



Title	Endovascular Stents for Abdominal Aortic Aneurysms: A Systematic Review and Economic Model
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Aim

To determine the clinical and cost effectiveness of endovascular aneurysm repair (EVAR) of infrarenal abdominal aortic aneurysms (AAAs) in patients at varying levels of risk.

Conclusions and results

Open repair is more likely to be cost effective than EVAR on average in patients considered fit for open surgery. EVAR is likely to be more cost effective than open repair in a subgroup of patients at higher risk of operative mortality. These results are based on extrapolation of midterm results of clinical trials. Evidence does not currently support EVAR in the treatment of ruptured aneurysms. Follow-up of the UK trials should be undertaken, and the relative costs of procedures and devices should be investigated further. Six RCTs were included in the clinical effectiveness review. Thirty-four studies evaluated the role of patients' baseline characteristics in predicting risks of particular outcomes after EVAR. Most were based on data from the EUROSTAR registry relating to devices in current use. Compared with open repair, EVAR reduces operative mortality (odds ratio 0.35, 95% CI 0.19 to 0.63) and medium-term, aneurysm-related mortality (hazard ratio 0.49, 95% CI 0.29 to 0.83), but offers no significant difference in all-cause mortality. EVAR is associated with increased rates of complications and reinterventions, which are not offset by any increase in health-related quality of life. EVAR trial 2 comparing EVAR with nonsurgical management in patients unfit for open repair found no differences in mortality between groups. However, many patients randomized to nonsurgical management crossed over to receive surgical repair of their aneurysm. The cost-effectiveness systematic review identified 6 published decision models. Both models considered relevant for the decision in the UK concluded that EVAR was not cost effective on average compared with open repair at a threshold of 20 000 pounds sterling (GBP) per quality-adjusted life-year (QALY). Another model concluded that EVAR would be on average more cost effective than

no surgical intervention in unfit patients at this threshold. The Medtronic model concluded that EVAR was more cost effective than open repair for fit patients at this threshold. The York economic evaluations found that EVAR is not cost effective compared with open repair on average at a threshold of GBP 30 000 per QALY, with the results very sensitive to model assumptions and the baseline risk of operative mortality. Exploratory analysis to evaluate management options in patients unsuitable for open surgery suggested that the cost effectiveness of EVAR might be sensitive to aneurysm size and patient's age at operation. Indicative modeling suggests that EVAR may be cost effective for small aneurysms in some patient groups. Ongoing RCTs will provide further evidence relating to these patients.

Recommendations

See Executive Summary link at www.hta.ac.uk/project/1678.asp.

Methods

See Executive Summary link at www.hta.ac.uk/project/1678.asp.

Further research/reviews required

1) Follow-up of the UK trials (EVAR trial 1, EVAR trial 2) should be undertaken. 2) The relative procedure and device costs should be investigated further. 3) Opportunities for individual patient meta-analysis of all RCTs relating to EVAR should be sought. 4) Research is needed on the rates of late complications, reinterventions, and aneurysm-related mortality after EVAR, in particular those associated with the most recent generation of devices. 5) The optimal surveillance policy following EVAR should be investigated. 6) The extent to which the relative treatment effect of EVAR on operative mortality can be assumed constant across subgroups of patients should be investigated.