ultrasound for post-EVAR surveillance in many centers.

**Prof. Bastos Gonçalves:** Prof. Powell is better qualified to answer this question. My impression is that, despite some technologic improvements, the overall quality of follow-up has not improved. In fact, it may have degraded to some extent due to excessive workload (ie, more patients being treated with EVAR leads to more follow-up required) and possible oversimplification of follow-up with near-exclusive use of duplex ultrasound, which is more operator dependent and cannot detect certain complications such as dilating sealing zones or migration without endoleak.

#### **Going forward, how can postprocedure engagement be improved? What advice would you offer on how to ensure a follow-up strategy is accessible for the patient?**

**Prof. Powell:** The engagement needs to be established before the procedure.

**Prof. Bastos Gonçalves:** The use of computerized protocols that automatically recall patients or alert for absences is a great addition to standard methods. Apps and other digital tools are changing the way we practice medicine and may be well suited to improving EVAR follow-up. Improving literacy regarding not only the operation itself but cardiovascular disease as a whole and risk factor management in particular is also needed. ■

#### *Disclosures*

*Prof. Powell:* None.

*Prof. Bastos Gonçalves:* Received proctoring and speaker fees from Cook Medical, W. L. Gore & Associates, and Medtronic.

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