

临床论著

脊髓纵裂手术前后胫后神经体感诱发电位分析

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摘要 20 例脊髓纵裂患者手术前后进行了两下肢胫后神经皮层体感诱发电位(CSEP)检查,并选择了 20 例正常人作为对照组,结果发现手术组与对照组 CSEP 有显著性差异,手术治疗后患者 CSEP 的 P₄₀峰潜伏期及波幅明显改善,患者两下肢间的 CSEP 亦有明显差异。表明 CSEP 是一敏感、客观、可靠的诊断指标,可用来判断神经损害的程度,评价手术疗效。文中并讨论了神经缺陷的机理。

关键词 脊髓纵裂 体感诱发电位

脊髓纵裂是一少见的先天性发育异常,脊髓或马尾被骨嵴分为两半,骨嵴抑制了脊柱生长期脊髓的上升,牵拉脊髓产生神经缺陷,临床表现为下肢软弱、无力、发育不良、感觉减退或消失,反射异常、各种足畸形及腰背部皮肤异常等^[1,2]。以前观察其神经功能状态仅依靠临床体格检查,本文通过测试胫后神经皮层体感诱发电位,旨在客观地评价患者的神经功能及纵裂骨嵴切除术后胫后神经体感诱发电位变化。

资料与方法

1. 患者的收集:我科自 1978~1993 年 2 月共收治脊髓纵裂 39 例,其中 20 例手术治疗前后进行了体感诱发电位检查,男 5 例,女 15 例,年龄 4~15 岁,平均 10.6 岁,随访 2 月~6 年,

临床上多数有神经症状。同时选择了 20 例同年龄及身高的正常人为对照组。所有患者无其它神经系统疾患。

2. 胫后神经皮层体感诱发电位(CSEP):采用 Neuromatic 2000C 型诱发电位仪,室温保持 20~22℃。受检者应尽量保持全身肌肉放松,闭目禁止与他人交谈,鼓励睡眠。每例分别刺激两侧胫后神经,记录 CSEP,电位常规检测两次,取平均值。

结 果

1. 20 例患者,35 根胫后神经 CSEP P₄₀峰潜伏期比对照组明显延长($P < 0.001$);5 根胫后神经 CSEP 波形消失,与对照组间有显著差异($P < 0.025$)(见表 1)。

表 1 对照组与手术组胫后神经 CSEP P₄₀峰潜伏期变化

对 照 组		手 术 组		P 值 (t, x ² 检验)
根	P ₄₀ 峰潜伏期	根	P ₄₀ 峰潜伏期	
40	33.77±6.22	35	39.76±11.10	<0.001
40	波形存在	5	波形消失	<0.025

2. 手术组 16 例患者(32 根胫后神经), CSEP P₄₀峰潜伏期手术后明显缩短($P < 0.001$),P₄₀波幅明显增加($P < 0.001$);4 例患者,

5 根胫后神经 CSEP 波形手术前消失而手术后恢复($P < 0.01$)(见表 2、3)。

表 2 手术组 40 根胫后神经 CSEP P₄₀峰潜伏期变化

例	根	术前	术后	术前-术后	P 值(t, x ²)
16	32	40.28±11.09	36.09±6.28	4.18±8.59	<0.001
4	5	波形消失	波形恢复		<0.01

表 3 手术组 40 根胫后神经 CSEP P₄₀波幅变化

例	根	术前	术后	术前—术后	P(t, x ² 检验)
16	32	1.34±1.16	1.82±1.35	-0.45±0.72	<0.001
4	5	波形消失	波形恢复		<0.01

3. 手术组 P₄₀波形存在的 16 例患者, 手术前神经功能明显异常侧下肢胫后神经 CSEP P₄₀峰潜伏期达 43.73±9.04ms, 比对侧下肢的 36.83±8.64 明显延长, 两者之差为 6.90±6.80(P<0.001); 4 例患者中, 3 例单侧下肢胫后神经 CSEP 波形消失, 1 例双侧波形消失。

讨 论

脊髓纵裂神经功能状态的判断, 以往临床医生多根据体格检查并依赖病人的合作而作出, 难免带有一定的主观性, 且轻重程度较难掌握, 缺乏客观性数据。体感诱发电位技术可不受主观等因素的影响, 并能应用计算机技术进行定量测量及分析。体感诱发电位异常表现在潜伏期, 波幅及波形变化^[3]。为了增强选择性, 减少误差, 本文选择了具有较高可靠性及重复性的潜伏期及波幅为观察指标。需要指出的是波幅虽然在正常人中变异较大, 但病人手术前后自身对照尚可排除其影响。众所周知, 小孩或老年人神经传导速度较慢, 为了不把固有的正常潜伏期列为异常, 也要考虑到别的影响因素如年龄、温度、身高及检查神经的类型^[4]。我们在室温 20~22℃ 下进行胫后神经 CSEP 检查, 并选择了同年龄及身高相接近的 20 例正常人为对照组, 结果手术组患者胫后神经 CSEP 明显异常, 其中 5 根胫后神经 CSEP 波形消失, 可能系神经损害严重, 导致传导不完全或完全阻滞。有人认为脊髓纵裂骨嵴固定脊髓在较低的解剖位置, 以致脊柱生长期间脊髓的正常上升和移动减弱, 结果牵拉脊髓产生神经缺陷^[5]。脊髓受牵拉后血液供应减少, 脊髓神经原线粒体的氧代谢障碍, 从而引起电生理学异常, 产生神经缺陷^[6, 7]。短潜伏期 CSEP 由对局部缺血敏感的粗有髓神经纤维传递^[4]。我们发现手术切除纵裂骨嵴后两下肢胫后神经 CSEP P₄₀峰潜伏期

和波幅明显改善, 考虑缺血是其病损的主要机理。而 Guthkelch^[2]提出另一机理为单侧脊髓发育异常。本组 20 例患者, 手术发现 10 例骨嵴两侧脊髓粗细不等, 有发育异常存在。16 例患者手术前两下肢胫后神经 P₄₀峰潜伏期有明显差异; 3 例单下肢 CSEP 波形消失, 1 例双下肢 CSEP 波形消失。因此, 我们认为神经缺陷两种因素都起作用。手术后改善可能归功于牵拉的直接解除及儿童畸变神经组织可能的重新发育分布的代偿, 使有功能可利用的粗有髓体感神经纤维数目增加, 传导阻滞向正常的转化及可能改善了神经原的血液供应即氧代谢^[4]。脊髓纵裂的体感诱发电位检查是一评价神经功能状态的先进、客观及敏感指标, 可用来确定神经缺陷的程度, 评价手术治疗效果, 指导手术治疗。(本文承蒙王尚昆教授指导特此致谢)

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Abstract of Original Articles

Analysis on pre- and postoperative somatosensory evoked potentials of diastematomyelia

Cheng Bin(程斌) Wang Kun-zheng(王坤正) Chen Jun-chang(陈君长) et al

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Cortical somatosensory evoked potential (CSEP) examination stimulated from posterior tibial nerve were performed on 20 patients suffering diastematomyelia pre- and postoperatively, selecting 20 normal subjects as control group in the meanwhile. We found that CSEP changes were statistically significant between patients and normal subjects ($P < 0.05$). Postoperative P_{40} peak latencies and amplitudes changed significantly in patients and CSEP had apparent difference in bilateral lower extremities preoperatively. It showed that CSEP is a sensitive, reliable objective diagnostic parameter that may be used to establish the severity of neural damage and evaluate the operative efficacy. The mechanism of neural defect is discussed in the article.

Key words Diastematomyelia Somatosensory evoked potential

(Original article on page 5)

Clinico-pathological study on juvenile spontaneous scoliosis

Chen Zhong-qi(陈中奇) Yang Guang(杨广) Kong Xia(孔霞) et al

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Thirty cases of spontaneous scoliosis were observed under light and ultra microscopic and immuno-histochemical examinations. The results indicated that the fascia, muscle of main depressive area of the trunk had adhesive degenerative phenomena, the pathological characteristics are infection, muscular fibrotic degeneration, connective tissue proliferation, adhesion and scar formation. It offers an objective foundation for comprehensive treatment.

Key words Scoliosis Ultrstructure Immuno-chemical histology

(Original article on page 7)

Influence of immuno-activity of cellular oxidation metabolic function of the external used Chinese herb during wound healing—Study on the mechanism of Wei Nong Zhang Rou(3)

Li Xiu-lan(李秀兰) Ji Gen-yuan(纪根媛) Zhao Feng-yi(赵凤仪) et al

Tianjin Institute of Orthopaedics (300211)

Oxidation metabolic function of neutrophils, lymphocytes, exudate cells of wound surface and the influence of wound surface exudation on normal neutrophils and lymphocytes were detected by means of chemiluminescence-Cl during application of Chinese herbs on wound healing. The results of experiments indicated that external applying of Chinese herbs can activate neutrophils and lymphocytes to produce-Cl. The difference is very evident ($P < 0.01$) as compared with control group. During wound healing neutrophils were activated at first then lymphocytes till healing stage. The exudation cells of the wound surface bears rather strong-Cl activity. Those of the ex-

ternal used Chinese herb group is superior than control group ($P < 0.01$). Exudation of external applied Chinese herb group can serve as activator of neutrophils and lymphocytes, it bears similar action as zymosan and canavaline A. There is very weak action in control group.

Key words Trauma and injury Traditional Chinese medicinal therapy
Immunology, cellular Wei Nong Zhang Rou

(Original article on page 9)

Biomechanical principal and clinical application of the novel annular external fixator

Huang Xiao-zhou(黄孝舟) Wang Yi-jin(王以进) Fan bin(凡道斌) et al
Chaohu District Orthopaedic Hospital, Anhui Province(238000)

Since June of 1986, 184 cases including 146 cases of fresh fracture; 16 cases, chronic fracture; 4, non-union; 13, elongation of bone; 5, genu varum malformation were treated by self-made novel annular external fixator with satisfactory therapeutic effect. Various modes of fixation with this fixator were examined with biomechanics, it shows that various number of pins, types, directions and locations were related with stability of the fixation.

Key words Fracture fixator, external Biomechanics

(Original article on page 12)

Analysis of remote therapeutic effect on surgical treatment of prolapse of lumbar intervertebral disc

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From 1975 to 1994, 500 cases of prolapse of lumbar intervertebral disc were treated with fenestration operation of vertebral lamina and ligamentum flavum and total laminectomy two forms of operation. The results indicated that there is no difference between two forms of operation in the releasing of sciatic neuralgia. But the former bears advantage of minor injury, it can not only remove the prolapsed nucleus, removal of complex lesion around the disc and recovery of nervous function but also can maintain the stability of the spine. The rate of excellency and good is 98%.

Key words Prolapse of lumbar intervertebral disc Surgery, operation

(Original article on page 17)

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