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Effects of Pain and Disability of Chinese Patients Undergoing Lumbar Fusion Surgery With Dynamic Devices

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Background: Lumbar spinal structure deterioration, including narrow disc, spinal canal stenosis, and sliding vertebrae body, also called lumbar spine degenerative diseases (LDD), which often bring lower back and legs pain, neurogenic claudication, neuropathy, and consequently, it decreases patients' daily physical activity. If the conservative treatment is invalid, lumbar fusion surgery is applied as a traditional method for patients with LDDs. However, the traditional lumbar fusion surgery, may lead to a pathologic deterioration and increase instability of the adjacent segment, such as adjacent segment disease. Therefore, the semi-rigid dynamic devices (ISOBAR TTL and PEEK Rod) have been developed for stabilizing lumbar spinal activity and preventing adjacent segment disease. However, the relevant study is lack in Taiwan.

Purpose: This study compared pain and disability of Chinese patients undergoing lumbar spine fusion surgery with semi-rigid dynamic devices and traditional lumbar fusion surgery.
Methods: Patients, who were diagnosed as lumbar spine degenerative diseases by a neurosurgeon for an initial lumbar fusion surgery, were included. A sample of 59 Chinese patients undergoing lumbar fusion surgery participated in this study, including the experimental group (dynamic devices: ISOBAR TTL or PEEK Rod, n=39) and the control group (traditional lumbar fusion surgery, n=20). Data were collected in a big teaching hospital in Taiwan from May, 2015 to Sep, 2018. The demographic questionnaire, Pain VAS scale, and Oswestry Disability Index (ODI), were used to evaluate patients before and 6 months after lumbar fusion surgery. The Pain VAS is a visual 0-10 scale for assessing pain levels. The ODI has 10 questions rated on a 5-point Likert scale to measure daily functional limitations. The Chronbach-α of ODI were .890, showing good reliability. Descriptive statistics, Wilcoxon signed rank test, Mann-Whitney U-test and Kruskal-Wallis test were used for data analysis.
Results: The mean age of experimental group (using dynamic devices) and control group (traditional lumbar fusion surgery) was 55.77±12.68 and 57.95±12.62, respectively. Six months after lumbar fusion surgery, both groups had a significant improvement in pain levels and daily function limitation (all $p < .01$). The experimental group had less pain and daily function limitation than the control group (all $p<0.05$). Moreover, no significant differences were found in pain levels and daily function limitation between two groups in gender, age, and work categories (all $p>0.05$).
Conclusion: Lumbar fusion surgery with semi-rigid dynamic devices and traditional lumbar fusion surgery can both significantly improve pain levels and daily function limitation for patients with lumbar spine degenerative diseases. Moreover, lumbar fusion surgery with semi-rigid dynamic devices has better efficacy than the traditional lumbar fusion surgery in decreasing pain and daily function limitation. Thus, we suggest that

clinical nurses should regular follow-up pain and daily function limitation for the LDDs patients after receiving a lumbar surgery. Also, nurses should provide a proper pain management and discharge plan for LDD patients when they discharge. Since our data were collected from a large hospital in Taiwan, which may limit the generalization of results. Thus, we suggest that doctors should well explain the function and complications of semi-rigid dynamic devices to the patients before taking lumbar fusion surgery.

Title:

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Keywords:

lumbar degenerative diseases, pain and disability and semi-rigid dynamic devices

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Abstract Summary:

1. This study compared pain and disability of Chinese patients undergoing lumbar spine fusion surgery with semi-rigid dynamic devices and traditional lumbar fusion surgery. 2. Lumbar fusion surgery with semi-rigid dynamic devices has better efficacy than the traditional lumbar fusion surgery in decreasing pain and daily function limitation.

Content Outline:

Introduction

(A)Lumbar spinal structure deterioration, including narrow disc, spinal canal stenosis, and sliding vertebrae body, also called lumbar spine degenerative diseases (LDD), which often bring lower back and legs pain, neurogenic claudication, neuropathy, and consequently, it decreases patients' daily physical activity. If the conservative treatment is invalid, lumbar fusion surgery is applied as a traditional method for patients with LDDs.
(B)Traditional lumbar fusion surgery, may lead to a pathologic deterioration and increase instability of the adjacent segment, such as adjacent segment disease. Therefore, the semi-rigid dynamic devices (ISOBAR TTL and PEEK Rod) have been developed for stabilizing lumbar spinal activity and preventing adjacent segment disease. However, the relevant study is lack in Taiwan.

Method

(A)This study compared pain and disability of Chinese patients undergoing lumbar spine fusion surgery with semi-rigid dynamic devices and traditional lumbar fusion surgery.
(B)A sample of 59 Chinese patients undergoing lumbar fusion surgery participated in this study, including the experimental group (dynamic devices: ISOBAR TTL or PEEK Rod, n=39) and the control group (traditional lumbar fusion surgery, n=20).
(C)The demographic questionnaire, Pain VAS scale, and Oswestry Disability Index (ODI), were used to evaluate patients before and 6 months after lumbar fusion surgery.
(D)All questionnaires have good reliability and validity. Descriptive statistics, Wilcoxon signed rank test, Mann-Whitney U-test and Kruskal-Wallis test were used for data analysis.

Conclusion

(A)Lumbar fusion surgery with semi-rigid dynamic devices and traditional lumbar fusion surgery can both significantly improve pain levels and daily function limitation for patients with lumbar spine degenerative diseases.
(B)Lumbar fusion surgery with semi-rigid dynamic devices has better efficacy than the traditional lumbar fusion surgery in decreasing pain and daily function limitation.

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