

# Endovascular versus open repair of abdominal aortic aneurysm

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**A**bdominal aortic aneurysm is a common condition of increasing prevalence, particularly among older men (over 60 years), with increasing risk of rupture, depending on its dimensions. At this moment there are two options of treatment: open surgical repair (practiced since 1951) and minimally invasive endovascular aneurysm repair (first reported in 1986). The three principal randomized trials comparing endovascular and open repair of abdominal aortic aneurysm have all shown a marked benefit of endovascular repair with respect to 30-day operative mortality. In the current trial, called the United Kingdom Endovascular Aneurysm Repair 1 (EVAR 1) trial, the authors compared the long-term results of endovascular versus open repair of large aneurysms. Methods and results: From 1999 through 2004 at 37 hospitals in the United Kingdom, the authors randomly assigned 1252 patients with large abdominal aortic aneurysms (5.5 cm in diameter) to undergo either endovascular or open repair; 626 patients were assigned to each group. Patients were followed for rates of death, graft-related complications, reinterventions, and resource use until the end of 2009. Logistic regression and Cox regression were used to compare outcomes in the two groups. The 30-day operative mortality was 1.8% in the endovascular-repair group and 4.3% in the open-repair group (adjusted odds ratio for endovascular repair as compared with open repair, 0.39; 95% confidence interval [CI], 0.18 to 0.87;  $P=0.02$ ). The endovascular-repair group had an early benefit with respect to aneurysm-related mortality, but the benefit was lost by the end of the study, at least partially because of fatal endograft

ruptures (adjusted hazard ratio, 0.92; 95% CI, 0.57 to 1.49;  $P=0.73$ ). By the end of follow-up, there was no significant difference between the two groups in the rate of death from any cause (adjusted hazard ratio, 1.03; 95% CI, 0.86 to 1.23;  $P=0.72$ ). The rates of graft-related complications and reinterventions were higher with endovascular repair, and new complications occurred up to 8 years after randomization, contributing to higher overall costs.

## Conclusion

The results over a median follow-up period of 6 years confirm the previously published midterm findings that operative mortality associated with endovascular repair of abdominal aortic aneurysm was only a third of that associated with the open-repair procedure and that aneurysm-related mortality was reduced during the early years after endovascular repair. However, the early benefit was completely lost in the longer term, with substantially higher aneurysm-related mortality after 4 years in the endovascular-repair group than in the open-repair group and new graft-related complications and reinterventions continued to be reported for as long as 8 years after endovascular procedures were performed. Secondary rupture after aneurysm repair was reported only after endovascular repair and appeared to explain the long-term increase in aneurysm-related mortality. In contrast, open repair was very durable but was associated with higher operative mortality. These findings have implications for the selection of patients for endovascular repair, the choices for patients, surveillance after repair, and cost-effectiveness.  $\square$

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### Comment on a paper:

Greenhalgh M, Allison DJ, Bell PRF et al – Endovascular versus Open Repair of Abdominal Aortic Aneurysm. The United Kingdom EVAR Trial Investigators: *New England Journal of Medicine* May 20, 2010; 362:1863-1871