

Clinical Study

Clinical outcomes in older patients after posterolateral lumbar fusion

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Abstract

BACKGROUND CONTEXT: Older patients are often advised that their age is a contraindication to lumbar fusion surgery. There is, however, limited available data to support or contradict this assertion. Although prior studies of surgical treatment for lumbar degenerative disease suggest that older patients obtain symptomatic pain relief, an evaluation of fusion outcomes based on modern Health-Related Quality of Life (HRQOL) measures is lacking.

PURPOSE: The purpose of this study was to document clinical outcomes based on standardized HRQOL measures in patients over 65 years of age treated by lumbar decompression and fusion surgery.

DESIGN/SETTING: This study was a retrospective review of prospectively collected patient reported outcomes data.

PATIENT SAMPLE: Ninety-seven consecutive patients over 65 years of age treated by lumbar decompression and fusion between 2000 and 2004 were enrolled in a prospective health status outcomes protocol. Eighty-five patients (88%) had complete data at a minimum 2-year follow-up.

OUTCOME MEASURES: Medical Outcomes Study Short Form 36v.2 (SF-36), Oswestry Disability Index (ODI), numeric rating scales (NRS) back and leg pain scores.

METHODS: Patients over 65 years of age treated by lumbar fusion were evaluated based on HRQOL measures at a minimum of 2 years postoperatively. Variables including history of prior surgery and occurrence of a perioperative complication were evaluated. A comparison group of patients 50 to 64 years of age was also analyzed.

RESULTS: In patients over 65 years old, mean improvement of 6.21 points in SF-36 Physical Composite Score and 5.75 points in SF-36 Mental Composite Score was observed. There was a mean 16.38-point improvement in ODI, 3.08-point improvement in back pain NRS, and 2.65-point improvement in leg pain NRS. SF-36 subscale scores showed improvement for all parameters except general health, where there was a small but statistically significant decline. There was no difference in outcomes at 2 years postoperatively based on the occurrence of a perioperative complication. Patients undergoing a primary lumbar surgical procedure had consistently better outcomes than patients undergoing a revision procedure.

CONCLUSIONS: The results of this study support the efficacy of lumbar decompression and fusion in selected patients over 65 years of age. Occurrence of a perioperative complication did not adversely affect clinical outcome. Patients undergoing a revision procedure should be counseled with regard to the more limited benefits seen with revision surgery. © 2007 Elsevier Inc. All rights reserved.

Keywords:

Lumbar fusion; Medical Outcomes Study Short Form 36v.2; Oswestry Disability Index; Health-Related Quality of Life measures; Older patients; Complications

FDA device/drug status: not applicable.

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Introduction

Symptomatic lumbar degenerative disease is a frequent problem in the elderly population. Substantial disability, often as a result of neurogenic claudication, generates the dilemma of an elderly patient faced with a major surgical

procedure. Although decompression alone is often sufficient, lumbar fusion may be necessary in older patients with spondylolisthesis and degenerative scoliosis or if extensive facet resection is required. In the past, older patients have often been advised that their age was a contraindication to surgical treatment involving fusion. In some instances, patients have undergone limited and thus inadequate decompression in order to avoid the need for a concomitant fusion procedure.

It remains largely unproven to what extent older patients will benefit from lumbar decompression and fusion. Most of the existing literature examines clinical series comprised primarily of lumbar decompression procedures and only a small minority of fusion cases [1,2]. The limited available data regarding fusion procedures focus primarily on the substantial rate of perioperative complications [3–5]. There is no established correlation between the occurrence of a complication and the subsequent effect on clinical outcome. It is also unclear to what extent the physiologic stress of a lumbar fusion procedure adversely affects general health and function in older patients.

As the population ages and the expectations of older patients increase, an evidence-based assessment of surgical treatment in this group becomes progressively important. Although prior studies of surgical treatment for lumbar degenerative disease suggest that older patients obtain reasonable symptomatic pain relief [6–8], an evaluation of fusion outcomes based on modern Health-Related Quality of Life (HRQOL) measures is lacking. The purpose of this study is to document clinical outcomes based on standardized HRQOL measures in patients over 65 years of age treated by lumbar decompression and fusion surgery.

Methods

After receiving Institutional Review Board approval, medical and surgical records of patients over 65 years of age treated by lumbar decompression and fusion between 2000 and 2004 were reviewed. Consecutive patients were enrolled in a prospective health status outcomes protocol (Low Back 2000; PhDx, Albuquerque, NM), which included both patient and physician questionnaires tracking demographic, diagnostic, and HRQOL data. These data were collected as part of the authors' standard clinical practice, in a combined orthopedic/neurosurgical tertiary spine center program. Data collection was supported in part by research grants from Medtronic (Memphis, TN) and Norton Healthcare (Louisville, KY). Baseline measures were collected at the time that patients were scheduled for surgery. Inclusion criteria for this study were a decompression and fusion procedure between L1 and S1. Demographic data included age, gender, and smoking history. In this older population, the primary indication for surgery was most commonly either neurogenic claudication or significant radicular pain, with or without neurologic deficit. In some

cases, the indication was unremitting and disabling low back pain. The rationale for fusion was classified as disc pathology (mechanical disc space collapse with Modic changes), spinal stenosis (requirement for extensive facet resection), spondylolisthesis, degenerative scoliosis, post-decompression instability, or nonunion. With the exception of patients showing significant or progressive neurologic deficit, our standard conservative treatment included medication, physical therapy, and epidural blocks. The majority of patients had all three modalities preoperatively, but the specific duration of therapy or number of blocks was not tabulated. All patients had thorough preoperative medical clearance.

Perioperative surgical data consisted of levels treated, operative time, estimated blood loss, and hospital stay. There was no standardized postoperative rehabilitation protocol. Need for in-patient rehabilitation was determined, in patients who progressed slowly, by a consultant physiatrist. Some patients also received outpatient rehabilitation. HRQOL measures were the Medical Outcomes Study Short Form 36v.2 (SF-36), Oswestry Disability Index (ODI), and back and leg pain numeric rating scale (NRS) scores. The occurrence of any postoperative reoperation or revision procedure was also noted. Of the 97 patients enrolled in the study, 85 (88%) had complete data at a minimum 2-year (range, 24–45 months) follow-up.

A comparison group of contemporaneous lumbar fusion patients, ages 50 to 64, was also evaluated. This group consisted of 93 patients treated by the same surgeons. Evaluation was again based on a minimum 2-year follow-up (range, 23–49 months). Comparison of the two age groups was undertaken for demographic, perioperative, and postoperative HRQOL outcome variables. Additional subgroup analysis was performed based on preoperative diagnosis and occurrence of perioperative complications.

Dichotomous variables were analyzed by using a chi-square test. To test for any significant difference in the number of surgical levels involved in the two groups, the Mann-Whitney nonparametric test was used. Paired *t* tests to determine if a difference exists between the preoperative and 2-year HRQOL measures among the different subgroups was used with an $\alpha=0.05$. Linear regression analysis was used to determine if any interaction existed between age, revision status, presence of a complication, and HRQOL measures.

Results

The 85 patients over age 65 included 55 women (64.7%) and 30 men. Age range was 65 to 85 (mean, 72.1) years old. The group included 7 smokers (8.2%) (Table 1). Preoperative diagnosis was spondylolisthesis (31), spinal stenosis (18), degenerative scoliosis (11), disc pathology (2), post-decompression instability (15), and nonunion (8) (Table 2). The mean time to follow-up was 33 ± 8 months.

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