

手法复位联合经皮椎体成形术和中医骨折三期辨证 用药治疗骨质疏松性胸腰椎压缩骨折的临床研究

牛强卫

(河南宏力医院, 河南 长垣 453400)

摘要 目的:探讨手法复位联合经皮椎体成形术(percutaneous vertebm plasty, PVP)和中医骨折三期辨证用药治疗骨质疏松性胸腰椎压缩骨折的临床疗效和安全性。**方法:**将 92 例骨质疏松性胸腰椎压缩骨折患者随机分为单纯 PVP 组和手法复位联合 PVP 与中医骨折三期辨证用药组, 每组 46 例。分别于术前、术后 24 h 及术后 6 个月测定 2 组患者矢状位伤椎前缘高度、矢状位脊柱后凸 Cobb 角、腰背部疼痛视觉模拟量表(visual analogue scale, VAS)评分、Oswestry 功能障碍指数(Oswestry disability index, ODI)评分, 并观察并发症发生情况。**结果:**手术前后不同时间点间矢状位伤椎前缘高度的差异有统计学意义, 即存在时间效应($F = 13.657, P = 0.019$); 2 组患者矢状位伤椎前缘高度总体比较, 组间差异有统计学意义, 即存在分组效应($F = 13.687, P = 0.018$); 术前 2 组患者矢状位伤椎前缘高度比较, 差异无统计学意义[(11.70 ± 0.78) mm, (11.70 ± 0.68) mm, $t = 0.987, P = 0.175$]; 术后 24 h、术后 6 个月, 手法复位联合 PVP 和中医骨折三期辨证用药组矢状位伤椎前缘高度均高于单纯 PVP 组[(18.90 ± 0.22) mm, (13.10 ± 1.02) mm, $t = 13.654, P = 0.018$; (18.90 ± 0.36) mm, (13.90 ± 0.24) mm, $t = 18.353, P = 0.014$]; 时间因素与分组因素存在交互效应($F = 13.569, P = 0.021$)。手术前后不同时间点间矢状位脊柱后凸 Cobb 角的差异有统计学意义, 即存在时间效应($F = 14.365, P = 0.015$); 2 组患者矢状位脊柱后凸 Cobb 角总体比较, 组间差异有统计学意义, 即存在分组效应($F = 21.670, P = 0.006$); 术前 2 组患者矢状位脊柱后凸 Cobb 角比较, 差异无统计学意义(18.60° ± 0.98°, 15.70° ± 0.69°, $t = 0.887, P = 0.145$); 术后 24 h、术后 6 个月, 手法复位联合 PVP 和中医骨折三期辨证用药组矢状位脊柱后凸 Cobb 角均小于单纯 PVP 组(5.90° ± 0.62°, 12.10° ± 0.47°, $t = 16.684, P = 0.008$; 3.67° ± 0.56°, 11.90° ± 0.64°, $t = 20.353, P = 0.004$); 时间因素与分组因素存在交互效应($F = 14.347, P = 0.013$)。手术前后不同时间点间腰背部疼痛 VAS 评分的差异有统计学意义, 即存在时间效应($F = 29.365, P = 0.003$); 2 组患者腰背部疼痛 VAS 评分总体比较, 组间差异有统计学意义, 即存在分组效应($F = 1.670, P = 0.026$); 术前 2 组患者腰背部疼痛 VAS 评分比较, 差异无统计学意义[(8.60 ± 0.98) 分, (8.70 ± 0.79) 分, $t = 0.487, P = 0.745$]; 术后 24 h、术后 6 个月, 手法复位联合 PVP 和中医骨折三期辨证用药组腰背部疼痛 VAS 评分均低于单纯 PVP 组[(2.90 ± 0.52) 分, (3.10 ± 0.67) 分, $t = 1.684, P = 0.028$; (2.67 ± 0.56) 分, (3.20 ± 0.66) 分, $t = 1.353, P = 0.024$]; 时间因素与分组因素存在交互效应($F = 11.347, P = 0.014$)。手术前后不同时间点间 ODI 评分的差异有统计学意义, 即存在时间效应($F = 33.453, P = 0.002$); 2 组患者 ODI 评分总体比较, 组间差异有统计学意义, 即存在分组效应($F = 3.670, P = 0.036$); 术前 2 组患者 ODI 评分比较, 差异无统计学意义[(42.68 ± 1.06) 分, (42.79 ± 0.97) 分, $t = 0.879, P = 0.216$]; 术后 24 h、术后 6 个月, 手法复位联合 PVP 和中医骨折三期辨证用药组 ODI 评分均低于单纯 PVP 组[(20.56 ± 0.58) 分, (24.58 ± 0.54) 分, $t = 5.249, P = 0.019$; (11.67 ± 0.49) 分, (19.49 ± 0.51) 分, $t = 4.251, P = 0.034$]; 时间因素与分组因素存在交互效应($F = 34.387, P = 0.022$)。手法复位联合 PVP 和中医骨折三期辨证用药组未发生骨水泥渗漏、神经脊髓损伤及感染等并发症。单纯 PVP 组 3 例发生骨水泥渗漏, 其中 1 例出现神经压迫症状给予急诊探查减压术治疗后症状消失, 2 例未出现神经症状给予严密观察而未做处理; 其余患者均未出现神经、脊髓损伤等并发症。2 组患者并发症发生率比较, 差异无统计学意义($\chi^2 = 2.044, P = 0.153$)。**结论:**对于骨质疏松性胸腰椎压缩骨折患者, 采用手法复位联合 PVP 和中医骨折三期辨证用药治疗, 比单纯 PVP 治疗更有利于恢复伤椎前缘高度、纠正脊柱后凸畸形、缓解腰背部疼痛和恢复脊柱功能, 且安全可靠。

关键词 骨折, 压缩性; 骨质疏松性骨折; 胸椎; 腰椎; 椎体成形术; 正骨手法; 辨证论治; 临床试验

A clinical study of manipulative reduction combined with percutaneous vertebroplasty and oral application of traditional Chinese medicine according to three – stage syndrome differentiation principles for treatment of osteoporotic thoracolumbar vertebral compression fractures

NIU Qiangwei

Henan Honliv Hospital, Changyuan 453400, Henan, China

ABSTRACT Objective: To explore the clinical curative effects and safety of manipulative reduction combined with percutaneous verte-

broplasty (PVP) and oral application of traditional Chinese medicine (TCM) according to three-stage syndrome differentiation principles for treatment of osteoporotic thoracolumbar vertebral compression fractures. **Methods:** Ninety-two patients with osteoporotic thoracolumbar vertebral compression fractures were randomly divided into monotherapy group and combination therapy group, 46 cases in each group. The patients in monotherapy group were treated with PVP, and the patients in combination therapy group were treated with manipulative reduction combined with PVP and oral application of TCM according to three-stage syndrome differentiation principles. The anterior border height of injured vertebrae and Cobb angle of kyphotic deformity in the sagittal plane, visual analogue scale (VAS) scores and Oswestry disability index (ODI) scores were evaluated before surgery and at 24 hours and 6 months after the surgery respectively, and the complications were also observed. **Results:** There was statistical difference in the anterior border height of injured vertebrae in the sagittal plane between different timepoints before and after the surgery, in other words, there was time effect ($F = 13.657, P = 0.019$). There was statistical difference in the anterior border height of injured vertebrae in the sagittal plane between the 2 groups in general, in other words, there was group effect ($F = 13.687, P = 0.018$). There was no statistical difference in the anterior border height of injured vertebrae in the sagittal plane between the 2 groups before the surgery (11.70 ± 0.78 vs 11.70 ± 0.68 mm, $t = 0.987, P = 0.175$). The anterior border height of injured vertebrae in the sagittal plane was higher in combination therapy group compared to monotherapy group at 24 hours and 6 months after the surgery respectively (18.90 ± 0.22 vs 13.10 ± 1.02 mm, $t = 13.654, P = 0.018$; 18.90 ± 0.36 vs 13.90 ± 0.24 mm, $t = 18.353, P = 0.014$). There was interaction between time factor and group factor ($F = 13.569, P = 0.021$). There was statistical difference in the Cobb angle of kyphotic deformity in the sagittal plane between different timepoints before and after the surgery, in other words, there was time effect ($F = 14.365, P = 0.015$). There was statistical difference in the Cobb angle of kyphotic deformity in the sagittal plane between the 2 groups in general, in other words, there was group effect ($F = 21.670, P = 0.006$). There was no statistical difference in the Cobb angle of kyphotic deformity in the sagittal plane between the 2 groups before the surgery (18.60 ± 0.98 vs 15.70 ± 0.69 degrees, $t = 0.887, P = 0.145$). The Cobb angles of kyphotic deformity in the sagittal plane were less in combination therapy group compared to monotherapy group at 24 hours and 6 months after the surgery respectively (5.90 ± 0.62 vs 12.10 ± 0.47 degrees, $t = 16.684, P = 0.008$; 3.67 ± 0.56 vs 11.90 ± 0.64 degrees, $t = 20.353, P = 0.004$). There was interaction between time factor and group factor ($F = 14.347, P = 0.013$). There was statistical difference in lower back pain VAS scores between different timepoints before and after the surgery, in other words, there was time effect ($F = 29.365, P = 0.003$). There was statistical difference in lower back pain VAS scores between the 2 groups in general, in other words, there was group effect ($F = 1.670, P = 0.026$). There was no statistical difference in the lower back pain VAS scores between the 2 groups before the surgery (8.60 ± 0.98 vs 8.70 ± 0.79 points, $t = 0.487, P = 0.745$). The lower back pain VAS scores were lower in combination therapy group compared to monotherapy group at 24 hours and 6 months after the surgery respectively (2.90 ± 0.52 vs 3.10 ± 0.67 points, $t = 1.684, P = 0.028$; 2.67 ± 0.56 vs 3.20 ± 0.66 points, $t = 1.353, P = 0.024$). There was interaction between time factor and group factor ($F = 11.347, P = 0.014$). There was statistical difference in ODI scores between different timepoints before and after the surgery, in other words, there was time effect ($F = 33.453, P = 0.002$). There was statistical difference in ODI scores between the 2 groups in general, in other words, there was group effect ($F = 3.670, P = 0.036$). There was no statistical difference in the ODI scores between the 2 groups before the surgery (42.68 ± 1.06 vs 42.79 ± 0.97 points, $t = 0.879, P = 0.216$). The ODI scores were lower in combination therapy group compared to monotherapy group at 24 hours and 6 months after the surgery respectively (20.56 ± 0.58 vs 24.58 ± 0.54 points, $t = 5.249, P = 0.019$; 11.67 ± 0.49 vs 19.49 ± 0.51 points, $t = 4.251, P = 0.034$). There was interaction between time factor and group factor ($F = 34.387, P = 0.022$). No complications such as bone cement leakage, nerve injury, spinal cord injury and infection were found in combination therapy group. The bone cement leakage was found in 3 patients in monotherapy group, and the nerve compression symptoms were found in one patient and then disappeared after emergency treatment with exploratory surgery and decompression surgery. The other two patients without nerve symptoms were not treated. The spinal cord injuries and infections were not found in other patients of monotherapy group. There was no statistical difference in complication incidences between the two groups ($\chi^2 = 2.044, P = 0.153$). **Conclusion:** The combination therapy of manipulative reduction combined with PVP and oral application of TCM according to three-stage syndrome differentiation principles is more conducive to recovering the anterior board height of injured vertebrae, correcting the kyphotic deformity, alleviating lower back pain and restoring the spinal function compared to monotherapy of PVP in the treatment of osteoporotic thoracolumbar vertebral compression fractures, and it is safe and reliable.

Key words fractures, compression; osteoporotic fractures; thoracic vertebrae; lumbar vertebrae; vertebroplasty; bone setting manipulation; syndrome differ treatment; clinical trial

随着人口老龄化的加剧和人们生活行为方式的改变,老年骨质疏松症患者越来越多,而骨质疏松性椎体压缩骨折患者也相应增多。该病是老年人常见病、多发病,严重影响其健康和生活质量。目前临床上治疗该病的方法较多,但其疗效不一。2014 年 6 月至 2015 年 2 月,我们对 92 例骨质疏松性胸腰椎压缩骨折患者分别采用单纯经皮椎体成形术(percutaneous vertebroplasty, PVP)和手法复位联合 PVP 与中医骨折三期辨证用药治疗,并对 2 种方法的疗效和安全性进行了比较,现报告如下。

1 临床资料

1.1 一般资料 纳入研究的患者 92 例,男 31 例、女 61 例。年龄 60~80 岁,中位数 73 岁。均为在河南宏力医院住院治疗的骨质疏松性胸腰椎压缩骨折患者,其中 T₁₀ 骨折 9 例、T₁₁ 骨折 24 例、T₁₂ 骨折 32 例、L₁ 骨折 23 例、L₂ 骨折 4 例。试验方案经医院医学伦理委员会审查通过。

1.2 诊断标准 采用《中医病证诊断疗效标准》中胸腰椎骨折的诊断标准^[1]。

1.3 纳入标准 ①符合上述诊断标准;②新鲜单节段椎体压缩骨折;③骨密度测定 T 值 ≤ -2.5;④骨折椎体后壁完整;⑤椎体前缘压缩不超过椎体高度的 2/3。

1.4 排除标准 ①估计不能配合治疗或全身状况较差不能耐受治疗者;②爆裂性骨折者;③骨折块突入椎管内并出现神经压迫症状者;④脊柱转移瘤、原发性肿瘤导致胸腰椎压缩骨折者;⑤合并全身或局部感染性病变者;⑥凝血功能障碍者。

2 方法

2.1 分组方法 采用随机数字表将符合要求的 92 例患者随机分为单纯 PVP 组和手法复位联合 PVP 与中医骨折三期辨证用药组,每组 46 例。2 组患者性别、年龄、骨折部位等基线资料比较,差异无统计学意义,具有可比性(表 1)。

表 1 2 组骨质疏松性胸腰椎压缩骨折患者基线资料的比较

组别	例数	性别(例)		年龄(岁)	骨折部位(例)				
		男	女		T ₁₀	T ₁₁	T ₁₂	L ₁	L ₂
手法复位联合 PVP ¹⁾ 和中医骨折三期辨证用药组	46	17	29	72.32 ± 13.52	5	12	15	12	2
单纯 PVP 组	46	14	32	73.33 ± 12.43	4	12	17	11	2
检验统计量		$\chi^2 = 0.438$		$t = 0.084$	$\chi^2 = 0.280$				
P 值		0.508		0.956	0.991				

1) 经皮椎体成形术(percutaneous vertebra plasty, PVP)

2.2 治疗方法 所有患者入院后均卧硬板床,后背垫软枕;常规给予钙剂口服、鲑鱼降钙素喷鼻剂喷鼻及阿仑膦酸钠片口服等抗骨质疏松症药物治疗,同时应用下肢静脉泵并皮下注射低分子肝素钙预防下肢深静脉血栓形成。

2.2.1 手法复位 患者俯卧于电动牵引床上,胸部及下腹部各垫一高约 15 cm 的软枕,做骨盆持续牵引,牵引重量为患者体重的 1/3~1/2,持续牵引约 20 min 后在维持牵引下进行手法复位。术者立于患者一侧,先在伤椎棘突周围以揉、滚、按、摩、捋等手法放松患者腰背部肌肉;再用双手掌根叠加置于骨折椎体的后凸棘突部位,力量由轻到重,适应性按压后逐步加大按压力,并快速短促下压数次,直至棘突后凸消失或基本消失。

2.2.2 PVP 床边复查腰椎侧位 X 线片确认腰椎前缘压缩基本复位后,使胸腰段椎体继续处于过伸位,

用 C 形臂 X 线机透视定位伤椎并标记进针点和测算进针路径、深度等。局部麻醉成功后,取单侧椎弓根穿刺入路,使穿刺针头于矢状位 X 线片上位于椎体前 1/3 处、正位 X 线片位于椎体中线水平。调制骨水泥至拉丝期,沿穿刺通道,在 C 形臂 X 线机透视下用注射器将骨水泥缓慢注入椎体,每个椎体注入 2.0~4.0 mL。透视见骨水泥在椎体内弥散良好后,拔出穿刺针,消毒后加压包扎,继续保持俯卧位 10 min 后返回病房。

2.2.3 中医骨折三期辨证用药 按照中医骨折三期辨证用药原则给予中药口服治疗。骨折初期(骨折后 2 周)口服复元活血汤,其药物组成:柴胡 15 g、天花粉 9 g、当归 9 g、红花 6 g、甘草 6 g、穿山甲(炮)6 g、大黄 15 g、桃仁 9 g。疼痛明显者加用制乳香 6 g、制没药 6 g;正虚明显者加用党参 10 g。每日 1 剂,水煎分 2 次口服,连服 2 周。骨折中期(骨折后 3~4 周)口

服接骨紫金丹,其药物组成:土鳖虫 20 g、制乳香 20 g、制没药 20 g、煅自然铜 20 g、骨碎补 20 g、大黄 20 g、血竭 20 g、硼砂 20 g、当归 20 g,上药共研细末,每次 6 g,每日 2 次口服,连服 2 周。骨折后期(骨折后 5~6 周)口服虎潜丸,其药物组成:黄柏(酒炒) 240 g、龟甲(酒炙) 120 g、知母(酒炒) 60 g、熟地黄 60 g、陈皮 60 g、白芍 60 g、锁阳 45 g、虎骨(用狗骨代,炙) 30 g、干姜 15 g,上药共研细末,制蜜丸,每次 9 g,每日 2 次,共 2 周。

2.3 疗效和安全性对比方法 分别于术前、术后 24 h 及术后 6 个月测定 2 组患者矢状位伤椎前缘高度、矢状位脊柱后凸 Cobb 角、腰背部疼痛视觉模拟量表(visual analogue scale, VAS) 评分^[2]、Oswestry 功能障碍指数^[3](Oswestry disability index, ODI) 评分,并在组间和时间点间进行比较。观察并发症发生情况。

2.4 数据统计学方法 采用 SPSS16.0 软件对所得数据进行统计学分析,2 组患者性别、骨折部位、并发症的组间比较采用 χ^2 检验,年龄的比较采用 t 检验,矢状位伤椎前缘高度、矢状位脊柱后凸 Cobb 角、腰背部疼痛 VAS 评分及 ODI 评分的比较采用重复测量资料的方差分析,检验水准 $\alpha = 0.05$ 。

3 结果

手术前后不同时间点间矢状位伤椎前缘高度的差异有统计学意义,即存在时间效应;2 组患者矢状位伤椎前缘高度总体比较,组间差异有统计学意义,即存在分组效应;术前 2 组患者矢状位伤椎前缘高度比较,差异无统计学意义;术后 24 h、术后 6 个月,手法复位联合 PVP 和中医骨折三期辨证用药组矢状位伤椎前缘高度均高于单纯 PVP 组;时间因素与分组因素存在交互效应(表 2)。手术前后不同时间点间

矢状位脊柱后凸 Cobb 角的差异有统计学意义,即存在时间效应;2 组患者矢状位脊柱后凸 Cobb 角总体比较,组间差异有统计学意义,即存在分组效应;术前 2 组患者矢状位脊柱后凸 Cobb 角比较,差异无统计学意义;术后 24 h、术后 6 个月,手法复位联合 PVP 和中医骨折三期辨证用药组矢状位脊柱后凸 Cobb 角均小于单纯 PVP 组;时间因素与分组因素存在交互效应(表 3)。手术前后不同时间点间腰背部疼痛 VAS 评分的差异有统计学意义,即存在时间效应;2 组患者腰背部疼痛 VAS 评分总体比较,组间差异有统计学意义,即存在分组效应;术前 2 组患者腰背部疼痛 VAS 评分比较,差异无统计学意义;术后 24 h、术后 6 个月,手法复位联合 PVP 和中医骨折三期辨证用药组腰背部疼痛 VAS 评分均低于单纯 PVP 组;时间因素与分组因素存在交互效应(表 4)。手术前后不同时间点间 ODI 评分的差异有统计学意义,即存在时间效应;2 组患者 ODI 评分总体比较,组间差异有统计学意义,即存在分组效应;术前 2 组患者 ODI 评分比较,差异无统计学意义;术后 24 h、术后 6 个月,手法复位联合 PVP 和中医骨折三期辨证用药组 ODI 评分均低于单纯 PVP 组;时间因素与分组因素存在交互效应(表 5)。手法复位联合 PVP 和中医骨折三期辨证用药组未发生骨水泥渗漏、神经脊髓损伤及感染等并发症。单纯 PVP 组 3 例发生骨水泥渗漏,其中 1 例出现神经压迫症状给予急诊探查减压术治疗后症状消失,2 例未出现神经症状给予严密观察而未做处理;其余患者均未出现神经、脊髓损伤等并发症。2 组患者并发症发生率比较,差异无统计学意义($\chi^2 = 2.044, P = 0.153$)。典型病例 X 线片见图 1。

表 2 2 组骨质疏松性胸腰椎压缩骨折患者矢状位伤椎前缘高度

组别	例数	矢状位伤椎前缘高度($\bar{x} \pm s, \text{mm}$)				F 值	P 值
		术前	术后 24 h	术后 6 个月	合计		
手法复位联合 PVP ¹⁾ 和中医骨折三期辨证用药组	46	11.70 ± 0.78	18.90 ± 0.22	18.90 ± 0.36	16.38 ± 0.67	14.963	0.018
单纯 PVP 组	46	11.70 ± 0.68	13.10 ± 1.02	13.90 ± 0.24	12.11 ± 0.52	12.859	0.019
合计	92	22.10 ± 1.09	21.00 ± 1.23	31.00 ± 1.50	12.60 ± 0.88	13.657 ²⁾	0.019 ²⁾
t 值		0.987	13.654	18.353	13.687 ²⁾	(F = 13.569, P = 0.021) ³⁾	
P 值		0.175	0.018	0.014	0.018 ²⁾		

1) 经皮椎体成形术(percutaneous vertebm plasty, PVP); 2) 主效应的 F 值和 P 值; 3) 交互效应的 F 值和 P 值

表 3 2 组骨质疏松性胸腰椎压缩骨折患者矢状位脊柱后凸 Cobb 角

组别	例数	矢状位脊柱后凸 Cobb 角($\bar{x} \pm s, ^\circ$)				F 值	P 值
		术前	术后 24 h	术后 6 个月	合计		
手法复位联合 PVP ¹⁾ 和中医骨折三期辨证用药组	46	18.60 ± 0.98	5.90 ± 0.62	3.67 ± 0.56	8.40 ± 0.79	13.476	0.013
单纯 PVP 组	46	15.70 ± 0.69	12.10 ± 0.47	11.90 ± 0.64	12.48 ± 0.59	12.764	0.028
合计	92	33.10 ± 1.02	16.00 ± 1.23	15.10 ± 1.50	14.80 ± 0.98	14.365 ²⁾	0.015 ²⁾
t 值		0.887	16.684	20.353	21.670 ²⁾		
P 值		0.145	0.008	0.004	0.006 ²⁾	(F = 14.347, P = 0.013) ³⁾	

1) 经皮椎体成形术(percutaneous vertebm plasty, PVP); 2) 主效应的 F 值和 P 值; 3) 交互效应的 F 值和 P 值

表 4 2 组骨质疏松性胸腰椎压缩骨折患者腰背部疼痛 VAS 评分

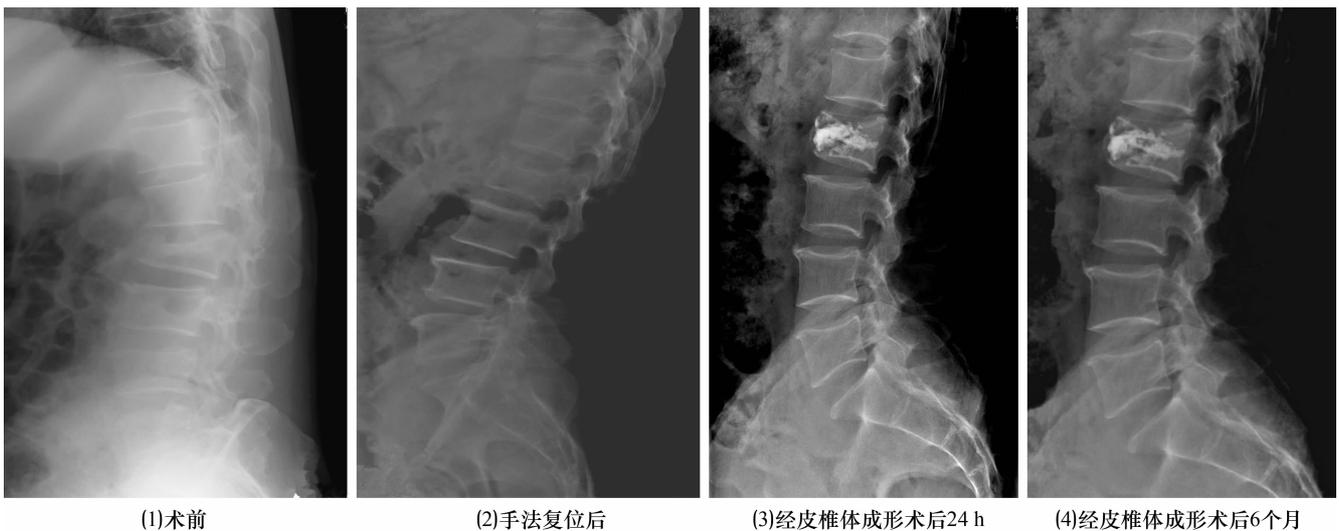
组别	例数	腰背部疼痛 VAS 评分($\bar{x} \pm s, 分$)				F 值	P 值
		术前	术后 24 h	术后 6 个月	合计		
手法复位联合 PVP ¹⁾ 和中医骨折三期辨证用药组	46	8.60 ± 0.98	2.90 ± 0.52	2.67 ± 0.56	3.40 ± 0.69	33.476	0.001
单纯 PVP 组	46	8.70 ± 0.79	3.10 ± 0.67	3.20 ± 0.66	4.48 ± 0.55	29.764	0.006
合计	92	33.10 ± 1.02	16.00 ± 1.23	2.90 ± 1.50	4.80 ± 0.98	29.365 ²⁾	0.003 ²⁾
t 值		0.487	1.684	1.353	1.670 ²⁾		
P 值		0.745	0.028	0.024	0.026 ²⁾	(F = 11.347, P = 0.014) ³⁾	

1) 经皮椎体成形术(percutaneous vertebm plasty, PVP); 2) 主效应的 F 值和 P 值; 3) 交互效应的 F 值和 P 值

表 5 2 组骨质疏松性胸腰椎压缩骨折患者 ODI 评分

组别	例数	ODI 评分($\bar{x} \pm s, 分$)				F 值	P 值
		术前	术后 24 h	术后 6 个月	合计		
手法复位联合 PVP ¹⁾ 和中医骨折三期辨证用药组	46	42.68 ± 1.06	20.56 ± 0.58	11.67 ± 0.49	36.58 ± 0.83	36.537	0.001
单纯 PVP 组	46	42.79 ± 0.97	24.58 ± 0.54	19.49 ± 0.51	41.53 ± 0.64	32.794	0.003
合计	92	42.71 ± 0.71	21.34 ± 0.64	16.98 ± 0.85	38.89 ± 0.79	33.453 ²⁾	0.002 ²⁾
t 值		0.879	5.249	4.251	3.670 ²⁾		
P 值		0.216	0.019	0.034	0.036 ²⁾	(F = 34.387, P = 0.022) ³⁾	

1) 经皮椎体成形术(percutaneous vertebm plasty, PVP); 2) 主效应的 F 值和 P 值; 3) 交互效应的 F 值和 P 值

图 1 L₂ 椎体压缩骨折手术前后 X 线片

患者,男,66 岁,骨质疏松性 L₂ 椎体压缩骨折,采用手法复位联合经皮椎体成形术和中医骨折三期辨证用药治疗

4 讨论

骨质疏松症是由于多种原因导致的骨密度和骨

质量下降、骨微结构破坏,造成骨脆性增加,从而容易发生骨折的全身性骨病。骨质疏松性椎体压缩骨折

往往没有外伤史,或仅由轻微外伤如腰扭伤、蹲坐跌倒等引起,部分患者症状轻微,仅表现为变换体位时疼痛明显,但大多数患者表现为腰背持续疼痛甚至剧烈疼痛,站立及行走时疼痛加剧。采用传统非手术疗法治疗该病,患者需卧床 8~12 周,但长期卧床易出现坠积性肺炎、褥疮、泌尿系感染、下肢深静脉血栓等并发症,且治疗后易遗留慢性腰背部疼痛、脊柱后凸畸形等后遗症,严重影响患者的生活和生存质量。Kado 等^[4]报道,椎体压缩性骨折 5 年内病死率为 23%~34%,接近髌部骨折。所以,脊柱骨折后的积极治疗对于老年患者改善症状、减少并发症、提高生存质量有着重要作用。

对于胸腰椎压缩骨折的诊断和治疗方法,在我国古代医学典籍中已有记载。元代危亦林的《世医得效方》一书中有关于悬吊复位法等正骨手法治疗脊柱骨折的记载,同时代李仲南的《永类钤方》中也记载了牵引下按压复位治疗腰椎骨折的方法。中医正骨手法复位可以很好地恢复骨折椎体的高度,而复位过程中的牵引后伸运动可减小椎体内的压力,降低 PVP 术中发生骨水泥渗漏的风险^[5]。我们在进行手法复位时,以伤椎棘突为支点进行弹性按压,力量由轻到重,利用前纵韧带的牵拉维持作用,能较好地纠正后凸畸形、恢复椎体前缘高度。该手法在术中可以重复使用,但应意避免暴力按压,也不必强求完全恢复椎体高度。

PVP 属微创技术,操作简单,风险相对较低,能快速缓解患者腰背部疼痛症状,有效恢复骨折椎体强度,该术式是目前治疗胸腰椎压缩性骨折尤其是骨质疏松性椎体压缩骨折的主要手术方式^[6-7]。PVP 能迅速地缓解疼痛从而在短期内恢复患者活动能力,避免长期卧床所导致的各种并发症^[8-9]。骨水泥的注入会明显改变手术椎体和邻近椎体的生物力学特性^[10],降低手术椎体再骨折的发生率,明显恢复脊柱功能。越来越多的国内外学者认为,PVP 可通过增加压缩椎体高度而增强椎体的稳定性,且能更好地缓解腰背部疼痛^[11-12]。对于椎体陈旧性骨折引起的疼痛,PVP 治疗可以快速解除疼痛,而且可降低骨水泥发生渗漏的风险^[13-14]。

笔者认为 PVP 术后能减轻腰背部疼痛的原因可能与下列因素有关:①骨水泥注入骨折椎体后能消除骨折间的微运动,稳定椎体内微小骨折,恢复椎体高

度和维持脊柱力学的稳定,从而减少微运动对椎体中窦椎神经的刺激,减轻腰背部疼痛;②骨水泥注入椎体后聚合产生较高的温度可以毁坏窦椎神经或骨水泥的毒性引起的化学神经消融作用^[15]。但单纯采用 PVP 术治疗骨质疏松性椎体压缩骨折,存在恢复骨折椎体高度效果欠佳、术后慢性腰背疼痛、骨水泥渗漏等问题^[16-17]。为减少骨水泥渗漏的发生,我们的经验是:①要注意穿刺针的位置,使穿刺针头在矢状位 X 线片上位于椎体前 1/3 处、正位 X 线片上位于椎体中线水平;②术中注射骨水泥时应在 X 线透视下进行,一旦发现骨水泥渗漏应立即停止推注,适当调整针尖位置后再推注骨水泥;③应在骨水泥处于拉丝期时将其缓慢推注椎体;④骨水泥注射量以不超过椎体体积的 1/4 为准,以降低发生骨水泥渗漏的几率;⑤术后应保持俯卧位至少 10 min 后再变换体位,以保证骨水泥固化过程不受干扰。

对于骨质疏松性胸腰椎压缩骨折的治疗,必须注意整体观念,标本兼治,即将椎体骨折的局部治疗和骨质疏松症的全身治疗结合在一起,这样才能即快速缓解腰背部疼痛,又能降低骨折不愈合及邻近椎体再骨折的发生几率,保证远期疗效。因此,在临床上我们采用手法复位联合 PVP 治疗的同时配合中医骨折三期辨证用药治疗此类骨折。骨折早期,局部肿胀、疼痛,采用复元活血汤加减,可以活血化瘀、行气止痛;骨折中期,瘀血消而未尽,骨连而未坚,给予具有祛瘀生新、接骨续筋功效的接骨紫金丹,可以起到活血化瘀、促进骨折愈合的作用;骨折晚期口服具有养血活血、补益肝肾、舒筋通络功效的虎潜丸,可以达到补益肝肾、接骨续筋、舒筋通络的效果,从而可以促进骨质代谢,改善骨密度,利于骨折修复。有研究显示,骨质疏松性椎体压缩骨折术后继续进行抗骨质疏松治疗,具有降低再骨折的风险^[17]。本研究结果显示,对于骨质疏松性胸腰椎压缩骨折患者,采用手法复位联合 PVP 和中医骨折三期辨证用药治疗,较单纯 PVP 治疗更有利于恢复伤椎前缘高度、纠正脊柱后凸畸形、缓解腰背部疼痛和恢复脊柱功能,且安全可靠。

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