

· 临床研究 ·

定位腰椎斜扳手法结合超声引导下腰脊神经后内侧支阻滞术治疗腰椎关节突关节综合征的临床研究

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摘要 目的:探讨定位腰椎斜扳手法结合超声引导下腰脊神经后内侧支阻滞术治疗腰椎关节突关节综合征的临床疗效和安全性。**方法:**纳入腰椎关节突关节综合征患者 74 例,按照入组顺序采用随机数字表法随机分为 2 组,每组 37 例,分别采用定位腰椎斜扳手法联合超声引导下腰脊神经后内侧支阻滞术(手法联合神经阻滞组)和单纯超声引导下腰脊神经后内侧支阻滞术(神经阻滞组)治疗。2 组患者在以上治疗的基础上均口服美洛昔康分散片 14 d,并进行臀桥、单侧臀桥、侧卧提臀、卷腹、小燕飞等腰肌康复锻炼 2 个月。分别于治疗前及神经阻滞术后 2 周、6 个月,采用数字评分法(numeric rating scale, NRS)对患者腰腿疼痛情况进行评分,采用 Oswestry 功能障碍指数(Oswestry disability index, ODI)量表对腰椎功能进行评分,进行腰部等速肌力测试并记录屈伸肌峰值力矩比值,测量腰部无痛活动角度。记录不良反应发生情况。**结果:**①腰腿疼痛 NRS 评分。时间因素和分组因素存在交互效应($F=20.423, P=0.000$)。治疗前后不同时间点之间腰腿疼痛 NRS 评分的差异有统计学意义,即存在时间效应($F=19.278, P=0.000$)。2 组患者腰腿疼痛 NRS 评分总体比较,差异无统计学意义,即不存在分组效应($F=10.423, P=0.479$)。2 组患者腰腿疼痛 NRS 评分均随时间呈先下降后上升趋势[(7.12 ± 1.56)分, (1.47 ± 0.29)分, (1.61 ± 0.55)分, $F=16.556, P=0.000$; (7.09 ± 1.43)分, (1.52 ± 0.37)分, (2.13 ± 0.61)分, $F=14.234, P=0.000$],但 2 组的变化趋势不完全一致。治疗前及神经阻滞术后 2 周,2 组患者腰腿疼痛 NRS 评分比较,差异均无统计学意义($t=0.086, P=0.931; t=0.646, P=0.519$)。神经阻滞术后 6 个月,手法联合神经阻滞组腰腿疼痛 NRS 评分低于神经阻滞组($t=3.851, P=0.000$)。②ODI 评分。时间因素和分组因素存在交互效应($F=33.423, P=0.000$)。治疗前后不同时间点之间患者 ODI 评分的差异有统计学意义,即存在时间效应($F=24.364, P=0.000$)。2 组患者 ODI 评分总体比较,差异无统计学意义,即不存在分组效应($F=7.192, P=0.593$)。2 组患者 ODI 评分均随时间呈先下降后上升趋势[(16.84 ± 4.29)分, (4.34 ± 1.09)分, (4.79 ± 1.21)分, $F=17.479, P=0.000$; (16.14 ± 4.13)分, (4.56 ± 1.09)分, (5.74 ± 1.44)分, $F=13.563, P=0.000$],但 2 组的变化趋势不完全一致。治疗前及神经阻滞术后 2 周,2 组患者 ODI 评分比较,差异均无统计学意义($t=0.715, P=0.476; t=0.868, P=0.388$)。神经阻滞术后 6 个月,手法联合神经阻滞组 ODI 评分低于神经阻滞组($t=3.072, P=0.003$)。③腰部屈伸肌峰值力矩比值。时间因素和分组因素存在交互效应($F=14.005, P=0.001$)。治疗前后不同时间点之间患者腰部屈伸肌峰值力矩比值的差异有统计学意义,即存在时间效应($F=12.621, P=0.000$)。2 组患者腰部屈伸肌峰值力矩比值总体比较,差异无统计学意义,即不存在分组效应($F=9.043, P=0.341$)。2 组患者腰部屈伸肌峰值力矩比值均随时间呈先下降后上升趋势[(92.47 ± 10.49)%, (72.34 ± 8.05)%, (75.47 ± 9.41)%, $F=5.783, P=0.000$; (91.47 ± 13.41)%, (72.52 ± 9.04)%, (81.59 ± 11.14)%, $F=4.025, P=0.000$],但 2 组的变化趋势不完全一致。治疗前及神经阻滞术后 2 周,2 组患者腰部屈伸肌峰值力矩比值比较,差异均无统计学意义($t=0.357, P=0.721; t=0.091, P=0.928$)。神经阻滞术后 6 个月,手法联合神经阻滞组腰部屈伸肌峰值力矩比值低于神经阻滞组($t=2.552, P=0.012$)。④腰部无痛前屈角度。时间因素和分组因素存在交互效应($F=29.473, P=0.000$)。治疗前后不同时间点之间患者腰部无痛前屈角度的差异有统计学意义,即存在时间效应($F=21.413, P=0.000$)。2 组患者腰部无痛前屈角度总体比较,差异无统计学意义,即不存在分组效应($F=12.347, P=0.573$)。2 组患者腰部无痛前屈角度均随时间呈先下降后上升趋势(76.54° ± 12.11°, 38.72° ± 5.44°, 40.44° ± 8.97°, $F=9.249, P=0.000$; 75.29° ± 13.05°, 37.37° ± 7.52°, 53.21° ± 11.44°, $F=14.178, P=0.000$),但 2 组的变化趋势不完全一致。治疗前及神经阻滞术后 2 周,2 组患者腰部无痛前屈角度比较,差异均无统计学意义($t=0.427, P=0.671; t=0.884, P=0.379$)。神经阻滞术后 6 个月,手法联合神经阻滞组腰部无痛前屈角度小于神经阻滞组($t=5.343, P=0.000$)。⑤腰部无痛后伸角度。时间因素和分组因素存在交互效应($F=19.545, P=0.001$)。治疗前后不同时间点之间患者腰部无痛后伸角度的差异有统计学意义,即存在时间效应($F=14.213, P=0.000$)。2 组患者腰部无痛后伸角度总体比较,差异无统计学意义,即不存在分组效应($F=11.247, P=0.612$)。2 组患者腰部无痛后伸角度均随时间呈先下降后上升趋势(79.33° ±

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7.09°, 63.24° ± 6.51°, 65.97° ± 8.04°, $F = 4.874$, $P = 0.000$; 80.41° ± 8.21°, 64.97° ± 7.54°, 74.97° ± 9.17°, $F = 6.037$, $P = 0.000$), 但 2 组的变化趋势不完全一致。治疗前及神经阻滞术后 2 周, 2 组患者腰部无痛后伸角度比较, 差异无统计学意义 ($t = 1.291$, $P = 0.103$; $t = 1.455$, $P = 0.721$)。神经阻滞术后 6 个月, 手法联合神经阻滞组腰部无痛后伸角度小于神经阻滞组 ($t = 6.433$, $P = 0.000$)。⑥安全性。手法联合神经阻滞组无不良反应发生; 神经阻滞组发生恶心、呕吐等消化道症状 1 例, 停药后好转; 2 组患者不良反应发生率比较, 差异无统计学意义 ($P = 1.000$)。结论: 采用定位腰椎斜扳手法联合超声引导下腰脊神经后内侧支阻滞术治疗腰椎关节突关节综合征, 与单纯采用超声引导下腰脊神经后内侧支阻滞术比较, 二者在缓解患者腰腿疼痛、增加腰椎活动度、改善腰部肌力平衡、恢复腰椎功能方面近期疗效相当、安全性相当, 但前者的中期疗效优于后者。

关键词 神经传导阻滞; 脊神经; 超声检查; 关节突关节; 腰部斜扳法

A clinical study of lumbar fixed-position oblique-pulling manipulation combined with ultrasound-guided lumbar spinal nerves posteromedial branch blocking for treatment of lumbar facet joint syndrome

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ABSTRACT **Objective:** To explore the clinical curative effects and safety of lumbar fixed-position oblique-pulling manipulation combined with ultrasound-guided lumbar spinal nerves posteromedial branch blocking for treatment of lumbar facet joint syndrome (LFJS). **Methods:** Seventy-four LFJS patients were enrolled in the study and were randomly divided into 2 groups by using random digits table according to their enrolled sequence, 37 cases in each group. The patients were treated with lumbar fixed-position oblique-pulling manipulation combined with ultrasound-guided lumbar spinal nerves posteromedial branch blocking (combination therapy group) and ultrasound-guided lumbar spinal nerves posteromedial branch blocking alone (monotherapy group) respectively, followed by oral application of meloxicam dispersible tablets for 14 days and psoas muscles rehabilitation exercises for 2 months in all patients. The lumbago-leg pain and lumbar function were scored by using numeric rating scale (NRS) and Oswestry disability index (ODI) respectively, moreover, the waist isokinetic muscle strength test was performed and the ratio of flexor muscle peak torque (PT) to extensor muscle PT was recorded, and the waist painless activity angle was measured before the treatment, at 2 weeks and 6 months after the nerve blocking surgery respectively, and the adverse reactions were observed and recorded. **Results:** ① There was interaction between time factor and group factor in lumbago-leg pain NRS scores ($F = 20.423$, $P = 0.000$). There was statistical difference in lumbago-leg pain NRS scores between different timepoints before and after the treatment, in other words, there was time effect ($F = 19.278$, $P = 0.000$). There was no statistical difference in lumbago-leg pain NRS scores between the 2 groups in general, in other words, there was no group effect ($F = 10.423$, $P = 0.479$). The lumbago-leg pain NRS scores presented a time-dependent trend of decreasing firstly and increasing subsequently in the 2 groups (7.12 ± 1.56, 1.47 ± 0.29, 1.61 ± 0.55 points, $F = 16.556$, $P = 0.000$; 7.09 ± 1.43, 1.52 ± 0.37, 2.13 ± 0.61 points, $F = 14.234$, $P = 0.000$), while the 2 groups were inconsistent with each other in the variation tendency. There was no statistical difference in lumbago-leg pain NRS scores between the 2 groups before the treatment and at 2 weeks after the nerve blocking surgery ($t = 0.086$, $P = 0.931$; $t = 0.646$, $P = 0.519$). The lumbago-leg pain NRS scores were lower in combination therapy group compared to monotherapy group at 6 months after the nerve blocking surgery ($t = 3.851$, $P = 0.000$). ② There was interaction between time factor and group factor in ODI scores ($F = 33.423$, $P = 0.000$). There was statistical difference in ODI scores between different timepoints before and after the treatment, in other words, there was time effect ($F = 24.364$, $P = 0.000$). There was no statistical difference in ODI scores between the 2 groups in general, in other words, there was no group effect ($F = 7.192$, $P = 0.593$). The ODI scores presented a time-dependent trend of decreasing firstly and increasing subsequently in the 2 groups (16.84 ± 4.29, 4.34 ± 1.09, 4.79 ± 1.21 points, $F = 17.479$, $P = 0.000$; 16.14 ± 4.13, 4.56 ± 1.09, 5.74 ± 1.44 points, $F = 13.563$, $P = 0.000$), while the 2 groups were inconsistent with each other in the variation tendency. There was no statistical difference in ODI scores between the 2 groups before the treatment and at 2 weeks after the nerve blocking surgery ($t = 0.715$, $P = 0.476$; $t = 0.868$, $P = 0.388$). The ODI scores were lower in combination therapy group compared to monotherapy group at 6 months after the nerve blocking surgery ($t = 3.072$, $P = 0.003$). ③ There was interaction between time factor and group factor in the ratio of flexor muscle PT to extensor muscle PT ($F = 14.005$, $P = 0.001$). There was statistical difference in the ratio of flexor muscle PT to extensor muscle PT between different timepoints before and after the treatment, in other words, there was time effect ($F = 12.621$, $P = 0.000$). There was no statistical difference in the ratio of flexor muscle PT to extensor muscle PT between the 2 groups in general, in other words, there was no group effect ($F = 9.043$, $P = 0.341$). The ratio of flexor muscle PT

to extensor muscle PT presented a time-dependent trend of decreasing firstly and increasing subsequently in the 2 groups (92.47 ± 10.49 , 72.34 ± 8.05 , 75.47 ± 9.41 %, $F = 5.783$, $P = 0.000$; 91.47 ± 13.41 , 72.52 ± 9.04 , 81.59 ± 11.14 %, $F = 4.025$, $P = 0.000$), while the 2 groups were inconsistent with each other in the variation tendency. There was no statistical difference in the ratio of flexor muscle PT to extensor muscle PT between the 2 groups before the treatment and at 2 weeks after the nerve blocking surgery ($t = 0.357$, $P = 0.721$; $t = 0.091$, $P = 0.928$). The ratio of flexor muscle PT to extensor muscle PT was lower in combination therapy group compared to monotherapy group at 6 months after the nerve blocking surgery ($t = 2.552$, $P = 0.012$). ④There was interaction between time factor and group factor in waist painless anteflexion angle ($F = 29.473$, $P = 0.000$). There was statistical difference in waist painless anteflexion angle between different timepoints before and after the treatment, in other words, there was time effect ($F = 21.413$, $P = 0.000$). There was no statistical difference in waist painless anteflexion angle between the 2 groups in general, in other words, there was no group effect ($F = 12.347$, $P = 0.573$). The waist painless anteflexion angle presented a time-dependent trend of decreasing firstly and increasing subsequently in the 2 groups (76.54 ± 12.11 , 38.72 ± 5.44 , 40.44 ± 8.97 degrees, $F = 9.249$, $P = 0.000$; 75.29 ± 13.05 , 37.37 ± 7.52 , 53.21 ± 11.44 degrees, $F = 14.178$, $P = 0.000$), while the 2 groups were inconsistent with each other in the variation tendency. There was no statistical difference in waist painless anteflexion angle between the 2 groups before the treatment and at 2 weeks after the nerve blocking surgery ($t = 0.427$, $P = 0.671$; $t = 0.884$, $P = 0.379$). The waist painless anteflexion angle was smaller in combination therapy group compared to monotherapy group at 6 months after the nerve blocking surgery ($t = 5.343$, $P = 0.000$). ⑤There was interaction between time factor and group factor in waist painless backward – extension angle ($F = 19.545$, $P = 0.001$). There was statistical difference in waist painless backward – extension angle between different timepoints before and after the treatment, in other words, there was time effect ($F = 14.213$, $P = 0.000$). There was no statistical difference in waist painless backward – extension angle between the 2 groups in general, in other words, there was no group effect ($F = 11.247$, $P = 0.612$). The waist painless backward – extension angle presented a time-dependent trend of decreasing firstly and increasing subsequently in the 2 groups (79.33 ± 7.09 , 63.24 ± 6.51 , 65.97 ± 8.04 degrees, $F = 4.874$, $P = 0.000$; 80.41 ± 8.21 , 64.97 ± 7.54 , 74.97 ± 9.17 degrees, $F = 6.037$, $P = 0.000$), while the 2 groups were inconsistent with each other in the variation tendency. There was no statistical difference in waist painless backward – extension angle between the 2 groups before the treatment and at 2 weeks after the nerve blocking surgery ($t = 1.291$, $P = 0.103$; $t = 1.455$, $P = 0.721$). The waist painless backward – extension angle was smaller in combination therapy group compared to monotherapy group at 6 months after the nerve blocking surgery ($t = 6.433$, $P = 0.000$). ⑥No adverse reactions were found in combination therapy group; while the gastrointestinal reaction (1 case), manifesting as nausea and vomiting, was found in monotherapy group, and the symptoms were improved after stopping the medicine. There was no statistical difference in the incidence rate of adverse reactions between the 2 groups ($P = 1.000$). **Conclusion:** The combination therapy of lumbar fixed-position oblique-pulling manipulation and ultrasound-guided lumbar spinal nerves posteromedial branch blocking is similar to monotherapy of ultrasound-guided lumbar spinal nerves posteromedial branch blocking in short-term curative effects and safety in relieving lumbago-leg pain, enhancing lumbar range of motion, improving waist muscle balance and restoring lumbar function in treatment of LFJS, however, the former is better than the latter in mid-term curative effects.

Keywords nerve block; spinal nerves; ultrasonography; zygapophysial joint; lumbar oblique thrust

骨关节炎是老年退行性病变中较为常见的一种, 临床表现以病变部位慢性疼痛为主。但近年来的研究^[1-2]显示, 由于工作环境改变、长时间久坐、缺乏锻炼等因素, 此类疾病有年轻化的趋势。腰椎关节是人体重要的承重及发力关节, 由腰椎关节突关节骨关节炎所致的腰椎关节突关节综合征 (lumbar facet joint syndrome, LFJS) 在临床上也较为常见。目前临床上治疗 LFJS 的主要方法可分为运动及物理康复治疗、药物治疗、介入治疗及手术治疗 4 大类^[3]。但在临床实践中, 运动及物理康复治疗、药物治疗均存在起效慢、效果差等不足。介入治疗虽然起效快, 但同样存

在作用持续时间有限、疾病复发的可能性较大等问题。手术治疗为有创治疗, 术后恢复时间长, 且患者的手术意愿较低, 通常作为最后方案^[4]。为探讨更好的 LFJS 治疗方法, 2018 年 1 月至 2019 年 8 月, 我们分别采用定位腰椎斜扳手法联合超声引导下腰脊神经后内侧支阻滞术及单纯的超声引导下腰脊神经后内侧支阻滞术治疗 LFJS 患者 74 例, 并对 2 种方法的临床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 腰椎关节突关节综合征患者 74 例, 均为在中国人民武装警察部队海警总队医院门诊就

诊的患者。本研究方案经医院医学伦理委员会审查通过。

1.2 纳入标准 ①符合《脊柱小关节骨关节炎诊治专家共识》中 LFJS 诊断标准^[3];②关节突关节处有固定压痛;③美国麻醉医师协会(American Society of Anesthesiologists, ASA)病情分级^[5]为 I 级或 II 级;④对本研究方案知情同意,并签署知情同意书。

1.3 排除标准 ①本次治疗前 1 周内应用过镇痛药物者;②合并腰椎间盘突出症等腰椎病变者;③合并严重的慢性疾病或脏器功能障碍者;④预计依从性差者。

1.4 退出标准 ①未完成全部疗程者;②治疗过程中接受其他方法治疗者;③失访者。

2 方法

2.1 分组方法 按照入组顺序采用随机数字表法随机分为手法联合神经阻滞组和神经阻滞组,每组 37 例。

2.2 治疗方法 手法联合神经阻滞组采用定位腰椎斜扳手法联合超声引导下腰脊神经后内侧支阻滞术治疗,神经阻滞组采用超声引导下腰脊神经后内侧支阻滞术治疗。2 组患者在以上治疗基础上均口服美洛昔康分散片(扬子江药业有限公司,批号:国药准字 H20010207),每次 7.5 mg,每日 2 次,连续服用 14 d;并进行臀桥、单侧臀桥、侧卧提臀、卷腹、小燕飞等腰肌康复锻炼,每次约 30 min,每 3 d 进行 1 次,连续锻炼 2 个月。

2.2.1 超声引导下腰脊神经后内侧支阻滞术 在药物治疗和康复锻炼期间,完善术前检查后,行超声引导下腰脊神经后内侧支阻滞术。患者俯卧位,常规消毒、铺巾,采用飞利浦 EPIQ5 超声仪器 C5-1 探头,探头频率为 3~5 MHz。超声下确定腰椎横突与上关节突交界区域,并行感觉测试诱发相应腰脊神经后内侧支支配区域的感觉反应,将混合注射液注射于腰脊神经后内侧支目标靶点(图 1)。混合注射液组成:盐酸利多卡因注射液 1 mL、复方倍他米松注射液 1 mL、腺苷钴胺注射液 1.0 mg 加生理盐水稀释至 15 mL。每个注射点注射 3 mL。

2.2.2 定位腰椎斜扳法 神经阻滞术后行定位腰椎斜扳法。患者上肢伸直坐于凳上,医者立于患者后方,双手大拇指置于腰部脊柱两侧,拇指均匀发力向下按压患者腰椎横突,由 L₁ 逐节检查至 L₅,双手拇指按压深度不均匀节段即为关节突关节紊乱节段。然

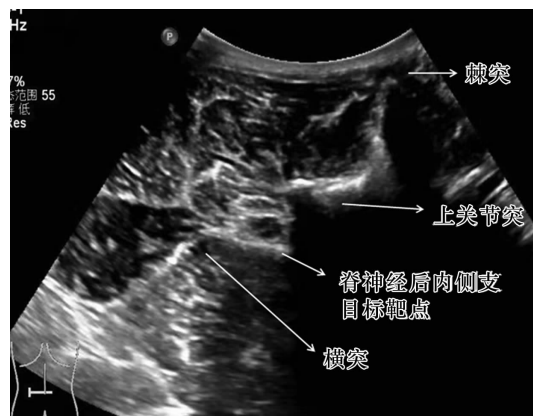
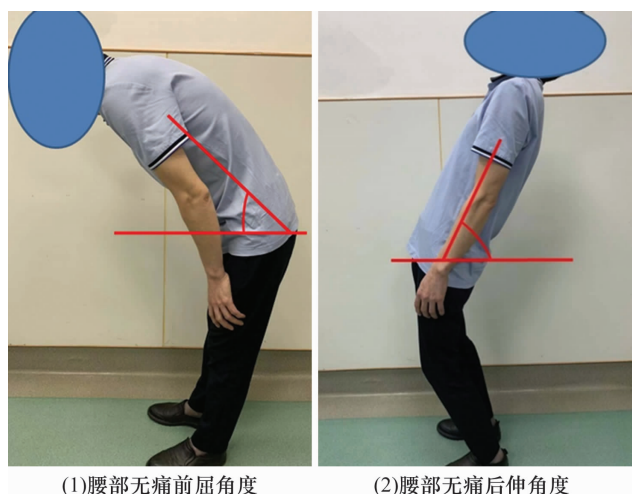


图 1 超声引导下腰脊神经后内侧支阻滞术超声声像图

后患者侧卧于治疗床上,医者将一手拇指按压于关节突关节紊乱节段。患者上侧下肢屈髋、屈膝,当医者拇指感觉按压部位下侧活动时,患者保持此时的屈髋、屈膝角度,医者单手拖拽患者下方上肢使患者上半身以脊柱为轴线扭转至拇指感觉按压部位上侧活动,患者保持此时上半身扭转角度。医者再用一手按患者肩前部向远推,另一手肘部半屈以前臂上段抵住患者臀部向近扳,将患者脊柱扭转至弹性限制位后,将抵住臀部的一侧手的拇指置于紊乱节段并扳动,出现关节弹响声、拇指感觉目标关节位移即为成功。一侧斜扳成功后,患者换成对侧卧位同样手法再行 1 次。共进行 1 次。

2.3 疗效及安全性评价方法 分别于治疗前及神经阻滞术后 2 周、6 个月,采用数字评分法(numeric rating scale, NRS)^[6]对患者腰腿疼痛情况进行评分;采用 Oswestry 功能障碍指数(Oswestry disability index, ODI)量表^[7]对腰椎功能进行评分,总分 50 分;采用德国产 PHYSIOMED CONTREX TP1000 人体肌力评估和训练系统进行腰部等速肌力测试,记录屈伸肌峰值力矩比值;测量患者腰部前屈、后伸至发生疼痛时腋中线与水平线之间的夹角,即腰部无痛活动角度(图 2),角度越小,腰部活动度越好。记录不良反应发生情况。

2.4 数据统计方法 采用 SPSS22.0 统计软件处理数据。2 组患者性别、ASA 病情分级、合并症、病变节段的组间比较均采用 χ^2 检验;年龄、体质量指数的组间比较采用 t 检验;治疗前后各时间点腰腿疼痛 NRS 评分、ODI 评分、腰部屈伸肌峰值力矩比值及腰部无痛前屈、后伸角的比较均采用重复测量数据的方差分析;不良反应发生率的比较采用精确概率法;检验水准 $\alpha=0.05$ 。



(1)腰部无痛前屈角度 (2)腰部无痛后伸角度

图2 腰部无痛活动角度测量示意图

3 结果

3.1 分组结果 2 组患者基线资料比较,差异无统计学意义,具有可比性(表 1)。

3.2 疗效评价结果

3.2.1 腰腿疼痛 NRS 评分 时间因素和分组因素存在交互效应;治疗前后不同时间点之间腰腿疼痛 NRS 评分的差异有统计学意义,即存在时间效应;2 组患者腰腿疼痛 NRS 评分总体比较,差异无统计学意义,即不存在分组效应;2 组患者腰腿疼痛 NRS 评分均随时间呈先下降后上升趋势,但 2 组的变化趋势不完全一致;治疗前及神经阻滞术后 2 周,2 组患者

腰腿疼痛 NRS 评分比较,差异均无统计学意义;神经阻滞术后 6 个月,手法联合神经阻滞组腰腿疼痛 NRS 评分低于神经阻滞组。见表 2。

3.2.2 ODI 评分 时间因素和分组因素存在交互效应;治疗前后不同时间点之间患者 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,差异无统计学意义,即不存在分组效应;2 组患者 ODI 评分均随时间呈先下降后上升趋势,但 2 组的变化趋势不完全一致。治疗前及神经阻滞术后 2 周,2 组患者 ODI 评分比较,差异均无统计学意义;神经阻滞术后 6 个月,手法联合神经阻滞组 ODI 评分低于神经阻滞组。见表 3。

3.2.3 腰部屈伸肌峰值力矩比值 时间因素和分组因素存在交互效应;治疗前后不同时间点之间患者腰部屈伸肌峰值力矩比值的差异有统计学意义,即存在时间效应;2 组患者腰部屈伸肌峰值力矩比值总体比较,差异无统计学意义,即不存在分组效应;2 组患者腰部屈伸肌峰值力矩比值随时间均呈先下降后上升趋势,但 2 组的变化趋势不完全一致;治疗前及神经阻滞术后 2 周,2 组患者腰部屈伸肌峰值力矩比值比较,差异均无统计学意义;神经阻滞术后 6 个月,手法联合神经阻滞组腰部屈伸肌峰值力矩比值低于神经阻滞组。见表 4。

表 1 2 组腰椎关节突关节综合征患者基线资料

组别	样本量/ 例	年龄/ ($\bar{x} \pm s$, 岁)	性别/例		BMI ¹⁾ / ($\bar{x} \pm s$, kg · m ⁻²)	ASA ²⁾ 病情分级/例		合并症/例			病变节段/例		
			男	女		I 级	II 级	3)	4)	5)	L ₁ ~ L ₂	L ₃ ~ L ₄	L ₅
手法联合 神经阻滞组	37	46.49 ± 6.12	21	16	21.39 ± 2.56	25	12	11	7	5	2	14	21
神经阻滞组	37	47.23 ± 5.49	19	18	21.55 ± 2.77	27	10	9	4	3	3	12	22
检验统计量		$t = 0.547$	$\chi^2 = 0.218$		$t = 0.258$	$\chi^2 = 0.259$		$\chi^2 = 2.656$			$\chi^2 = 0.377$		
P 值		0.585	0.641		0.797	0.611		0.103			0.828		

1) 体质质量指数;2) 美国麻醉师协会;3) 高血压;4) 糖尿病;5) 高脂血症。

表 2 2 组腰椎关节突关节综合征患者治疗前后各时间点腰腿疼痛数字评分

组别	样本量/ 例	腰腿疼痛数字评分/($\bar{x} \pm s$, 分)				F 值	P 值
		治疗前	神经阻滞术后 2 周	神经阻滞术后 6 个月	合计		
手法联合 神经阻滞组	37	7.12 ± 1.56	1.47 ± 0.29	1.61 ± 0.55	3.42 ± 0.84	16.556	0.000
神经阻滞组	37	7.09 ± 1.43	1.52 ± 0.37	2.13 ± 0.61	3.97 ± 0.98	14.234	0.000
合计	74	7.11 ± 1.44	1.49 ± 0.29	1.89 ± 0.43	3.69 ± 0.96	19.278 ¹⁾	0.000 ¹⁾
检验统计量		$t = 0.086$	$t = 0.646$	$t = 3.851$	10.423 ¹⁾	$F = 20.423^{2)}$,	
P 值		0.931	0.519	0.000	0.479 ¹⁾	$P = 0.000^{2)}$	

1) 主效应的 F 值和 P 值;2) 交互效应的 F 值和 P 值。

3.2.4 腰部无痛前屈角度 时间因素和分组因素存在交互效应;治疗前后不同时间点之间患者腰部无痛前屈角度的差异有统计学意义,即存在时间效应;2 组患者腰部无痛前屈角度总体比较,差异无统计学意义,即不存在分组效应;2 组患者腰部无痛前屈角度均随时间呈先下降后上升趋势,但 2 组的变化趋势不完全一致;治疗前及神经阻滞术后 2 周,2 组患者腰部无痛前屈角度比较,差异均无统计学意义;神经阻滞术后 6 个月,手法联合神经阻滞组腰部无痛前屈角度小于神经阻滞组。见表 5。

3.2.5 腰部无痛后伸角度 时间因素和分组因素存在交互效应。治疗前后不同时间点之间患者腰部无痛后伸角度的差异有统计学意义,即存在时间效应。2 组患者腰部无痛后伸角度总体比较,差异无统计学意义,即不存在分组效应。2 组患者腰部无痛后伸角

度均随时间呈先下降后上升趋势,但 2 组的变化趋势不完全一致。治疗前及神经阻滞术后 2 周,2 组患者腰部无痛后伸角度比较,差异无统计学意义。神经阻滞术后 6 个月,手法联合神经阻滞组腰部无痛后伸角度小于神经阻滞组。见表 6。

3.3 安全性评价结果 手法联合神经阻滞组无不良反应发生;神经阻滞组发生恶心、呕吐等消化道症状 1 例,停药后好转;2 组患者不良反应发生率比较,差异无统计学意义($P=1.000$)。

4 讨论

腰椎关节突关节是复合体滑膜囊关节,对人体起着承重和控制腰椎旋转等作用^[8]。腰椎关节突关节退行性病变会导致关节结构的改变,且腰椎关节突关节骨关节炎可刺激关节腔内炎性因子的释放,是诱发腰痛的重要原因^[9-11]。早期口服抗炎药物可缓解局

表 3 2 组腰椎关节突关节综合征患者治疗前后各时间点 Oswestry 功能障碍指数评分

组别	样本量/ 例	Oswestry 功能障碍指数评分/ $(\bar{x} \pm s, \text{分})$				F 值	P 值
		治疗前	神经阻滞术后 2 周	神经阻滞术后 6 个月	合计		
手法联合 神经阻滞组	37	16.84 \pm 4.29	4.34 \pm 1.09	4.79 \pm 1.21	8.01 \pm 2.99	17.479	0.000
神经阻滞组	37	16.14 \pm 4.13	4.56 \pm 1.09	5.74 \pm 1.44	8.64 \pm 2.78	13.563	0.000
合计	74	16.53 \pm 4.21	4.45 \pm 1.12	5.19 \pm 1.41	8.39 \pm 3.12	24.364 ¹⁾	0.000 ¹⁾
检验统计量		$t=0.715$	$t=0.868$	$t=3.072$	7.192 ¹⁾	$F=33.423^{2)}$,	
P 值		0.476	0.388	0.003	0.593 ¹⁾	$P=0.000^{2)}$	

1) 主效应的 F 值和 P 值;2) 交互效应的 F 值和 P 值。

表 4 2 组腰椎关节突关节综合征患者治疗前后各时间点腰部屈伸肌峰值力矩比值

组别	样本量/ 例	腰部屈伸肌峰值力矩比值/ $(\bar{x} \pm s, \%)$				F 值	P 值
		治疗前	神经阻滞术后 2 周	神经阻滞术后 6 个月	合计		
手法联合 神经阻滞组	37	92.47 \pm 10.49	72.34 \pm 8.05	75.47 \pm 9.41	78.57 \pm 9.34	5.783	0.000
神经阻滞组	37	91.47 \pm 13.41	72.52 \pm 9.04	81.59 \pm 11.14	80.24 \pm 12.57	4.025	0.000
合计	74	91.94 \pm 12.67	72.45 \pm 8.31	78.03 \pm 10.57	79.41 \pm 10.04	12.621 ¹⁾	0.000 ¹⁾
检验统计量		$t=0.357$	$t=0.091$	$t=2.552$	9.043 ¹⁾	$F=14.005^{2)}$,	
P 值		0.721	0.928	0.012	0.341 ¹⁾	$P=0.001^{2)}$	

1) 主效应的 F 值和 P 值;2) 交互效应的 F 值和 P 值。

表 5 2 组腰椎关节突关节综合征患者治疗前后各时间点腰部无痛前屈角度

组别	样本量/ 例	腰部无痛前屈角度/ $(\bar{x} \pm s, ^\circ)$				F 值	P 值
		治疗前	神经阻滞术后 2 周	神经阻滞术后 6 个月	合计		
手法联合 神经阻滞组	37	76.54 \pm 12.11	38.72 \pm 5.44	40.44 \pm 8.97	50.42 \pm 11.39	9.249	0.000
神经阻滞组	37	75.29 \pm 13.05	37.37 \pm 7.52	53.21 \pm 11.44	59.87 \pm 12.54	14.178	0.000
合计	74	75.31 \pm 12.49	37.49 \pm 6.74	47.34 \pm 9.42	56.37 \pm 10.94	21.413 ¹⁾	0.000 ¹⁾
检验统计量		$t=0.427$	$t=0.884$	$t=5.343$	12.347 ¹⁾	$F=29.473^{2)}$,	
P 值		0.671	0.379	0.000	0.573 ¹⁾	$P=0.000^{2)}$	

1) 主效应的 F 值和 P 值;2) 交互效应的 F 值和 P 值。

表 6 2 组腰椎关节突关节综合征患者治疗前后各时间点腰部无痛后伸角度

组别	样本量/ 例	腰部无痛后伸角度/ $(\bar{x} \pm s, ^\circ)$				F 值	P 值
		治疗前	神经阻滞术后 2 周	神经阻滞术后 6 个月	合计		
手法联合 神经阻滞组	37	79.33 \pm 7.09	63.24 \pm 6.51	65.97 \pm 8.04	69.73 \pm 7.42	4.874	0.000
神经阻滞组	37	80.41 \pm 8.21	64.97 \pm 7.54	74.97 \pm 9.12	72.42 \pm 9.84	6.037	0.000
合计	74	80.04 \pm 7.92	64.32 \pm 6.89	69.51 \pm 8.93	70.23 \pm 8.51	14.213 ¹⁾	0.000 ¹⁾
检验统计量		$t = 1.291$	$t = 1.455$	$t = 6.433$	11.247 ¹⁾	$F = 19.545^{2)},$	
P 值		0.103	0.721	0.000	0.612 ¹⁾	$P = 0.001^{2)}$	

1)主效应的 F 值和 P 值;2)交互效应的 F 值和 P 值。

部炎性反应,而康复锻炼能增强腰肌力量、促进血液循环,这 2 种方法是治疗 LFJS 的基础方式^[12-13]。但开展腰肌康复锻炼的前提是患者能耐受疾病所致的疼痛。腰脊神经后内侧支穿过竖脊肌、背阔肌腱膜、髂嵴后部达臀上部皮下,对其进行药物阻滞,短期内能很好地缓解腰腿部疼痛^[14]。但当阻滞药物效果减弱时患者疼痛会复发^[15]。且由于关节软骨缺损、关节囊缩窄等原因,LFJS 患者关节突关节的不稳定性显著增加,活动时极易发生关节囊及软骨组织被上下关节挤压,导致腰椎活动度下降,而此类症状很难通过药物缓解^[10]。

单纯神经阻滞并未缓解关节周围组织的卡压,炎症并未缓解,且卡压处炎性因子浸润周围组织会导致炎症加重^[16]。关节周围组织受到卡压会诱发椎体移位,最终引起椎间孔狭窄、神经根受压,下肢症状无法缓解甚至加重^[17]。而椎体移位所产生的旋转力或剪切力还会将更多的周围软组织卷入 2 个椎体之间,发生无菌性炎症。因此,关节紊乱是导致 LFJS 症状不缓解甚至加重及治疗后复发的重要因素^[18]。定位腰椎斜扳法中基础手法为后伸、牵拉、前屈及扭转腰椎,定位病变节段后通过力的综合作用,能有效松动该节段内的关节,从而缓解关节对周围组织的挤压,改善腰椎的活动度^[19]。通过手法调整,及时纠正椎体位置,能避免椎间孔狭窄及周围组织无菌性炎症的发生,从而有效缓解腰部和下肢症状。

本研究结果表明,采用定位腰椎斜扳手法联合超声引导下腰脊神经后内侧支阻滞术治疗 LFJS,与单纯采用超声引导下腰脊神经后内侧支阻滞术比较,二者在缓解患者腰腿疼痛、增加腰椎活动度、改善腰部肌力平衡、恢复腰椎功能方面近期疗效相当、安全性相当,但前者的中期疗效优于后者。本研究的样本量较小,结果可能存在一定偏倚,还需开展大样本、多中心的临床研究。

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(下转第 22 页)