

剂量(原药液)可与正红花油媲美。本实验已证实它对软组织损伤的良好治疗作用。

(致谢:病理教研室李观林老师等协助实验)

参 考 文 献

1. 朱显华,等.魏氏消瘀膏治疗软组织挫伤的实验研

究.中国中医骨伤科杂志 1989, 5(2):11

2. 湖南医学院第二附属医院检验科.临床生化检验,湖南科学技术出版社,1983,349.

3. 王绪明,等.挫伤的造模方法及相关指标观察.中医骨伤科杂志 1987; 3(4):14.

调节固定器与膝功能架的生物力学测试

天津医院骨科研究所(300211)

师宜健 韩慧 邢晖 王志彬 朱式仪 顾云伍

摘要 天津医院创伤骨科设计的调节固定器与膝功能架治疗股骨髁间骨折,取得了较好的临床效果。本文报导对该固定器进行临床生物学测试分析,结果表明:外内侧支撑杆的牵引力分别为5.5kg和6.8kg,压垫下压力约为4.5kg,动态测试结果表明:所测试的各部分力值均有约10~20%的波动,符合骨折固定的弹性理论,即相对固定有利于骨折的愈合。

关键词 骨折固定器 股骨髁间骨折 生物力学 实验研究

天津医院创伤骨科设计的调节固定器与膝功能架治疗股骨髁间骨折,取得了较好的临床效果。本文对这一装置进行生物力学测试分析。

材料与方 法

1. 调节固定器的结构:以调节固定器为主体,配合膝功能架和小夹板固定三部分构成组合装置。调节固定器由纵向牵引杆、扣压连接桥、压垫、特制髁部加压螺纹和骨圆针组成。膝功能架由坐架、伸屈活动托板、牵引绳杆等组成。

2. 测试方法:

(1) 测力传感器:①支撑杆传感器:为测试支撑杆的牵引力值,设计一方框式压力传感器安装于支撑杆内。为防止弯矩的影响,通过在传感器和支撑杆接触部位,装一钢珠而形成的万向头结构来克服。②板式传感器:设计制做板式传感器用于测试压垫的压力值。③在扣压连接桥的一侧,将上下两面贴应变片,串联组成全桥电路,可测得扣压连接桥的压力值。

(2) 实验仪器:国产YD-15型动态电阻应变仪和SC16型光线示波器, YJ-16型静态电阻应变仪。

(3) 测试步骤:使用带有传感器的调节固

定器,对一例股骨髁间骨折的成年男性进行临床生物力学实测。首先在复位过程中测得复位力,在治疗期间每周测试一次,至下地练功前。内容包括复位和功能活动下的牵引力和股四头肌收缩力的变化规律。

测试结果

表 1 术中静态测试值 单位(g)

	外侧杆	内侧杆	连接桥	压垫
复位	5563	6770	1478	4447

表 2 膝关节功能锻炼测试值 单位(g)

	外侧杆	内侧杆	连接桥	压垫
第一周	1541	1880	1016	497
第二周	2509	2720	1627	769
第三周	4930	5278	1836	1258
第四周	6783	7250	1587	1780

表 3 股四头肌收缩测试值 单位(g)

	外侧杆	内侧杆	连接桥	压垫
第一周	909	912	1147	227
第二周	1437	1678	1035	465
第三周	2394	2574	1106	874
第四周	3772	4050	1214	1227

结果分析

股骨作为一个承受压弯为主的结构,在其四个不同侧面上呈现不同的应力分布。从而在骨的发育中以不同的几何形式及密度分布,充分适应其生理应力的要求,所以要使断骨愈合后完全恢复肢体正常功能,就要适应其不同的生理应力^[1]。使用调节固定器与膝功能架配合治疗股骨髁间骨折,进行生理性的功能锻炼,对于骨痂的改造和膝关节的功能恢复是方便而简易的方法。

内外侧支撑杆的牵引力分别为5.56kg和6.77kg,此牵引力达到了保守治疗方法,如胫骨结节牵引、髁上冰钳牵引等治疗方法所需有效牵引力的要求,并可满足复位后维持牵引力。通过内外侧支撑杆的调节,可矫正股骨下端与骨折近端的重叠移位和内外翻成角,并可同时矫正股骨髁间的纵向移位,由于内收肌力量较强,可适当将内侧杆牵引力大于外侧杆牵引力。

术中在电视X线机下调节微调器和髁部加压螺钉,矫正髓间侧向分离并安装扣压连接桥。在调节侧方压力,使侧方固定牢靠测定扣压连接桥的固定力为1.48kg。

压垫下压力约为4.45kg,通过压垫作用可对抗因骨折远端肢体重量作用,而在骨折断端间所形成的剪力。同时正是由于压垫作用力的存在,才使双针二维空间固定器形成三维空间

固定器。

由于支架是一种不超关节的固定装置,为患者提供了早期进行功能锻炼的方便条件。在牵引架的有效固定下,遵循中西医结合治疗骨折“筋骨并重”“动静结合”的原理,可以鼓励患者进行股四头肌收缩和膝关节伸直、屈曲的功能活动。这种早期功能锻炼对于肌力和膝关节的功能恢复是极为有益的^[2]。

在复位后,由于血肿机化,骨折断端吸收和周围软组织在外固定载荷下,等张收缩等生理原因影响下,固定的前两周力值变化不大,后两周变化幅度增大并维持稳定。

在患者练功时进行动态测试发现,此固定器所测试的几部分力值均有约10~20%的波动,这种交变应力刺激符合骨折固定的弹性理论观点^[3]:相对固定有利于骨折愈合,功能锻炼时压垫下压力变化幅度较大,而且四周测试结果显示,压垫下的压力变化斜率较其它三条曲线均大,这种现象说明,压垫效应对该功能支架的稳定性起着重要作用。

参 考 文 献

1. 尚天裕,等.肌肉内在动力对中西医结合治疗股骨骨折的机理探讨.中医杂志1982;23(6):65.
2. Lindahl D. and Morin A. The mechanics of extension of the Knee-joint. Acta Orthop. Scand. 38:226 1967.
3. 顾志华,高瑞亭主编:骨伤生物力学基础,天津大学出版社1990.

书 讯

1. 《小针刀疗法》,朱汉章著。本书论述了小针刀治疗慢性软组织损伤和骨折畸形愈合等疾病。单价:每本5.80元(包括邮寄费)。

2. 《腰痛的最新疗法》,宋一同编著。本书收集治疗腰椎骨质增生、椎间盘突出症、腰肌劳损等各种腰痛病症的经验和方法。单价:3.50元(包括邮寄费)。

3. 《高等教育自学考试中医专业本科必考课程自学大纲》合订本,高教自考委员会编著。单价:3.70元(包括邮寄费)。

欲购者,请寄款至:100700 北京市东直门内海运仓3号《中国骨伤》编辑部钟方收,款到即寄书。汇款时请注明所购书名及收件人详细地址、邮编和姓名。

Abstracts of Original Articles

Experimental study on prolapsed lumbar intervertebral disc treated by Ban Ti manipulation

Zhang Xian-song(张显崧)et al

Guangzhou First Army University of Medical Science(510515)

Drew on the experience of Nachemson's method, and mimicing Ban Ti manipulation, the changes of nuclear pressure of the intact fresh cadaver were measured in motion. The results of experiment indicated that there were an increasing tendency of the internuclear pressure during the process of manipulation between L₃₋₄ and L₄₋₅, and a decreasing of the internuclear pressure between L_{5-S₁}. The author realized that the Ban Di manipulation couldn't restore the prolapsed nucleus, but it could probably change the relation between the position of the prolapsed nucleus and the compressed nerve root.

Key words Prolapse of lumbar intervertebral disc Manipulation of bone setting Biomechanics Experimental study

(Original article on page 5)

Experimental study on Shang Tong Yi Cha Ling in treating soft tissue injury

Jiang Meng-liang(蒋孟良)et al

Institute of Exploitation of Chinese Medicine, Hunan College of Traditional Chinese Medicine (410007)

In this article, observation was made on the animal experimental muscle injury, and proved that Shang Tong Yi Cha Ling bore the effect of alleviation of the degree of muscular necrosis, decreasing the scar. And it explored the mechanism of treating trauma via semi-quantitative analysis of the pathology and plasma fibrinogen contents and pH value of the traumatic muscles.

Key words Shang Tong Yi Cha Ling Soft tissue injury Pharmacology Experimental study

(Original article on page 7)

Biomechanical tests on the adjustment fixator and knee joint functional frame

Shi Yi-jian(师宜健)et al

Institute of Orthopaedics, Tianjin Hospital (300211)

Better clinical results had been obtained with the adjustment fixator and knee joint functional frame in treating intercondylar fracture of the femur designed by

the Department of Traumatology, Tianjin Hospital. In this Paper, clinical biomechanical measurements were made, the results indicated that the traction force of the external and internal supporter were 5.5kg and 6.8kg respectively, the pressure force underneath the pressing cushion was about 4.5kg. Results of the motive measurement indicated that the pressure value of all parts bore a fluctuation around 10-20%. It accorded with the theory of elastic fixation of fracture treatment.

Key words Fracture fixator Biomechanics Experimental study

(Original article on page 9)

Prolapsed lumbar intervertebral disc treated with traditional Chinese medicine based on syndrome-differentiation

Wu Yun-ding (吴云定), Shi Wei-zhi (施维智)

Xiang Shan Hospital of traditional Chinese medicine, Shanghai (200025)

In this article, the author applied traditional Chinese medicine with syndrome-differentiation, such as Chinese medication orally as well as external application, combined with pelvic traction in treating 281 cases of prolapsed lumbar intervertebral disc. The results were cured, 96 cases; markedly effective, 178 cases; ineffective, 7 cases; with a total effective rate of 97.4%.

Key words Prolapse of lumbar intervertebral disc traditional Chinese medicinal therapy treated by syndrome-differentiation

(Original article on page 11)

Protrusion of lumbar intervertebral disc and tumor of cauda equina

Jiang wei-da(江伟达) Zheng Xiao-wen(郑效文)

Affiliated Yueyang Hospital, Shanghai College of Traditional Chinese Medicine (200031)

There are plenty of similarities among clinical manifestations between tumor of cauda equina and protrusion of lumbar intervertebral disc, so they are easily to be mixed. Through clinical analysis of 17 cases of surgical proved tumor of cauda equina, the author realizes that the ailment has an evident characteristics of waist and leg pain, negative in Laseque's sign, tenderness over the paravertebral space, less than half of them with parasthesia around the saddle area. positive CSF protein content qualitatively, elevation of the protein content quantitatively, a large cup-like defect in the myelography, early X-ray film showed flattening of the pedicle of vertebral arch, rarely there is broadening between the distance within these pedicles. CT scanning and MRI examination can't be relied on. Early operation is recommended.

Key words Tumor of cauda equina Protrusion of lumbar intervertebral disc Differential diagnosis Operative therapy

(Original article on page 28)