The value of a pantaloon cast test in surgical decision making for chronic low back pain patients: a systematic review of the literature supplemented with a prospective cohort study


CRD summary
This review concluded that the pantaloon cast test with substantial pain relief suggests a favourable outcome for lumbar fusion surgery compared with conservative management. However, without an assessment of study quality and with the inclusion of only a very limited number of small and quite variable studies, the authors’ conclusions may not be reliable and should be interpreted with caution.

Authors' objectives
To assess the value of the pantaloon cast test when selecting patients with chronic lower back pain (LBP) for lumbar fusion surgery or conservative management.

Searching
MEDLINE, Current Contents and the Cochrane Controlled Trials Register were searched up to October 2003; the search terms were not reported. In addition, the reference lists of retrieved articles were screened for further studies. No restrictions were placed on the language or date of publication.

Study selection
Studies of well-described orthosis or pantaloon casts, applied for stabilisation of the lumbosacral region, in at least 20 patients with chronic LBP, either with or without previous spinal surgery, who did not respond to conservative treatment, were eligible for inclusion. Eligible studies had to assess pain relief pre-operatively and compare it with the outcome of lumbar fusion, and have a minimum follow-up period of 6 months. The authors did not specify any 'gold' standard against which the pantaloon cast test should be compared. Studies of patients with objective neurological motor deficits, or who had diagnosed fractures, infectious diseases, ankylosing spondylitis, neoplasms, congenital or adolescent idiopathic scoliosis or kyphosis, were excluded from the review. The included studies all included patients with previous spinal surgery; two also included patients with degenerative disc disease. The types of intervention included a fibreglass cast, moulded rigid thoracic lumbosacral orthosis or canvas corset with plastic posterior reinforcement, and a moulded plaster body jacket with optional unilateral hip extension. One study included a control group of nonsurgical management patients, whereas the other studies did not use any control group. Two studies included both test-positive and -negative patients, but the other only included test-positive patients. Where stated, the participants were followed up for a mean of either 12 or 19 months; in one study all patients were followed up for 24 months.

Two reviewers screened the studies to determine whether they met the aforementioned inclusion criteria, and any disagreements were resolved through consensus or through the intervention of a third reviewer.

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
The authors summarised the findings using a narrative synthesis and presented some data in a summary table.

Results of the review
Three studies (n=120), one of which was a controlled study, were included in the review.
Only the controlled study reported a significantly better outcome after fusion, compared with conservative treatment, for patients who reported significant pain relief after a positive cast test ($\chi^2 p=0.002$). However, in another study the outcome after lumbar fusion was not significantly different for patients with a positive cast test compared with those with a negative cast test.

**Authors' conclusions**
A pantaloon cast test with substantial pain relief suggests a favourable outcome for lumbar fusion surgery compared with conservative management, but a negative test has no value in surgical decision-making. Evidence from a cohort study, not included in the review, suggests that the test has no value in those patients who have had previous spinal surgery, and that the test is only associated with a favourable outcome in chronic LBP patients without prior spinal surgery.

**CRD commentary**
This review answered a clear review question and searched for published data in any language, but does not appear to have sought unpublished data, thereby suggesting a risk of publication bias. Appropriate steps were taken to reduce the risk of reviewer error and bias when selecting the studies, but there were few details of how the data were extracted and study quality does not appear to have been assessed. This makes it difficult to assess the reliability of the data, although the brief descriptions of study design suggest that the data may not be reliable. Some study details were tabulated and, given the small number of studies and differences in intervention and study design and population, the narrative synthesis appears appropriate. Overall, given the types of study design included and the paucity of data, the authors' conclusions may not be reliable and should be interpreted with caution.

**Implications of the review for practice and research**
Practice: The authors stated that a negative test has no value in surgical decision-making. They also stated that, apart from the inconvenience, the pantaloon test has a negligible complication rate.

Research: The authors did not state any implications for further research.

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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.