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Clinical Study

Evaluation of clinical results and quality of life after surgical reconstruction for rheumatoid cervical spine

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Abstract

BACKGROUND CONTEXT: The EuroQol (EQ-5D) is a widely used comprehensive measure of health-related quality of life. There has been no study that has evaluated the health-related quality of life before and after the surgical reconstruction of rheumatoid arthritis (RA) cervical spine lesions using EQ-5D.

PURPOSE: The present study aimed to evaluate the improvement of quality of life before and after surgical reconstruction of rheumatoid cervical spine using EQ-5D, and the surgical outcomes of cervical spine affected by RA.

STUDY DESIGN: A retrospective study of the patients who underwent surgical reconstruction of cervical disorders in RA.

PATIENT SAMPLE: Twenty-five patients (seven men, 18 women, mean age 62.2 years) who underwent surgical reconstruction of cervical disorders in RA were enrolled.

OUTCOME MEASURES: Japanese Orthopaedic Association (JOA) score and EQ-5D.

METHODS: Clinical symptoms were evaluated before surgery and at 2 years after surgery by measuring the JOA score. We also investigated health-related quality of life before surgery and outcome at 2 years after surgery using the EQ-5D questionnaire.

RESULTS: Mean observation period was 46.3 months. Mean JOA score significantly improved from 9.1±4.5 points before surgery to 12.4±2.8 at the 2 years after surgery (p=.0001). All the EQ-5D data were improved at the 2 years after surgery, compared with the data before surgery; especially, pain (p=.005), usual activity (p=.005), mobility (p=.008), and anxiety/depression (p=.02) were significantly improved. Utility weight was 0.37±0.27 before surgery and 0.56±0.26 at the 2 years after surgery, showing significant improvement at the 2 years after surgery compared to before surgery (p=.002).

CONCLUSIONS: The surgical reconstruction of rheumatoid cervical spine has been demonstrated to improve patients' health-related quality of life.

Keywords: EuroQol; Japanese Orthopaedic Association score; Rheumatoid arthritis; Cervical reconstruction; Health-related quality of life

Introduction

Complications of the cervical spine are common in patients with rheumatoid arthritis (RA) often resulting in anatomical deformities, particularly those of the upper cervical spine [1]. Clinical and radiological signs of rheumatoid changes of the cervical spine are present in up to 86% of all RA patients [2,3]. Isolated atlantoaxial subluxation (AAS) is present in the early stage of the disease. With further progression, osseous destruction of

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EVIDENCE & METHODS

Context
Reconstructive procedures for cervical spine problems due to rheumatoid arthritis are often complicated, difficult, and risky. Demonstration of a significant positive impact for patients is needed to justify such interventions.

Contribution
In this article, the authors showed that both JOA and EuroQol scores improved following surgical intervention. The lack of a control group limits conclusions regarding how much of the observed change is due to the surgery or due to other interventions, natural history, regression to the mean, etc.

Implication
This is a simple case series report and, as such, an estimation of therapeutic effect is limited. Additional limitations include its small size, retrospective nature, and the concomitant effects of multiple interventions. That said, the congruent findings of the EuroQol and JOA metrics suggest these may be reasonable tools to employ in assessing outcomes in this disease. Both are easier to apply than the SF-36 and, importantly, can be directly employed for cost-effectiveness (or utility) analyses; whereas the conversion of SF-36 for such uses has been controversial.

—*The Editors*

the joints can lead to vertical instability. Although the involvement of the middle and lower cervical spine can cause subaxial instability, neurological deficits can occur at any time [4]. These disorders produce myelopathy and severe occipital/neck pain, and reduce the quality of life (QOL) of these patients [5–7]. Furthermore, these disorders occasionally lead to quadriplegia and respiratory muscle paralysis. Cervical reconstruction surgery may be indicated and produce an improvement in the QOL of these patients.

The EuroQol-5D (EQ-5D) questionnaire is a widely used comprehensive measurement of health-related QOL and can be used to generate a single index value or utility [8,9]. The EQ-5D is used in various patient groups including those with spine diseases. However, no study has used the EQ-5D to evaluate the health-related QOL before and after surgical reconstruction of RA cervical spine lesions. The objectives of this study were to evaluate QOL using the EQ-5D before and after surgical reconstruction of cervical disorders in RA patients and investigate the utility of the performed surgery. Furthermore, we assessed the surgical outcomes of cervical spine affected by RA.

Materials and methods

After approval by the investigational review board of our hospital, 25 patients [seven men and 18 women; mean age, 62.2±7.8 years (mean±S.D.)] who underwent surgical reconstruction of cervical disorders in RA from January 2002 to November 2007 were studied. The mean patient height was 151.6±7.7 cm (range, 135–166 cm), and mean weight was 46.3±9.0 kg (range, 32–73 kg). All consecutive patients with follow-up durations 2 years or more were included in this study.

The fusion areas of these patients were as follows: seven cases (two men and five women; mean age, 55.9±5.7 years) of C1–C2, six cases (all women; mean age 66.4±7.6 years) of C0–C2 or C3, eight cases (four men and four women; mean age, 64.4±8.2 years) of C0–C4 to T2, and four cases (one man and three women; mean age, 62.3±5.5 years) of other levels of cervical or cervicothoracic fusion. The mean RA duration was 15.7±8.0 years. Patients' details are shown in Table 1.

The following surgical procedures were performed: C1–C2 transarticular screw fixation (Magerl and Brooks procedure) [10] in AAS patients and cervicothoracic fusion using transpedicular screws in subaxial subluxation and occipitocervical or occipitothoracic fusion in AAS, vertical subluxation, and subaxial subluxation patients [9].

We evaluated health-related QOL before surgery and 2 years after surgery using the EQ-5D questionnaire. The EQ-5D questionnaire consists of five sections covering the health domains of mobility, self-care, usual activity, pain, and anxiety/depression [8,11]. Each domain is rated according to three levels of severity: no problems (1 point), some or moderate problems (2 points), and severe problems (3 points). Utility weights can then be attached to the EQ-5D health state provided by the questionnaire; these weights lie on a scale wherein full health and death are represented by scores of 1 and 0, respectively. Some severe health states are given negative scores, meaning that from a social perspective, being in these states is regarded as worse than death. The validity and reliability of this instrument has been indicated previously [11–18].

Clinical symptoms were studied before and 2 years after surgery according to Japanese Orthopaedic Association (JOA) scores [19]. The data were analyzed using the Wilcoxon signed rank sum test using SPSS software (SPSS Japan Inc., an IBM company, Tokyo, Japan). The level of significance was set at $p<.05$.

Results

The patients' follow-up periods ranged from 24 to 108 months (mean 61.3±24.3 months). None of the 25 patients died at the final follow-up. The EQ-5D scores before and 2 years after surgery were as follows: mobility, 2.17±0.56 and 1.88±0.61; self-care, 2.21±0.78 and 2.13±0.80; usual