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Research Article

Long Term Effects on Quality of Life After Short Segment Pedicle Screw Fixation of Thoracolumbar Fractures in Pakistani Population

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Abstract

Objective: To assess the long term relation of quality of life after pedicle screw fixation (PSF)

Introduction: Compare to other types of chronic pain, failed back surgery syndrome (FBSS) patients experience greater degree of pain and a lower health-related quality of life. Furthermore, our understanding to this relationship is limited.

Material and Methods: A retrospective study of Pakistani patients that had PSF 4 to 5 years ago. There were called and interviewed using EQ-5D-5L and SF-36 questionnaire. Data was recorded and analyze through SPSS version 21.

Results: 36 patients were enrolled, 13 were females and 22 were males, ranged between 21 to 89 years. 44% patients reported to have health greater than 75%. Oswestry Disability Index scale showed that 0-20 score in 19/36 (53%) of the patients and 21-40 score in 11/36-30%. EQ-5D-5L showed index score of 0.56. For SF-36 questionnaire, pain was statistically significant with the PCS model (coefficient for PCS: 0.796 [all $P < 0.001$]) and also with the MCS model, score was (coefficient 0.782 [$P < 0.001$]) with pain.

Discussion: Not many studies available on patients with FBSS and long term follow. Higher scores of ODI has been seen with chronic back pain, compare to other abnormalities. There has been statistical significant and notable association between patient's levels of pain, disability, and generic Health related Quality of life, has been proven by many studies. Limitations include low sample size, uneven age distribution.

Conclusion: Establishing the relationship between disease-specific outcomes (such as pain and functional ability) and quality of life can aid with future research studies.

Keywords: Euroqol-5D; Failed Back Surgery Syndrome; Neuropathic Pain; Quality Of Life; SF36, ODI; Spine; Pedicle Screw Fixation

Introduction

Failed back surgery syndrome is chronic pain in the lower back that may or may not include legs, which persists or recurs after successful spinal surgery [1,2]. The most common causes of failed back surgery are foraminal stenosis, painful disc, pseudoarthrosis, neuropathic pain, recurrent disc herniation, facet pain, sacroiliac joint pain, and iatrogenic instability [3,4]. Compare to other types of chronic pain, FBSS patients experience greater degree of pain, a lower health-related quality of life and greater disability, presenting significant social and economic burden [5]. Moreover, our understanding of the epidemiology of FBSS and relation to quality of life remains poor and is therefore an important area for future research. Hence, it emphasize the need both to identify strategies to prevent FBSS and to develop evidenced-based guidelines for the management of established FBSS. For a spinal fusion, simultaneous instrumentation carries a greater chance of achieving a fusion, and pedicle fixation is the technique most commonly used [6]. In this article, we will look at the patients that underwent pedicle screw fixation and long term effects they had on quality of life related to pain and discomfort.

Methods and Materials

The study was approved by the Institutional Review Board of the hospital. List of the patients that underwent Pedicle Screw Fixation since 2013 were retrieved. Patients were approached

through telephone. After consent was taken, questions were asked about back pain and their quality of life at present time from Questionnaires EQ-5D-5L and SF-36. SPSS Statistics 21 was used for the analysis. EQ-5D-5L: 5L versions, describing health on the dimensions of mobility, self-care, usual activities, pain/discomfort and anxiety/depression. The 5L version used 'no problems', 'slight problems', 'moderate problems', 'severe problems' and 'extreme problems/unable to'. The SF-36 is a multicultural scale, has 36 questions and categorized into eight-domain profile of scores: physical functioning (10 items), general health (5 items), role physical (i.e., role limitations due to the physical health problems; 4 items), bodily pain (2 items), social functioning (2 items), energy/fatigue (4 items), role emotional (i.e., role limitations due to emotional problems; 3 items), and mental health (5 items). For each domain, a score ranging from 0 to 100 was assessed with a higher score indicating better health. All subscales are scored from 0 to 100 depending on the self-reported response. Higher scores indicate better mental health functioning and overall quality of life. Physical mental score (PCS) is calculated by the following four domains: physical functioning, general health, role physical and bodily pain. While mental component score (MCS) is calculated by: social functioning, energy/fatigue, role emotional and mental health.

Results

Patients that had surgery 4 to 5 years ago were approached through telephone. Out of 164 patients, only 77 patients answered telephone call. From those only 36 patients gave consent for the interview. 20 patients were passed away while out of remaining 23, either could not respond or did not give consent. Among 36 patients, 13 (37%) were females and 22(63%) were males. Participants ranged in age from 21 to 89 years. Table 1 show patients divided according to the gender and age groups. Informed consent was obtained from participants before questions were asked. Overall health obtained out of 100% is depicted in Table 2 and Figure 1. It shows 44% patients have health greater than 75%, while pain and health did not improve significantly in 34% of patients. Oswestry Disability Index scale showed that 0-20 score in 19/36 (53%) of the patients, 21-40 score in 11/36-30% and 41-60 in 6 out of 35 (17%) of them. Tables 3 & 4 shows 5-Level EuroQoL-5 Dimension Version Distribution. It portrays that most subjects reported "no problems" in mobility (41.0%, 14/36) and self-care (47%, 14/36) dimensions. In activity domain, majority reported either "no problem" (36%, 13/36) and "slight problem" (33%, 22/36), while pain or discomfort was "slight problem" (42%, 15/36) and "moderate problem" (30%, 11/36). Anxiety was none in 39%. Index score was 0.56. For SF-36 questionnaire, most marked their answers in range between 26-75%. Physical functioning has most in 0-25% that is 10/36 (28%) patients and 26-50% that is 12/36 (33%), while role limitations fall between 0-25% that is 22/36 of the patients. In emotional dimension, 16/36 (44%) had role limitations but 22/36 (66%) had emotional well-being above 50%. Mental health is above 50% for half of the patients. Majority of the patients reported to have energy levels between 25% to 75% and also social functioning. Pain was significantly better in 55% (20/36) of the patients. Pain was statistically significant with the PCS model (coefficient for PCS: 0.796 [all $P < 0.001$]) and also with the MCS model, score was (coefficient 0.782 [$P < 0.001$]) with pain.

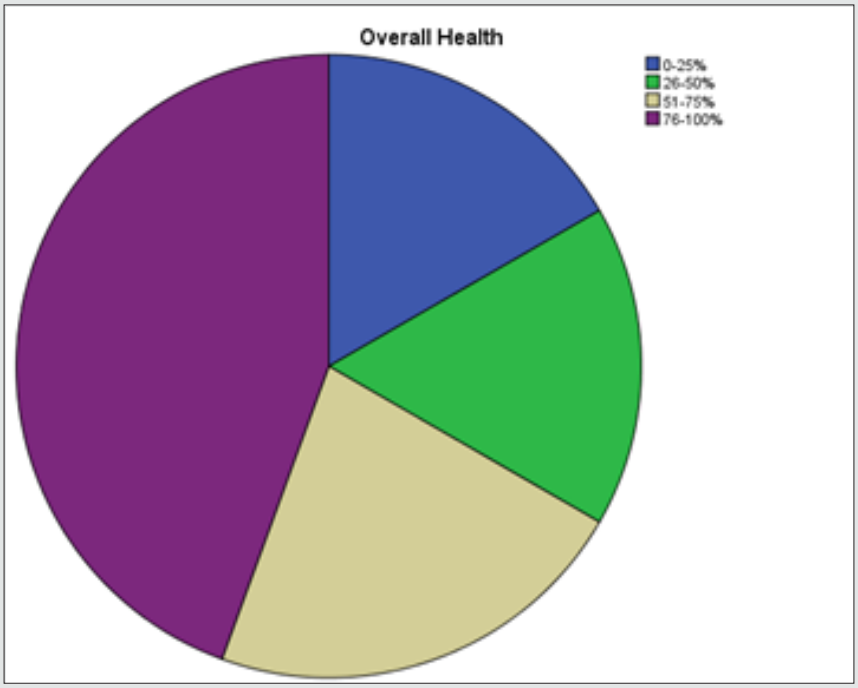

Figure 1: Pie chart of Percentages of overall health.

Table 1: Age and sex distribution of patients.

Age (Range)	Males	Females
21-30	0	2
31-40	2	2
41-50	2	1
51-60	4	4
61-70	8	1
71-80	3	2
81-90	5	1
Total	24	13

Table 2: Percentages of overall health.

Percentage of Health	Frequency	Percentage
0-25	6	17
26-50	6	17
51-75	8	22
76-100	16	44
Total	36	100

Table 3: EQ-5D-5L individual category scores.

Scale	Mobility	Self-Care	Activity	Pain or Discomfort	Anxiety or Depression
No	14 (40)	17 (47)	13 (36)	4 (11)	14 (39)
Slight	3 (8)	9 (25)	12 (33)	15 (42)	15 (42)
Moderate	8 (22)	5 (14)	4 (11)	11 (30)	7 (19)
Severe	8 (22)	4 (11)	3 (9)	6 (17)	0 (0)
Unable	3 (8)	1 (3)	4 (11)	0 (0)	0 (0)
Total	36	36	36	36	36

Table 4: SF-36 individual category scores.

%	Physical Functioning	Role limitations Physical Health	Role Limitations Emotional Health	Energy/ Fatigue	Emotional Well Being	Social Functioning	Pain	Mental Health
0-25	10 (28)	22 (61)	15 (42)	5 (14)	1 (3)	5 (14)	7 (19.5)	4 (11)
26-50	12 (33)	3 (8)	3 (8)	15 (42)	12 (33)	12 (33)	9 (25)	14 (40)
51-75	6 (17)	2 (6)	2 (6)	14 (39)	16 (44)	12 (33)	7 (19.5)	16 (44)
76-100	8 (22)	9 (25)	16 (44)	2 (5)	7 (20)	7 (20)	13 (36)	2 (5)
Total	36	36	36	36	36	36	36	36

Discussion

While reviewing the literature, there are not many studies available on patients with FBSS and long term follow up. Moreover, less information available on their quality of life, which should be prioritize over other outcome questionnaire. According to consensus between authors, both disease specific and a general health questionnaires should be used [7]. Our study involves patients that had surgery done 4 to 5 years ago. The score reported for a normal population where the ODI has been reported at an average of around 10 [8]. Higher scores have been reported in various conditions of the spine with chronic back pain and metastasis presenting the highest degree of disability with an average score around 50 [8]. In our study, majority has ODI between 0-20 that is 19/36 (53%) patients, compare to Moelmer, et al. that has ODI was 24.9 of with follow up for FBSS after average of 3.8 years [9]. There has been degree of association between patient's levels of pain, disability, and generic Health related Quality of life (HRQoL) depends on both the HRQoL measure and the dimensions of HRQoL being investigated [10]. Another study has also shown that functional ability (as measured by the ODI) is significantly associated with SF-36 [11]. Similarly, in our study also shows strong statistical significant correlation for both mental and physical component with pain. Number of studies have been reported with the EQ-5D scores and SF 36 in spinal pathology. In a

recent study of patients, with low back pain, EQ-5D scores ranged from 0.33 to 0.72, in which highest scores in patients with the most favorable prognosis [12]. Our study score was 0.57, using UK based value set as Pakistan based value set was not available and this has also been applied in previous studies [13-15]. In the Moelmer, et al. present study the patients had a mean EQ-5D score of 0.70 and another study score for patients with lumbar disc herniation, where scores improved from 0.3 before surgery to 0.7 one year after the operation [9,16]. There are many limitations to this study, more than half of the patients in our study are greater than 60 years old, and sample size was very small. The generalizability (from one country to another) of the findings of single-country studies is often limited by many factors such as the health-care system in which patients are treated, the societal set of values [17]. Hence, responses can vary not only between countries, but also within the same country [18-20].

Conclusion

There are not much literature available on long term quality of life of pedicle screw fixation patients. Patients who are undergoing posterior fixation for a thoracolumbar fracture can be informed that they are likely to experience reduced HRQL 2 to 6 years after the procedure. Moreover, establishing the relationship between disease-specific outcomes (such as pain and functional ability) and HRQoL can help in better strategic data collection in future research studies. The development of such tools would also help address the never-ending problem of missing data, arising from dropout, in longitudinal studies.

Authors' Disclosure of Conflicts of Interests

The authors declare that they have no conflict of interests.

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