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·临床研究·

低温等离子射频消融联合盘内注射技术治疗椎间盘源性腰痛的效果

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[摘 要] **目的** 探讨低温等离子射频消融联合盘内注射治疗椎间盘源性腰痛(DLBP)的临床效果。**方法** 纳入我院因DLBP接受低温等离子射频消融联合盘内注射技术治疗且临床资料完整的53例患者。记录患者生理功能、生理职能、躯体疼痛、总体健康、活力、社会功能、情感职能、精神健康评分,并比较术前、术后1个月和术后12个月患者腰背部疼痛视觉模拟量表(VAS)评分、Oswestry功能伤残指数(ODI)及生活质量SF-36量表各维度评分变化情况。**结果** 患者平均手术时间(113.19±6.61)min,术中失血量平均(49.81±14.21)mL,平均住院时间(7.51±1.67)d,平均随访时间(14.58±2.35)个月。与术前比较,术后1个月及术后12个月患者腰背部VAS评分和ODI降低,差异均具有统计学意义($P<0.01$);与术后1个月比较,术后12个月患者腰背部VAS评分和ODI降低,差异均具有统计学意义($P<0.01$)。与术前比较,术后12个月患者生活质量SF-36量表各维度评分变化差异均具有统计学意义($P<0.01$)。**结论** 低温等离子射频消融联合盘内注射技术可有效治疗DLBP,提高患者生活质量。

[关键词] 椎间盘源性腰痛;低温等离子;射频消融;盘内注射;生活质量

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Low temperature plasma radiofrequency ablation combined with intradiscal injection technique for the treatment of discogenic low back pain

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Abstract: Objective To investigate the clinical effect of low temperature plasma radiofrequency ablation combined with intradiscal injection technique in the treatment of discogenic low back pain(DLBP). **Methods** A total of 53 patients with complete clinical data who received low temperature plasma radiofrequency ablation combined with intradiscal injection technique for DLBP in our hospital were included. The physiological function, physical function, physical pain, general health, vitality, social function, emotional function, and mental health scores of patients were recorded, and the visual analogue scale (VAS) score for low back pain, Oswestry disability index (ODI), and changes in each dimension of the quality of life SF-36 scale before surgery, 1 month after surgery, and 12 months after surgery were compared. **Results** The average operation time of the patients was (113.19±6.61) minutes, the average intraoperative blood loss was (49.81±14.21) mL, the average hospital stay was (7.51±1.67) days, and the average follow-up time was (14.58±2.35) months. The VAS scores of low back pain and ODI of patients 1 month and 12 months after operation were decreased compared with those before operation, and the differences were statistically significant ($P<0.01$); the VAS scores of low back pain and ODI of patients 12 months after operation were decreased compared with those 1 month after operation, and the differences were statistically significant ($P<0.01$). There were statistically significant differences in the scores of each dimension of the quality of life SF-36 scale in patients 12 months after surgery compared with those before operation ($P<0.01$). **Conclusion** Low temperature plasma radiofrequency ablation combined with intradiscal injection technique can effectively treat DLBP and improve the quality of life of patients.

Keywords: discogenic low back pain; low temperature plasma; radiofrequency ablation; intradiscal injection; quality of life

椎间盘源性腰痛(discogenic low back pain,DLBP)是由于椎间盘内部破裂(internal discdisruption,IDD)、解剖结构改变、破坏或代谢紊乱、炎症介质产生等,刺激椎间盘纤维上的疼痛感觉神经末梢,导致持续顽固性腰痛和非神经根性牵涉痛[1],其治疗方式目前在临床上仍未得到统一[2-5]。椎体间融合术被认为是治疗DLBP的重要方式[6],椎间孔镜下髓核摘除及纤维环热成形、低温等离子椎间盘射频消融亦可获得满意的临床疗效。但低温等离子射频消融后椎间盘髓核内部会形成局部真空,导致炎症因子聚集,疼痛不能缓解或缓解不彻底。据此,我们尝试射频后进一步行抗炎治疗,对DLBP患者进行低温等离子射频消融术的同时注入适量复方倍他米松与利多卡因混悬液,术后患者腰背部疼痛明显缓解,取得了较好的临床效果,现报道如下。

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1 资料与方法

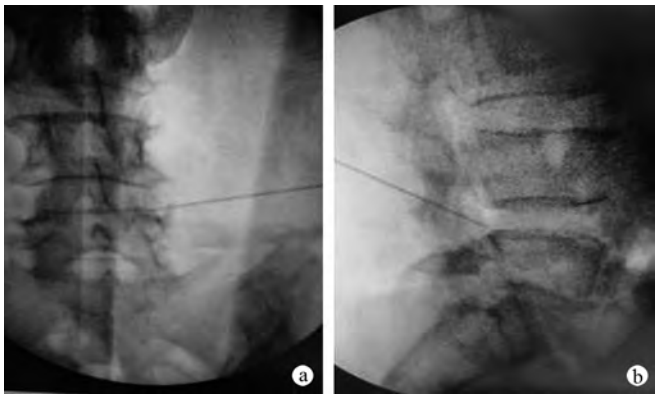
1.1 临床资料

纳入2018年1月至2019年12月我院因DLBP接受低温等离子射频消融联合盘内注射技术治疗且临床资料完整的患者53例,其中男31例,女22例。患者平均年龄(48.55±5.27)岁,平均骨密度(1.1±0.03)SD。纳入标准:①慢性腰痛超过6个月,保守治疗无效;②影像学检查见椎间盘纤维环后缘高信号区(high intensity zone,HIZ);③经椎间盘造影确诊为DLBP,椎间盘封闭后再次出现腰痛并接受椎间孔镜髓核摘除联合低温等离子射频消融术治疗。排除标准:①有下肢神经放射症状;②影像学检查存在椎间盘突出、椎管狭窄、腰椎不稳等;③外伤、感染、肿瘤等原因引起的腰痛;④有腹部或腰椎手术史。本研究获得我院医学伦理委员会批准(20200725),并取得所有患者的知情同意。

1.2 方法

椎间盘造影:常规以伴有终板Modic改变、终板许莫氏结节或纤维环后缘HIZ的椎间盘为目标节段,取邻近椎间盘为对比节段。患者取俯卧位,中线旁开10~12 cm为穿刺点,以椎间盘中心为目标,在C型臂X射线机透视下逐渐进针至目标点后拔出针芯,推入造影剂。如患者出现下腰痛复制,透视见造影剂向椎间盘后缘或终板渗透则为造影阳性。造影阳性者注入1 mL倍他米松及1 mL罗派卡因混合液行椎间盘封闭。常规行邻近节段造影以获得阴性对照。椎间盘造影确诊为DLBP,椎间盘封闭后再次出现腰痛者拟行手术治疗。

椎间盘低温等离子射频消融及盘内注射技术:患者取俯卧位,在C型臂X射线机透视下定位确定责任节段间隙。常规消毒铺巾,棘突中线旁开12~14 cm进针,利多卡因逐层进行浸润麻醉。C型臂X射线机透视引导下通过"安全三角"穿刺至责任椎间盘中央,拔出穿刺针,经穿刺针管置入低温等离子射频刀头。透视下调整刀头位置至椎间盘后1/3处,启动等离子装置。拔出等离子刀头,通过穿刺针筒注入复方倍他米松、1%利多卡因注射液(按1∶2比例配制)的混悬液约2 mL。经$L_{4/5}$左侧入路对L_4椎间盘进行射频消融,正侧位透视显示穿刺针平$L_{4/5}$椎间隙水平,穿刺针远端靠近下关节突内侧缘;侧位透视显示穿刺针略过L_5上关节突肩部,于神经根出口靠近下位椎体后缘,见图1。



a:正位;b:侧位

图1 术中X射线透视情况

1.3 临床疗效指标

术前及术后1个月、12个月采用疼痛视觉模拟量表(visual analogue scale,VAS)评分评估患者腰背部疼痛,Oswestry功能伤残指数(Oswestry disability index,ODI)评估患者下腰部功能变化。术前及术后12个月采用SF-36量表评价患者生活质量,分为生理健康和心理健康两个大类,包括生理功能、生理职能、躯体疼痛、总体健康、活力、社会功能、情感职能、精神健康。所有参数由2名资深脊柱外科主治医师同时采集记录,结果取2人平均值。

1.4 统计学方法

采用SPSS 20.0软件进行数据录入和统计学分析。计量资料以均数±标准差($\bar{x}\pm s$)表示。各组资料采用*Kolmogorov-Smirnov*检验(*K-S*检验)判断数据接近正态分布。采用校正t检验比较手术前后计量资料间的差异,$P<0.05$为差异有统计学意义。

2 结果

2.1 患者手术一般情况

患者平均手术时间(113.19±6.61)min,术中失血量平均(49.81±14.21)mL,平均住院时间(7.51±1.67)d,平均随访时间(14.58±2.35)d,围术期无脊髓神经根损害、腰背部疼痛加重患者。

2.2 患者各时间点腰背部疼痛VAS评分及ODI变化

与术前比较,术后1个月及术后12个月患者腰背部VAS评分和ODI降低,差异均具有统计学意义($P<0.01$);与术后1个月比较,术后12个月患者腰背部VAS评分和ODI降低,差异均具有统计学意义($P<0.01$),见表1。

2.3 患者生活质量的变化情况

与术前比较,术后12个月患者SF-36量表各维度评分变化差异均具有统计学意义($P<0.01$),见表2。

表 1 手术前后患者 VAS 评分及 ODI 变化($\bar{x} \pm s$)

指标	术前	术后 1 个月	术后 12 个月	t_1	t_2	t_3	P_1	P_2	P_3
VAS 评分/分	6.85 ± 1.12	3.49 ± 0.51	2.19 ± 0.62	21.672	26.097	17.548	0.000	0.000	0.000
ODI/%	32.83 ± 5.05	17.80 ± 1.06	14.56 ± 1.22	22.223	25.008	13.984	0.000	0.000	0.000

注:t_1、P_1 为术后 1 个月与术前比较结果;t_2、P_2 为术后 12 个月与术前比较结果;t_3、P_3 为术后 1 个月与术后 12 个月比较结果

表 2 手术前后患者生活质量变化($\bar{x} \pm s$,分)

指标	术前	术后 12 个月	t	P
生理功能	18.23 ± 6.53	43.58 ± 5.29	−22.645	0.000
生理职能	9.58 ± 3.02	47.58 ± 7.20	−33.875	0.000
躯体疼痛	23.45 ± 5.83	10.70 ± 2.05	14.415	0.000
总体健康	25.28 ± 7.90	61.15 ± 9.44	−22.784	0.000
活力	26.70 ± 5.61	36.72 ± 5.11	−8.904	0.000
社会功能	27.36 ± 7.95	47.89 ± 13.23	−8.691	0.000
情感职能	29.66 ± 5.49	39.77 ± 4.18	−9.630	0.000
精神健康	27.21 ± 5.13	37.55 ± 10.41	−7.127	0.000

3 讨论

3.1 椎间盘源性腰痛的病理生理

在诸多因素影响下,椎间盘逐步发生退变,其生理及机械稳定性结构被损坏[7]。退变椎间盘纤维环外 1/3 及终板有丰富的浅感觉神经末梢,椎间盘退变或损伤、纤维环出现破口后,可在局部产生多种炎症因子并发生炎症因子外漏,且纤维环裂隙内可生成炎性血管及肉芽组织,外部神经纤维沿着裂隙向盘内生长,继而出现神经敏化[8-9]。外漏的髓核组织出现免疫暴露,发生自身免疫反应;破裂椎间盘内的炎症因子和信号递质刺激终板裂隙及软骨下骨内的神经末梢亦可引起腰痛[10-11]。部分顽固性 DLBP 可持续数年,甚至进行性加重,给患者工作生活带来严重影响。

3.2 椎间盘源性腰痛的外科治疗

既往研究显示,微创技术,如椎间盘射频消融术、椎间孔镜技术等治疗 DLBP 可获得满意的临床效果[12-14],且椎体间融合术可彻底切除破损椎间盘,从根源上治疗 DLBP[15]。DLBP 患者腰椎 MRI 影像学表现为椎间盘内部生理结构损害、外层纤维环破裂,但椎间盘无突出、硬膜囊及神经根鲜有受压[16]。C 型臂椎间孔镜可行突出椎间盘髓核摘除,扩大椎管、神经根管及侧隐窝,使神经根得到充分松解,有效缓解患者下腰痛。该技术可最大程度摘除病损椎间盘,但仍可能存在残留髓核突出、节段不稳等情况。临床研究显示,部分 DLBP 患者经椎间孔镜技术治疗后,早期症状缓解,一段时间后可能发生同节段椎间盘二次突出,需再次行根治性脊柱融合术。从生物力学及临床经验分析,原因可能为椎体间融合手术过程中需剥离腰背部肌肉,腰部核心力量的肌肉组织遭到损害,部分患者术后长期存在腰背部酸胀疼痛;且术后固定融合节段机械硬度增强,邻近节段应力增加或失衡,椎间盘退变加速,故椎体间融合手术需严格把握手术指征,并综合评估患者获益—风险关系。

本研究尝试在责任椎间盘髓核内对髓核进行低温等离子射频消融,使纤维环破口及髓核皱缩固化汽化,以减轻椎间盘内部压力,使欲突出或膨出的髓核回纳;同时最大限度损毁椎间盘髓核内引起疼痛敏化的神经末梢,促使纤维环回缩成形;消除炎症因子,破除免疫暴露等因素,最大程度缓解患者下腰痛。射频结束后椎间盘原髓核部位形成一中空区域,我们予复方倍他米松、1% 利多卡因注射液混悬液 2 mL 注入,以期进一步抗炎并稀释局部炎症因子浓度,达到长期缓解腰痛的目的,结果显示,术后 1 个月及术后 12 个月,患者腰背部疼痛较术前显著缓解,且术后 12 个月患者疼痛较术后 1 个月改善更明显;ODI 亦呈上述规律变化。证明低温等离子射频消融联合盘内注射技术治疗 DLBP 临床疗效确切。本研究生活质量 SF-36 量表评分结果显示,术后 12 个月患者生理功能、生理职能、躯体疼痛、总体健康、活力、社会功能、情感职能及精神健康较术前均发生显著改变,说明低温等离子射频消融联合盘内注射技术可有效治疗 DLBP。

综上所述,低温等离子射频消融联合盘内注射技术治疗椎间盘源性腰痛可有效缓解患者腰背部疼痛,提高患者生活质量。

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·临床报道·

快速康复外科在肝癌伴门静脉高压症患者开腹射频消融联合切脾断流术中的应用

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[摘 要] **目的** 探讨快速康复外科(ERAS)在肝癌伴门静脉高压症患者行开腹射频消融联合切脾断流术治疗中的应用效果。**方法** 将我院103例肝癌伴门静脉高压症行开腹射频消融联合切脾断流术的患者随机分为观察组($n=51$)和对照组($n=52$)。对照组患者予以常规干预,观察组患者予以ERAS管理。比较2组患者术后住院时间、首次排气时间、首次下床时间、生活质量、术后并发症发生率、术后总生存率及术后1年上消化道出血复发率。**结果** 观察组术后住院时间、生活质量、首次排气时间、首次下床时间、术后并发症发生率及术后1年上消化道出血复发率均明显优于对照组($P<0.05$),而2组患者术后总生存率比较,差异无统计学意义($P>0.05$),但是观察组患者中位生存时间明显长于对照组($P<0.05$)。**结论** ERAS能提高肝癌伴门静脉高压症患者行开腹射频消融联合切脾断流术后的临床疗效,缩短住院时间,改善生活质量,降低术后并发症发生率及术后上消化道出血复发率。

[关键词] 快速康复外科;门静脉高压症;肝癌;开腹射频消融;切脾断流术
[中图分类号] R473.6 [文献标识码] A [收稿日期] 2022-04-27

Application of enhanced recovery after surgery in open radiofrequency ablation combined with splenectomy and devascularization for liver cancer patients with portal hypertension

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Abstract: Objective To investigate the effect of enhanced recovery after surgery in the treatment of liver cancer patients with portal hypertension undergoing open radiofrequency ablation combined with splenectomy and devascularization. **Methods** A total of 103 liver cancer

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