

# HAPPILY EVAR AFTER? THE TRUTH ABOUT ENDOVASCULAR ANEURYSM REPAIR

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## Background

- Endovascular aneurysm repair (EVAR) for abdominal aortic aneurysm (AAA) repair has been responsible for a seismic shift in the management of AAAs, however surgical opinion remains divided, with there being a clinical equipoise regarding which method is superior.
- Compared to traditional open surgical repair (OSR), EVAR is associated with significantly improved peri-operative morbidity and mortality.
- As technology and applications of EVAR continue to evolve, so does the literature investigating its outcomes.
- Recently, longer-term follow-up results of randomised controlled trials (RCTs) comparing EVAR and OSR have been published.

## Objectives

- Evaluate long-term outcomes from prospective multi-centre RCTs, assessing the effectiveness, advantages and disadvantages of EVAR and OSR, in terms of endograft-related complications, re-intervention rates, and longer-term mortality, to determine whether EVAR really is the better option.

## Methods

- A Medline and Embase search was conducted to identify prospective multi-centre randomised controlled trials (RCTs) comparing EVAR to OSR in patients with unruptured AAAs considered fit for both procedures
- RCTs comparing different patient cohorts such patients with as ruptured AAAs and smaller cohort studies were excluded

## Results

### Trials:

- Thus far, 4 RCTs (**EVAR-1, DREAM, OVER, ACE**) have been established comparing EVAR and OSR in patients with unruptured AAAs

### Peri-operative Mortality (30d or in-hospital)

- Lower with EVAR than OSR

### Longer-term Mortality

- No significant difference between EVAR and OSR
- 1 RCT showed 8-15yr mortality was higher with EVAR than OSR

### Re-intervention rates

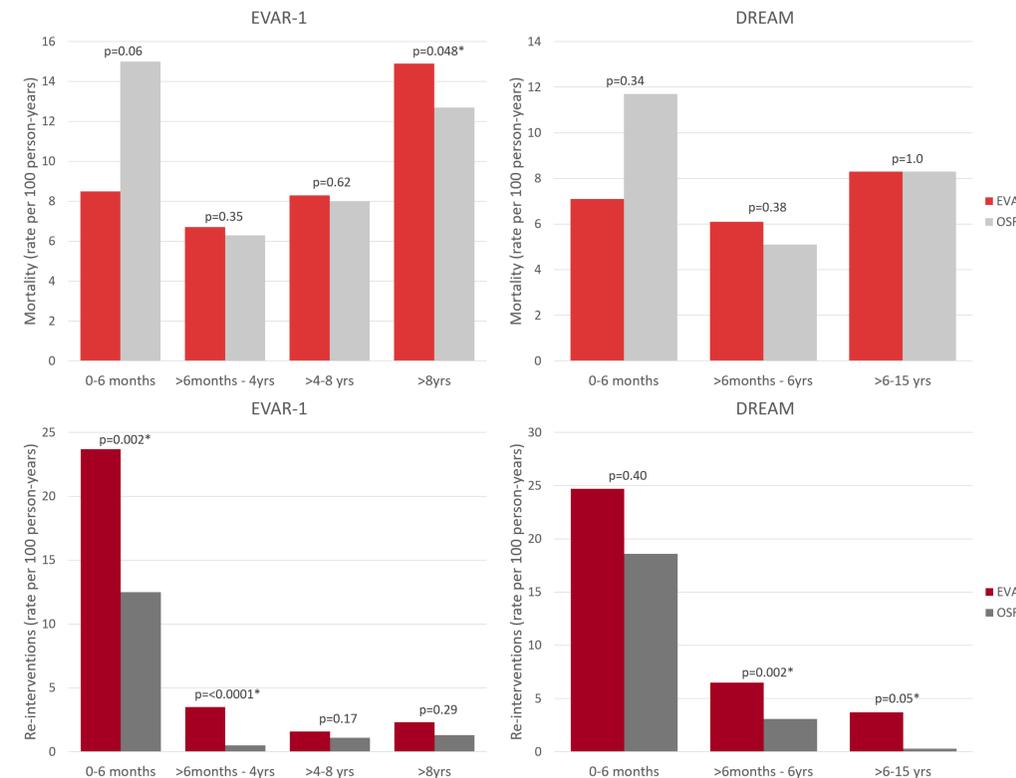
- Considering total follow-up periods, there were higher rates of re-intervention in EVAR patients than OSR at follow-up of up to 15yrs

### EVAR-1

- Mortalities lower in EVAR in first 6 months
- Mortalities greater in late follow-up for EVAR
- Sig late divergence of survival curves in favour of OSR partly due to greater increase in late mortality of AAA-related deaths in EVAR (2° sac rupture)
- 2° sac rupture more common in EVAR at any period
- Rate of re-intervention higher in EVAR at all timepoints
- EVAR ONLY SAFE IF LIFELONG SURVEILLANCE + REINTERVENTIONS PERFORMED**

### OVER

- Reduction in peri-operative mortality with EVAR sustained just to 3 years, not after
- Significant interaction observed b/w age and treatment type; survival increased among patients <70 yrs in EVAR
- Long-term survival similar
- RUPTURE FOLLOWING EVAR REMAINS CONCERN**



### DREAM

- No difference in overall survival between OSR and EVAR despite increasing number of 2° procedures in EVAR patients → perhaps longer follow-up to see negative impact
- Only early survival benefit for EVAR
- Occurrence of deaths due to aneurysm rupture and need for 2° interventions in EVAR patients >6yrs post-randomisation demonstrates its lack of durability
- Patients living longer post-surgery - NEED CLOSE SURVEILLANCE**

### ACE

- No difference in cumulative survival rates between EVAR and OSR
- Significantly lower cumulative survival free of death and vascular re-intervention rate in EVAR patients, with trend to higher AAA-related mortality
- Similar risk of early and mid-term risk between EVAR and OSR → NO EARLY EVAR REDUCTION IN MORTALITY**



## Conclusion

- The widespread popularity of EVAR for the repair of AAAs is mainly supported by its short-term advantages.
- This early survival benefit of EVAR is not sustained, with development of EVAR-related post-operative complications, predominantly endoleaks, stent-graft migration and stent-limb thrombosis requires further corrective re-intervention. Thus, lifelong imaging surveillance is crucial to determine the occurrence of such events, and plan timely intervention to prevent secondary sac rupture. This results in EVAR being costlier over a patient's lifetime when compared to OSR.
- Data from longer-term trials however are based on initial EVAR device generations, thus newer stent-grafts are likely to improve safety and expand their applicability
- Further longer-term RCTs are warranted to compare the relative benefits and disadvantages of modern devices.

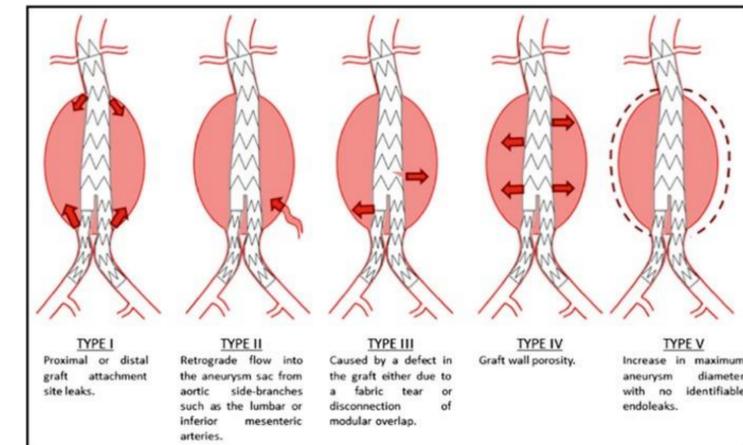


Figure 1: Classification of Endoleaks

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