*Biomedical Research 2016; 27 (1): 155-158*

*ISSN 0970-938X*
*www.biomedres.info*

# Quality of life after lumbar spinal surgery.

**Yu-Shun Fang, Qing-Song Zhang***

Department of Orthopaedic Surgery, Puai Hospital of Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430033, PR China

**Abstract**

**Lumbar spinal stenosis (LSS) is a common disease for spinal surgeries among elderly adults. However, the health-related quality of life (HRQoL) after LSS has not been thoroughly investigated. In the present study, we evaluated the HRQoL after surgery in 127 patients with LSS in a Chinese population. The Medical Outcome Short Form 36 (SF-36) was used to evaluate the HRQoL before surgery and one year after the treatment. We observed improvements in all 8 domains of the HRQoL one year after discharge, though only those in two mental health domains and three physical health domains. Nevertheless, comparing with a healthy reference group, the HRQoL among these patients remained poorer in all domains. Our study suggests that surgical treatment may improve HRQoL in patients with LSS. This study also implies that the HRQoL assessment is a useful tool to assess the outcomes in patients with LSS after surgeries.**

**Keywords**: Lumbar spinal stenosis, HRQoL, Quality of life, Prognosis, Surgery.

*Accepted December 04, 2015*

## Introduction

Lumbar spinal stenosis (LSS) is a common disease for surgeries, which mostly affects adults aged 65 years or above and can result in both functional problems and severe symptoms at lower limbs. [1]. Despite that the first choice for the treatment of LSS is widely accepted as a non-operative therapy, a large proportion of patients still warrant surgical treatment if the conservative therapies are not effective. Previous studies evaluating the prognosis after surgeries for LSS has mainly involved routine clinical investigations [2-5]. During the past decade, there have been emerging studies employing health-related quality of life (HRQoL) in assessing the outcomes in patients with LSS after surgeries [6-8]. It has been reported that patients with LSS had significant improvements in the HRQoL of patients after surgical treatment, although the scores were still lower than heathy reference populations [6]. Nevertheless, existing evidence remains limited and more studies are needed to confirm these observations. Particularly, to our best knowledge, there are scare studies which have evaluated the HRQoL in patients with LSS after surgeries in the Chinese population. Considering the extremely limited evidence in Chinese populations, we investigated the HRQoL in a group of Chinese patients with LSS after surgical treatment with a prospective design.

## Methods

We recruited study subjects from a large public hospital in Wuhan, China. This hospital houses one of the largest orthopedic surgery centers serving a population of over 10 million. All consecutive patients who had undergone surgical treatment for LSS during July 2012 to December 2013 were invited to participate. Among the 148 patients who had been invited, 127 agreed to participate and the major reasons for unparticipating were unwillingness [15] and impaired hearing or mental problems [8]. We performed surgical treatment, i.e., spinal decompression and a partial undercutting facetectomy, in all these patients according to a standard protocol. The specific surgical procedures were developed based on considerations of patients' clinical features and radiographic and/or magnetic resonance imaging results. We also included an age- and sex-matched reference group from out-patients in the same hospital who underwent general health check-ups during the study period. There were 104 participants out of 115 people who were invited, with a participation rate of 90.4%, in the reference group.

We conducted in-person interviews with all participants to collect basic demographic and medical information, as well as to evaluate the HRQoL with the well validated Medical Outcome Short Form 36 (SF-36) [9, 10]. This generic tool consists of a total of 36 items and the results can be used to calculate separate summarizing scores for both aspects, i.e., the physical component summary (PCS) and the mental component summary (MCS). The first administration of the questionnaire was performed on the first day of patients' admission to the hospital. Patients with LSS were invited to visit the hospital to finish the second questionnaire one year after discharge. They were provided with a medical follow-

up to improve the completeness of follow-up. Only five of them did not participated in the second interview because of changes of contact information and lost to follow-up. We performed this study after being approved by the ethics committees of the university and the hospital. In addition, we obtained written informed consents from all participants before enrollments.

We compared the measurements of HRQoL with the non-parameter Wilcoxon's rank sum tests. We also calculated odds ratios (ORs) associated with a set of factors potentially influencing the HRQoL scores one year after surgery, together with the corresponding 95% confidence intervals (CIs), in non-conditional logistic regressions. Patients were dichotomized into two groups according to the median values of HRQoL scores. Variables included in the models are: gender, age at diagnosis (≤ 60, >60 years), education level, as well as the Roland-Morris (RM) score. We performed all statistical analyses with the statistical software package SAS 9.4 for windows (SAS Institute Inc., Cary, NC, USA), and the predefined significance level was 0.05.

## Results

The patients group included 83 men (65.4%) and 44 women (34.6%) with the average age at diagnosis of 60.3 (± 11.7) years. The reference group was well matched by sex and age. There was no substantial difference in education level or marital status between these two groups, although the heathy control subjects seemed to be better educated than patients with SLL. More detailed basic and clinical information are shown in Table 1.

As shown in Table 2, the HRQoL in patients with LSS

***Table 1:*** *Basic and clinical information in participants*

| Variables | Patients with LSS (n=127) | Healthy controls (n=104) |
|---|---|---|
| Sex, n (%) | | |
| Males | 83 (65.4) | 68 (65.4) |
| Females | 44 (34.6) | 36 (34.6) |
| Age at diagnosis or interview, years | | |
| <50 | 21(16.5) | 17 (16.3) |
| 50-59 | 39 (30.7) | 32 (30.8) |
| ≥ 60 | 67 (52.8) | 55 (52.9) |
| Mean (SD), years | 60.3 (11.7) | 61.4 (10.6) |
| Educational level, n (%) | | |
| Less than high school | 86 (67.7) | 65 (62.5) |
| High school or above | 41 (32.3) | 39 (37.5) |
| Marital status, n (%) | | |
| Married or cohabitant | 117 (92.1) | 98 (94.2) |
| Single or divorced | 10 (7.9) | 6 (5.8) |
| Duration of symptoms, months | | |
| Mean (SD) | 13.2 (4.1) | |
| Spinal levels involved in treatment | | |
| Single | 115 (90.5) | |
| Double | 12 (9.5) | |

LSS: lumbar spinal stenosis; SD: standard deviation

***Table 2:*** *Health-related quality of life (mean ± standard deviation) among patients with lumbar spinal stenosis (LSS) and the healthy control subjects*

| Dimensions | Patients with LSS | | Healthy controls (n =104) |
|---|---|---|---|
| | Before surgery (n=127 ) | 1 year after surgery (n=122 ) | |
| Physical function | 54.9 (21.8) | 64.4 (27.8)*# | 72.4 (23.0) |
| Role physical [1] | 50.9 (23.6) | 58.5 (21.8)*# | 69.8 (25.6) |
| Bodily pain | 51.4 (22.7) | 64.2(27.7)*# | 73.7 (26.8) |
| General health | 48.5 (22.6) | 52.5 (21.0)# | 68.7 (26.5) |
| Vitality | 41.2 (19.8) | 48.4 (20.7)*# | 58.1 (24.0) |
| Social function | 55.1 (22.3) | 59.4 (25.7)# | 69.8 (28.7) |
| Role emotion [2] | 58.7 (25.1) | 63.4 (26.2)# | 68.7 (26.4) |
| Mental health | 52.3 (21.6) | 58.6 (22.4)*# | 65.2 (25.7) |

*$P$<0.05 compared with measurements before treatment.

#$P$<0.05 compared with the reference group.

[1]Role limitations due to physical health; [2]Role limitations due to emotional health.

had evident improvements in both mental and physical health domains one year after surgery compared with measurements before the surgery. However, only such improvements in two mental health domains and three physical health domains were statistically significant. Furthermore, the HRQoL scores remained statistically lower in these patients who had received surgery for SLL compared with the healthy reference population.

Results from logistic regressions showed that being aged 60 years or above was associated with a poorer physical health outcome (adjusted OR=1.6, 95% CI: 1.1-2.3), while men were shown to have better mental health scores than women (adjusted OR=1.8, 95% CI: 1.0-3.2). Severe disability as indicated by a higher RM score was associated with lower scores on both mental and physical health aspects, but only the association with physical health was statistically significant (adjusted OR=1.9, 95% CI: 1.1-3.3).

## Discussion

LSS is a common musculoskeletal disease closely associated with impaired HRQoL in patients. Typical symptoms such as server pain and numbness have been shown to have a strong negative influence on HRQoL in LSS patients [11]. Surgery has been widely performed in the treatment for LSS if the nonsurgical measures are not effective. Previous studies have shown that the surgical treatment was more effective than nonsurgical therapies in both relieving symptoms and improving function [12]. However, whether surgical treatment could improve the patients' HRQoL remains inconclusive by far.

In the present study, we have evaluated HRQoL in a group of Chinese patients suffering from LSS after surgical treatments with a prospective design. Our results suggested significantly improved HRQoL in patients with LSS one year after discharge. Such findings were consistent with earlier lines of evidence [6-8]. This study also confirmed the need for continuous supports for a better HRQoL in these patients, as their HRQoL scores remain lower than the healthy reference group in spite of the acknowledgeable improvements.

A major strength of this study is that we conducted face-to-face interview for HRQoL measurements both before and one year after the treatment. Some previous studies only conducted such interviews for the first time but interviewed participants on telephone for a later follow-up [13]. Such differential interviewing methods might have introduced information bias if there were systematic differences dependent on interview methods. Further advantages of our study include a prospective design and the inclusion of a healthy reference group. However, there are some limitations in our study. For example, as similar to previous studies, we only recruited participants from a single hospital and the results might not be generalized to other settings or populations, particularly those with distinct socioeconomic or clinical backgrounds. Furthermore, we observed increased scores for general health, social function and role emotion, although the differences were not statistically significant. It is probably because the sample size of this study did not have sufficient statistical power to detect significant findings for these domains. More studies with larger sample sizes are still warranted.

In summary, we have observed improved HRQoL over time in a group of Chinese patients with LSS after surgery. This study also highlighted the usefulness of measuring HRQoL in evaluating prognosis after surgery for LSS. The findings in our study still need to be further confirmed by more investigations with larger sample sizes in external populations.

## Acknowledgement

We appreciate all colleagues within the Department of Orthopaedic Surgery in Wuhan Puai Hospital for their assistance in coordinating the study and collecting data.

## References

1. Ciol MA, Deyo RA, Howell E, Kreif S. An assessment of surgery for spinal stenosis: time trends, geographic variations, complications, and reoperations. J Am Geriatr Soc 1996; 44: 285-290.
2. Herno A, Airaksinen O, Saari T, Sihvonen T. Surgical results of lumbar spinal stenosis. A comparison of patients with or without previous back surgery. Spine (Phila Pa 1976) 1995; 20: 964-969.
3. Sigmundsson FG. Determinants of outcome in lumbar spinal stenosis surgery. Acta Orthop 2014; 85: 1-45.
4. Omidi-Kashani F, Hasankhani EG, Ashjazadeh A. Lumbar spinal stenosis: who should be fused? An updated review. Asian Spine J 2014; 8: 521-530.
5. Athiviraham A, Wali ZA, Yen D. Predictive factors influencing clinical outcome with operative management of lumbar spinal stenosis. Spine J 2011; 11: 613-617.
6. Padua L, Padua R, Mastantuoni G, Pitta L, Caliandro P, Aulisa L. Health-related quality of life after surgical treatment for lumbar stenosis. Spine (Phila Pa 1976) 2004; 29: 1670-1674.
7. Schillberg B, Nystrom B. Quality of life before and after microsurgical decompression in lumbar spinal stenosis. J Spinal Disord 2000; 13: 237-241.
8. Hsu KY, Zucherman JF, Hartjen CA. Quality of life of lumbar stenosis-treated patients in whom the X STOP interspinous device was implanted. J Neurosurg 2006; 5: 500-507.
9. Sararaks S, Azman AB, Low LL, Rugayah B, Aziah AM, Hooi LN. Validity and reliability of the SF-36: the Malaysian context. Med J Malaysia 2005; 60: 163-179.
10. Li L, Wang HM, Shen Y. Chinese SF-36 Health Survey: translation, cultural adaptation, validation, and normalisation. J Epidemiol Community Health 2003; 57: 259-263.
11. Pahl MA, Brislin B, Boden S. The impact of four common lumbar spine diagnoses upon overall health status. Spine J 2006; 6: 125-130.

12. Kovacs FM, Urrútia G, Alarcón JD. Surgery versus conservative treatment for symptomatic lumbar spinal stenosis: a systematic review of randomized controlled trials. Spine (Phila Pa 1976) 2011; 36: E1335-1351.

13. Battié MC, Jones CA, Schopflocher DP. Health-related quality of life and comorbidities associated with lumbar spinal stenosis. Spine J 2012; 12: 189-195.

**Correspondence to:**

Qing-Song Zhang
Department of Orthopaedic Surgery
Puai Hospital of Tongji Medical College
Huazhong University of Science and Technology
Wuhan
China