Meta-analysis of clinical trials comparing scleral buckling surgery to pneumatic retinopexy

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Authors' objectives
To compare scleral buckling surgery and pneumatic retinopexy for the treatment of primary rhegmatogenous retinal detachment.

Searching
MEDLINE was searched from 1966 (end date not reported) and some search terms were provided. Published abstracts from the Association for Research in Vision and Ophthalmology were searched for the previous 5 years.

Study selection
Study designs of evaluations included in the review
Prospective comparative studies were eligible for inclusion. Follow-up studies of previously published series were excluded. The included studies were randomised controlled trials (RCTs) and non-randomised controlled trials.

Specific interventions included in the review
Studies evaluating both scleral buckling surgery and pneumatic retinopexy were eligible for inclusion.

Participants included in the review
Studies of patients with primary rhegmatogenous retinal detachment were eligible for inclusion. The included studies were of patients with primary retinal detachment or rhegmatogenous retinal detachment.

Outcomes assessed in the review
The outcomes eligible for inclusion were not explicitly stated. All the included studies assessed whether a secondary procedure was required following treatment.

How were decisions on the relevance of primary studies made?
The author did not state how the papers were selected for the review, or how many reviewers performed the selection.

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

Data extraction
The author did not state how the data were extracted for the review, or how many reviewers performed the data extraction. The percentage of patients requiring a secondary procedure following the intervention was estimated.

Methods of synthesis
How were the studies combined?
The studies were combined in a meta-analysis using the Mantel-Haenszel method.

How were differences between studies investigated?
Statistical heterogeneity was investigated using the chi-squared test and visually using a L'Abbé plot (not reported). A sensitivity analysis was carried out by removing individual studies from the statistical pooling.

Results of the review
Four studies were included: three RCTs and one non-randomised controlled trial. There were two studies with a total of
336 eyes and two studies with a total of 40 patients.

Secondary procedures were less common following scleral buckling surgery than after pneumatic retinopexy (odds ratio 0.491; 95% confidence interval: 0.285, 0.771).

Statistically significant heterogeneity was not detected (P>0.05).

When individual studies were removed from the statistical pooling, the odds ratio ranged from 0.4 to 0.5.

**Authors' conclusions**

The results demonstrated that, compared with pneumatic retinopexy, scleral buckling surgery is associated with a lower incidence of patients requiring a secondary procedure.

**CRD commentary**

Inclusion criteria were stated for the intervention, participants and study design, though it was unclear why follow-up studies of previously published series were excluded. Only one electronic database and conference abstracts from one association were searched, therefore it is possible that studies were missed. The author did not report using review procedures that help to reduce error and bias. The quality of the studies was not formally assessed and the review findings were not considered in the context of study quality. It is unclear whether it was appropriate to pool the studies, in particular whether it was appropriate to pool randomised and non-randomised studies: only minimal details of the individual studies were reported, making it difficult to assess whether there was clinical heterogeneity, and the P-value for the test of statistical heterogeneity could have been more conservative. Given these limitations, the conclusions of this review cannot be regarded as robust.

**Implications of the review for practice and research**

The author did not state any implications for practice or further research.

**Bibliographic details**

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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.