The MRC spine stabilization trial: surgical methods, outcomes, costs, and complications of surgical stabilization


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to assess the outcomes and costs associated with three surgical procedures for patients with chronic low back pain. The authors’ concluded that the outcomes of surgery were broadly similar in the three treatment groups and that more complex and expensive operations did not improve outcomes. There were some limitations in the methodology and the results should be considered with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the outcomes and costs associated with different types of surgery for patients with chronic low back pain, using data from a randomised trial that compared surgery with intensive rehabilitation.

Interventions
Three types of surgery were investigated: flexible instrumentation using Graf Ligament; posterolateral fusion (instrumented or non-instrumented); and 360° fusion.

Location/setting
UK/secondary care.

Methods
Analytical approach:
The effectiveness data were derived from one arm of a multi-centre randomised controlled trial. The time horizon was 24 months. The authors did not report the study perspective.

Effectiveness data:
The effectiveness data were derived from the surgical arm of the Spinal Stabilization Trial, the aim of which was to compare surgery with rehabilitation. There were 136 patients assigned to one of three surgical techniques, based on the surgeon’s choice for the best outcome for that patient. Some differences were observed between the three groups at baseline; for example, there was a higher proportion of smokers in the Graf group and a higher proportion of patients in the PF group had a diagnosis of spondylolisthesis.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The primary clinical outcomes were the Oswestry Disability Index and the Shuttle Walking Test.

Cost data:
The costs of surgery, in-patient and out-patient care, and physiotherapy, and other costs related to back pain were included. Some of the surgery costs were obtained from the lead investigating centre participating in the trial. The price year was 2002 to 2003 and costs were in UK pounds sterling (£). Further details of the cost analysis were presented elsewhere (Rivero-Arias, et al. 2005, see ‘Other Publications of Related Interest’ below for bibliographic details).
Analysis of uncertainty:
There was no analysis of uncertainty.

Results
The mean change in the Oswestry Disability Index was -10.3 in the Graf group, -12.4 in the posterolateral fusion group, and -17.7 in the 360° fusion group. The mean change (in metres) in the Shuttle Walking Test was 75 in the Graf group, 163.3 in the posterolateral fusion group, and 89.3 in the 360° fusion group.

The mean cost of surgery was £6,927 in the Graf group, £6,164 in the posterolateral fusion group, and £9,264 in the 360° fusion group. The mean cost of secondary care in the follow-up period was £1,261 in the Graf group, £697 in the posterolateral fusion group, and £1,912 in the 360° fusion group.

Authors' conclusions
The authors concluded that the outcomes of surgery were broadly similar in the three treatment groups and that more complex and expensive operations did not improve outcomes.

CRD commentary
Interventions:
The interventions were clearly reported and appear to have been the relevant surgical strategies in the authors' setting.

Effectiveness/benefits:
The effectiveness data were derived from one arm of a randomised controlled trial. This trial was powered to detect differences between surgery and rehabilitation, but it does not appear to have had sufficient power to detect differences between surgical techniques. The patients were not randomised to the various surgical techniques, but were assigned by the surgeon. It is likely that the surgeon's decision was based on the severity or history of the condition, which are also likely to impact on the outcome of the surgery.

Costs:
The authors did not report a perspective so it is unclear if the appropriate cost categories were included. In general, the cost analysis was poorly reported, but it was stated that full details were reported elsewhere (Rivero-Arias, et al. 2005). For example, no unit costs or resource quantities were reported. The costs were incurred over a 24-month period, but they do not appear to have been discounted.

Analysis and results:
No synthesis of the effectiveness and cost data was performed so, in effect, a cost-consequence analysis was performed. While the results were clearly reported, the impact of uncertainty was not investigated, which makes it impossible to assess whether the results were robust. The authors compared their findings with those from other studies which, in general, had similar results.

Concluding remarks:
Overall, there were some limitations in the methodology and the results should be considered with caution.

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