

# 经 Delta 通道椎间孔镜治疗神经根型颈椎病

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**【摘要】** 目的:探讨经 Delta 通道椎间孔镜治疗神经根型颈椎病的早期临床疗效及安全性。方法:对 2017 年 9 月至 2018 年 7 月收治的 10 例神经根型颈椎病患者行经 Delta 通道后路椎间孔镜下椎间盘摘除术,其中男 6 例,女 4 例;年龄 30~62(41.5±4.3)岁;均为单侧根性症状,其中 C<sub>4,5</sub> 2 例, C<sub>5,6</sub> 5 例, C<sub>6,7</sub> 3 例。所有患者 CT 及 MRI 检查提示无后纵韧带骨化及黄韧带钙化等影像学表现,颈椎动力位 X 线片无颈椎不稳,经系统非手术治疗 6 周以上,疗效欠佳。观察患者术前及末次随访时颈肩痛 VAS 评分、JOA 评分、NDI 评分、颈椎生理曲度、颈椎病变节段椎间高度和稳定性的改变。结果:所有手术顺利完成,无脊髓、神经根或大血管损伤情况的发生。手术时间 70~120 min,平均 90 min;术中出血量 30~90 ml,平均 40 ml。10 例患者均获得随访,时间 6~14 个月,平均 9 个月。所有患者术后神经根性疼痛缓解满意,神经功能有所改善。VAS 评分由术前的 7.15±2.01 降至末次随访时的 1.59±0.83;JOA 评分由术前的 12.57±1.24 升至末次随访时的 16.42±0.58;NDI 评分由术前的 41.82±4.71 提高到末次随访时的 9.59±3.52;末次随访与术前比较差异均有统计学意义( $P<0.05$ )。颈椎生理曲度 D 值由术前的(8.21±0.84) mm 升至末次随访时的(10.89±0.96) mm( $P<0.05$ )。病变节段椎间高度术前、末次随访时分别为(5.62±0.59)、(5.60±0.57) mm,差异无统计学意义( $P>0.05$ )。末次随访时颈椎动力位 X 线片未见颈椎不稳。结论:经 Delta 通道后路椎间孔镜下椎间盘摘除术治疗神经根型颈椎病能获得较为满意的疗效,且不影响颈椎的稳定性,安全性可靠,值得临床应用。

**【关键词】** 神经根型颈椎病; Delta 通道; 椎间孔镜; 椎间盘切除术

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## Treatment of cervical spondylosis radiculopathy with posterior intervertebral foraminal discectomy via Delta channel

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**ABSTRACT Objective:** To explore the clinical efficacy and safety of posterior intervertebral foraminal discectomy via Delta channel for cervical spondylosis radiculopathy in the early phase. **Methods:** From September 2017 to July 2018, 10 patients with cervical spondylosis radiculopathy underwent posterior intervertebral foraminal discectomy via Delta channel. There were 6 males and 4 females, aged from 30 to 62 years old with an average of (41.5±4.3) years old. All of them had unilateral symptoms caused by cervical nerve root compression, including 2 cases of C<sub>4,5</sub>, 5 cases of C<sub>5,6</sub> and 3 cases of C<sub>6,7</sub>. CT and MRI examination of all the patients did not show ossification of posterior longitudinal ligament or calcification of ligamentum flavum, and no cervical spine instability was present in dynamic radiographs. The clinical outcome was poor after more than 6 weeks of systematic non-surgical treatment. The VAS score, JOA score, NDI score, the cervical spine physiological curvature, and the height and stability of the compressed cervical vertebrae were measured before operation and at the latest follow-up. **Results:** All patients successfully completed the surgeries without any spinal cord, nerve root or major blood vessel injury. The operation time was 70 to 120 min with an average of 90 min. Intraoperative blood loss ranged from 30 to 90 ml with an average of 40 ml. All the 10 patients were followed up for 6 to 14 months with an average of 9 months. Postoperative nerve root pain got relieved and nerve function was improved in all patients. VAS score decreased from 7.15±2.01 before surgery to 1.59±0.83 at the latest follow-up; JOA score increased from 12.57±1.24 before surgery to 16.42±0.58 at the latest follow-up; NDI score increased from 41.82±4.71 before surgery to 9.59±3.52 at the latest follow-up. All the results above presented significant difference between latest follow-up and preoperative ( $P<0.05$ ). The D value of cervical physiological curvature increased from (8.21±0.84) mm before surgery to (10.89±0.96) mm at the latest follow-up, and the difference was also statistically significant ( $P<0.05$ ). The height of the diseased vertebrae was (5.62±0.59) mm before surgery and (5.60±0.57) mm at the latest follow-up, with no statistically significant difference ( $P>0.05$ ). At the latest follow-up, no cervical instability was observed on dynamic radiographs. **Conclusion:** Treatment of cervical spondylosis radiculopathy by posterior intervertebral foraminal discectomy via Delta channel can obtain a satisfactory clinical outcome with-

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out affecting the stability of cervical vertebra. The surgery is safe, reliable and worthy of clinical application.

**KEYWORDS** Cervical spondylotic radiculopathy; Delta channel; Intervertebral foramina; Discectomy

长久以来,神经根型颈椎病(cervical spondylotic radiculopathy, CSR)多以非手术治疗为主,但对于症状影响工作生活者或出现了肌力减退者,经系统正规保守治疗无效者需行手术治疗。Delta 脊柱全内镜技术(Joimax 公司)作为新一代大通道脊柱全内镜手术系统,与显微内镜一样可采用椎板间入路,手术通道管直径为 10 mm,相对于常规经皮内镜而言可使用更大尺寸手术器械,极大地增强了经皮内镜处理椎管狭窄的能力,使椎管减压过程更快捷,配合常规镜使用也能很好地处理神经腹侧的压迫。本文总结了 2017 年 9 月至 2018 年 7 月行经 Delta 通道后路椎间孔镜下椎间盘摘除术 10 例患者,现报告如下。

## 1 资料与方法

### 1.1 一般资料

本组 10 例,男 6 例,女 4 例;年龄 30~62(41.5±4.3)岁。所有病例为典型的单侧 CSR,其中 C<sub>4,5</sub> 2 例, C<sub>5,6</sub> 5 例, C<sub>6,7</sub> 3 例。临床表现为单侧上肢麻痛,肌力减退,反射减弱等,无脊髓受压表现。颈椎动力位 X 线片显示无颈椎不稳,CT 及 MRI 检查显示的病变节段与神经功能障碍定位均一致,且无后纵韧带骨化及黄韧带钙化影像学表现。10 例患者均经系统正规保守治疗 6 周以上,疗效欠佳。术前颈肩痛 VAS 评分 5~10(7.15±2.01)分,JOA 评分 10~14(12.57±1.24)分,NDI 评分 36~45(41.82±4.71)分。采用 Borden 等<sup>[1]</sup>测量法测定术前颈椎曲度 D 值为 6.5~9.6(8.21±0.84)。采用 Emery 等<sup>[2]</sup>方法测定病变椎间高度为 4.6~6.3(5.62±0.59) mm。

### 1.2 治疗方法

**1.2.1 手术方法** 10 例患者均采用气管插管全身麻醉,俯卧位,头高脚低,颈部稍前屈,头架固定,X 线透视下定位病变节段。常规消毒、铺巾,于颈后正中线病变椎间隙患侧旁开 1~1.5 cm 处置入穿刺针,X 线透视确认穿刺针位于病变节段上位椎板下缘靠近关节突内缘骨面,以穿刺针为中心作 1.0 cm 纵行切口。置入导丝,沿导丝逐级旋入扩张套管,始终注意套管抵在硬性骨面上;再次透视套管前端正位于病变椎间隙中点,侧位于关节突关节后缘。置入 Delta 通道,安装镜头,台下调试影像系统至图像清晰。Delta 通道下清除附着在椎板及关节突关节表面的软组织,找到病变节段“V”点(即病变椎间隙上下椎板邻近关节突的交界处),使用动力磨钻磨除椎板及关节突骨质,磨除的关节突关节不得超过 50%;镜下找到脊膜外缘及神经根,并牵开神经根,显露突出的髓核组织,用髓核钳取出;若钩椎关节增生压迫神

经根者予磨钻仔细小心磨除。Delta 通道下观察无活动性出血,神经根松弛,退出内镜及 Delta 通道,切口缝合,无菌敷料覆盖。

**1.2.2 术后处理** 术后常规采用激素、抗炎、营养神经、脱水等治疗。术后第 2 天佩戴颈托后下床活动,维持颈托制动 4~6 周。复查 CT 加三维重建了解减压情况。

### 1.3 观察项目与方法

记录患者手术前后颈肩痛 VAS 评分;采用日本骨科学会(JOA)17 评分法<sup>[3]</sup>对患者手术前后脊髓神经功能进行评价;观察手术前后颈椎残障指数(neck disability index, NDI)<sup>[4]</sup>。手术前后采用 Emery 等<sup>[2]</sup>方法在颈椎正侧位 X 线片上测量病椎椎间高度,采用 Borden 等<sup>[1]</sup>方法测量颈椎生理曲度,根据颈椎过伸过屈位 X 线片评价颈椎失稳情况(水平位移>3 mm 或椎间角度>10°),并记录患者术后有无颈肩部轴性疼痛等并发症的发生。

### 1.4 统计学处理

应用 SPSS 19.0 软件进行统计分析。术前与末次随访 VAS 评分、JOA 评分、NDI 评分、椎间高度及生理曲度比较均采用配对 *t* 检验。以 *P*<0.05 为差异有统计学意义。

## 2 结果

本组患者均顺利完成手术,无脊髓、神经、大血管等损伤,手术时间 70~120 min,平均 90 min;术中出血量 30~90 ml,平均 40 ml。所有患者术后神经根性疼痛缓解满意,神经功能有所改善,并获得了有效随访,时间 6~14 个月,平均 9 个月。末次随访时 VAS 评分、JOA 评分和 NDI 评分较术前均有明显改善(*P*<0.05);颈椎生理曲度 D 值较术前有所改善(*P*<0.05);病椎椎间高度无明显变化(*P*>0.05)。见表 1。复查 CT 加三维重建示减压彻底,颈椎过伸过屈位 X 线片未见颈椎失稳;随访期间无颈肩部轴性疼痛等并发症的发生。典型病例见图 1。

## 3 讨论

对于经系统保守治疗无效的 CSR 患者,且影像学表现与临床定位相一致者,需行手术干预。目前手术治疗 CSR 常用术式有:颈椎前路减压融合术(anterior cervical decompression and fusion, ACDF),后路“key-hole”椎间孔切开减压术,颈椎后路内窥镜下椎间盘切除术(microendoscopic discectomy, MED),后路显微内镜颈椎髓核摘除术(cervical microendoscopic discectomy, CMED)及经皮内镜下颈椎后路间盘切除术(posterior percutaneous endoscopic cervical

表 1 神经根型颈椎病 10 例患者手术前后观察项目比较 ( $\bar{x} \pm s$ )

Tab.1 Comparison of observation items of 10 patients with CSR before and after operation ( $\bar{x} \pm s$ )

时间	颈肩痛 VAS 评分(分)	JOA 评分(分)	NDI 评分(分)	颈椎曲度 D 值(mm)	椎间高度(mm)
术前	7.15±2.01	12.57±1.24	41.82±4.71	8.21±0.84	5.62±0.59
末次随访	1.59±0.83	16.42±0.58	9.59±3.52	10.89±0.96	5.60±0.57
t 值	8.085	8.894	17.333	6.644	0.077
P 值	0.000	0.000	0.000	0.000	0.469



图 1 患者,男,50 岁,颈痛 2 年,加重伴右上肢麻木半年就诊,经系统保守治疗无效,经 Delta 通道椎间孔镜下行 C<sub>5,6</sub> 椎间盘摘除术 1a,1b. 术前颈椎 MRI 矢状面和横断面示 C<sub>5,6</sub> 椎间盘向右侧突出,右侧 C<sub>6</sub> 神经根受压 1c,1d. 术前颈椎 CT 及重建未见后纵韧带骨化和黄韧带钙化 1e. 术中定位及安放工作套管 1f. 术后 3 d,CT 横断面示突出的 C<sub>5,6</sub> 髓核已摘除,椎板见磨除的“锁孔” 1g. 术后 3 d,CT 三维重建示 C<sub>5,6</sub> 右侧上下椎板缘磨除部分骨质后见一“锁孔”,图中红圈位置 1h,1i. 术后 10 个月颈椎过伸过屈位 X 线片未见颈椎失稳

Fig.1 A 50-year-old male patient with neck pain for 2 years, the symptom was worsening and present with right upper extremity numbness and pain for half a year. All these symptoms were not relieved after systematic conservative treatment. Intervertebral foraminal C<sub>5,6</sub> discectomy via Delta channel was performed 1a,1b. Preoperative cervical MRI on sagittal and transverse view showed a C<sub>5,6</sub> disc herniation to the right, and the right C<sub>6</sub> nerve root was compressed 1c,1d. Preoperative cervical CT with reconstruction showed no ossification of posterior longitudinal ligament or calcification of ligamentum flavum 1e. Intraoperative positioning and alignment of working cannula 1f. Three days after operation, the CT in transverse view showed that the herniated nucleus pulposus of C<sub>5,6</sub> had been removed, and the "key-hole" had been removed in the vertebral plate 1g. Three days after operation, postoperative CT with three-dimensional reconstruction showed a "key-hole" in the upper and lower lamina margin of the right side of C<sub>5,6</sub> after the partial bone removal, indicated by the red circle on the figure 1h,1i. The X-ray films in over-flexure posture and over-extending posture showed no cervical instability at 10 months after operation

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discectomy, PPECD), 但不同的术式各有利弊<sup>[5-9]</sup>。

ACDF 是治疗 CSR 的金标准, 具有减压彻底、脊柱稳定良好等优势, 但是随之而来的术后吞咽困难、颈椎活动受限、相邻节段的退变及假关节形成等并发症也受到了国内外学者的广泛关注<sup>[10-11]</sup>。后路“key-hole”椎间孔切开减压术作为一种传统手术可直接扩大椎间孔摘除突出的髓核, 达到神经根减压的目的, 避免了融合, 保留了颈椎的运动节段; 但由于术中广泛的剥离颈后椎旁肌, 易导致椎旁肌去血管神经化, 从而出现术后颈肩部轴性疼痛、肌肉萎缩及颈椎失稳等并发症<sup>[12-13]</sup>。随着微创理念和微创手术器械的发展, 基于“key-hole”技术衍生出诸多微创术式, 微创术式具有创伤小、出血少、住院时间短、恢复快及保留了运动节段等优势。颈椎后路 MED 术、CMED、PPECD 是当前常见的微创术式, 相较于 ACDF 可避开颈部重要的神经血管, 减少了术后并发症发生率, 与“key-hole”技术相比, 具有避免了颈后椎旁肌的破坏, 保持了颈椎周围韧带的完整性, 减少了术后颈肩部轴性疼痛发生率的优点。但颈椎后路 MED 术具有术中操作空间有限、适应证窄等不足, 且需要术者熟练的手术技巧, 学习曲线较长<sup>[8]</sup>; CMED 术中易镜下出血, 导致视野不清, 影响减压手术的进行<sup>[8, 14]</sup>; PPECD 需要严格控制适应证, 缺乏手术标准, 且长期疗效有待进一步探究<sup>[15-16]</sup>。

随着国内外脊柱微创器械和技术的发展, 依赖椎间孔镜器械的 Delta 大通道技术开始萌芽。Delta 通道孔镜技术是在全身麻醉下经后路椎板间入路实施减压, 术中可切除肥厚的黄韧带、增生的关节突及部分椎板等致病因素, 从而达到较大范围的精准减压。Delta 大通道相对于传统通道具有明显的优势: (1) 内镜工作通道达 6 mm, 可选择的手术器械范围更广, 术中操作更加灵活。(2) 大通道带来的大视野, 使得镜下视野更清晰。(3) 带螺纹的工作套管以旋入的方式固定, 使得工作通道更稳定, 降低了通道脱出或误入椎管的风险。(4) 可潜行进入椎管内实施减压, 且可经同一手术切口实施两侧减压, 由于是潜行途径, 不切除骨性结构, 所以颈椎稳定性并未受到影响。Delta 通道下椎间孔镜技术, 不仅达到了微创的目的也避免了微创技术减压范围局限的不足; 但 Delta 技术并不能够处理中央型颈椎间盘突出、脊髓型颈椎病、颈椎不稳定或颈椎畸形等问题, 且手术适应证相对狭窄。本组 10 例经 Delta 通道椎间孔镜治疗的 CSR 患者, 术后无神经脊髓损伤的发生。经过平均 9 个月随访, 无患者出现颈肩部轴性疼痛, 摄颈椎动力位 X 线片未出现颈椎失稳; 10 例患者颈肩痛 VAS 评分、JOA 评分、NDI 评分及颈椎生理曲度较术

前均有明显改善 ( $P < 0.05$ ); 病变节段椎间隙高度与术前比较变化不明显 ( $P > 0.05$ )。

总之, Delta 通道下孔镜技术是一种非融合手术, 创伤小, 对节段的稳定性及活动度影响不大, 对于颈椎间盘侧后方突出及椎间孔骨性狭窄的患者, 能够对神经根直接减压, 早期疗效满意, 且恢复快、缩短了患者住院时间, 值得临床应用。但由于目前病例数较少, 随访时间短, 远期疗效有待进一步观察。

参考文献

- [1] Borden AG, Rechtman AM, Gershon Cohen J. The normal cervical lordosis[J]. Radiology, 1960, 74: 806-809.
- [2] Emery SE, Bolesta MJ. Robison anterior cervical fusion compasion of the standard and modified techniques[J]. Spine (Phila Pa 1976), 1994, 19(6): 660-663.
- [3] Yonenobu K, Wada E, Tanaka T, et al. Japanese Orthopaedic Association Cervical Myelopathy Evaluation Questionnaire (JOACMEQ): Part 2. Endorsement of the alternative item[J]. J Orthop Sci, 2007, 12(3): 241-248.
- [4] Vernon H, Mior S. The neck disability index: a study of reliability and validity[J]. J Manipulative Physiol Ther, 1991, 14(7): 409-415.
- [5] McGirt MJ, Mehrlich M, Parker SL, et al. 165 ACDF in the outpatient ambulatory surgery setting: analysis of 1000 consecutive cases and comparison to hospital inpatient ACDF[J]. Neurosurgery, 2015, 62(Suppl 1): 220.
- [6] Hilton Jr DL. Minimally invasive tubular access for posterior cervical foraminotomy with three-dimensional microscopic visualization and localization with anterior/posterior imaging[J]. Spine J, 2007, 7: 154-158.
- [7] 刘东宁, 易伟宏, 王尔天, 等. 颈椎后路内窥镜下椎间盘切除术治疗单节段神经根型颈椎病[J]. 中国脊柱脊髓杂志, 2013, 23(7): 594-598.  
LIU DN, YI WH, WANG ET, et al. Treatment of cervical spondylotic radiculopathy by posterior cervical endoscopic discectomy[J]. Zhongguo Ji Zhu Ji Sui Za Zhi, 2013, 23(7): 594-598. Chinese.
- [8] Adamson TE. Microendoscopic posterior cervical laminoforaminotomy for unilateral radiculopathy: results of a new technique in 100 cases[J]. J Neurosurg, 2001, 95(Suppl 1): S51-S57.
- [9] Ruetten S, Komp M, Merk H, et al. Full-endoscopic cervical posterior foraminotomy for the operation of lateral disc herniations using 5.9 mm endoscopes: a prospective, randomized, controlled study[J]. Spine (Phila Pa 1976), 2008, 33(9): 940-948.
- [10] Shillingford J, Laratta J, Hardy N, et al. National outcomes following single-level cervical disc arthroplasty versus anterior cervical discectomy and fusion[J]. J Spine Surg, 2017, 3(4): 641-649.
- [11] 陈波, 金格勒, 杨毅, 等. 颈椎间盘置换与颈前路减压植骨融合治疗单节段颈椎病中期疗效的 Meta 分析[J]. 中国脊柱脊髓杂志, 2014, 24(6): 517-525.  
CHEN B, JIN GL, YANG Y, et al. Meta analysis of mid-stage efficacy of cervical disc replacement and anterior cervical decompression and bone grafting for single-segment cervical spondylosis[J]. Zhongguo Ji Zhu Ji Sui Za Zhi, 2014, 24(6): 517-525. Chinese.
- [12] Bhaganagare AS, Nagesh S, Shrihari B, et al. Management of cervical monoradiculopathy due to prolapsed intervertebral disc, an

- institutional experience[J]. J Craniovertebr Junction Spine, 2017, 8(2):132-135.
- [13] Ratliff JK, Cooper PR. Cervical laminoplasty: a critical review[J]. J Neurosurg, 2003, 98(Suppl 3):S230-S238.
- [14] 刘东宁, 易伟宏, 谭杰, 等. 显微内镜颈椎髓核摘除术治疗单节段神经根型颈椎病的临床疗效[J]. 中国骨与关节杂志, 2016, 5(5):339-343.
- LIU DN, YI WH, TAN J, et al. Clinical effect of microendoscopic cervical nucleus pulposus excision in the treatment of single-segment radiculopathy of cervical spondylosis[J]. Zhongguo Gu Yu Guan Jie Za Zhi, 2016, 5(5):339-343. Chinese.
- [15] 张迎春, 陈太声, 朱华. 经椎间孔镜后路治疗神经根型颈椎病早期疗效观察[J]. 中国骨伤, 2018, 31(4):306-310.
- ZHANG YC, CHEN TS, ZHU H. Early curative effect of transforaminal posterior approach in the treatment of cervical spondylotic radiculopathy[J]. Zhongguo Gu Shang/China J Orthop Trauma, 2018, 31(4):306-310. Chinese with abstract in English.
- [16] 赵文奎, 祝斌, 刘晓光. 经皮脊柱内镜治疗神经根型颈椎病研究进展[J]. 中国疼痛医学杂志, 2018, 24(8):571-575.
- ZHAO WK, ZHU B, LIU XG. Research progress of percutaneous spinal endoscopy in the treatment of cervical spondylotic radiculopathy[J]. Zhongguo Teng Tong Yi Xue Za Zhi, 2018, 24(8):571-575. Chinese.
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## 全内镜 I See 技术治疗单节段退行性腰椎管狭窄症

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**【摘要】** 目的: 探讨全内镜 I See 技术治疗单节段退行性腰椎管狭窄症的临床疗效及优势。方法: 回顾性分析 2017 年 1 月至 2018 年 3 月采用全内镜 I See 技术治疗的 38 例单节段退行性腰椎管狭窄症患者的临床资料, 其中男 16 例, 女 22 例; 年龄 35~79(53.45±12.56)岁; 手术节段 L<sub>3,4</sub> 5 例, L<sub>4,5</sub> 23 例, L<sub>5</sub>S<sub>1</sub> 10 例。术后采用腰腿痛 VAS 评分、ODI 评分、Macnab 评定标准评估临床疗效。结果: 所有患者获得术后 12 个月以上的随访。手术时间 55~130(86.0±17.5) min, 术中出血量 10~50(17±6) ml, 住院时间 3~7 d, 平均 4.6 d。腰腿痛 VAS 评分及 ODI 评分术前与术后 3 d、3、12 个月相比差异均有统计学意义(P<0.05)。根据腰椎功能 Macnab 评定标准, 优 15 例, 良 19 例, 可 4 例。结论: 全内镜 I See 技术治疗单节段退行性腰椎管狭窄症疗效确切, 具有创伤小、住院时间短、恢复快等优势。

**【关键词】** 全内镜; 脊柱融合术; 退行性腰椎管狭窄症

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**Full endoscopic I See technique for the treatment of single-segment degenerative lumbar spinal stenosis** WEN Jie, ZHANG Hui, SONG Yu-xin, ZHANG Fu-qiang, WANG Dong, WANG Zhong-hua, and LIU Lin\*. \*The Second Department of Orthopaedics, Gansu Provincial People's Hospital, Lanzhou 730000, Gansu, China

**ABSTRACT Objective:** To investigate the clinical efficacy and advantages of the full endoscopic I See technique for the single-segment degenerative lumbar spinal stenosis. **Methods:** The clinical data of 38 patients with the single-segment degenerative lumbar spinal stenosis treated by full endoscopic I See technique from January 2017 to March 2018 were analyzed retrospectively. There were 16 males and 22 females, aged from 35 to 79 years with an average of (53.45 ± 12.56) years. Five cases were L<sub>3,4</sub>, 23 cases were L<sub>4,5</sub>, 10 cases were L<sub>5</sub>S<sub>1</sub>. The clinical efficacy was evaluated by VAS, ODI and Macnab scores. **Results:** All the patients were followed up for more than 12 months after operation. The length of operation was from 55 to 130 (86.0 ± 17.5) min. Intraoperative blood loss was ranging from 10 to 50 (17 ± 6) ml, and the hospitalization length was from 3 to 7 days with an average of 4.6 days. The VAS scores of low back pain assessed before operation, and 3 d, 3 months, 12 months post-operation were 6.67 ± 1.25, 3.87 ± 1.35, 2.55 ± 1.21, 2.05 ± 0.97, respectively, and the differences were statistically significant (P < 0.05); VAS scores of leg pain at these time-points were 7.85 ± 2.62, 3.31 ± 1.42, 2.02 ± 1.13, 1.85 ± 0.86, respectively, and the dif-

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