Long-Term Outcomes of EVAR Trials: How Do We Reconcile the Differences?

Prof. Jan Blankensteijn compares the results from the EVAR 1 and DREAM trials and discusses possible shortcomings of these data and the path ahead for future investigation.

WITH JAN BLANKENSTEIJN, MD, PhD

First, how would you currently define "long term" as pertains to data for endovascular aneurysm repair (EVAR)?

With the EVAR 1 and DREAM studies describing 15-year outcomes, the term becomes a bit relative, but technically, *long term* should be defined as 5 years. However, it is also important to realize that both randomized controlled trials (RCTs) have shown that half of EVAR patients survive for 10 years after the procedure, so the concept that long-term durability may not be of utmost importance in "old" aneurysm patients is false, at least in patients suitable for both open and endovascular repair.

What is your overall impression of the long-term EVAR data we have?

The long-term data from both registries are very solid, and RCTs are all pointing in the same direction. Of course, any long-term study is limited by the fact that the devices described may no longer be in use, but theoretically, survival rates are only partially and indirectly driven by the type of endograft used.

What are the key common findings and discrepancies of EVAR 1 and DREAM?

Both studies found no long-term survival difference between open repair and EVAR at 10 years (40%–50%). There was an indication of decrease in the EVAR group. In EVAR 1, there was an indication of more cancer deaths beyond 12 years. The number of patients in the DREAM trial was too small for this post hoc subanalysis.

How did the patient selection differ between the key trials and from everyday practice?

The EVAR 1 and DREAM studies were very similar, but aneurysms in EVAR 1 were a bit larger on average (6.5 vs 6.0 cm), and patients were slightly older (74 vs 70 years) and had lower pulmonary function (forced expiratory volume in 1 second, 2.2 L/s vs 2.6 L/s). Consequently, all survival rates in EVAR 1 are a few percentage points below that of the DREAM study. The most important difference in patient selection in the RCT setting versus everyday practice is that the trial patients had to be suitable for both open and endovascular repair. Many of my everyday practice EVAR patients would not have qualified for inclusion in the trials on account of the higher surgical risk. Generalization of the RCT results to these patients is confounded.

In addition, both indications and devices have changed over the past 20 years. Now that fenestrated EVAR (FEVAR) is available, aortic necks that are marginally suitable for infrarenal EVAR are readily treated with FEVAR instead of EVAR. It is likely that a proportion of patients included in EVAR 1 and DREAM fell into this category, increasing the rate of endoleaks and reinterventions in the trials.

As with any long-term data, especially in a randomized trial, the technologies available at the outset may be somewhat outdated by the end of the trial and particularly its data collection period. To what degree do you think the evolution of EVAR stent graft systems confounds application of long-term data to current practices?

As previously mentioned, this is unavoidable when looking at long-term data. However, I do not think survival is significantly driven by the type, brand, or make of endograft. Newer devices may provide better long-term results in terms of decreased complications (eg, endoleaks, migration) and reinterventions, but at the same time, newer devices lean on new technology (smaller, smaller, smaller) that may not turn out to be as durable as tested in vitro. As a result, any new device should be followed with scrutiny.

How have follow-up protocols changed versus those in the trial publications, and how might this affect outcomes?

We have all come to trust most of the time-tested endografts. This has reduced the intensity of EVAR follow-up in terms of frequency and methodology (duplex ultrasound, CT). Many questions still remain for EVAR follow-up, such as whether the added CT scans increase the risk of malignancy, whether this risk outweighs the risks of failing durability, and whether duplex ultrasonography is accurate enough to identify problems or delineate patients who are safe from rupture versus those who are at higher risk. Add to this the issue of constantly evolving technology, and we must confess that we still don't know much about EVAR follow-up.

What do the data tell us about EVAR in younger, more fit patients versus older and higher-risk patients?

Patients with more advanced peripheral artery occlusive disease (as indicated by ankle-brachial index) have worse survival outcomes, but that's a no-brainer. Although the data to support this view are scant, the trial data seem to show us that younger, fitter patients have more advantages with EVAR compared to open repair than older, less fit patients. But again "less fit patients" unsuitable for open repair were not randomized. Nevertheless, the initial theory, based on the unknown long-term durability of EVAR, that relatively young patients would be better off with open repair has been proven false.

In what ways might the data present challenges in terms of patient preferences (ie, if a patient has a strong preference for EVAR but his/her demographic fared poorly in this arm of a trial)? How do you recommend handling these discussions and decisions with patients?

The data show that there are short-term advantages of EVAR over open repair and no differences in terms of survival in the long term, but only if EVAR is anatomically a good option. If not, risks of reintervention and associated morbidity and mortality must be taken into account. The trials have provided solid, long-term data to put these issues into perspective so that we can fully inform the patient.

What should the next large-scale, long-term EVAR trial seek to evaluate?

We have tried several times to find a way to compare the outcomes of open repair, FEVAR, and enhanced EVAR for treating juxtarenal aneurysms in an RCT. Acquiring funds for long-term, clinical device trials has become difficult. Health care insurers and device companies seem to have no interest in long-term data. Defining equipoise between open and endovascular repair of juxtarenal aneurysms and randomizing patients will be an ethical dilemma, and the number of patients required for a meaningful comparison asks for multinational trial designs, which are costly and difficult to organize. ■

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