·病例报告·

斜外侧腰椎间融合术治疗退行性腰椎疾病一例

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Oblique lumbar interbody fusion for treatment of degenerative disease of the lumbar spine: one case report

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患者　女性，48岁，主因反复腰腿痛3年，加重伴间歇性跛行3个月，于2015年8月12日入院。患者3年前无明显诱因出现间断性腰部胀痛伴双臀和双大腿疼痛，活动和行走无明显受限，劳累后加重、卧床休息后缓解，当地医院行腰椎CT检查显示，L_{4-5}椎间盘突出，临床诊断为L_{4-5}椎间盘突出症。予牵引、理疗、敷中药（具体药物不详）等治疗后好转，但上述症状反复发作，时轻时重。3个月前腰痛和双下肢放射痛加重，尤以右侧显著，伴间歇性跛行，当地医院予镇痛药治疗（具体方案不详）效果不佳，为求进一步手术治疗遂至我院就诊。患者自发病以来，精神、睡眠、饮食正常，大小便正常，体重无变化。既往史、个人史和家族史无特殊。入院后体格检查：体温36.5 ℃，脉搏75次/min，呼吸20次/min，血压109/77 mm Hg（1 mm Hg = 0.133 kPa）。神志清楚，语言流利，查体合作，扶入病房，被动体位；脊柱和四肢未见明显畸形，$L_{4\sim5}$水平棘突和棘间压痛，腰椎和椎旁压痛、叩击痛，双侧坐骨神经出口处和走行区压痛；双下肢Lasegue征及其加强试验均阳性，右下肢Fabere试验阳性、左下肢阴性，双侧股神经牵拉试验阳性；双下肢肌力4^{+}级、肌张力正常，双侧腱反射减弱；视觉模拟评分（VAS）8分，Oswestry功能障碍指数（ODI）62分。腰椎X线检查显示，L_4椎体Ⅰ度滑脱（图1a，1b）。MRI显示，腰椎生理曲度消失，L_4–S_1椎间盘退行性变，L_{4-5}椎间盘后凸，相应层面硬脊膜囊明显受压，侧隐窝变窄，椎管狭窄、最狭窄处约0.70 cm，黄韧带（LF）无明显增厚，脊髓下段和马尾神经未见明显异常（图1c）。临床诊断为$L_{4\sim5}$椎体退行性滑脱；L_{4-5}椎间盘突出症。遂行$L_{4\sim5}$小切口斜外侧腰椎间融合术联合左侧$L_{4\sim5}$椎体螺钉内固定术。患者右侧卧位，床头升高15°，气管插管全身麻醉于L_{2-3}棘突间隙行腰椎穿刺，置入腰大池引流管（上海瑞邦生物材料有限公司），缓慢释放脑脊液10 ml后，注入碘海醇注射液10 ml，行腰髓X线造影以了解硬脊膜囊受压情况（图2a）。于左下腹部腋前线与L_{4-5}椎间隙水平线交点做长为4～5 cm的直切口，钝性分离腹外斜肌、腹内斜肌、腹横肌和腹膜后脂肪，经腹膜后间隙继续钝性分离腰大肌与大血管鞘之间间隙以显露椎体。X线引导下定位L_{4-5}椎间隙，于侧方切开纤维环，以刮匙和铰刀去除髓核组织和椎间隙上下软骨板组织，植入填充自固化磷酸钙人工骨（上海瑞邦生物材料有限公司）和角度6°、大小12 mm×50 mm的Clydesdale椎间融合器（美国Medtronic公司），复查正侧位X线，可见椎间融合器位置良好，椎间隙增宽，椎间孔高度增加，腰椎前凸增大（图2b）；同时行腰髓X线造影显示硬脊膜囊受压明显改善。然后植入$L_{4\sim5}$椎体螺钉，连接棒连接并锁紧固定（图2c）。拔除腰大池引流管，逐层缝合腹壁肌肉、筋膜、皮下组织和皮肤（http://

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图1 腰椎影像学检查所见 1a,1b 过伸过屈位X线显示,L_{4-5}椎体Ⅰ度滑脱(箭头所示) 1c 矢状位T_2WI显示,L_{4-5}椎间盘后凸,相应层面硬脊膜囊明显受压(箭头所示) **图2** 脊髓X线造影所见 2a L_{4-5}椎间隙平面及其下方充盈缺损(箭头所示),表明局部硬脊膜囊受压明显 2b 椎间融合器植入后椎间隙增宽、椎间孔高度增加(箭头所示) 2c 椎体螺钉植入后L_{4-5}椎间隙及其下方充盈缺损明显改善(箭头所示),表明减压效果满意 **图3** 术后复查矢状位T_2WI显示,L_{4-5}椎间隙平面椎管前后径明显增大(箭头所示)

Figure 1 Lumbar MRI findings Flexion-extension X-ray showed Ⅰ degree degenerative spondylolisthesis (arrows indicate; Panel 1a, 1b). Sagittal T_2WI showed L_{4-5} intervertebral disc degeneration and obvious dural sac compression of the same level (arrow indicates, Panel 1c). **Figure 2** Myelography findings Myelography showed contrast agents filling defect at and below the level of L_{4-5}, indicating local dural sac compression (arrow indicates, Panel 2a). Lateral X-ray revealed intervertebral space and foramen height increased after the interbody fusion cage implantation (arrow indicates, Panel 2b). Repeated myelography showed contrast agents filling improvement at and below the level of L_{4-5}, indicating satisfied decompression effect (arrow indicates, Panel 2c). **Figure 3** Postoperative sagittal T_2WI showed increased diameter of the spinal canal at L_{4-5} level (arrow indicates).

www.cjcnn.org/index.php/cjcnn/pages/view/v1634)。分别于术前0.50 h和术后24 h静脉滴注头孢曲松钠0.50 g/d以预防感染。术后患者疼痛症状明显好转,VAS评分为3分,ODI评分为23分;复查腰椎MRI显示,L_{4-5}椎间盘平面椎管前后径达12.40 mm(图3)。术后第4天,患者疼痛缓解满意,肢体能够活动自如,手术切口愈合良好,病情稳定,一般情况良好,遂出院。

讨 论

腰椎间盘摘除术和腰椎间融合术是治疗退行性腰椎病变的主要手术方式之一,其中小切口斜外侧腰椎间融合术(OLIF)是一种由直接侧方腰椎间融合术(DLIF)和经前路腰椎间融合术(ALIF)演变而来的微创术式[1]。该术式经腹膜后于腰大肌以及腹主动脉和(或)髂总动静脉之间的自然间隙直达腰椎间隙,从而完成椎间盘摘除、椎间融合器植入以达到减压和植骨融合目的。由于手术通道不经过腰大肌,可以有效避免腰丛神经损伤,显著减少相关并发症,因此无需同时行术中神经电生理学监测[2]。OLIF经前侧方入路摘除椎间盘,并植入一个体积较大的椎间融合器,可有效撑开椎间隙,使得后纵韧带拉伸、椎间孔扩大,从而达到间接减压目的[3]。美国Medtronic公司生产的Clydesdale椎间融

合器设计成前高后低形状，自带一定前凸角度（6°～12°），植入后有助于恢复腰椎生理曲度。该术式具有手术时间短、手术创伤小、术中出血量少、恢复迅速的优点，其常见适应证包括：（1）退行性腰椎滑脱（DLS）。（2）退行性脊柱侧凸畸形。（3）椎间盘源性疼痛。（4）腰椎间盘退行性变。（5）后路减压术后翻修等。而游离性椎间盘突出、重度黄韧带增生等则不适宜该术式[4]。关于该术式的手术要点，我们的体会是：（1）术前仔细评估MRI以了解腰大肌与腹部大血管之间的间隙，若该间隙 <1 cm（约9%患者）不适宜该术式[5]。（2）术中切开纤维环时，切口应尽量位于椎体侧方正中位置，以使椎间融合器植入位置尽量位于椎体中央。（3）术中行脊髓X线造影对评估间接减压效果具有重要意义。（4）为减少椎间融合器移位和沉降，OLIF多联合后路微创经皮椎弓根螺钉内固定术。为了进一步减小手术创伤和降低手术费用，我们的临床经验是，对于单节段病变、Ⅱ度以下滑脱、无明显骨质疏松的患者，采用OLIF联合前入路单根钉棒行侧方固定，从而实现小切口、一次性完成椎间融合和固定，同样可以取得良好临床效果[6]。目前，OLIF仅在少数三级甲等医院的骨科和神经外科开展，由于其手术时间短、手术创伤小、术中出血量少、临床疗效可靠，故该项技术的临床应用前景十分广阔。

参 考 文 献

[1] Mayer HM. A new microsurgical technique for minimally invasive anterior lumbar interbody fusion. Spine (Phila Pa 1976), 1997, 22:691-699.

[2] Silvestre C, Mac - Thiong JM, Hilmi R, Roussouly P. Complications and morbidities of mini - open anterior retroperitoneal lumbar interbody fusion: oblique lumbar interbody fusion in 179 patients. Asian Spine J, 2012, 6:89-97.

[3] Ohtori S, Orita S, Yamauchi K, Eguchi Y, Ochiai N, Kishida S, Kuniyoshi K, Aoki Y, Nakamura J, Ishikawa T, Miaygi M, Kamoda H, Suzuki M, Kubota G, Sakuma Y, Oikawa Y, Inage K, Sainoh T, Sato J, Fujimoto K, Shiga Y, Abe K, Toyone T, Inoue G, Takahashi K. Mini - open anterior retroperitoneal lumbar interbody fusion: oblique lateral interbody fusion for lumbar spinal degeneration disease. Yonsei Med J, 2015, 56: 1051-1059.

[4] Fujibayashi S, Hynes RA, Otsuki B, Kimura H, Takemoto M, Matsuda S. Effect of indirect neural decompression through oblique lateral interbody fusion for degenerative lumbar disease. Spine (Phila Pa 1976), 2015, 40:E175-182.

[5] Molinares DM, Davis TT, Fung DA. Retroperitoneal oblique corridor to the L_2–S_1 intervertebral discs: an MRI study. J Neurosurg Spine, 2015.[Epub ahead of print]

[6] Liu W. Evaluation of replantation of spinous process and lamina and autogenous bone fusion after resection of intraspinal tumors. Zhongguo Xian Dai Shen Jing Ji Bing Za Zhi, 2013, 13: 1006-1010.[刘伟. 棘突椎板切开复位并植骨融合术在椎管内肿瘤手术中的应用. 中国现代神经疾病杂志, 2013, 13:1006-1010.]

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