Part II: Post-Operative Improvements in the Euro Quality of Life (EuroQol) and Oswestry Disability Index (ODI) Scores in Lumbar Spine Surgical Patients

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OBJECTIVE. To measure the surgery outcome of patients at 6, 12 and 24 weeks using the Oswestry Disability Index and the Euro Quality of Life (EuroQol).

MATERIALS AND METHODS. Ninty-three out of a total of 311 patients who underwent spinal surgery at Bangkok Hospital between August 2010 and June 2011 and had completed their 6 months follow up.

RESULTS AND CONCLUSION. The study found that surgery did improve the functionality of patients who had back pain due to radiculopathy, lumbar spinal stenosis, and herniated nucleus pulposus. Measured by ODI and Quality of Life (QOL) methodology, the treatment outcomes showed significant improvement.

Surgery is one of the treatment alternatives for patients with spine conditions. In the United States of America, up to 4.6 million spine surgeries are performed each year.[1] Nowadays, surgical technologies and treatment options are advanced and very diverse. There have been many comparative studies in the U.S and Europe on the outcome of each treatment technique.[2] The study of Jacobs and team in 2010 compared the outcomes of surgical treatment against conservative treatment in a group of patients who were diagnosed with sciatica due to lumbar disc herniation. Comparing the efficiencies of different surgical techniques; a landmark paper by Copay AG et al,[3] measured outcomes using methods such as the Quality of Life (QOL) Questionnaire, the Oswestry Disability Index (ODI), and the Pain Scales.[4] On average, there are about 500 lumbar spine patients who undergo invasive and surgical interventions at Bangkok Spine Academy annually. This prospective study measured the outcome of patients who underwent lumbar surgery at Bangkok Spine Academy, utilizing EuroQol and ODI preoperatively and at various postoperative intervals of 6, 12 and 24 weeks.

Materials and Methods

Sample Size

A total of 311 lumbar spine surgical patients were treated at Bangkok Spine Academy between August 2010 and June 2011. Out of this group, we analyzed the available data of 93 patients who had already completed their 6 months follow up. The study is ongoing and these are therefore preliminary results.

Outcome Measures

The Euro Quality of Life (EuroQol): Pre-operative measurements of mobility, self-care, activities of daily life, pain, and anxiety and/or depression were determined pre-operation and at 6, 12, 24

weeks by EuroQol using Visual Analogue Scale (VAS) and 5 Dimensions (5D).[5]

Oswestry Disability Index (ODI): ODI versions with a scale ranking from 0-5 were used. Questionnaires addressing 10 common activities were administered, using both English and validated translations into other languages.[6,7]

The EuroQol Visual Analogue Scale (EQ-VAS): The EQ-VAS is a part of the EuroQol Questionnaire. The patients rate their current health state on the line, which ranges from 0-100 (The worst to the best imaginable health).[8]

Data Analysis

This descriptive statistic is used to analyze demographic data. EuroQol 5D is composed of five dimensions and patients can rate their perceived health status into 3 possible levels in each dimension, i.e. No problems, some problems, and severe problems. We have decided to look at the frequency of reported problems, so split the data into two levels of severity: No problem (i.e. level 1) and problems (i.e. levels 2 and 3). The paired T-Test was used for statistical analysis of ODI, and EQ-VAS both pre and post operatively. The One-way Repeated Measure ANOVA was used for comparing the data at 4 intervals.

Results

From August 2010 to June 2011, a total of 93 consecutive patients (44 males and 49 females), whose mean age was 53.12 years old (range 24-88), undergoing lumbar spine surgery were enrolled. The number of the patients who underwent lumbar decompression surgery with fusion was 33 (35.48%). Fourteen patients (27.95%) underwent the lumbar microdiscectomy surgery. Patients who underwent lumbar decompression surgery without fusion numbered 16 (17.20%). Only 1 person (1.07%) underwent total disc replacement surgery and the total number of patients who underwent mixed procedure surgery was 17 (18.27%).

The finding of ODI of 77 patients who had completed all 4 period questionnaires reported the average pre-operative score equaled 42.49, which indicated severe disability. The average score at the 6th week after surgery was 16.85. This showed that there was a significant improvement (p-value < 0.05). The average score at the 12th week and the 24th week were 11.14 and 5.36 respectively. The ODI Score after the surgery was rated at minimal disability. If compared with the baseline score, they they showed a significant improvement (p-value < 0.05), which is illustrated in Figure 1.

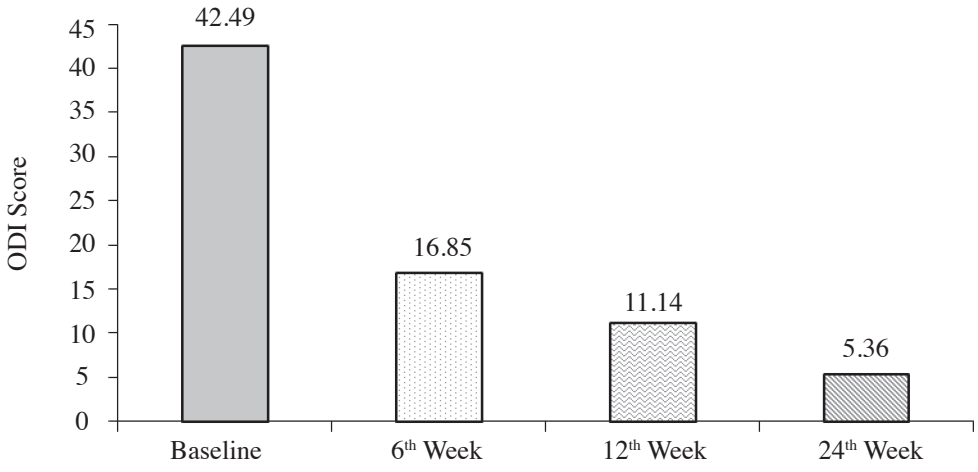

Figure 1: *The comparison of the average Oswestry Disability Index (ODI) score at pre-operation, the 6th week, the 12th week, and the 24th week.*

The finding of EuroQol VAS 0-100 showed an average pre-operative score of 50.36. The average score at the 6th week was 76.38; compared to the baseline score, there was a significant improvement (p-value < 0.05). The average score of the 12th week and the 24th week were 80.19 and 83.85 respectively. The statistically significant improvements are shown in Figure 2.

The EuroQol-5Dimensions (EQ-5D)

Using EuroQol-5D, pre-operative mobility problem was 91.96%. The mobility problems of the 6th week, the 12th week, and the 24th week post-operatively were 45.38%, 22.45% and 15.79% respectively. The self-care problem pre-operation was 58.04%. The self-care problem at the 6th week, the 12th week, and the 24th week were, 22.69%, 12.24% and 5.06% respectively. Activities of daily living pre-operation were 92.86%. At the 6th week, the 12th week, and the 24th week were 49.58%, 36.73%, and 15.79% respectively. Pain problems pre-operation were 98.21%. At the 6th week, the 12th week, and the 24th week pain was 63.03%, 31.63%, and 11.84% respectively. Anxiety and depression problems pre op were 80.8%. At the 6th week, the 12th week, and the 24th week, these had become 14.29%, 4.08%, and 2.63% respectively. The least reported health problem was self-care and the second to last was anxiety and depression. The highest proportion of problems was seen in pain and discomfort followed by usual activity. This is illustrated in Figure 3.

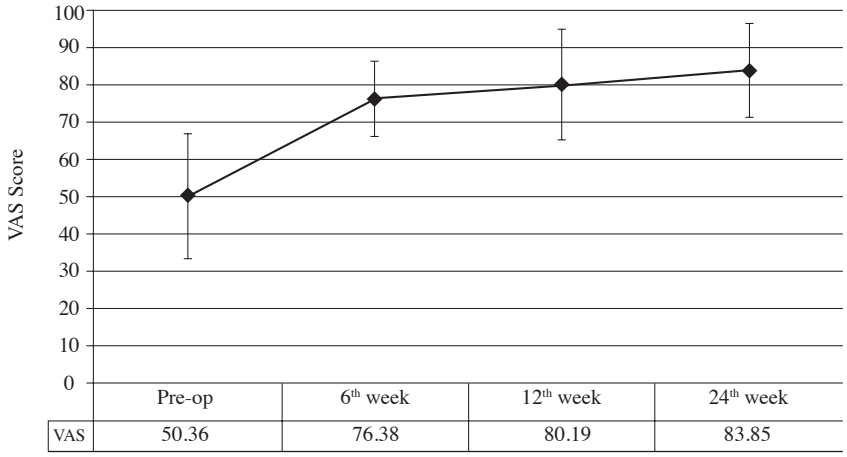

Figure 2: *The comparison of the average EuroQol VAS 0-100 at pre-operation, the 6th week, the 12th week, and the 24th week.*

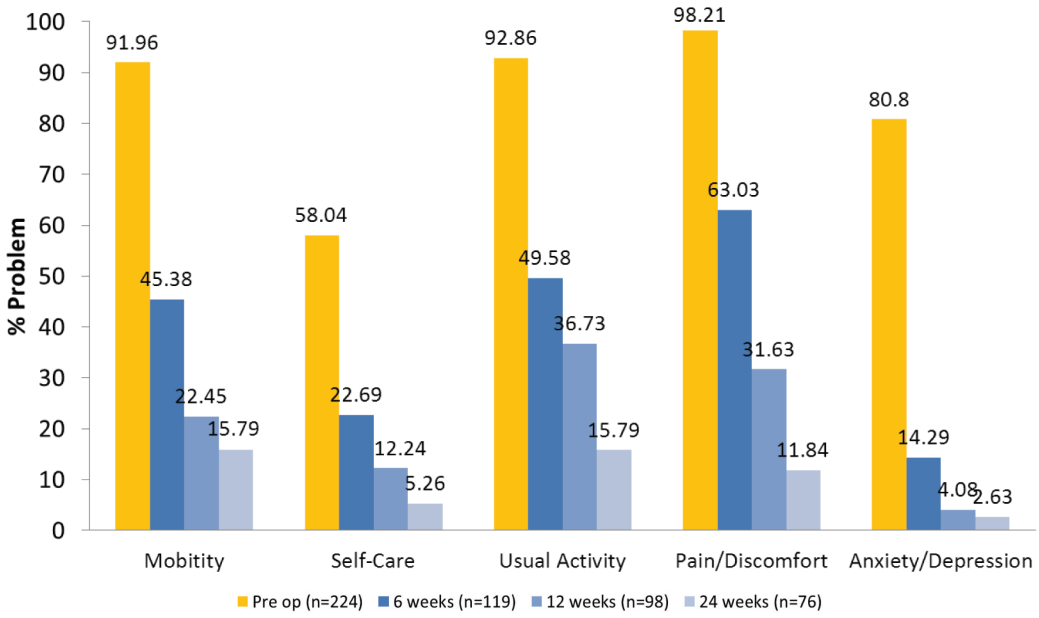

Figure 3: *The comparison of the proportion of problems EuroQol-5D at pre operation, the 6th week, the 12th week and the 24th week.*

Discussion

Results indicated that in this selective sampling of spinal surgery patients, (lumbar decompression surgery with fusion 35.48%, lumbar microdiscectomy surgery 27.95%, lumbar decompression surgery without fusion 17.2%, total disc replacement surgery 1.07% and mixed procedure 18.27%), patients' disability and quality of life all improved post operatively, as measured by ODI, EuroQol 5D and VAS.

The study found that the surgery could improve the functionality of patients who have back pain due to radiculopathy, lumbar spinal stenosis, and herniated nucleus pulposus. Measured by ODI and QOL methodology, the treatment outcomes showed significant improvement. However, the limitation of this study to date was the sample size. In the future, we will have a bigger sample size, which will enable us to do a comparative study, classifying patients by the types of surgery they underwent. In addition, the average of baseline ODI score before surgery was remarkably different from the post surgery score. The average of baseline ODI score was 42.49, and the average of 24th week post-operative score was 5.36. The data collection method at the baseline period was done by questionnaire while 80% of data collection method at the post-operative period was done by telephone interview. At any rate bias may be possible when the interview is conducted by telephone because some people are reluctant to answer phone interviews.

Based on Stephen Glassman's 2002 review of Food and Drug Administration (FDA) protocol, the excellent outcome of surgery is defined as that which can show a 15 points ODI Improvement scores over the baseline period.[9,10] Our findings showed that 79% of patients had ODI score at excellent outcome level, and 21% of them had ODI score improvement but not by as much as 15 points. The reasons that prevented this group of patients from seeing their ODI Improvement score reach 15 points were due to post-operative complication factors which included dural tear (0.3%), neurological deficit(0.3%), reoperation(1.2%), and surgical site infection rate (0.9%) at superficial levels.[11] Nevertheless, the incidence of reported complications were still relatively low when measured against with the reported international experience.[12-14]

Conclusion

The methodology of measuring the lumbar spine surgery outcome by the Oswestry Disability Index questionnaires and the EuroQol 5D questionnaires is internationally accepted; therefore, it is appropriate and practical to apply these measurements to assess our treatment outcomes. Finally, we would like to continue to apply this methodology to study spinal patients who were treated by other techniques, such as intervention treatment. We note that more consistent data collection methods should reduce or eliminate the bias seen in this set of patients.

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