Nonoperative management of cervical myelopathy: a systematic review

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CRD summary
This review compared the safety and effectiveness of non-operative treatment, with those of surgery, and assessed the risk of neurological deterioration for patients with cervical myelopathy or asymptomatic cord compression. There was a lack of high-quality evidence to support non-surgical treatment. There was potential for bias in the review, but the authors' conclusions seem appropriate.

Authors' objectives
To assess the safety and effectiveness of non-surgical treatment for patients with cervical myelopathy, and to assess the risk of neurological deterioration, due to some activities or mild trauma, in patients with asymptomatic cord compression.

Searching
PubMed and The Cochrane Library were searched for articles published in English between 1956 and November 2012. Search terms were not reported. Reference lists of relevant articles were manually searched.

Study selection
Eligible for inclusion were studies comparing non-operative treatments, with each other or with surgery, for patients (aged 18 years or older) with cervical myelopathy, and studies assessing the effects of various activities or mild trauma, in patients with asymptomatic cervical cord compression. Only patients with myelopathy due to ossification of the posterior longitudinal ligament were eligible. The clinical outcomes of interest, for treatments, included the assessment of their effects in patients with varying severity of myelopathy, neurological status, functional status, health-related quality of life, and pain (arm and neck). For activities or mild trauma, the risk of neurological deterioration was the outcome of interest. Studies of fewer than 10 patients were excluded.

The included studies were published between 1995 and 2011. Where reported, the mean age of patients ranged from 49 to 67 years. Patients had mild or moderate-to-severe cervical myelopathy. Non-operative treatments included bed rest, physical therapy, medication, injections, orthoses, and traction. Various surgical procedures were used, such as anterior decompression and laminoplasty. Various measures were used to assess each outcome. Traumatic events included falls, sports injury or injury from objects, occupational injury, and traffic accidents.

Two reviewers screened studies for inclusion.

Assessment of study quality
Two reviewers independently assessed study quality and risk of bias, according to the Agency for Healthcare Research and Quality (AHRQ) criteria.

Data extraction
For studies assessing treatments, the outcome means and proportions were extracted. For studies assessing activities or mild trauma, the data on neurological deterioration were extracted, where available, to calculate risk ratios and their 95% confidence intervals for individual studies.

The authors did not state how many reviewers extracted the data.

Methods of synthesis
The evidence was presented in a narrative synthesis, based on the strength of the evidence and the strength of recommendations. The strength of evidence was assessed using published methods; it was considered to be high, moderate, low, or insufficient (as defined in the review). The strength of recommendations was based on published criteria and considered to be strong or weak.

Results of the review
Five studies were included in the review. The mean follow-up ranged from 12 months to 10 years. Where reported, the percentage of patients reporting the longest follow-up was 69 or 100. The evidence for all outcomes was either low or insufficient strength.

Low strength evidence suggested that non-operative treatment was equivalent or better for neurological outcomes, compared with surgery, for patients with mild cervical myelopathy (one randomised controlled trial).

Two retrospective cohort studies of patients with moderate-to-severe cervical myelopathy were subject to confounding, as the treatment groups were allocated according to severity of myelopathy or patient choice. These studies found that surgery was associated with higher rates of neurological improvement; surgically treated patients had more severe myelopathy at the start.

No study directly addressed the outcome of non-operative treatment by severity of myelopathy.

There was insufficient evidence to determine whether various activities or mild trauma increased the risk of developing or worsening myelopathy (two retrospective cohort studies).

**Authors' conclusions**
There was a lack of high-quality evidence to support non-surgical treatment for cervical myelopathy.

**CRD commentary**
The review question and inclusion criteria were clearly stated. Two electronic databases were searched for relevant literature, with a restriction to articles published in English, so relevant data may have been missed. Study quality and risk of bias were assessed. The results were a little difficult to follow, but seemed to suggest that most studies were of low quality, and all were at some risk of bias. It was unclear whether data extraction was performed by two people, which means that reviewer error and bias cannot be ruled out.

Given the differences between studies in their patient and study characteristics, a narrative synthesis was appropriate. There was little evidence, with small samples, and this was reflected in the low or insufficient strength of evidence presented.

There was potential for bias in the review, but the authors' conclusions reflect the evidence and seem appropriate.

**Implications of the review for practice and research**
**Practice:** The authors stated that they did not recommend the routine prescription of non-surgical treatment for patients with moderate-to-severe myelopathy. They recommended that if it was considered, care should be taken to monitor for neurological deterioration. They also recommended that patients should be counselled about the uncertainties around minor trauma as a risk factor for neurologic deterioration.

**Research:** The authors stated that further studies, preferably randomised controlled trials, were needed to clarify the role of non-operative treatment, particularly for patients with milder myelopathy. Studies were needed to compare the safety, cost, mortality, neurologic progression, and complications associated with non-operative treatment and surgery.

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