

INVITED COMMENTARY

Where now for Endovascular Repair of Ruptured AAA?

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The ECAR study is the third randomised trial that has failed to demonstrate any survival advantage for patients with ruptured AAA treated by an endovascular stent-grafting technique. Although of different designs, both IMPROVE¹ and the Amsterdam aneurysm study² essentially came to the same conclusion of no overall mortality benefit. The randomised controlled trial findings conflict with those of the numerous cohort studies, which have demonstrated a survival benefit for EVAR.³ In attempting to explain these conflicting findings, the most important factor appears to be patient selection. A recent meta-analysis identified that although EVAR conferred a significant benefit over open repair in most cohort studies, these studies were at a high risk of bias.³ More specifically, patients are often assigned to EVAR when haemodynamically stable and with favourable aortic anatomy, introducing a well-defined selection bias.⁴

Randomised trials in the emergency setting are difficult to design and conduct. The ECAR study has a number of important limitations that reduce its overall impact. The patients randomised in the trial were a highly selected cohort of the overall population of patients presenting to trial centres with a RAAA. In fact only 20% of patients, those who were haemodynamically stable and anatomically suitable for EVAR, were randomised. The interventions and outcomes of the majority (80%) including those who were not offered any intervention were not reported. In this highly selected group it could have been anticipated that outcomes would be good, and therefore basing the power calculation on a 40% open repair mortality is hard to justify. This combined with the failure to complete recruitment, resulted in the ECAR study being underpowered.

It is also worth considering why centres failed to recruit. Certainly the entry criteria (stable and EVAR-friendly anatomy) were restrictive, and ruptured AAA appears to be a waning disease, but were there other reasons? The impact of the lenient credentialing of trial centres in the ECAR may have influenced patient outcomes. Patients waited some considerable time (2.9 hours) to receive an EVAR compared

with open repair (1.3 hours), and almost three-quarters of patients were treated with an AUI EVAR configuration (despite their stability), suggesting that centres may not have been as expert in delivering emergency EVAR as they were with open repair.

The principal factor-influencing outcome of RAAA appears to be aortic anatomy. Evidence from Dick et al.⁵ suggests that outcomes for open repair are significantly better in those patients who are anatomically suitable for EVAR, and furthermore suggests that borderline anatomical suitability confers improved outcomes over patients who are not suitable for EVAR. The recent data from IMPROVE⁶ reported that infra-renal neck length is an important factor affecting outcome after RAAA surgery. It is not wholly surprising that a longer neck confers advantages, not only in those patients undergoing REVAR but also in those undergoing open repair by providing a suitable infra-renal clamp site.

So, if, as the randomised trials suggest, EVAR confers no mortality benefit over open repair in anatomically suitable patients, then do any patients benefit from EVAR? IMPROVE suggests that females (and those undergoing EVAR under local anaesthesia) may have better outcomes. There is, however, another group who may potentially benefit from EVAR - those patients previously offered no intervention for their ruptured AAA. This group is difficult to define, as "turn down rates" are often not reported, and account for over 40% of patients presenting with ruptured AAA in the UK.⁷ Evidence from cohort studies suggests that EVAR is offered to older patients who otherwise may not be offered any intervention.⁸ And offering intervention to a greater proportion of patients presenting with ruptured AAA will have the greatest impact on reducing overall mortality rates. Delivery of an effective 24/7 emergency EVAR service in vascular centres is going to be a key component in delivering improved outcomes for patients presenting with ruptured AAA.

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