

Clinical Studies

Comparison of usual surgical advice versus a nonaggravating six-month gym-based exercise rehabilitation program post–lumbar discectomy: results at one-year follow-up

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Abstract

BACKGROUND CONTEXT: Discectomy is the surgery of choice for the lumbosacral radicular syndrome. Previous studies on the postsurgical management of these cases compare one exercise regime to another. This study compares an exercise-based group with a control group involving no formal exercise or rehabilitation.

PURPOSE: The outcomes of a formal postsurgical exercise-based rehabilitation when compared with the usual rehabilitative surgical advice were evaluated.

STUDY DESIGN: A randomized clinical trial comparing management regimes after lumbar discectomies.

PATIENT SAMPLE: Ninety-three lumbar discectomy patients were randomized to two groups.

OUTCOME MEASURES: The following postoperative outcomes were used: levels of pain; levels of function; psychological well-being; time off work; levels of medication; and number of doctor/therapist visits.

METHODS: Ninety-three lumbar discectomy patients were randomized to two groups. The treatment group undertook a 6-month supervised nonaggravating exercise program. The control group followed the usual surgical advice to resume normal activities as soon as the pain allowed. Both groups were followed for 1 year by using validated outcome measures.

RESULTS: The results are based on an intention-to-treat analysis. Patients in both groups improved during the 1-year follow-up ($p=.001$). There was no statistical significance between the groups at the clinical endpoint. The treatment group returned to work 7 days earlier and had fewer days off work in the 1-year follow-up period.

CONCLUSION: There was no statistical advantage gained by the group that performed the 6-month supervised nonaggravating exercise program at 1-year follow-up. They did, however, have fewer days off work. © 2006 Elsevier Inc. All rights reserved.

Keywords:

Postdiscectomy rehabilitation; Exercise program

Introduction

Low back surgery can absorb significant financial resources [1]. Advances in radiological imaging and

improved surgical outcomes, have led to increasing rates of spinal surgery. In 2000, the prevalence of lumbar discectomy in New Zealand was estimated at 45 per 100,000 of population. By 2003, this prevalence was estimated to have increased to 61 per 100,000 of population. This was calculated by extrapolating the numbers for the province of Canterbury (population 400,000) to New Zealand as a whole (population 4,000,000). A study comparing back surgery rates of 10 first-world nations with those of the United States found New Zealand rates to be in the middle of the group [2].

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In an attempt to lower rates of postoperative complications, there has been a trend away from laminectomy and fusion towards simple discectomy [3,4]. Lumbar discectomy is reserved for treating severe, unremitting low back and leg pain associated with neurological signs (increasing motor blockade, bladder and rectal sphincter problems). These symptoms need to have been confirmed by magnetic resonance imaging scans of the lumbar spine demonstrating disc prolapse.

Lumbar discectomies generally provide good outcomes [3,4]. Unsatisfactory outcomes can, however, occur in 10–40% of cases [3,4]. A number of variables contribute to these failures. These include inadequate preoperative selection criteria and surgical technique, unsatisfactory work status, legal involvement, and the preoperative psychological and physical state of the individual [5].

Despite the current popularity of lumbar disc surgery in the Western world, there is a lack of research regarding their management postoperatively. A Cochrane Review of “Rehabilitation after lumbar disc surgery” [6] found 13 studies that fitted their benchmark criterion. Six of these studies were rated as high-quality. One criterion shown to improve postoperative functional outcome was rehabilitation [7–10]. In New Zealand, a dominant paradigm post-lumbar discectomy is the return to preinjury levels of function as soon as possible. Formal rehabilitation programs, however, are not usually incorporated into the postsurgical management plan.

The six high-quality studies reviewed by the Cochrane Collaboration each examined various different post-lumbar discectomy rehabilitation management regimes [6]. They all concluded that a proactive approach, such as a formal, active rehabilitation program after surgery, achieved superior results when compared with traditional conservative methods. One study focused on return to work outcomes using a behavioral management program [11]. Five of these studies involved active physical exercise programs [7–10,12]. The studies using exercise programs all acknowledged the importance of direct contact with the study participants. This contact allowed the program supervisors to reinforce the benefits of remaining active and to allay fears relating to postsurgical pain. To do this, the active exercise programs incorporated aspects of cognitive behavioral therapy into the exercise programs.

The study by Donceel et al. [11] supports the concept of the cognitive behavioral approach. A patient positively motivated with regard to their rehabilitation program increased the likelihood of success. The psychological aspects of both acute and chronic pain patients are improved by physical training [13,14]. Exercise programs have the potential of positively influencing a patient’s physical and mental well-being.

The five previously mentioned exercise rehabilitation studies all compared one postsurgical exercise regime with another. The present study compares a formal exercise program with a nonexercise program. Thus the nonexercise

group is a true control group. Similar to the advice given to patients in the Donceel study [11], the advice given to patients in the control group (CG) was to return to their normal daily routine as soon as their pain allowed them to do so. In the Donceel study [11], patients were advised to return to normal duties as soon as possible, but to minimize heavy lifting or avoid lifting that involved twisting and bending, in the early stages after surgery. Carragee et al. [15] made use of this proactive advice as well, and took it a step further by placing no restrictions on bending and lifting. This resulted in a return to work 1.7 weeks after surgery. Carragee et al. [15] noted that the study population of high socioeconomic white-collar workers might have skewed the return-to-work data.

A number of low back pain studies report the benefits of exercise relating to pain reduction and functional improvement [16–18]. These studies have used specific exercise regimes directed at patient populations of acute low back pain or lumbar spine instability. Although lumbar discectomy patients are in a different category than these conditions, similarities do exist. Lumbar discectomy patients have experienced acute or chronic low back pain, and may or may not present with lumbar instability. Discectomy patients are usually at the more severe end of the low back pain spectrum. They have maintained a low level of function for a protracted period of time, leading to general physical deconditioning. This is why the exercise program prescribed in this study is of a more holistic nature (Table 1).

The exercise program used in this study is based on three phases of strength training. This incorporates the concept of periodization that has been shown to provide superior results in terms of strength training. In the case of this study, the trial group gymnasium fees were funded by a research grant and the principal investigator (PI) provided the physiotherapy follow-up sessions at no cost. In New Zealand, under usual circumstances 80% of patients are covered by a national insurance scheme, the Accident Compensation Corporation; only private patients would have to pay for the program, and many of these are covered by private insurance.

The aim of this study is to evaluate whether a formal postsurgical, gym-based exercise program would produce superior functional outcomes when compared with the usual rehabilitative advice given by a spinal surgeon. The spinal surgeon involved with this study performs approximately 150 lumbar discectomies per annum. This would be assessed by means of a randomized controlled trial with a 3-year follow-up period. The following postoperative outcomes were used: levels of pain; levels of function; psychological well-being; time off work; levels of medication; and number of doctor/therapist visits. The data presented here are the results of follow-up at 1 year.

Methodology

The patient population was selected from the list of surgical patients from one spinal surgeon. This occurred over

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