

· 临床研究 ·

长节段与短节段固定治疗退行性腰椎侧凸并椎管狭窄的短期临床疗效分析

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【摘要】目的 分析长节段与短节段固定治疗退行性腰椎侧凸(DLS)并椎管狭窄的短期临床疗效, 探索手术适应证。

方法 回顾性分析第二军医大学附属长征医院脊柱外科2014年1月—2015年7月收治的81例DLS并椎管狭窄患者临床资料, 其中长节段组(A组)33例, 手术节段为T₁₀~S₁ 10例、T₁₀~L₅ 4例、T₁₁~S₁ 12例、T₁₁~L₅ 7例; 短节段组(B组)48例, 手术节段为L_{2~4} 2例、L_{3~4} 4例、L_{3~5} 10例、L_{4~5} 12例、L_{4~S₁} 12例, L_{5~S₁} 8例。记录并比较术前及末次随访时腰椎侧凸Cobb角、腰椎活动度(ROM)、腰痛视觉模拟量表(VAS)评分、下肢痛VAS评分、Oswestry功能障碍指数(ODI)及并发症发生情况。**结果** A组末次随访时腰椎侧凸Cobb角、腰椎ROM显著小于B组, 差异有统计学意义($P<0.05$)。A组末次随访腰痛VAS评分及ODI显著低于B组, 差异有统计学意义($P<0.05$); 下肢痛VAS评分2组比较差异无统计学意义($P>0.05$)。A组围手术期出现脑脊液漏2例、切口感染2例、肺部感染1例、一过性神经根损伤1例, B组出现脑脊液漏1例、一过性神经根损伤1例。**结论** 2种固定方式均能有效改善DLS并椎管狭窄患者下肢疼痛及间歇性跛行症状。与短节段固定相比, 长节段固定对腰痛改善效果较好, 但腰椎ROM变小且围手术期并发症较多。

【关键词】 腰椎; 椎管狭窄; 脊柱侧凸; 内固定器

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Short term clinical analysis of long segment and short segment fixation for degenerative lumbar scoliosis associated with spinal stenosis

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【Abstract】 Objective To analyze the short-term clinical efficacy of long segment and short segment fixation for degenerative lumbar scoliosis (DLS) associated with spinal stenosis, and explore the surgical indications. **Methods** From January 2014 to July 2015, 81 DLS patients with spinal stenosis treated in Changzheng Hospital were involved in this retrospective study. For long segment group (group A, 33 cases), operated segments were T₁₀~S₁ in 10 patients, T₁₀~L₅ in 4, T₁₁~S₁ in 12, T₁₁~L₅ in 7; and short segment group (group B, 348 cases), operated segments were L_{2~4} in 2 patients, L_{3~4} in 4, L_{3~5} in 10, L_{4~5} in 12, L_{4~S₁} in 12, L_{5~S₁} in 8. Scoliosis Cobb's angle, rang of motion (ROM), low back pain visual analogue scale (VAS) score, leg pain VAS score, Oswestry disability index (ODI) and complications had been used for comparing the difference between the 2 groups.

Results Scoliosis Cobb's angle and ROM in group A were significantly less than those in group B at the final follow-up ($P<0.05$). Low back pain VAS score and ODI in group A were significantly lower than those in group B at the final follow-up ($P<0.05$). Leg pain VAS score showed no statistical significance between the 2 groups ($P>0.05$). Cerebrospinal fluid leak and wound infection were occurred in 2 patients respectively, lung infection and nerve root injury in 1 respectively in group A, but there was only 1 case of cerebrospinal fluid leak case and nerve root injury respectively in group B. **Conclusion** Both long and short segment fixation can effectively improve the leg pain and intermittent claudication symptoms. Compared with short segment fixation, long segment

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fixation is better in relieving lumbar pain, but poorer in maintaining lumbar spine mobility and provides more complications.

【Key Words】 Lumbar vertebrae; Spinal stenosis; Scoliosis; Internal fixators

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退行性腰椎侧凸(DLS)是一种复杂的脊柱退行性疾病, 好发于老年人, 常合并有腰椎椎管狭窄、腰椎滑脱等病理改变^[1-2]。目前手术是治疗该类疾病的有效方法, 手术可重建脊柱稳定性, 有效解除神经根压迫, 改善症状, 提高患者生活质量^[3-4]。临幊上较为认可的术式有短节段减压固定术及长节段矫形减压固定术^[5]。本研究对2014年1月—2015年7月在第二军医大学附属长征医院脊柱外科行长节段与短节段手术治疗的DLS并椎管狭窄患者临床疗效进行比较, 探索手术适应证, 为临幊治疗提供参考。

1 资料与方法

1.1 一般资料

纳入标准: ①DLS合并椎管狭窄, 主要症状为腰痛、下肢痛、间歇性跛行; ②手术方式为腰椎后路减压植骨融合内固定术; ③随访>12个月, 病例资料完整, 年龄>45岁。排除标准: ①合并急性腰部外伤、腰椎结核、颈椎病等可交叉引起双下肢疼痛、行走功能障碍者; ②合并双下肢外周神经损伤病史者。

按照以上标准共纳入患者81例。长节段组(A组)33例, 其中男13例、女20例, 年龄(67.0 ± 13.5)岁, 病史(8.5 ± 3.1)年, 随访(25.1 ± 11.6)个月。短节段组(B组)48例, 其中男20例、女28例, 年龄(65.4 ± 15.2)岁, 病史(9.2 ± 4.2)年, 随访(23.6 ± 13.0)个月。2组患者年龄、性别、随访时间、病史差异无统计学意义, 具有可比性。长节段组手术节段为T₁₀~S₁ 10例、T₁₀~L₅ 4例、T₁₁~S₁ 12例、T₁₁~L₅ 7例。短节段组手术节段为L₂₋₄ 2例、L₃₋₄ 4例、L₃₋₅ 10例、L₄₋₅ 12例、L₄~S₁ 12例, L₅~S₁ 8例。

1.2 手术方法

患者全身麻醉后取俯卧位, 采用后正中入路, 逐层切开皮肤、皮下筋膜, 骨膜下剥离骶棘肌, 显露手术区域。长节段组与短节段组均进行常规置钉、减压、融合等操作。2组患者均行椎板切除减压、双侧神经根管扩大减压及椎间植骨融合、椎弓根螺钉内固定术。长节段组腰椎MRI上认定椎管狭窄节段均给予切除椎板、潜行减压神经根管, 于责任椎间隙行椎间融合, 并对腰椎侧凸进行适当矫正, 矫正程度根据术前影像学资料及术中探查情况而定。短节段组对手术节段进行减压植骨融合, 并

于原位固定腰椎。术后2组患者均给予常规治疗, 均于术后2周佩戴腰围下床活动, 术后2个月内仍以卧床为主。术后3个月、6个月、1年时分别于门诊随访, 随访时拍摄腰椎正侧位、过伸位及过屈位X线片, 必要时拍摄全脊柱X线片。

1.3 观察指标

记录所有患者术前及末次随访时腰椎侧凸Cobb角、腰椎活动度(ROM)、腰痛视觉模拟量表(VAS)评分^[6]、下肢痛VAS评分、Oswestry功能障碍指数(ODI)^[7]及并发症发生情况。侧凸Cobb角于腰椎侧位X线片上测量, 为上端椎上终板与下端椎下终板间的角度。腰椎ROM为过伸、过屈位矢状面X线片腰椎Cobb角之差。以上所有参数均由2名硕士研究生单独测量, 取平均数。

1.4 统计学处理

采用SPSS 18.0软件对数据进行统计学分析。其中计量资料或连续资料用 $\bar{x} \pm s$ 表示, 采用t检验, 以 $P < 0.05$ 为差异具有统计学意义。

2 结 果

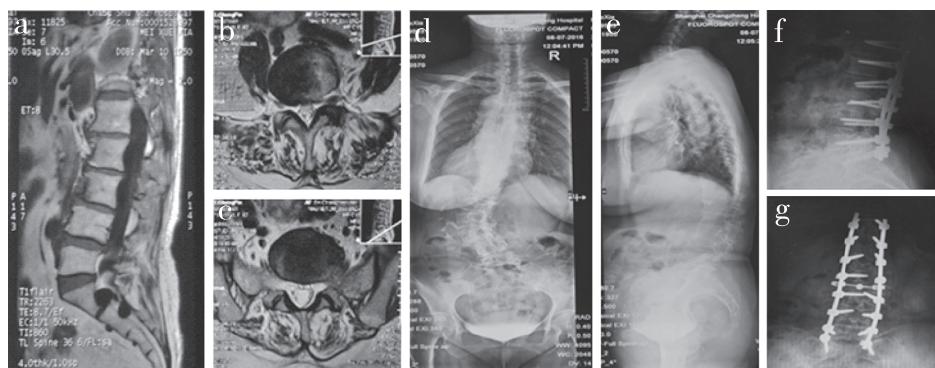
2组患者术前腰椎侧凸Cobb角、腰椎ROM、腰痛及下肢痛VAS评分、ODI差异均无统计学意义($P > 0.05$, 表1)。A组末次随访时腰椎侧凸Cobb角、腰椎ROM、腰痛及下肢痛VAS评分、ODI与术前相比差异均有统计学意义($P < 0.05$)。B组末次随访时腰椎侧凸Cobb角、腰椎ROM与术前相比差异无统计学意义($P > 0.05$); 腰痛及下肢痛VAS评分、ODI与术前相比差异均有统计学意义($P < 0.05$)。末次随访时, A组腰椎侧凸Cobb角、腰椎ROM显著小于B组, 差异有统计学意义($P < 0.05$); A组腰痛VAS评分及ODI低于B组, 差异有统计学意义($P < 0.05$); 下肢痛VAS评分2组比较差异无统计学意义($P > 0.05$)。A组围手术期出现脑脊液漏2例、切口感染2例、肺部感染1例、一过性神经根损伤1例, B组出现脑脊液漏1例、一过性神经根损伤1例。脑脊液漏患者均给予常规伤口加压包扎、抗感染等治疗, 3例均于术后48 h拔除引流管, 切口顺利愈合。切口感染、肺部感染患者均在常规抗感染治疗后痊愈。2例一过性神经根损伤患者观察1周后神级功能均恢复至接近术前水平。2组患者典型病例影像学资料见图1, 2。

表1 统计数据
Tab. 1 Statistical data

组别 Group	n	侧凸 Cobb 角/(°) Scoliosis Cobb's angle/(°)		ROM/(°) Pre-operation		腰痛 VAS 评分 Low back pain VAS score		下肢痛 VAS 评分 Leg pain VAS score		ODI(%) Pre-operation	
		术前 Pre-operation	末次随访 Final follow-up	术前 Pre-operation	末次随访 Final follow-up	术前 Pre-operation	末次随访 Final follow-up	术前 Pre-operation	末次随访 Final follow-up	术前 Pre-operation	末次随访 Final follow-up
		A	33	24.3 ± 10.7	4.5 ± 7.7*	33.6 ± 12.8	7.5 ± 8.5*	5.6 ± 2.7	2.3 ± 1.2*	7.3 ± 3.5	1.8 ± 1.1*
B	48	21.4 ± 11.8	18.8 ± 10.0△	32.4 ± 10.9	29.7 ± 11.2△	5.2 ± 3.1	4.0 ± 1.6*△	7.7 ± 3.2	2.2 ± 1.4*	68.0 ± 11.9	35.0 ± 9.3*△

注: *与术前相比, $P < 0.05$; △与A组相比, $P < 0.05$

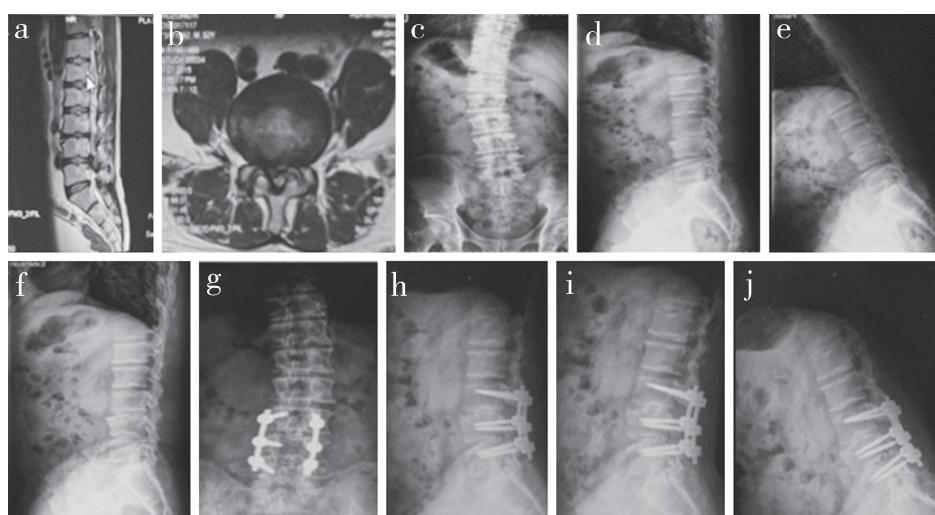
Note: * $P < 0.05$, compared with pre-operation; △ $P < 0.05$, compared with group A



女, 68岁, DLS并椎管狭窄, 行长节段内固定术, 术前腰痛VAS评分7分, 下肢痛VAS评分5分, ODI 68%; 末次随访腰痛VAS评分改善至2分, 下肢痛VAS评分改善至2分, ODI改善至28% a~c: 术前MRI示腰椎侧凸, L₄₋₅椎管狭窄 d, e: 术前全脊柱X线片示腰椎侧凸Cobb角38.4° f, g: 术后1年X线片示腰椎侧凸Cobb角改善至5.7°

Female, 68 years old, DLS with spinal stenosis, receives long segment fixation, preoperative back pain VAS score is 7 points, leg pain VAS score 5 and ODI 68%, and change to 2, 2, 28% respectively at final follow-up a~c: Preoperative MRIs show lumbar scoliosis and L₄₋₅ level stenosis d, e: Preoperative roentgenographs show scoliosis Cobb's angle is 38.4° f, g: Roentgenographs at postoperative 1 year show scoliosis Cobb's angle changes to 5.7°

图1 A组典型病例影像学资料
Fig. 1 Imaging data of a typical case in group A



男, 65岁, DLS并椎管狭窄, 行短节段内固定术, 术前腰痛VAS评分4分, 下肢痛VAS评分7分, ODI 64%; 末次随访腰痛VAS评分改善至2分, 下肢痛VAS评分改善至2分, ODI改善至30% a, b: 术前MRI示多节段腰椎椎间盘突出, L₃₋₅椎管狭窄 c~f: 术前X线片示腰椎侧凸Cobb角29.4°, ROM 31.4° g~j: 术后1年X线片示腰椎侧凸Cobb角28.6°, ROM 30.7°

Male, 65 years old, DLS with spinal stenosis, received short segment fixation, preoperative back pain VAS score, leg pain VAS score and ODI are 4, 7 and 64% respectively, and which are decreased to 2, 2, 30% respectively at final follow-up a, b: Preoperative MRIs show multiple segmental disc herniation with L₃₋₅ stenosis c-f: Preoperative roentgenographs show scoliosis Cobb's angle is 29.4°, and ROM is 31.4° g-j: Roentgenographs at postoperative 1 year show scoliosis Cobb's angle is decreased to 28.6°, and ROM to 30.7°

图1 B组典型病例影像学资料
Fig. 1 Imaging data of a typical case in group B

3 讨 论

DLS好发于老年人,且>65岁患者多见,随着人口老龄化日益加剧,其发生率呈上升趋势,是导致老年人生活质量下降的重要原因之一^[3, 8-9]。老年患者器官功能下降,代谢能力不足,且易合并多种慢性疾病,手术耐受性较差^[10]。而DLS常合并有长节段腰椎椎管狭窄、腰椎不稳、腰椎滑脱、骨质疏松等病理改变,病史长,病情复杂^[9, 11-12]。以上因素导致DLS患者手术治疗方案的选择成为脊柱外科的难点,症状改善有限、复发率高、围手术期并发症发生率高等是亟待解决的难题^[13]。

DLS的手术治疗目前尚存诸多争议,手术节段的选择是其中之一^[13]。有学者认为手术矫正侧凸、长节段固定腰椎与减压同等重要^[3, 14-17]。椎管及侧隐窝彻底的减压可解除神经根静态压迫,但如不进行长节段固定矫正侧凸,椎体变形对神经根的牵拉及腰椎不稳将持续存在,且随着患者年龄增大,侧凸将继续进展,邻近节段退行性变加剧,易导致术后腰腿痛复发。另有学者认为老年人体质特殊,对手术耐受性较差,长节段固定创伤大、出血多、手术时间长,易导致围手术期严重并发症发生,而通过短节段减压固定同样可有效缓解患者腰腿痛、间歇性跛行等症状^[13, 17-19]。本研究发现,长节段固定更易于发生脑脊液漏、切口感染、肺部感染等并发症,与上述报道相符。

越来越多的学者致力于长、短节段固定适应证的研究。有学者认为DLS常合并有多种病理改变,责任节段的明确是手术方式选择的重要基础^[20-21]。对于症状集中、责任节段连续的患者,可选择短节段有限减压固定,以缓解症状;对于症状分散、责任节段不明确、腰椎椎管广泛狭窄的患者则应进行长节段彻底减压并矫正畸形^[22-24]。有学者认为腰椎侧凸的程度是手术节段选择的主要参考因素^[25-26]。Cobb角≤20°的患者,侧凸较轻,对神经根及腰后部肌肉的影响较小,且术后Cobb角仍有一定进展缓冲空间,宜进行短节段固定;Cobb角>20°的患者,易出现脊柱失稳,在重力及骨质疏松等多因素作用下侧凸易进展,宜进行长节段矫形固定,预防术后腰痛^[1, 3]。

本研究结果显示,末次随访时2组下肢痛VAS评分差异无统计学意义,两者均能有效改善患者下肢痛症状。但长节段固定组腰痛VAS评分、ODI显著优于短节段固定组。可能原因为DLS合并椎管狭窄患者腰痛来源于腰椎不稳、腰椎滑脱、骨质疏

松、小关节不稳、腰椎侧凸后棘突双侧肌肉受力不均等,长节段固定后腰椎侧凸被部分矫正,腰椎不稳、腰椎滑脱、小关节不稳等情况改善,同时内固定系统分担了部分肌肉受力,使患者腰痛症状显著改善,生活质量改善较佳。而短节段固定对腰椎侧凸矫正有限,对腰椎的稳定作用有限,因此术后腰痛改善有限,且随着侧凸的进展,腰痛有进一步加重的可能^[13-14, 20]。

据此,对于腰痛明显、侧凸较重且合并腰椎不稳和/或腰椎滑脱而腿痛较轻,经药物、腰背肌训练等非手术治疗症状未改善的患者,在全身情况允许的条件下,选择长节段固定对腰痛改善可能更为有利。对于以腿部症状为主的患者,选择短节段固定,通过有效的神经根减压,也可较好地改善下肢疼痛、间歇性跛行等症状。具体临床实践中,手术节段的选择需充分考虑患者的手术耐受力、责任节段的分布、腰椎侧凸的程度、疼痛的范围与程度、是否合并腰椎滑脱及骨质疏松等因素,视个体情况选择最佳手术方案。

4 小 结

综上所述,长节段及短节段固定均能有效改善下肢疼痛及间歇性跛行症状。长节段固定对腰痛改善作用较好,但术后腰椎ROM变小且围手术期并发症较多;短节段固定可保留腰椎ROM且围手术期并发症较少,但对腰痛症状改善较有限。然而本研究病例数较少,随访时间较短,有待大样本、多中心的临床研究进一步验证。

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