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• 病例报告 •

影像学无腰椎管狭窄表现的马尾神经损伤 1 例

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Cauda equina injury without imaging findings of lumbar spinal stenosis: a case report DUAN Li-qiang and GU En-peng, Department of Orthopaedics, Tianjin Binhai New Area Hospital of Traditional Chinese Medicine, the Fourth Affiliated Hospital of Tianjin University of Traditional Chinese Medicine, Tianjin 300457, China

KEYWORDS Cauda equina injury; Spinal stenosis; Case report

患者, 男, 36 岁, 2016 年 11 月 25 日主因双下肢无力伴大便次数增多 2 年余入院, 入院时双下肢酸

软无力, 每天大便 4~5 次, 偶有失禁, 小便正常, 无外伤史。查体: 腰椎生理曲度变浅, 腰椎肌肉紧张, L₅S₁ 棘间压痛, 左侧梨状肌压痛, 无放射痛, 鞍区麻木, 肛周反射未引出, 提睾反射双侧对称引出, 足背及足底皮肤感觉双侧对称正常, 踝背伸肌力左 V 级, 右 V 级, 拇背伸肌力左 IV 级, 右 V 级, 足跖屈肌力左 V 级, 右 V 级。膝腱反射左活跃右活跃, 跟腱反射左活跃, 右活跃, 双侧巴宾斯基征阴性, 双侧霍夫曼征阴性;

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腰椎活动度:前屈 30°,后伸 5°,左屈 10°,右屈 10°,左旋 10°,右旋 10°;疼痛视觉模拟评分(visual analog scale, VAS)^[1]8 分;日常生活活动能力量表^[2]95 分。腰椎正侧位、过伸位 X 线片可见腰椎生理曲度变浅,多发腰椎间盘突出退变,未见明显失稳(图 1a, 1b, 1c, 1d)。腰椎 CT 显示 L₅S₁ 椎间盘后方突出(图 1e);腰椎 MRI 显示 L₅S₁ 椎间盘向后突出,同水平硬膜囊未受压迫,马尾沉降征阳性(图 1f, 1g);患者无肠炎、肠易激惹综合征等胃肠道疾病史,结合患者症状、体征及 MRI,入院后完善相关检查,相关科室会诊,排除胃肠道疾患导致的大便次数增多。入院诊断:腰椎间盘突出症;马尾神经损伤。完善相关检查,排除手术禁忌证,于入院 3 d 后在静脉+局麻下行腰椎椎间孔镜手术治疗。

手术方法:患者俯卧位,胸髂部垫枕约 10 cm,腹部悬空,调整手术床使患者腰部处于前屈位,选取 L₅S₁ 左后外侧入路,C 形臂 X 线定位 L₅S₁ 椎间隙,标记穿刺点,常规碘伏消毒术区 3 遍,铺巾,1%利多卡因局部麻醉穿刺部位皮肤、皮下筋膜后,穿刺针穿刺,C 形臂 X 线定位针尖正位于 S₁ 左侧上关节突肩部,侧位位于 S₁ 左上关节突尖部周围,植入导丝拔出穿刺针,继续予以 0.5%利多卡因麻醉左侧关节突周围,顺导丝逐级旋入 1~4 级套管,扩张管逐级扩张通道,扩张至穿透椎间孔周围组织,拔出 3 级扩张管,使用 1 号骨锯旋转穿过 S₁ 左侧上关节突腹侧皮质,磨掉上关节突腹侧部分骨质,随后拔出 1 号骨锯,旋入 3 号扩张管及鸭嘴管,拔出 4 级扩张管,使用 2 号骨锯旋转穿过 S₁ 左侧上关节突腹侧皮质,磨掉上关节突腹侧部分骨质,拔出 1~3 级套管及 2 号骨锯。使用长穿刺针头通过鸭嘴套管扎入 L₅S₁ 椎间隙内,透视见针尖正侧位在椎间隙内,注入造影剂染色溶液(碘海醇与亚甲蓝比例 9:1) 2 ml,透视见造影剂在椎间隙内,台下调试影像系统至图像清晰,植入椎间孔镜设备,持续生理盐水冲洗,入镜根据镜下所见,当髓核钳或蓝钳植入椎间孔外缘时(图 1h, 1i),患者马尾神经损伤症状复制,退出髓核钳或蓝钳,症状缓解,予髓核钳或蓝钳交替层层钳取周围致压物,直至椎管中央部(图 1j),使用等离子消融刀头止血、消融,使用一次性等离子刀,对 L₅ 椎体下缘、S₁ 椎体上缘多点消融、电凝,镜下可见下落的硬膜,转动工作通道,可见硬膜漂浮,搏动可,神经根松弛,镜下观察无活动性出血,取出椎间孔镜设备及鸭嘴套管,切口缝合,无菌纱布包扎,术毕。

疗效观察:术后第 1 天,查腰部及左侧梨状肌压痛减轻,鞍区感觉较术前好转,拇背伸肌力左 V 级,右 V 级,大便次数检测不准(因患者未正常饮食),跟

膝腱反射均正常;术后第 3 天,查腰部及左侧梨状肌无压痛,鞍区感觉减弱,每天大便 2~3 次;术后第 7 天,患者查鞍区感觉正常,大便每日 1 次,VAS 评分 2 分,日常生活活动能力量表 100 分,遵医嘱予出院;术后 1 个月随访,查鞍区感觉正常,拇背伸肌力双侧对称 V 级,大便每日 1 次;3 个月后,患者查腰部及左侧梨状肌无压痛,鞍区感觉正常,跟膝腱反射均正常,拇背伸肌力双侧对称 V 级,VAS 评分 0 分。腰椎 MRI 见图 1k, 1l。

讨论

马尾神经损伤,是腰椎管狭窄并发症之一,在临床症状上主要表现为鞍区感觉异常、双下肢肌力减退、括约肌功能障碍、大小便失禁、性功能障碍等^[3]。相关研究^[4-7]显示腰椎间盘突出,椎管硬膜外血肿,原发性和转移性肿瘤,腰椎术后减压不彻底,神经水肿、血肿、游离脱出髓核以及手术部位使用过多明胶海绵等均可使硬膜囊受压,造成马尾神经损伤。归根结底,马尾神经没有结缔组织保护鞘,对压迫特别敏感。当椎管内有明显占位性病变时,马尾神经容易受损。根据文献记载^[8-10],腰椎间盘突出伴马尾神经损伤患者核磁资料的典型表现是腰椎间盘突出、相应水平硬膜囊受压及硬膜囊信号改变,矢状位上显示椎管狭窄。同时大量临床研究显示^[11-12],手术治疗能够直接解除马尾神经受压,明显改善患者生活质量,是治疗马尾神经损伤的主要手段。本案患者影像资料显示 L₅S₁ 间盘突出,矢状位未见明显椎管狭窄,轴位硬膜囊未明显受压,但伴有大便次数增多、偶发失禁、鞍区麻木等马尾神经受损的典型临床表现,同时结合患者病史及入院后相关科室会诊意见,排除部位性病变,所以仍考虑患者存在马尾神经受压,而且经手术治疗后,患者症状得到了明显改善,效果显著。

笔者认为,CT 和 MRI 等影像学检查虽然是目前诊断马尾神经受压最常用的辅助检查方法,但它们都不可避免地受到设备性能以及观察者技术水平、阅片经验和椎间盘邻近组织以及患者自身的姿势状态等诸多限制而影响其结果的准确性,而且在某些情况下椎间盘突出所致硬膜囊或神经根受压是间断或间隙性的,为一种动态压迫,而以静态的 CT 或 MRI 影像学检查方法来评估椎间盘突出、椎管狭窄及硬膜囊或神经根受压程度似乎并不完全可靠。从某种程度而言,这些影像学检查结果有可能跟实际情况不完全符合,这与覃静等^[13]对腰椎间盘突出症患者 CT 分析结论一致。此外,一些马尾神经受压患者的症状随体位的改变而发生变化,因此一些学者提出了突出髓核的静态致压观与动态致压观。当



图 1 患者,男,36 岁,双下肢无力伴大便次数增多 2 年,入院诊断:腰椎间盘突出症;马尾神经损伤 **1a,1b**. 术前腰椎正侧位 X 线示腰椎生理曲度变浅,多发腰椎间盘突出 **1c,1d**. 术前过伸过屈位 X 线示多发腰椎间盘突出 **1e**. 腰椎 CT 示 L₅S₁ 椎间盘突出,轻度骨质增生 **1f**. 腰椎 MRI 矢状位示 L₅S₁ 椎间盘后突出,同水平硬膜囊未明显受压,硬膜囊信号未见明显改变 **1g**. 轴位 L₅S₁ 椎间盘突出,同水平硬膜囊未受压,同水平椎管轻度狭窄 **1h,1i**. 术中置入通道定位点腰椎轴位及矢状定位 X 线片:通道正位位于 S₁ 左侧上关节突肩部,侧位位于 S₁ 左上关节突尖部周围,当髓核钳或蓝钳植入椎间孔外缘时,患者马尾神经损伤症状复制,退出髓核钳或蓝钳,症状缓解 **1j**. 术中置入通道后腰椎轴位定位 X 线片示髓核钳或蓝钳交替层层钳取周围致压物,通道至椎管中央部,马尾神经损伤症状未复制 **1k**. 术后 3 个月腰椎 MRI 矢状位示 L_{4,5}-L₅S₁ 椎间盘略突出,同水平硬膜囊未受压,同水平椎管轻度狭窄 L₅S₁ 椎间盘略突出 **1l**. 术后 3 个月轴位示同水平硬膜囊未明显受压,硬膜囊信号未见明显改变,水平椎管未见狭窄

Fig.1 A 36-year-old male patient with weakness in both lower extremities and increased stool frequency for 2 years, was admitted to the hospital for diagnosis: lumbar intervertebral disc herniation; cauda equina nerve injury **1a,1b**. Preoperative lumbar spine X-rays showed that the physiological curvature of the lumbar spine became shallow, multiple lumbar intervertebral disc degeneration **1c,1d**. Preoperative hyperextension and flexion X-rays showed multiple lumbar disc degeneration **1e**. Lumbar CT showed L₅S₁ intervertebral disc herniation and mild bone hyperplasia **1f**. Lumbar MRI sagittal view showed L₅S₁ posterior disc herniation, the dural sac at the same level was not significantly compressed, and the dural sac signal did not change significantly **1g**. Axial L₅S₁ intervertebral disc herniation, no compression of the dural sac at the same level, mild stenosis of the spinal canal at the same level **1h,1i**. Axial and sagittal X-rays of the lumbar spine at the location point of the intraoperative placement of the channel: the anterior view of the channel was located at the shoulder of the left superior articular process of S₁, and the lateral view was located around the tip of the left superior articular process of S₁. Symptoms of cauda equina injury occurred when the nucleus pulposus or blue clamp was implanted at the outer edge of the intervertebral foramen, however, the symptoms resolved when the nucleus pulposus or blue clamp was withdrawn **1j**. After the channel was placed during the operation, the axial positioning X-ray of the lumbar spine showed that the nucleus pulposus or blue forceps were alternately clamped layer by layer to remove the surrounding pressure objects, and the channel reached the central part of the spinal canal. The symptoms of cauda equina nerve injury were not replicated **1k**. Sagittal MRI of the lumbar spine at 3 months after operation showed that L_{4,5}-L₅S₁ intervertebral disc was slightly herniated, the dural sac at the same level was not compressed, and the spinal canal was slightly narrowed at the same level; L₅S₁ intervertebral disc was slightly herniated **1l**. Axial view at 3 months after the operation, the dural sac at the same level was not obviously compressed, the signal of the dural sac has not changed significantly, and there was no stenosis of the horizontal spinal canal

人体运动时,脊髓及马尾神经可在椎管内有些移动,马尾神经受压的概率也可能随体位变化而变化,这说明突出髓核致压是一动态的概念^[14]。本案例患者于术中,植入通道到达椎间孔外缘时,引发其症状复制,退出通道,症状缓解,表明植入通道时椎管容积变小,神经组织处于致压状态,达到了静态致压观的临界值,进而表明椎管内高压,与影像资料不符,故患者在立位动态下容易造成马尾神经损伤。因此,通常所采用的静态的影像学方法(卧位 CT 或 MRI 扫描)是难以客观评价椎管内动态的马尾神经是否受压与受压程度的真实情况。

回顾相关文献^[15-18]显示对于非神经系统病变所致马尾神经损伤的手术指征包括:(1)符合马尾神经损伤的临床表现。(2)MRI、CT 及其他影像学证实,有退行性病变或其相应致压向改变。(3)保守治疗无明显改善,甚至渐进性加重,严重影响患者生活质量。依据这些致压向通过后路椎板减压术或椎间孔镜间盘摘除术等术式充分减压椎管,释放神经根或硬膜囊,配合术后药物治疗,患者二便功能、鞍区感觉、性功能、下肢肌力等症状都得到改善。在本案例中术者依据其致压向选择腹侧减压,对患者进行术后 1、3、7 d,1、3 个月随访,马尾神经症状均逐渐改善及恢复,再次证明在 MRI 等影像中无明显椎管外致压状态下,依据患者症状适时积极植入通道解决患者症状的必要性。希望借此为广大临床医师提供一个参考:在临床诊疗中,当出现临床症状与影像学表现不符的情况,疾病的诊断不能过分依赖影像资料,要结合症状、体征综合分析,大胆诊断,从而及时有效治疗。

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