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·临床研究·

本体感觉神经肌肉促进技术对重型颅脑创伤患者术后平衡能力的影响

祁金敏[1],李宗喜[1],王巧琳[1],廖 羽[1],文 亮[2] (1.成都医学院第一附属医院神经外科,四川 成都 610500;2.重庆市南川区人民医院神经外科,重庆 南川 408400)

[摘 要] **目的** 探讨本体感觉神经肌肉促进技术(PNF)对重型颅脑创伤(SCT)患者术后平衡能力的影响。**方法** 选取接受大骨瓣减压术治疗的SCT患者120例,按照随机数字表法分为PNF组与对照组,每组60例。对照组术后行常规物理干预,PNF组术后行常规物理干预联合PNF。观察2组患者干预前后静态平衡功能、下肢运动功能及神经功能。**结果** 干预后,PNF组轨迹总面积、轨迹长度、单位面积轨迹长度均小/短于对照组($P<0.05$)。PNF组Berg平衡量表(BBS)评分、Fugl-Meyer评定量表(FMA)评分均高于对照组,美国国立卫生研究院卒中量表(NIHSS)评分均低于对照组($P<0.05$)。**结论** PNF有助于改善SCT患者的神经功能,提高患者术后平衡能力,并促进其术后恢复。

[关键词] 本体感觉神经肌肉促进技术;重型颅脑创伤;术后平衡能力;神经功能

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Effects of proprioceptive neuromuscular facilitation on postoperative balance ability in patients with severe craniocerebral trauma

QI Jin-min[1], LI Zong-xi[1], WANG Qiao-lin[1], LIAO Yu[1], WEN Liang[2] (1. Department of Neurosurgery, First Affiliated Hospital of Chengdu Medical College, Chengdu Sichuan 610500, China; 2. Department of Neurosurgery, People's Hospital of Nanchuan District, Chongqing 408400, China)

Abstract: Objective To investigate the effects of proprioceptive neuromuscular facilitation (PNF) on postoperative balance ability of patients with severe craniocerebral trauma (SCT). **Methods** A total of 120 patients with SCT who received large decompressive craniectomy were selected, and they were divided into the PNF group and the control group according to the random number table method, with 60 cases in each group. The control group received routine physical intervention after surgery, and the PNF group received routine physical intervention combined with PNF after surgery. The static balance function, lower extremity motor function and neurological function of the two groups before and after the intervention were observed. **Results** After the intervention, the total track area, track length and track length per unit area of the PNF group were all smaller/shorter than those of the control group ($P<0.05$). The Berg balance scale (BBS) scores and Fugl-Meyer assessment (FMA) scores of the PNF group were all higher than those of the control group, and the National Institutes of Health Stroke Scale (NIHSS) scores of the PNF group was lower than that of the control group ($P<0.05$). **Conclusion** PNF is helpful to improve the neurological function of patients with SCT, improve their postoperative balance ability, and promote their postoperative recovery.

Keywords: proprioceptive neuromuscular facilitation; severe craniocerebral trauma; postoperative balance ability; neurological function

重型颅脑创伤(severe craniocerebral trauma,SCT)为暴力打击导致的头颅及脑组织严重损伤,SCT发生后,患者脑组织常产生极为复杂的病理生理、病理学变化,若治疗不及时,易导致患者死亡[1]。目前手术是SCT的主要治疗方法,可挽救多数患者生命,但仍难以彻底改善脑功能,故多数患者术后常存在一定程度的并发症[2]。其中平衡能力降低或丧失是SCT患者术后常见的并发症,而躯干位置感觉异常及躯干肌力降低是影响SCT患者术后平衡能力的重要因素,因此,纠正躯干位置感觉异常、增强躯干肌力是提高SCT患者术后平衡能力的关键[3]。研究显示,本体感觉神经肌肉促进技术(proprioceptive neuromuscular facilitation,PNF)有助于改善躯干位置感觉,增强躯干肌力,提高平衡能力[4]。但临床上该技术多应用于脑卒中患者术后康复,极少见到将其应用于SCT患者的报道。为此,本研究将SCT患者应用PNF治疗,以探究PNF对患者术后平衡能力的影响。

[通信作者] 文 亮,E-mail:287173513@qq.com

1 资料与方法

1.1 临床资料

选取2015年7月至2020年6月于成都医学院第一附属医院接受大骨瓣减压术治疗的SCT患者120例,男75例,女45例;年龄25~70岁,平均(45.63±4.75)岁;受伤至入院时间1~4 h,平均(1.68±0.19)h;格拉斯哥

昏迷量表(Glasgow coma scale,GCS)评分3~8分,平均(5.46±0.56)分;致伤因素:交通伤62例,高坠伤41例,摔伤15例,打击伤2例。按照随机数字表法将120例患者分为PNF组与对照组,每组60例。对照组术后行常规物理干预,PNF组术后行常规物理干预联合PNF。2组患者基线资料比较,差异无统计学意义($P>0.05$),见表1。纳入标准:经临床症状及脑部影像学诊断为SCT;颅脑闭合性损伤;行大骨瓣减压术;预期生存时间>90 d;既往躯干及四肢功能正常;依从性良好。排除标准:合并其他部位损伤影响运动;既往有神经系统疾病、颅脑手术史;神经、精神疾病无法配合;肝肾功能异常。本研究经成都医学院第一附属医院伦理委员会批准,所有患者对本研究均知情同意。

表1 2组患者基线资料比较($n=60$)

组别	性别/例		年龄/岁	受伤至入院时间/h	GCS评分/分	致伤因素/例			
	男	女				交通伤	高坠伤	摔伤	打击伤
PNF组	36	24	45.58±4.70	1.70±0.20	5.44±0.54	30	21	8	1
对照组	39	21	45.82±4.80	1.66±0.18	5.48±0.57	32	20	7	1
χ^2/t	0.317		0.277	1.152	0.395	0.156			
P	0.573		0.783	0.252	0.694	0.984			

1.2 方法

对照组大骨瓣减压术后行常规物理干预。患者意识清醒、病情好转后开始行床上体位变换、关节活动度训练、坐站训练、肌力训练、核心稳定训练等。每天1次,每周5 d,共12周。

PNF组大骨瓣减压术后行常规物理干预联合PNF。常规物理干预同对照组。PNF:①躯干屈曲伸展,即患者端坐,干预者正对患者站立,并将双手置于其肩前方,告知患者两侧髂前上棘位置,然后嘱其将对侧肩部向髂前上棘位置靠拢,期间干预者适当给予拮抗,待患者屈曲躯干至最大程度时,干预者以双手于患者后肩部拮抗,并告知患者伸直躯干;②上肢屈曲伸展,即患者仰卧,干预者站立于床侧,指导患者先行单侧上肢屈曲伸展,然后再行双侧上肢屈曲伸展;③下肢屈曲伸展,即患者仰卧,干预者站立于床侧,指导患者单侧下肢髋关节、膝关节及踝关节依次完成屈曲伸展,然后指导患者依次完成双侧下肢髋关节、膝关节及踝关节屈曲伸展。上述动作循序渐进,逐渐增加屈曲伸展次数及时间。PNF于上午、下午各进行1次,每周5 d,共12周。

1.3 观察指标

比较2组干预前后静态平衡功能、下肢运动功能及神经功能情况。静态平衡功能以重心平衡测定仪检测睁眼、闭眼情况下眼球轨迹总面积、轨迹长度及单位面积轨迹长度,轨迹总面积、轨迹长度、单位面积轨迹长度越大/长,说明静态平衡功能越差。平衡功能、下肢运动功能、神经功能分别以Berg平衡量表(Berg balance scale,BBS)、Fugl-Meyer评定量表(Fugl-Meyer assessment,FMA)及美国国立卫生研究院卒中量表(National Institutes of Health Stroke Scale,NIHSS)进行评价,BBS、FMA得分越低说明平衡功能、下肢运动功能越差,NIHSS得分越高说明神经功能越差。

1.4 统计学处理

采用SPSS 19.0统计软件分析,计量资料以均数±标准差($\bar{x}\pm s$)表示,行t检验;定性资料行χ^2检验。检验水准α为0.05。$P<0.05$为差异有统计学意义。

2 结果

2.1 2组静态平衡功能比较

干预前,2组轨迹总面积、轨迹长度、单位面积轨迹长度比较,差异无统计学意义($P>0.05$);干预后,2组轨迹总面积、轨迹长度、单位面积轨迹长度均较干预前减小/缩短,且PNF组轨迹总面积、轨迹长度均小/短于对照组,差异均有统计学意义($P<0.05$),见表2。

表2 2组静态平衡功能比较($\bar{x}\pm s$,$n=60$)

指标	眼睛状态	时间	PNF组	对照组	t	P
轨迹总面积/mm^2	睁眼	干预前	82.98±8.54	80.76±8.49	1.428	0.156
		干预后	56.55±5.82*	63.57±6.54*	6.211	0.000
	闭眼	干预前	129.68±14.53	126.86±14.50	1.064	0.289
		干预后	50.95±5.24*	57.73±6.03*	6.574	0.000
轨迹长度/mm	睁眼	干预前	289.76±30.15	285.43±30.11	0.787	0.433
		干预后	226.75±23.43*	264.95±27.18*	8.246	0.000
	闭眼	干预前	486.87±50.63	481.27±50.59	0.606	0.546
		干预后	234.80±25.36*	298.97±27.35*	12.568	0.000
单位面积轨迹长度/mm	睁眼	干预前	6.50±0.67	6.54±0.69	0.322	0.748
		干预后	3.98±0.42*	4.42±0.46*	5.472	0.000
	闭眼	干预前	15.77±1.69	15.80±1.71	0.097	0.923
		干预后	4.69±0.48*	5.22±0.54*	5.682	0.000

*:与干预前比较,$P<0.05$

2.2 2组BBS、FMA、NIHSS评分比较

干预前,2组BBS、FMA、NIHSS评分比较,差异无统计学意义($P>0.05$);干预后,2组BBS、FMA评分均较干预前高,NIHSS评分均较干预前低,且PNF组

BBS、FMA 评分均高于对照组,NIHSS 评分低于对照组,差异均有统计学意义($P<0.05$),见表3。

表3 2组 BBS、FMA、NIHSS 评分比较($\bar{x}\pm s$,$n=60$,分)

指标	时间	PNF 组	对照组	t	P
BBS 评分	干预前	15.16±1.64	15.20±1.67	0.133	0.895
	干预后	30.74±3.22*	23.43±2.51*	13.869	0.000
FMA 评分	干预前	15.08±1.61	15.12±1.53	0.140	0.889
	干预后	35.67±3.75*	26.09±2.83*	15.795	0.000
NIHSS 评分	干预前	23.47±2.51	23.44±2.49	0.066	0.948
	干预后	7.65±0.84*	11.57±1.29*	19.725	0.000

*:与干预前比较,$P<0.05$

3 讨论

平衡能力是在外力作用或运动状态下,机体自动调整并维持姿势的能力,良好的平衡能力需要不同层次的神经系统、肌肉及关节等共同完成[5]。SCT 引发的高位中枢损伤易导致高位中枢易化脊髓的作用降低或丧失、脊髓前角不同类型运动神经元间失去平衡,致使发生牵张反射亢进,机体难以调整并维持正常姿势,引发不对称姿势、异常运动模式、肌张力异常等不良现象,导致患者术后平衡能力降低或丧失[6]。此外,SCT 导致运动神经元损伤、肌张力增高也是患者术后平衡能力降低或丧失的重要因素[7]。

PNF 可通过刺激本体感受器、牵张、压缩、施加阻力等方式提高躯干、四肢肌群控制及抗阻能力,并延伸至髋部、颈部等部位,促进整体功能提高[8-10]。在干预早期,PNF 可经最大阻力、节律启动等技术,促进拮抗肌与原动肌相互作用,诱导肌肉主动运动,提高姿势性张力。在干预中后期,PNF 可经躯干、上肢、下肢屈曲伸展改善肌张力、关节废用性僵硬及其协调性,促进拮抗肌与主动肌交替收缩,从而降低肌张力,解除肌肉痉挛,诱导异常姿势复常,提高肢体运动及协调能力,改善术后平衡能力[11-12]。静态平衡功能是评价术后平衡能力的重要指标。本研究干预后,2组轨迹总面积、轨迹长度、单位面积轨迹长度均减小/缩短,PNF 组轨迹总面积、轨迹长度、单位面积轨迹长度均小/短于对照组,说明 PNF 有助于提高 SCT 患者静态平衡功能。

神经功能恢复是 SCT 患者平衡功能恢复的关键[13]。PNF 可促进本体感受器将神经冲动上传至脊髓后索,再经内侧丘系上传至高位中枢,刺激高位中枢功能重建,进而改善中枢神经功能,提高患者术后平衡能力[14]。此外,SCT 患者术后进入康复期,不但可坐可站,且其脑损伤和血脑屏障破坏已趋于平稳,此时进行 PNF 可减轻颅脑创伤以及避免破坏血脑屏障,改善患者中枢神经功能[15]。本研究干预后,PNF 组 BBS、FMA 评分均高于对照组,NIHSS 评分低于对照组,说明 PNF 可有效提高 SCT 患者平衡功能及下肢运动功能,改善神经功能。

综上,PNF 应用于 SCT 患者,有助于改善其神经功能、平衡功能及下肢运动功能,提高术后平衡能力,促进其术后康复。

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·临床研究·

肩关节镜下张力带缝合对肱骨大结节骨折患者关节功能及美观度的影响

雷德会[1],张 帆[2],张晓玲[1] (1.攀枝花市中西医结合医院足踝肩肘科,四川 攀枝花 617000;2.攀枝花市中西医结合医院肩肘外科,四川 攀枝花 617000)

[摘 要] **目的** 研究肩关节镜下张力带缝合治疗肱骨大结节骨折对患者关节功能及美观度的影响。**方法** 选择我院收治的肱骨大结节骨折患者84例作为研究对象,按照随机数字表法均分为2组,每组42例,对照组患者采用肩关节镜下缝线缝合治疗,观察组采用肩关节镜下张力带缝合治疗。采用Neer评分评价临床疗效,采用Constant-Murley肩关节功能评分评估关节功能,自制调查问卷评估患者美观满意度和临床美观满意度。比较2组患者并发症情况。**结果** 2组患者临床疗效优良率比较,差异无统计学意义($P>0.05$)。治疗前,2组患者疼痛、日常生活活动、主动活动范围、肌力评分及总分差异均无统计学意义($P>0.05$);治疗后6个月,2组患者疼痛、日常生活活动、主动活动范围、肌力评分及总分较治疗前显著升高,差异有统计学意义($P<0.05$),且观察组显著高于对照组,差异有统计学意义($P<0.05$)。观察组患者美观满意度和临床美观满意度显著高于对照组,差异有统计学意义($P<0.05$)。2组患者并发症发生率比较,差异无统计学意义($P>0.05$)。**结论** 肩关节镜下张力带缝合治疗肱骨大结节骨折效果显著,患者关节功能恢复更佳,且美观度高,是安全可靠的治疗方案。

[关键词] 肱骨大结节骨折;肩关节;关节镜;张力带;关节功能;美观度
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Effect of tension band suture under shoulder arthroscopy on joint function and aesthetics in patients with fracture of greater tuberosity of humerus

LEI De-hui[1],ZHANG Fan[2],ZHANG Xiao-ling[1] (1.Department of Foot,Ankle,Shoulder and Elbow,Panzhihua Hospital of Integrated Traditional Chinese and Western Medicine,Panzhihua Sichuan 617000,China;2.Department of Shoulder and Elbow Surgery,Panzhihua Hospital of Integrated Traditional Chinese and Western Medicine,Panzhihua Sichuan 617000,China)

Abstract: Objective To study the effect of tension band suture under shoulder arthroscopy on joint function and aesthetics for patients with fracture of greater tuberosity of humerus. **Methods** A total of 84 patients with fracture of greater tuberosity of humerus admitted to our hospital were selected as the research objects, and they were divided into two groups according to the random number table method, with 42 cases in each group. The patients in the control group were treated with shoulder arthroscopic sutures suture, and the patients in the observation group were treated with tension band suture under shoulder arthroscopy. The Neer score was used to evaluate the clinical efficacy, the Constant-Murley shoulder joint function score was used to evaluate the joint function, and the self-made questionnaire was used to evaluate the patient's aesthetic satisfaction and clinical aesthetic satisfaction. The complications between the two groups were compared. **Results** There was no statistically significant difference in the excellent and good rate of clinical efficacy between the two groups ($P>0.05$). There was no statistically significant difference in pain, activities of daily living, active range of activities, muscle strength scores or aggregate scores between the two groups before treatment ($P>0.05$). After 6 months of treatment, the pain, activities of daily living, active range of activities,

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[通信作者] 张 帆,E-mail:190620378@qq.com

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