

重复经颅磁刺激治疗神经病理性疼痛一例

杨从敏 金荣疆 李柄佑 郑重 白新刚 郭鸿

【关键词】 神经痛; 经颅磁刺激; 病例报告

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Repetitive transcranial magnetic stimulation in the treatment of neuropathic pain: one case report

YANG Cong-min¹, JIN Rong-jiang¹, LI Bing-you¹, ZHENG Zhong², BAI Xin-gang¹, GUO Hong¹

¹Teaching and Research Section of Rehabilitation, Acupuncture and Massage College, Chengdu University of TCM, Chengdu 610075, Sichuan, China

²Sleep Medical Center, West China Hospital, Sichuan University, Chengdu 610041, Sichuan, China

Corresponding author: ZHENG Zhong (Email: zhengzhong1963@163.com)

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患者 男性, 56 岁, 主因双侧足跟疼痛 20 余年, 左下肢疼痛、冰冷感 6 年, 于 2014 年 7 月 1 日就诊。体格检查: 生命体征平稳, 内科系统检查未见明显异常。神经系统检查神志清楚, 言语模糊, 烦躁, 定向力准确; 双侧瞳孔等大、等圆, 直径约 2 mm, 对光反射灵敏, 眼球运动充分, 双眼闭目有力; 伸舌稍右偏; 四肢肌力 5 级、肌张力正常; 双上肢腱反射对称引出, 双下肢减退, 双手和双上肢前 1/2 痛觉减退, 双足和双小腿痛觉过敏, 双大腿痛觉减退; 双下肢 Babinski 征阳性、右下肢 Chaddock 征阳性, 脑膜刺激征阴性, 双侧指鼻试验和跟-膝-胫试验欠稳准, 步态不稳, 动作僵硬, Romberg 征阳性。实验室检查未见明显异常。头部 MRI 显示, 颅内多发梗死灶, 脑萎缩, 以小脑明显(图 1)。肌电图显示四肢周围神经运动传导速度为 30~40 m/s (≥ 51 m/s), 提示周围神经损伤; 上肢体感诱发电位(SEP)显示, 右侧本体觉中枢段传导时间约 9.50 ms (≤ 8.20 ms^[1]), 提示中枢神经系统损害。数字评价量表(NRS)评分 9 分, 汉密尔顿抑郁量表 24 项(HAMD-24)评分 25 分。

既往史、个人史及家族史 患者 10 年前诊断为

小脑萎缩, 高血压; 2 年半前发现尿道狭窄, 予手术治疗; 2 年前发现左心房黏液瘤, 予手术治疗; 1 年半前诊断为糖尿病。个人史和家族史均无特殊。

诊断与治疗过程 临床诊断为神经病理性疼痛。由于患者自述胃肠功能较差, 拒绝口服药物治疗, 予重复经颅磁刺激(rTMS)治疗。采用英国 Magstim 公司生产的 Magstim Rapid2 重复经颅磁刺激仪。初次治疗时确定运动阈值(MT), 定位前额叶背外侧皮质(DLPFC)^[2]。以“8”字线圈置于患者一侧运动 1 区(M1 区), 通过磁刺激仪机电放大器于对侧处于静息态的拇短展肌记录运动诱发电位(MEP), 调节磁刺激量, 使 10 次磁刺激中至少有 5 次运动诱发电位波幅 $> 50 \mu\text{V}$, 即为运动阈值; 引出运动诱发电位的 M1 区前移 4~5 cm 即为前额叶背外侧皮质。重复经颅磁刺激采用 90% 运动阈值刺激量, 刺激模式为: 1 Hz 低频刺激右侧前额叶背外侧皮质、20 Hz 高频刺激左侧前额叶背外侧皮质, 双侧各刺激 650 次脉冲, 1 次/d, 连续治疗 5 d、暂停 2 d, 共治疗 15 d。治疗后患者自诉全身剧烈疼痛明显缓解。NRS 评分 3 分, HAMD-24 评分 10 分。治疗结束后随访 1 个月无复发。3 个月后随访时, 自诉双侧足跟隐痛, 持续存在, 可忍受, 偶影响睡眠, 日常生活尚可。NRS 评分 4 分, HAMD-24 评分 18 分。

讨 论

研究显示, 神经病理性疼痛是一种在中枢或周围神经系统紊乱或原发性损伤后持续存在的慢性

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作者单位: 610075 成都中医药大学针灸推拿学院康复教研室(杨从敏, 金荣疆, 李柄佑, 白新刚, 郭鸿); 610041 成都, 四川大学华西医院睡眠医学中心(郑重)

通讯作者: 郑重 (Email: zhengzhong1963@163.com)

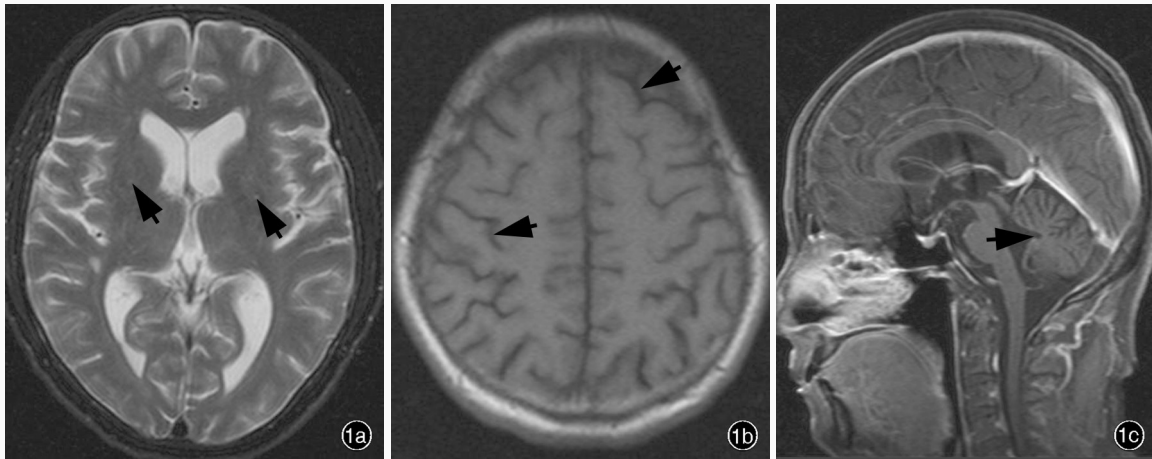


图 1 头部 MRI 检查所见 1a 横断面 T₂WI 显示基底节区多发性高信号(箭头所示),提示多发性脑梗死灶 1b 横断面 T₁WI 显示脑沟加深(箭头所示) 1c 矢状位 T₁WI 显示小脑脑沟增宽,提示小脑萎缩(箭头所示)

Figure 1 Head MRI findings. Axial T₂WI showed multiple high-intensity signals in basal ganglia, suggesting multiple infarcts (arrows indicate, Panel 1a). Axial T₁WI showed deepened sulci (arrows indicate, Panel 1b). Sagittal T₁WI showed widened sulci of cerebellum, suggesting cerebellar atrophy (arrow indicates, Panel 1c).

疼痛综合征,中枢敏化是其关键环节^[3],导致痛觉兴奋性神经元活性增加、抑制性神经元活性降低,从而产生痛觉过敏甚至超敏,痛觉的负性情感反应增强,导致认知功能障碍,出现自残和自杀现象^[4],主要表现为丘脑、前扣带回和前额叶激活,证实与情感反应和认知功能相关的脑区在神经病理性疼痛中发挥主要作用^[5-9]。同时,有研究显示,存在抑郁症状病史者更易发生神经病理性疼痛,加重不愉快的情感反应,进一步加剧疼痛程度,最终形成恶性循环^[10-12]。该例患者双足跟反复疼痛 20 余年,予各种治疗均未见明显疗效,严重影响日常生活,经心电图和体感诱发电位检查提示周围和中枢神经系统损害,符合神经病理性疼痛诊断标准^[13],根据 NRS 量表评定为重度疼痛, HAMD-24 量表评定为中度抑郁,提示患者疼痛已严重影响情绪和认知,且负性情绪越重、痛感知越敏锐、痛觉认知越差。因此,根据李焰生^[14]对《神经病理性疼痛诊治专家共识》的解读,社会心理因素在神经病理性疼痛的发展进程及诊断与治疗过程中占重要地位,镇痛药联合抗抑郁药治疗是目前临床治疗的主要途径。

重复经颅磁刺激通过置于头皮的线圈,引起局部电磁场改变,快速激活神经元,易化或抑制大脑皮质兴奋性,调节神经功能,从而达到治疗目的。一般而言,低频(≤ 1 Hz)磁刺激起抑制作用,高频($\geq 5 \sim 20$ Hz)磁刺激起兴奋作用。迄今为止,关于重复经颅磁刺激治疗神经病理性疼痛的报道较多,

但均集中于 M1 区的直接镇痛作用^[15-19],存在治疗有效率、远期疗效不确定的缺点。临床研究显示,高频重复经颅磁刺激作用于左侧前额叶背外侧皮质联合低频重复经颅磁刺激作用于右侧前额叶背外侧皮质是治疗重度抑郁安全、有效的方法^[20-22]。因此,该例患者采用低频刺激右侧前额叶背外侧皮质以降低其兴奋性,并可能通过调节痛觉传导系统而发挥快速镇痛作用;采用高频刺激左侧前额叶背外侧皮质以改善抑郁症状,提高认知功能,阻断恶性循环,从而发挥间接镇痛作用,使疼痛和抑郁症状均得到有效缓解,然而,随访 3 个月时,上述症状复发, NRS 和 HAMD-24 评分均增加,推测重复经颅磁刺激的疗效可能是及时但短暂的。

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