Outcome of endovascular treatment of acute type B aortic dissection

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CRD summary
This review concluded that endovascular stent-graft for complicated acute type B aortic dissection had favourable short-term outcomes, but that further research was needed. There were numerous methodological problems with the review and the included studies were observational and most were small. The conclusions cannot be regarded as reliable.

Authors' objectives
To assess the effects of endovascular repair for complicated type B acute aortic dissection.

Searching
MEDLINE was searched from 1997 to 2007. The search terms were reported. Reference lists of identified publications were checked.

Study selection
Studies of more than 10 participants that assessed treatment of complicated acute type B aortic dissection with endovascular stent grafts and reported on in-hospital mortality were sought. Type B acute aortic dissection was defined as dissection of the descending aorta presenting within 14 days of onset of symptoms. Studies on traumatic type B dissection were excluded.

The included studies appeared to be observational case series or registry studies. Some studies were on multiple pathologies, but data for relevant participants only were included. Where given, mean age of participants was 61 years and 76 per cent were men. Of those studies that reported particular details: 81 per cent had hypertension; 17 per cent had hypotension (systolic blood pressure of less than 100 mm Hg); 8.9 per cent had a history of stroke; 0.4 per cent had acute stroke; 18 per cent had renal impairment; and 15 per cent had leg ischaemia. Only people with complications (aortic rupture, impending rupture, peripheral malperfusion, uncontrolled hypertension or refractory pain) were treated. Anatomical criteria varied from landing zone with a diameter of less than 38 mm to less than 44 mm and length from more than 5 mm to more than 10 mm.

Outcomes reported included early outcomes (procedural success, defined as successful stent-graft in the intended site without emergency conversion to open surgery; emergency conversion, complete false lumen thrombosis; 30-day mortality; stroke; paraplegia; bowel infarction; major amputation; requiring dialysis; development of Type A dissection) and late outcomes (late mortality; overall survival; aortic rupture; need for reintervention). Follow up ranged from eight months to 48 months.

The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The numbers of events for each outcome were extracted. Where authors included a section on postoperative complications it was assumed that they would have reported any incidences of major in-hospital short-term complications. Where data for particular variables were available in less than 30 per cent of studies, those variables were excluded. If variables were not stated then they were taken to be unavailable and authors were not contacted for any further information.

Some studies included multiple pathologies. If data were available only for the combined group, weighted numbers were calculated for variables for all included participants.

Data were extracted independently by two authors. Discrepancies were resolved by discussion and consensus.
Methods of synthesis
The numbers of events in each study were added together and percentages calculated (related to the total number of participants in studies reporting each particular outcome).

Results of the review
Twenty nine observational studies (942 participants) were included. The number of participants in each study ranged from 10 to 131. Seventeen studies had less than 20 participants. Three studies had 120 or more participants and contributed 40 per cent of the total number of participants.

Early outcomes
Technical success was achieved in 95 per cent of cases (776 out of 813 participants). In-hospital mortality was nine per cent (85 out of 942 participants). Emergency conversion was required in 0.6 per cent (six out of 942). Major complications were uncommon: stroke 3.1 per cent (25 out of 812 participants); development of Type A dissection two per cent (18 out of 918); 2.1 per cent required dialysis (17 out of 812); paraplegia 1.9 per cent (18 out of 932 ); bowel infarction 0.9 per cent (seven out of 812); and major amputation 0.2 per cent (two out of 812).

Late outcomes
Late mortality occurred in 3.6 per cent of participants (31 out of 853). Late aortic rupture occurred in 0.8 per cent (six out of 722). Endovascular reintervention was required in 7.6 per cent (54 out of 714) and surgical reintervention in 2.8 per cent (20 out of 728). In addition, in two studies 13 out of 31 required reintervention (either endovascular or surgical, but not defined).

Overall 88 per cent survived to follow-up (range 56 per cent to 100 per cent; 26 studies).

Authors' conclusions
Data suggested that endovascular treatment of complicated acute type B aortic dissection resulted in favourable initial outcomes. More research was needed into longer-term outcomes.

CRD commentary
The inclusion criteria related to study population were clear, but criteria related to study design were not defined. Database searching was limited to only one database and studies may have been missed. It is possible that publication bias may have affected the results. Data were extracted in a way that was aimed at reducing errors, but the study selection process was not described and it was not clear whether the methods used were those aimed at reducing bias during the selection process. Some assumptions made during data extraction may have resulted in inaccuracies. The quality of included studies did not appear to have been assessed and no attempts were made to investigate any heterogeneity between studies. Combining outcomes by adding results from individual studies took no account of individual study characteristics and was probably inappropriate. In addition, no indication was given as to the proportion of participants who experienced any major adverse event. Most included studies were small and all appeared to be observational studies. Results from such types of studies may not be reliable as they can be affected by confounding factors (for example, patient selection). In view of these comments the authors' conclusions cannot be regarded as reliable.

Implications of the review for practice and research
Practice: The authors stated that endovascular repair was a treatment option for acute type B aortic dissection.

Research: The authors stated that further research of long-term outcomes was required.

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