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Symptoms and signs possibly indicating segmental, discogenic pain. A fusion study with 18 years of follow-up

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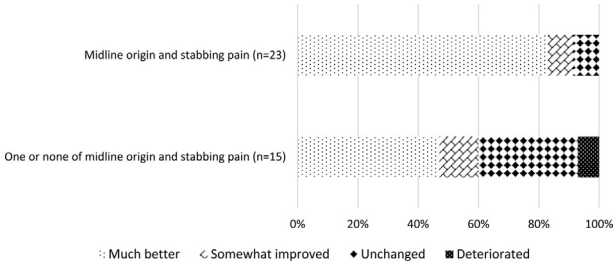
HIGHLIGHTS

- Specified symptoms related to a painful segment/disc are not previously reported.
- We analysed symptoms of patients with back pain relief following fusion operation.
- A symptom triad emerged: dominating aching midline pain, stabbing at sudden movements.
- Most patients also had diffuse leg pain radiation and often bladder frequency.
- Our results may improve selection of patients suitable for fusion surgery.

GRAPHICAL ABSTRACT



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ABSTRACT

Background: Only two out of the five existing randomized studies have reported better results from fusion surgery for chronic low back pain (CLBP) compared to conservative treatment. In these studies the back symptoms of the patients were described simply as "chronic low back pain". One possible reason for the modest results of surgery is the lack of a description of specified symptoms that might be related to a painful segment/disc, and patient selection may therefore be more or less a matter of chance. Previous prospective studies including facet joint injections and discography and eventually MRI have failed to identify patients with a painful segment/disc that will benefit from fusion surgery.
Purpose: Our purpose was to analyse in detail the pre-operative symptoms and signs presented by patients who showed substantial relief from their back pain following spinal fusion surgery with the aim of possibly finding a pain pattern indicating segmental, discogenic pain.
Methods: We analysed 40 consecutive patients, mean age 41 years, with a history of disabling low back pain for a mean of 7.7 years. Before surgery the patients completed a detailed questionnaire concerning various aspects of their back pain, and findings at clinical examination were thoroughly noted. Monosegmental posterior lumbar interbody fusion without internal fixation was performed using microsurgical technique. Outcome was assessed at 1, 2 and 4 years after surgery and finally at 18 years, using self-reporting measures and assessment by an independent examiner. Assessment at 18 years applied the Balanced Inventory for Spinal Disorders Questionnaire and the Roland-Morris Disability Questionnaire.
Results: According to the independent observer's assessment at two years 27 of the 40 patients were much improved. Analysis of the pre-operative depiction of the back symptoms of this group revealed a rather uniform pattern, the most important being: dominating back pain originating in the midline of the

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spine, with a dull, aching character and stabbing pain in the same area provoked by sudden movements. Most patients in this group also had diffuse pain radiation of various extension down one or both legs and often bladder dysfunction with frequency. At clinical examination, localized interspinal tenderness was observed within the spinal area in question and the patient's back pain was provoked by pressure in that area and by tapping a neighbouring spinous process.
At 18 years after surgery 19 patients assessed themselves as much improved. At that time 5 of them had pension due to age, 7 early pension, one worked full time and six patients part time. Eleven patients were re-operated due to defect bony healing.
Conclusions: The results may suggest that the use of a detailed symptom analysis and clinical examination may make it possible to select a subgroup of patients within the CLBP group likely to have better outcome following fusion surgery.
Implications: The next step would be to execute prospective studies and if our findings concerning back pain details and signs among CLPB patients can be confirmed this can provide for more accurate selection of patients suitable for fusion surgery.

1. Introduction

The clinical situation in patients with chronic low back pain (CLBP) varies considerably, from minor distress to total disablement. In more severe cases the demand for therapy is pressing both for the patient and the physician. For most patients with persistent unspecific pain for months and even years, a large number of non-specific treatments are proposed. Although some patients may benefit to an acceptable degree from these measures, many still experience unbearable pain after having tried all conservative methods, including psychological treatment. In such situations the possible value of spinal fusion may be discussed. However, only two out of five randomized studies have reported the results following fusion surgery for CLBP to be better than after conservative treatment [1–5]. One possible reason for the modest results of fusion surgery is the lack of a description of specified symptoms that might be related to a painful segment/disc, making patient selection more or less a matter of chance [6]. In the randomized studies mentioned above, the patients' back symptoms were described simply as "chronic low back pain" in three of the studies [2–4], as "back pain more pronounced than leg pain and no signs of nerve root compression" in the forth study [1], and as "low back pain" in the fifth study [5].

Our intention was to analyse in more detail the clinical symptoms and signs presented pre-operatively by those patients within the CLBP group who showed substantial relief from their back pain following fusion surgery, with the aim of possibly finding a pain pattern indicating segmental, discogenic pain.

2. Material and methods

2.1. Number of patients and pain duration

The material includes 40 consecutive patients, 35 women and 5 men, mean age 41 years (range 24–61), with a history of disabling low back pain for a mean of 7.7 years (range 2–36). All 40 patients were on sick leave and had been so for a mean of 4.0 years (range 1–15). All attempts at using conservative treatment methods, including long periods of physical therapy, had been unsuccessful.

2.2. Patient selection

Our intention was to find patients with symptoms from a presumed painful disc. According to our previous clinical experience, patients with more centrally located back pain had often reported a good outcome following fusion surgery. We therefore selected patients describing their back pain as located in proximity of the spine, and not in larger areas. Some, but not all of the patients had diffuse non-radicular pain radiation of varying extension down one or both legs. All patients were carefully examined radiologically by plain X-ray, CT scan or MRI in order to exclude those with specific reasons for their pain, e.g. disc herniation, stenosis, spondylolisthesis, etc.

2.3. Surgical procedure

All patients underwent monosegmental fusion without internal fixation. The presumptive painful level was chosen according to the signs at clinical examination and the results from intradiscal injection of local anaesthetic in at least two discs, blinded for the patients. Operations were performed regardless of whether or not various degenerative findings were present radiologically, and regardless of previous surgery or minor psycho-social problems. Posterior lumbar interbody fusion (PLIF) was performed using microsurgical technique. The operations were carried out between November 1987 and June 1988. Surgibone (calf bone) was used as transplant, which at that time was said to be equally effective as autologous bone [7,8]. Two patients underwent surgery at the L3–L4 level, 15 at the L4–L5 level and 23 at the L5–S1 level.

2.4. Questionnaire concerning symptoms

Before surgery all 40 patients completed a detailed questionnaire concerning various aspects of their symptoms, Table 1. The responses of those patients who showed much improvement at the 2-year follow-up, according to their own assessments and that of the independent examiner (see below), were analysed in order to determine if there was a pattern of symptoms indicating segmental, discogenic pain. These patients were also compared with those who did not show improvement following the operation.

2.5. Evaluation of outcome

In addition to the global assessments made by the patients, outcome was evaluated retrospectively by an independent observer (neurologist Henrik Weber (HW), Oslo, Norway). He also checked the list of names in the operation record during the period in question, ensuring that the patients had been operated on consecutively. The pre-operative state of the patients was recorded based on data from the hospital records and was confirmed by means of the patients' own report, including duration of pain, drug consumption, pain-provoking and alleviating factors, psycho-social state and the effect of conservative therapy. The patients were asked by HW to

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