The Influence of Percutaneous Endoscopy-Assisted Transforaminal Lumbar Decompression and Fusion in the Treatment of Single-Level Lumbar Spinal Stenosis on Multifidus Muscle from the Perspective of Traditional Chinese Medicine

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Abstract. Objective: To analyze the effect of percutaneous endoscopy assisted transforaminal lumbar spinal stenosis on multiissuis. Methods: Ten patients of single-segment lumbar spinal stenosis were selected from January 2020 to January 2021. All patients were treated with percutaneous endoscopic-assisted transforaminal lumbar decompression and fusion. Postoperative basic information was recorded, comparing efficacy related indicators before and after surgery, and lumbar polyfiis injury before and after surgery. Results: All patients completed the operation successfully, with no symptom aggravation or recurrence, and no serious complications. VAS score and VAS score of leg pain at 7d, March and June, and ODI level at 3 and June were significantly better than those before surgery, with P <0.05. In terms of patient serum CK level, postoperative 1d was significantly higher than preoperative, P <0.05, and no significant difference between postoperative 7d, P> 0.05. In Max-CSA, postoperative 7d was significantly greater than preoperative, P <0.05; no significant difference between postoperative March and June months compared with preoperative, P> 0.05. In terms of patient PI level, postoperative 7d was significantly greater than preoperative, with P <0.05, neither postoperative March nor June months were significant compared with preoperative difference, with P> 0.05. Conclusion: From the perspective of traditional Chinese medicine, the application of percutaneous endoscopy-assisted transforaminal lumbar decompression and fusion in the treatment of single segment lumbar spinal stenosis can achieve good early effect, and will not have a significant impact on the changes of polyfiis morphology and blood perfusion.

Keywords: Traditional Chinese Medicine Perspective; Percutaneous Endoscopic Assistance; Transforaminal Lumbar Decompression and Fusion; Single Segment Lumbar Spinal Stenosis; Multifiis Muscle.

1. Introduction

From the perspective of traditional Chinese medicine, the method of posterior approach to lumbar interspinal fusion is generally adopted in the treatment of lumbar spinal stenosis, which has relatively extensive clinical applications[1]. However, after the application of this surgical treatment, patients may have extensive intraoperative muscle dissection and long time distraction, or postoperative fiber scar compression, resulting in low back pain, paravertebral muscle atrophy and other complications. Therefore, attention is needed to reduce the destruction of the lumbar stable structure and surrounding muscle tissue during treatment[2]. With the development of endoscopic techniques, the treatment method of percutaneous endoscopy-assisted transforaminal lumbar decompression and fusion surgery is more minimally invasive. The operation adopts a small decompression and nail channel, which is conducive to ensure the normal order of muscle fibers, and then protect the lumbar polycleft muscle and reduce the occurrence of adverse conditions[3]. Based on this, this paper selected 10 patients with single segment lumbar spinal stenosis from January 2020 to January 2021 to analyze the effect of transintervertebral segment lumbar spinal stenosis on multifiis.

2. Data and Methods

2.1 General Information

Ten patients with single-segment lumbar spinal stenosis were selected, ranging from January 2020 to January 2021. Among the selected patients, 3 patients were male and 7 patients were female, 47 years old and 73 years old, on average (59.52 ± 11.52) years.

Inclusion criteria: All had symptoms of severe lumbar and leg pain and intermittent claudication, imaging indicated typical single-responsible lumbar spinal stenosis, ineffective conservative treatment for 3-6 months, the study content was informed to the patient and approved by the Medical Ethics Committee.

Exclusion criteria: Patients allergic to sulfur hexafluoride microbubble contrast agent, patients with poor compliance and not postoperative tracking, patients with other serious systemic diseases, patients with lumbar spondylolisthesis, patients with history of infection, tumor, fracture or lumbar surgery.

2.2 Methods

All were treated with percutaneous endoscopic-assisted transforaminal lumbar decompression and fusion, and all were operated by the same physician. The patient was placed in a prone position, with continuous epidural anesthesia and hip flexion knee lumbar bridge position. Routine disinfection and towel laying, and fluoroscopic positioning. The syringe needle was thrust into the skin at the L4 and L5 pedicles and cut the skin open for 5-6mm. The first guide was inserted through the L5 pedicle on the decompression side, with the midpoint of the upper edge. Position the bow guide on the L5 first pin and adjust the angle of 30-40°. Along the guide, the second pin was transdermal into the arthroite on L5. The skin was cut for 10-12mm via a second guide nail, and a stage 3 expansion sleeve was used to expand to the joint process, and the last stage expansion sleeve was removed. A stripper was used to push away the outer edge tissue of the upper L5 joint, place the hook sleeve, and hook it in front of the upper joint joint. Remove the level 1 and 2 sleeves and replace them with a toothed fixation rod to fix the upper arthrosis. Place the rod along the hook sleeve and then along the working sleeve. A 10mm diameter endoscope is placed into the working sleeve to reduce pressure under the mirror. The endoscope was continuously infused with warm saline, the residual upper joint was excised with an osteotomy into the safety triangle, and the working sleeve was rotated to provide outlet nerve root protection, remove the disc tissue under direct vision, and then, the endoscope was removed. The disc was processed through the working channel, and the disc tissue and cartilage endplate were removed with hingers and scraping spoons. Observation disc treated thoroughly line bony endplate. Select the appropriate penetrator according to the height of the vertebra, cut the left iliac spine for 2-3cm at the iliac spine, remove the iliac bone, implant into the vertebral space through the working channel, then place the penetrator, rotate the handle to 10-13mm height, contact with the cone plate and provide appropriate pressure. Intraspinal spinal canal decompression was performed through endoscopy, and it was confirmed that the walking nerve root and exit nerve root were intact. The pedicle screw was inserted percutaneous taneously for pressure fixation. After the examination was confirmed, the drainage tube was retained, the incision was closed, and the operation was completed.

2.3 Evaluation Indicators

postoperative basic information was recorded, comparing efficacy related indicators before and after surgery, and lumbar polyfiis injury before and after surgery. Basic postoperative information includes operation time, surgical incision length, intraoperative bleeding volume, postoperative wound diversion rate, postoperative bed rest time, and postoperative follow-up time. Efficacy-related indicators include pain score (VAS) and dysfunction score (ODI). The indicators related to polycleft muscle injury include serum creatine kinase (CK), maximum cross-sectional area of polycleft muscle

(Max-CSA) at the incision, and peak intensity of sulfur hexafluoride microbubble contrast agent (PI) in the blood transport of polycleft muscle at the incision.

2.4 Statistical Treatment

Data is processed by SPSS20.0 software to represent count and measurement data in means of number or rate and mean ± standard deviation, and the x is used^2, t tested separately, as P <0.05, representing significant differences.

3. Results

3.1 Basic Postoperative Information of the Patients

All patients were completed successfully, with operation time (292.48 ± 53.96) min, surgical incision length (8.69 ± 1.72) mm, intraoperative bleeding (119.12 ± 92.35) ml, postoperative wound diversion (39.46 ± 19.48) ml, postoperative bed time (21.71 ± 3.34) h, postoperative follow-up time (14.98 ± 7.07) months without asymptomatic aggravation or recurrence without serious complications.

3.2 Evaluation of Patient Efficacy-Related Indicators

The VAS score, VAS score of leg pain at 7d, March and June, and the ODI levels at March and June months were significantly better than before surgery, with P <0.05.

Table 1. Evaluation of Patient Efficacy-Related Index (± s) $\bar{x}$

time	LBP VAS (sub-points)	Leg pain VAS (points)	ODI(%)
Preoperative	7.21±0.79	5.91±1.20	53.42±12.23
7d after surgery	4.09±0.72	2.19±0.84	-
Three months after surgery	1.39±0.40	1.09±0.43	23.82±7.97
Six months after surgery	1.09±0.26	0.89±0.16	13.43±6.46

3.3 Evaluation of Indicators Related to Polyfiis Muscle Injury

In terms of patient serum CK level, postoperative 1d was significantly higher than preoperative, P <0.05, and no significant difference between postoperative 7d, P> 0.05. In Max-CSA, 7d was significantly greater than preoperative, P <0.05; March and June compared with preoperative, P> 0.05. In terms of patient PI level, postoperative 7d was significantly greater than preoperative, with P <0.05, neither postoperative March nor June months were significant compared with preoperative difference, with P> 0.05.

Table 2. Evaluation of Polypolymuscle Index (± s) $\bar{x}$

time	CK(U/L)	Max-CSA(mm^2)	PI(db)
Preoperative	79.32±30.45	501.62±127.54	2.72±0.70
1d after surgery	428.23±78.46	-	-
7d after surgery	95.17±21.35	624.88±101.93	4.62±1.19
Three months after surgery	-	521.43±60.37	2.96±0.48
Six months after surgery	-	494.46±62.55	2.57±0.33

4. Discussion

Although the posterior approach of lumbar intervertebral fusion is more commonly used in the treatment of lumbar degenerative diseases, which can achieve good nerve root decompression effect, but from the perspective of traditional Chinese medicine, the operation also has many disadvantages, which is easy to cause some adverse reactions or serious complications, resulting in motor dysfunction and other problems[4-5]. In order to reduce the occurrence of adverse conditions, attention should be paid to the protection of lumbar multilobis muscle in the surgery, reduce

unnecessary injury, and thus improve the surgical benefits and improve the prognostic effect. In recent years, under the concept of minimally invasive, the use of minimally invasive spinal technology can be fully and effectively decompression of lumbar spinal stenosis, and the use of minimally invasive lumbar decompression and fusion, to reduce the damage to polylobis muscle, and has achieved good results[6-7]. On this basis, the combination of spinal endoscopic techniques and the percutaneous spinal internal fixation technique produced a percutaneous endoscopic-assisted transforaminal lumbar decompression and fusion procedure. In the operation to accurately grasp the indications and contraindications, according to the patient related to the operation arrangement and the formulation of the operation plan, can achieve the ideal results. This surgical method for patients with single-segment lumbar spinal stenosis has achieved ideal therapeutic results from the perspective of TCM, while significantly reducing the adverse effects on polycleis, making patients achieve better prognostic effect [8]

To sum up, from the perspective of traditional Chinese medicine, percutaneous endoscopy assisted transforaminal lumbar decompression and fusion in the treatment of single segment lumbar spinal stenosis can achieve good early efficacy, and will not have a significant impact on polycleft muscle morphological changes and blood flow perfusion.

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