Open versus endovascular repair of traumatic aortic rupture: a systematic review

Akowuah E, Angelini G, Bryan AJ

CRD summary
This review concluded that endovascular repair reduced mortality and morbidity compared with conventional surgical repair in patients with traumatic aortic rupture. This was a short report, with limited details on the included studies, analysis, and review process, which makes it difficult to determine the reliability of the authors' conclusions and they should be interpreted very carefully.

Authors' objectives
To compare the effectiveness of conventional surgical repair with endovascular repair for the treatment of patients with traumatic aortic rupture.

Searching
MEDLINE, EMBASE, and the Cochrane Library were searched for published and unpublished articles. Search terms were reported. Reference lists and abstracts of major cardiology and cardiothoracic scientific meetings were also handsearched.

Study selection
Articles comparing conventional surgical repair with endovascular repair (using stents), for the emergency treatment of traumatic aortic rupture, were eligible for inclusion. Studies including acute aortic rupture were eligible if the data on traumatic aortic rupture were reported separately. Outcomes of interest included operative mortality, paraplegia, early complications, and late complications.

Details of the included studies were not reported and the authors did not state how many reviewers selected studies for inclusion.

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

Data extraction
The authors did not report how the data were extracted.

Methods of synthesis
The total number and percentage of patients experiencing the outcomes of interest were calculated for both treatment groups. It appears that operative mortality and paraplegia rates were compared between treatment groups to calculate statistical differences (p values), but this was not clear.

Results of the review
Ten retrospective series studies (n=262 patients; 153 undergoing surgical repair, 109 undergoing endovascular repair) were included. Study quality was poor and the median follow-up, where reported, was at 36 months.

Endovascular stents significantly reduced the operative mortality and postoperative paraplegia compared with surgical repair. Operative mortality was 7% for endovascular stents and 19% for surgical repair (p=0.01). Postoperative paraplegia was 1% for endovascular stents and 6% for surgical repair (p=0.01).

Major morbidity was more common in patients undergoing surgical repair (14 patients) than in those undergoing endovascular repair (nine patients). Where reported, there were no long-term complications observed with endovascular repair, while eight patients undergoing open repair reported some form of long-term complication (five studies).

Authors' conclusions
Endovascular repair resulted in lower mortality and morbidity compared with conventional surgical repair for the treatment of traumatic aortic rupture.

**CRD commentary**
The review question was clear, but the inclusion criteria were broad and the outcomes of interest were not pre-specified. The literature search was adequate and sought to identify unpublished data, but the search dates were not reported and it is possible that relevant data were missed. The authors did not report how each stage of the review process was undertaken, which means that reviewer error and bias cannot be ruled out. They did not report the process of validity assessment, but did state that study quality was poor, which affects the reliability of their conclusions. The study and population details were limited and it was unclear whether there was heterogeneity between the studies, which means that pooling of the operative mortality and postoperative paraplegia rates might not have been appropriate. Few patient details were provided, which makes it difficult to determine whether the patients were comparable at baseline, and the authors acknowledged that selection bias may have occurred, with healthier patients being treated with endovascular therapy. Only a small number of patients were included.

The report was very short and it was unclear whether this was due to a restriction on word count, which would explain the limited detail. Based on the information presented, there was potential for heterogeneity, the quality of the included studies was poor, and there were limitations in the review process. This makes it difficult to determine the reliability of the authors’ conclusions and they should be interpreted very carefully.

**Implications of the review for practice and research**
**Practice**: The authors stated that endovascular stents appeared to be widely applicable as emergency treatment and should be the treatment of choice for traumatic aortic rupture.

**Research**: The authors stated that data on the long-term stability of endovascular stents were required to fully assess the technique.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
19698868

**DOI**
10.1016/j.jtcvs.2008.05.047

**Original Paper URL**
http://www.jtcvsonline.org/article/S0022-5223(08)01149-5/abstract

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Acute Kidney Injury /complications; Aorta, Thoracic /injuries; Follow-Up Studies; Humans; Respiratory Distress Syndrome, Adult /complications; Retrospective Studies; Rupture /complications /surgery; Stents /utilization; Survival Rate; Vascular Surgical Procedures /mortality

**AccessionNumber**
12009108637
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.