



Clinical Study

Quality of life outcomes following cervical decompression for coexisting Parkinson disease and cervical spondylotic myelopathy

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Abstract

BACKGROUND CONTEXT: Coexisting Parkinson disease (PD) and cervical spondylotic myelopathy (CSM) presents a diagnostic and therapeutic challenge due to symptomatic similarities between the diseases. Whereas CSM patients are routinely treated with surgery, PD patients face poorer outcomes following spine surgery. No studies have investigated the quality of life (QOL) outcomes following decompression in coexisting PD and CSM.

PURPOSE: The purpose of the present study was to characterize QOL outcomes for patients with coexisting PD and CSM following cervical decompression.

STUDY DESIGN/SETTING: This is a matched cohort study at a single tertiary-care center.

PATIENT SAMPLE: Patients with coexisting PD and CSM undergoing cervical decompression between June 2009 and December 2014 were included. These patients were matched to controls with CSM alone by age, gender, American Society of Anesthesiologists classification, Modified Japanese Orthopaedic Association scores, and operative parameters.

OUTCOME MEASURES: The primary outcome measure was QOL outcomes assessed by change in the EuroQol 5-Dimensions (EQ-5D), Pain Disability Questionnaire (PDQ), and Patient Health Questionnaire-9 (PHQ-9) at last follow-up (LFU). Change in QOL exceeding the minimal clinically important difference (MCID) was secondary.

METHODS: QOL data were collected using the institutional prospectively collected database of patient-reported health status measures. Simple and multivariable regressions were used to assess the impact of PD upon change in QOL.

FDA device/drug status: Not applicable.

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IRB approval (15-135) was obtained before the start of study.

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RESULTS: Eleven PD patients were matched to 44 controls. Control patients experienced QOL improvement across all three measures, whereas PD patients only improved with respect to PDQ (89.9–80.7, $p=.03$). Despite no significant differences in preoperative QOL, PD patients experienced poorer QOL at LFU in EQ-5D (0.526 vs. 0.707, $p=.01$) and PDQ (80.7 vs. 51.4, $p=.03$), and less frequently achieved an EQ-5D MCID (18% vs. 57%, $p=.04$). However, no differences in the achievement of an MCID in PDQ or PHQ-9 were observed between cohorts. Multivariable regression identified PD as a significant independent predictor of poorer improvement in EQ-5D ($\beta=-0.09$, $p<.01$) and failure to achieve an EQ-5D MCID (odds ratio: 0.08, $p<.01$).

CONCLUSIONS: This is the first study to characterize QOL outcomes following cervical decompression for patients with coexisting PD and CSM. Although myelopathy may have been less severe among PD patients, a significant reduction in pain-related disability was observed following decompression. However, PD predicted diminished improvement in overall QOL measured by the EQ-5D. © 2016 Elsevier Inc. All rights reserved.

Keywords: Cervical spondylotic myelopathy; EQ-5D; Minimal clinically important difference; Multivariable regression; Parkinson disease; PDQ; PHQ-9; Quality of life

Introduction

As the second most common neurodegenerative disorder worldwide, Parkinson disease (PD) is estimated to affect 0.3% of the US population and 1% of individuals over 60 years of age [1,2]. The prevalence of PD in nursing homes exceeds 5%, and the projected number of patients with PD is expected to increase as the population ages [3,4]. Patients primarily suffer from motor symptoms, including tremor, rigidity, akinesia or bradykinesia, and postural instability and gait dysfunction [5–7]. The annual cost of treating PD in the United States has been estimated at \$10.8 billion, with annual direct medical costs estimated between \$10,043 and \$12,491 per patient [7].

Patients with PD can exhibit symptoms similar to those observed in spinal cord compression secondary to advanced spondylosis, such as ataxia, weakness, and bowel or bladder dysfunction [8]. These similarities present diagnostic and therapeutic challenges when PD and cervical spondylotic myelopathy (CSM) occur concomitantly. Patients suffering from CSM are typically treated with surgical decompression, generally resulting in favorable outcomes [9–13]. Such surgical intervention has a demonstrable quality of life (QOL) benefit [14–16]. Whereas decompression is necessary to prevent significant deterioration and loss of mobility in CSM [8,17–20], treatment for PD typically requires pharmacologic therapy [21], and in some cases surgical treatments such as deep brain stimulation [22–26]. This poses a dilemma for both neurologists and spine surgeons, as patients with PD alone undergoing spine surgery experience marginal improvement and high rates of reoperation and complications [27–30]. Motor-related disability and postural instability have been associated with poorer QOL in this patient population [31,32].

Despite the challenges associated with treating patients with coexisting PD and CSM, QOL outcomes following cervical decompression remain unstudied and unclear. Defining the QOL benefit of surgery may permit optimal patient management and prevent unnecessary surgical intervention. In the present study, we sought to investigate QOL outcomes

following cervical decompression in patients with coexisting PD and CSM. We hypothesized that patients with and without PD both benefit from surgery, but that patients with PD experience inferior QOL outcomes.

Materials and methods

Patient selection

A retrospective review of all patients diagnosed with both PD and CSM undergoing cervical decompression surgery at a single tertiary-care institution between June 2009 and December 2014 was conducted. Each patient within the PD cohort was manually matched to four control patients with CSM alone on the basis of gender, American Society of Anesthesiologists classification, and operative parameters (procedure, approach, and year). Matched controls differed from PD patients by at most 5 years in age, one operative vertebral level, and one point on the modified Japanese Orthopaedic Association classification of disability [33]. Patients were excluded if they had incomplete preoperative or postoperative EuroQol 5-Dimensions (EQ-5D). Patients with prior cervical surgery were excluded.

Data collection

Clinical, operative, and demographic data were retrospectively collected from electronic medical records. Spine surgeons confirmed diagnoses of CSM via history, physical examination, and magnetic resonance imaging. Neurologists confirmed diagnosis of PD on the basis of history and physical examination. QOL data were collected both preoperatively and through last follow-up (LFU).

Quality of life measures

Preoperative and postoperative QOL data were collected via an institutional prospectively collected database of patient-reported health status measures that includes validated questionnaires administered at each outpatient visit. Collected

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