Postoperative incision hernia in patients with abdominal aortic aneurysm and aortoiliac occlusive disease: a systematic review

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CRD summary
This review investigated the incidence of post-operative incision hernia associated with aortic reconstruction in patients with abdominal aortic aneurysm (AAA) or aortoiliac occlusive disease (AOD). Patients with AAA had a 3-fold increased risk of post-operative incision and inguinal hernia compared with patients with AOD. The review had a number of methodological weaknesses, but the conclusions are generally supported by the evidence presented.

Authors' objectives
To determine the incidence of post-operative incisional hernia associated with aortic reconstruction in patients with abdominal aortic aneurysm (AAA) compared with patients with aortoiliac occlusive disease (AOD).

Searching
MEDLINE was searched from 1966 to 2005. The references of articles retrieved were checked, as were other (unspecified) secondary sources. Two of the keywords were reported.

Study selection
Study designs of evaluations included in the review
The inclusion criteria did not mention study design. Prospective and retrospective comparative observational studies were included.

Specific interventions included in the review
Studies of midline incision for abdominal aortic reconstruction for AAA or AOD were eligible for inclusion.

Participants included in the review
Patients with AAA or AOD were eligible for inclusion.

Outcomes assessed in the review
The only outcome specified in the inclusion criteria was the incidence of post-operative incisional hernia, but the review also reported the incidence of post-operative inguinal hernia. The outcome assessment measures were clinical examination, ultrasound (US), computed tomography (CT) and/or magnetic resonance imaging (MRI).

How were decisions on the relevance of primary studies made?
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 authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
The studies were pooled statistically using a random-effects model to generate odds ratios (ORs) and 95% confidence intervals (CIs). Separate pooled estimates were derived for inguinal hernia and incision hernia. Publication bias was assessed by means of a funnel plot and a rank correlation test.

How were differences between studies investigated?
Chi-squared tests were used to investigate statistical heterogeneity between the studies. Sensitivity analyses were conducted to assess the impact of individual studies, of study design (prospective versus retrospective) and of outcome assessment method (clinical examination only versus US, CT or MRI).

Results of the review
Seven studies, with a total of 1,132 participants (719 with AAA and 413 with AOD), were included in the review. Three studies (n=654) were prospective and four were retrospective (n=478).

The overall incidence of incision hernia in the studies was 21% for AAA versus 9.8% for AOD.

Pooled analysis of all 7 studies showed that patients with AAA were 2.8 times more likely to experience post-operative incision hernia than patients with AOD (OR 2.79, 95% CI: 1.88, 4.13; based on 7 studies; p<0.0001). The findings were similar for inguinal hernia (OR 2.85, 95% CI 1.71, 4.77; based on 5 studies; p<0.0001). Risk factors differed between patients with AAA and patients with AOD, with the former being older and more likely to be male. However, pooled analysis of 3 studies that adjusted for these and other major risk factors showed more than five times the risk for incision hernia in patients with AAA compared with those with AOD (OR 5.45, 95% CI: 2.48, 11.94; p<0.0001).

There was clinical heterogeneity between the studies with regard to mean duration of follow-up, type of surgical closure used and follow-up measures. However, there was no statistically significant heterogeneity in the forest plots for either inguinal hernia or incision hernia (p=0.23 and p=0.99, respectively), and sensitivity analyses did not substantially change any of the pooled estimates. No evidence of publication bias was detected (p=0.33).

Authors’ conclusions
Patients with AAA have an approximately 3-fold increased risk of post-operative incision hernia compared with patients with AOD, and a similarly increased risk of post-operative inguinal hernia.

CRD commentary
The review question was clear, but the search was rather limited as only one database was searched. The clinical characteristics of participants and interventions in the included studies were adequately reported and the statistical methods used were satisfactory. However, the inclusion criteria were imprecise and no account was provided of how the study selection, data extraction or validity assessment were performed. It is unclear whether decisions were made independently by more than one person or whether the methodological quality of the primary studies was adequately evaluated. There was insufficient information about study design and quality.

The overall conclusions are supported by the data presented.

Implications of the review for practice and research
Practice: The authors stated that patients with AAA had a 3-fold increased risk of post-operative incisional and inguinal hernia over patients with AOD, which they attributed to defects in the extracellular matrix associated with AAA.

Research: The authors stated that a large multicentre prospective study is required to confirm the findings of this review.

Bibliographic details