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Functional Outcomes in Patients with Symptomatic Lumbar Degenerative Disease Treated Non-Surgically

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Abstract

Objective: To describe differences in initial and follow-up visit disability scores in patients with lumbar spine degenerative disease treated non-surgically.

Methods: Records for 53 patients (36 women, 17 men), including 12 high-risk patients (8 diabetics, 4 smokers) undergoing conservative treatment for lumbar spine disorders between September 2009 and March 2010 were reviewed. The mean difference between initial and follow-up visit Oswestry Disability Index (ODI) scores was determined.

Results: The difference between initial and follow-up ODI for all patients was 4.40% (± 12.24%, p: 0.01). Differences for female and male patients were 3.16% (± 11.43%, p: 0.10) and 7.03% (± 13.77%, p: 0.05) respectively. High risk and low risk patient cohorts showed improvements of 3.03% (± 12.12%, p: 0.42) and 4.76% (± 12.39%, p: 0.01) respectively. Overall, 32 of 53 patients showed improvement in ODI, 38% of which improved their score by >12%. 6 of 53 patients pursued elective spinal surgery, 33% of which had actually improved their ODI with conservative therapy.

Conclusion: Conservative therapy for patients with lumbar spine degenerative disease resulted in lower pain and disability, as evidenced by improvements in the Oswestry disability index. Men showed statistically significant greater improvements in pain and disability than did women undergoing similar treatment. Low risk patients showed greater improvements than patients considered high risk. An appreciable number of patients in our study pursued elective spinal surgery, some despite improvements with conservative therapy. Overall, the number electing surgery was much less than in previous studies.

Keywords: Lumbar spine; Conservative; Disability; Back pain

Introduction

Low back pain continues to be a major issue in modern health care, accounting for close to 15 million office visits, placing it in the top five complaints warranting physician visits creating significant impact both economically and on patient morbidity and disability. Despite an annual incidence of 6.4% [1] and a cumulative lifetime prevalence of nearly 80% [2], conflicting opinions and data still exist as to the proper diagnosis and treatment of this syndrome. Contributing to the confusion is the wide variety of diagnoses that may lead to what has been termed "sciatica" or the "lumbosacral radicular syndrome". The vast majority of causes of sciatica are thought to be mechanical factors such as muscle strains, herniated discs, compression fractures, spinal canal narrowing, and spondylolisthesis [3]. A specific cause, however, is only identified in about 20% of cases [4]. In addition, evidence of a specific cause often poorly correlates to the location or severity of patient reported symptoms, further confounding the diagnosis and treatment decisions.

Treatment for lumbar spine disease is similarly as complicated a decision as diagnosis. At the broadest level, two options exist: Surgery and conservative management. Both modalities have been shown to improve outcomes significantly [5]. Despite some data showing equivalent results in long term outcomes between surgical and conservative therapy [6], the rate of spinal surgery, especially lumbar fusion surgery, has increased rapidly over the past decades, giving the United States the highest rate of spinal surgery in the world [7].

The advantage of surgical management of lumbar spine disease over conservative, non-operative management is controversial. Current recommendations suggest that fusion surgery, while superior to no treatment, is as effective but not superior to intensive rehabilitation [8]. Other studies suggest that while no differences in long term outcomes exist between surgical and conservative treatment, surgery results in faster recovery from back pain [6] and greater relief of some symptoms [9]. Results favoring surgery may, however, be influenced by patient beliefs in treatment effects [10].

Aim of the Study

The purpose of our study is to analyze and describe differences in disability scores for patients undergoing nonsurgical spine care for lumbar degenerative disease.

Methods

Primary outcome

Mean difference between initial and follow-up Oswestry Disability Index (ODI).

Project overview

Records for thirty-six women and seventeen men undergoing conservative treatment for lumbar spine disease were examined for the date range September 2009–March 2010. 12 patients enrolled in the study were considered to be "high-risk" based on comorbidities (8 diabetics, 4 currently smoking). The Oswestry Disability Questionnaire, which has been shown to be a reliable measure of disability [11], was used as a measure of patient symptoms and disability. Patient ODI was determined at initial and subsequent follow-up visits. In addition to overall group changes in ODI, sub-group analysis based on gender and risk status were performed. Patients were given the option to cross-over and pursue elective spinal surgery at any time during the study if symptoms and disability level warranted.

Results

Primary outcome analysis

The difference between initial and follow-up visit ODI scores for all patients analyzed as a group showed a 4.40% (± 12.24%, p: 0.01) improvement from baseline. Further sub-group analysis of female and male cohorts showed a mean difference of 3.16% (± 11.43%, p: 0.10) in females and 7.03% (± 13.77%, p: 0.05) in males. High risk patients showed a mean improvement of 3.03% (± 12.12%, p: 0.42), while low-risk patients showed improvement of 4.76% (± 12.39%, p: 0.01). Overall, 32 of 53 enrolled patients (60%) improved their ODI scores, 20 (38%) of which improved their scores by at least 12% (**Figure 1)**.

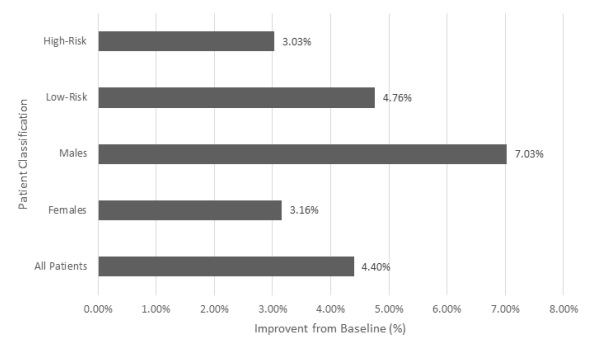

Figure 1: Percent improvement from baseline of all patients and sub-groups. This figure illustrates the percent improvement from the baseline found from analysis of the difference between initial and follow-up visit ODI scores for all patients and patient sub-group classifications after conservative treatment.

Secondary outcome analysis

Of 53 enrolled patients, 6 (11.3%) pursued elective spinal surgery. 2 of these patients had improved their ODI scores with conservative therapy prior to electing surgical treatment (**Table 1)**.

Group	Total (n:53)	Improved ODI score with conservative treatment
All enrolled patients	53	32
Pursued elective surgery after conservative treatment	6	2

Table 1: Patient decision to pursue elective surgery and ODI score improvement.

Discussion

Low back pain as a chronic problem

It is commonly quoted that 90% of low back pain resolves within 12 months. From the perspective of a physician who ceases to see return visits for such complaints, this may seem accurate. More likely, however, this number simply reflects the perceived futility of back pain. A study found that of patients presenting with new back pain complaints, only 32% returned with similar complaints at 3 months and only 8% continued to return to their physician beyond 3 months [1]. Only 25% of these patients expressed relief of pain at 12 months, indicating that many simply stopped consulting their physician, despite continued pain [1]. This lack of continued treatment may contribute to acute back pain's 20%-30% rate of transition to chronic pain [12]. Our results support a proactive approach to back pain management. 100% of patients studied continued to follow up at nine months, a much higher rate than seen in previous studies. This rate, however, may be influenced by its setting in a surgical specialty office. Many of these patients may have initially seen a primary care physician and were either referred or self-referred for more specialized treatment. Multiple factors affect back pain, including physical, emotional, social, and psychiatric situations. Job dissatisfaction correlates closely to the onset of low back pain [4] and depression and distress have been shown to increase the rate of transition from acute to chronic back pain [13]. Previous experiences with back or other bodily pain also affect the natural history of back pain [14]. Previous chronic pain also affords a worse prognosis for recovery [15] and symptoms persisting beyond the acute stage result in worse prognosis, higher risk for chronic pain, and unfavorable post-operative outcomes [16,17].

Diagnostic considerations

The diagnosis of lumbar spine disease is a clinical one that may or may not be supported by additional testing. The use of imaging is recommended in the presence of 'red flag' conditions or symptoms [18]. Despite this recommendation, imaging is quite common in practice, especially when disc disease is suspected. Myelography is no longer recommended as a diagnostic tool, as are diagnostic nerve blocks [8]. CT scans and MRI are the two most utilized imaging modalities in lumbar spine disease, with MRI having up to 96% accuracy when compared to surgical findings [19]. The rate of false-positive findings is quite high for both CT and MRI. Several studies of asymptomatic individuals have shown very high rates of bulging or herniated intervertebral discs on CT or MRI, with numbers up to 80% [3], with the highest incidence being at the L5-S1 and L4-5 levels [2]. On average, only 36% of asymptomatic patients have normal disc anatomy at all spinal levels Bulges, protrusions, and mild to moderate nerve root compression correlate poorly with any specific symptom pattern [20]. Only severe nerve root compression and disc extrusion, present in only 1% of asymptomatic individuals, correlate well with ipsilateral, predictable pain [20]. Further, it has been shown that patient perception of weakness and dysesthesia shows very little correlation to nerve root compression [20] and pain remains the most reliable indicator. It can be stated, then, that imaging should be reserved for patients with red flag symptoms, uncertain diagnosis despite complete history and physical, or persistent and disabling symptoms despite therapy. In addition, it has been suggested that the term "disc herniation" is too broad, does not correlate well with symptoms, and should be replaced by specific anatomical diagnoses such as 'bulge', 'protrusion', or 'extrusion' with description of nerve root involvement if pertinent. Imaging results should always be interpreted according to the patients' symptoms and with awareness that the presence of disc abnormalities does not absolutely indicate the cause of pain.

Patient confidence in outcomes

While our patient population showed a much lower crossover to surgical treatment than previous studies, there were still a significant number of patients who chose surgery despite functional

improvement. Our crossover rate from conservative to surgical therapy was only 11%, in contrast to previous reports of approximately 40% [6,9,21]. This may be skewed due to a smaller number of enrolled patients in our study. This may also reflect local and physician confidence in the outcomes of conservative management. Patient perceptions and expectations influence treatment results and patients tend to have greater confidence in surgical treatment. Patients enrolled in one study were surveyed concerning their confidence in treatment; belief in treatment scores were consistently higher for surgery than for conservative therapy, regardless of which treatment group the patients were assigned to [1]. These pre-conceived opinions and beliefs in the outcome of treatment may have substantial effects on the observed treatment benefit, especially when treatment success is measured using patient reported symptoms and outcomes. Those same beliefs may contribute to the high regional variation seen in spinal surgery rates [7]. This may explain why our patients chose to proceed with surgery, despite improvement with conservative therapy. Pain is a condition in which the placebo effect has been shown substantial. 'Sham' treatments as well as true therapy have shown advantages over no therapy [22]. The placebo effect extends to both surgical and non-surgical treatment [23].

Effectiveness of conservative therapies

Conservative therapy is often the first line choice for the treatment of patients with mild to moderate symptoms or those who wish to avoid surgery. A multitude of nonsurgical options exist: Non-interventional therapies such as traction, physical therapy, chiropractic and osteopathic spinal manipulation, acupuncture and medication; and interventional, nonsurgical therapies such as anesthetic and steroid nerve root injections, chemonucleolysis, prolotherapy, epidural steroid injections, intradiscal steroid injections, facet joint injections, and spinal cord stimulation therapy.

Non-interventional therapy

Physical rehabilitation is a mainstay of low back therapy, regardless of whether patients receive surgical intervention or not. Standardized, supervised, intensive regimens are superior to informal rehabilitation [8], but simple physical exercise and exercise programs have shown efficacy in relieving pain and disability [4,24]. Post-operative rehabilitation has also been shown to improve functional status and faster return to work [25] and post-operative restrictions or delays to starting rehabilitation are not recommended [22,25]. Our data support the use of rigorous, standardized therapy as an effective treatment for lumbar spine disease. Massage therapy, acupuncture, NSAID's, exercise, and spinal manipulation have also shown moderate benefits [26,27]. Some evidence suggests that these therapies need to be continued for an extended period of time to demonstrate effectiveness [28]. There is also evidence to suggest that physical modalities such as manipulation and therapy for back pain may reduce the need for patients to use NSAID's for pain control [29].

Interventional, non-surgical therapy

Intradiscal steroid injections, facet join injections, and prolotherapy have shown no efficacy over sham [8], as well as local anesthetic injections [30]. The use of steroid + local anesthetic injection for nerve block has been shown effective in avoiding surgery, but not in pain management [31]. Epidural steroid injections may have the strongest evidence for efficacy of any of the interventional, non-surgical treatments. Several studies have shown moderate short-term benefit [8,32,33] but showed little effect beyond 12 months [16].

Effectiveness of surgical treatment

Surgery, specifically lumbar fusion surgery, is being performed for lumbar spine disease more than ever before and more than anywhere else in the world. In certain conditions, fusion surgery has been shown effective [34]. Overall, surgical management has resulted in improved leg pain [9] and speed of recovery from an acute episode [6]. While initially more expensive, surgical treatment had similar costs at one year as conservative management, mostly due to reductions in the use of pain medication and therapy services [35]. Characteristics of patients most likely to benefit from surgical intervention are moderate-severe pain, lack of response to more than a year of conservative therapy, and patients with limited comorbid conditions [8]. Patients who have a higher level of disability on presentation, as indicated by the ODI, tend to show greater improvement with surgery [31].

Review of literature–surgery *vs.* conservative therapy

Many studies and several reviews have addressed possible differences in outcomes between lumbar spine patients treated surgically and those treated conservatively with mixed results. Most have shown similar disability rates beyond one year [6,10] with substantial improvements in both groups [36] and slightly better, but not significant, improvement with surgery [37]. Other studies have suggested a recovery and leg pain relief benefit with surgical management, but again showed similar long term outcomes [6,9,21]. Our study provides further evidence of the benefit of conservative therapy for lumbar spine disease and supports the proposition that well-informed patients desiring to pursue conservative therapy for their back pain should be supported [35]. Specifically, men and low risk patients seem to do better with conservative therapy than women and patients with comorbid conditions. Interestingly, the 'low-risk' group described in our study is similar to the patients expected to have the best outcomes following spinal surgery [38]. This would suggest that healthier patients have better outcomes in lumbar spine disease than high risk patients, regardless of whether they are treated conservatively or surgically.

Conclusion

Conservative therapy for patients with lumbar spine degenerative disease results in lower pain and disability, as evidenced by improvements in the Oswestry Disability Index. Men in our study showed statistically significant greater improvements in pain and disability than did women undergoing similar treatment. Low risk patients showed greater improvements than patients considered high risk. Several patients in our study pursued elective spinal surgery, some despite improvements with conservative therapy. Overall, the number electing surgery was much less than in previous studies.

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