

## 实验研究

## 骨松 II 号对去卵巢兔骨代谢影响的骨计量学研究

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**摘要** 运用骨计量学观察了中药骨松 II 号对兔切除卵巢诱导的骨质疏松症实验模型的影响,并与尼尔雌醇进行对照。结果显示:骨松 II 号组与尼尔雌醇组在 BV/TV、OV/BV、OBI、dLs/BS 和 BFR(T) 等参数方面明显高于造模组和/或正常对照组,骨松 II 号组 OV/BV、OB% 以及 OBI 等参数较尼尔雌醇组明显升高。提示:骨松 II 号能增加成骨细胞数量,以产生较多骨质,使骨质疏松症模型兔的骨代谢恢复正常,达到防治骨质疏松症的目的,其作用一定程度上优于尼尔雌醇。

**主题词** 骨松 II 号 卵巢摘除 骨代谢 骨计量学

本实验运用骨计量学观察中药骨松 II 号对兔摘除卵巢(OVX)诱导的绝经后骨质疏松症实验模型的影响,并与尼尔雌醇进行对照,旨在观察骨松 II 号对绝经后骨质疏松症的疗效,并试图揭示其作用机理。

## 材料与与方法

1. 对象:21 只七月龄雌性新西兰白兔,平均重量为 3kg,随机分为 A、B、C、D 四组,A 组 6 只,为治疗组(OVX+骨松 II 号);C 组 5 只,为造模组(OVX)为正常对照组(SHAM);D 组为阳性对照组(OVX+尼尔雌醇)。

2. 造模方法:A、B、D 三组兔在戊巴比妥钠静脉麻醉下,摘除双侧卵巢。C 组作伪手术,单纯剖腹后立即关闭。

3. 饲养及给药途径:A 组给予骨松 II 号,将普通饲料与经加工浓缩的中药浸剂(骨松 II 号,主要药物组成为黄精、仙灵脾、牡蛎等)均匀混合,制成颗粒状饲料,其混合方法是按每只兔平均进食 400g 饲料计,药量相当于成人每公斤体重的 10 倍;B 组和 C 组则给予普通饲料;D 组给尼尔雌醇片(上海华联制药厂),每只每日 5mg。

4. 取材及不脱钙标本的制作:每只兔均于术后六月取材,取材前第 28 天和第 14 天先后两次肌注盐酸四环素 50mg/kg。取材时用静脉注射空气处死,均取左侧半骨盆,彻底清除附着于骨面的软组织后,于髌前上棘处横截髌骨翼,取约 0.5cm 厚髌骨横截骨块,立即放入 0.5% Villanueva 骨染色剂中染色 72 小时。然后顺序脱水脱脂:70% 乙醇 1 小时,95% 乙醇 1.0 小时,无水乙醇 1.5 小时,等量丙酮乙醇混合液 1.5 小时,丙酮 1.5 小时,二次。再将脱水脱脂后的骨块用浸透剂浸透

48 小时后,放入包埋剂,在负压 200mmHg 下抽吸 1 小时后,于恒温培养箱中,45℃ 24 小时,50℃ 24 小时,55℃ 24 小时,取出包埋块。于 Jung K 重型切片机切取 10 $\mu$ m 切片,置 30℃ 温水中展开,粘贴于载玻片上,干燥。为了解骨细胞的情况和显示骨组织的某些结构,部分切片用 1% 甲苯胺蓝复染 1 小时,染色前先将要包埋材料溶去,染色后用自来水冲去浮色,再用乙醇脱水<sup>[1]</sup>。干燥后用二甲苯透明,DPX 封固剂封固。

5. 骨形态计量学测定:于德国 Zeiss 公司 VIDAS 全自动图像分析系统上作骨形态计量学测定<sup>[2,3]</sup>,以一维之线、二维之面分别估测二维之面、三维之体,每张切片每个指标测 10 个视野。各测量值指标均以 t 检验作组间比较,另作 OBI、OB%、OBV 等有关成骨细胞参数与 BV/TV、MWT 等有关骨量诸参数间的相关性分析。

骨计量静力学参数的测定:(1)单位体积骨小梁骨量(BV/TV, %):视野中骨小梁面积占视野面积的百分比。(2)平均骨小梁宽度(Tb·Th,  $\mu$ m):每个视野测 10 个宽度,求平均值。(3)骨小梁面与体积比(BS/BV,  $\times 10^{-2} \mu\text{m}^2/\mu\text{m}^3$ ):表明单位骨小梁所占骨表面的多少。(4)平均骨壁厚宽(MWT,  $\mu$ m):粘合线到骨表面的平均距离,是完成一个骨再建周期新形成的骨量,测量时注意骨表面是否还残存类骨质,以确信该部位的骨再建已经完成。(5)相对类骨质量(OV/BV, %):视野中小梁类骨质面积与小梁面积的比值。(6)骨形成表面(OS/BS, %):类骨质面占骨小梁表面的百分比,有助于了解骨再建的活跃程度。(7)平均类骨质宽度(0·Th,  $\mu$ m):每视野测 10 个宽度,求其均值。(8)成骨细胞表面(OB, %):存有成熟的有活性的成骨细胞的骨表

面占总骨表面的百分比。(9)成骨细胞指数(OBI/ $\text{mm}^2$ ):单位视野面积成骨细胞的个数。(10)成骨细胞数(OB/10cm):每 10cm 骨面长度上成骨细胞的个数。(11)成骨细胞体积(OBV):成骨细胞形态各异,难以较为精确地测算其体积,故以视野下成骨细胞的平均面积作近似表示。

骨计量动力学参数的测定:

(1)四环素标记面(TeLS/BS, %):骨小梁四环素总标记面长度与骨小梁周长的比值。(2)四环素单标记面(sLS/BS, %):四环素单标记长度与骨小梁周长的比值。(3)四环素双标记面(dLS/BS, %):双标记长度与骨小梁周长的比值。(4)矿化沉积率(MAR, /day):四环素双标记线中点间的平均距离乘以  $\pi/4$ ,再除以两次标记所间隔的时间。(5)矿化延迟时间(MLT, day):平均

类骨质宽度与骨小梁矿化沉积率之比,说明从类骨质形成到矿化开始所间隔的时间。(6)组织水平的骨形成速率(BFR(T)):以 MAR 乘以相对骨形成面[ $(\text{dLS} + 1/2\text{sLS})/\text{BS}$  表示],即每天骨形成量。(7)基本多细胞单位(BMU):水平的骨形成速率[BFR(BMU)]/BFR(T)除以骨形成表面,表明类骨质覆盖的部位每天新形成的矿化骨体积。

(8)SIGMA(f):SIGMA 为完成一个骨重建周期所需的时间,而 SIGMA(f)是以一个骨重建周期中新形成的矿化骨体积与 BMU 水平的骨形成速率的比值表示,为骨形成相对的时间。

结 果

各项骨形态计量学参数测量值及统计学分析结果见表 1、表 2。

表 1 骨计量静力学参数测量结果和统计分析

	A(6 只)	B(5 只)	C(5 只)	D(5 只)
1 BV·TV	18.076 ± 3.675 <sup>c</sup>	15.116 ± 4.125 <sup>ac*</sup>	20.290 ± 2.983 <sup>c</sup>	21.430 ± 3.150 <sup>c</sup>
2 Tb·Th	123.884 ± 19.190 <sup>c</sup>	105.992 ± 20.363 <sup>a</sup>	117.710 ± 14.845	124.650 ± 13.670
3 BS/BV	2.133 ± 0.317	2.488 ± 0.441	2.330 ± 0.145	2.740 ± 0.170
4 MWT	39.984 ± 7.345	31.888 ± 5.965	33.112 ± 5.764	35.852 ± 7.884
5 OV/BV	11.272 ± 3.556 <sup>ac*</sup>	9.992 ± 2.578	6.624 ± 2.210 <sup>a</sup>	7.510 ± 3.460 <sup>a</sup>
6 OS/BS	32.640 ± 13.942 <sup>c</sup>	25.783 ± 7.978	18.942 ± 7.220 <sup>a</sup>	24.350 ± 4.730
7 O·Th	15.942 ± 4.728	14.934 ± 2.222	14.860 ± 1.536	15.470 ± 3.540
8 OB%	8.170 ± 0.756 <sup>dfg</sup>	4.380 ± 0.325 <sup>b</sup>	3.105 ± 0.197 <sup>b</sup>	5.540 ± 0.283 <sup>a</sup>
9 OBI/mm <sup>2</sup>	295.140 ± 78.343 <sup>dge</sup>	147.110 ± 45.932 <sup>bg</sup>	110.790 ± 39.587 <sup>bh</sup>	192.200 ± 69.473 <sup>bdf</sup>
10OB/10cm	2290.451 ± 502.455 <sup>dgh</sup>	1122.302 ± 278.143 <sup>b</sup>	807.411 ± 156.763 <sup>b</sup>	1401.743 ± 289.432 <sup>b</sup>
11 OBV	12.030 ± 5.350	11.470 ± 4.320	12.010 ± 5.220	11.200 ± 3.970

上标字母表示:

a, p < 0.05 与 A 组对照比较; c, p < 0.05 与 B 组对照比较; e, p < 0.05 与 C 组对照比较; g, p < 0.05 与 D 组对照比较

b, p < 0.01 与 A 组对照比较; d, p < 0.01 与 B 组对照比较; f, p < 0.01 与 C 组对照比较; h, p < 0.01 与 D 组对照比较

表 2 骨计量动力学参数测量结果和统计学分析

	A(6 只)	B(5 只)	C(5 只)	D(5 只)
1 TeLS/BS	80.320 ± 10.375 <sup>c</sup>	71.230 ± 13.860 <sup>c</sup>	57.020 ± 18.261 <sup>ac</sup>	67.445 ± 16.680
2 sLS/BS	28.657 ± 8.535	42.085 ± 8.964	33.704 ± 13.432	23.095 ± 12.301
3 dLS/BS	51.763 ± 8.915 <sup>dl</sup>	29.145 ± 6.603 <sup>bh</sup>	27.316 ± 8.884 <sup>bh</sup>	44.350 ± 8.884 <sup>dl</sup>
4 MAR	1.698 ± 0.377	1.574 ± 0.350	1.555 ± 0.428	1.685 ± 0.565
5 MLT	9.914 ± 0.854	9.179 ± 1.465	8.398 ± 3.463	9.181 ± 3.695
6 BFR(T)	1.010 ± 0.230 <sup>c</sup>	0.801 ± 0.273	0.668 ± 0.333 <sup>ac*</sup>	0.942 ± 0.464 <sup>c</sup>
7 BFR(BMU)	3.250 ± 0.430	3.001 ± 0.230	3.120 ± 0.370	3.760 ± 0.29
8 SIGMA(f)	13.136 ± 4.234 <sup>a</sup>	12.719 ± 5.983	11.528 ± 3.784	9.127 ± 2.103 <sup>a</sup>

上标字母表示同表 1

造模组(OVX)较正常对照组(SHAM)BV/TV 显著下降( $P < 0.05$ ),MWT 呈下降趋势(无统计学意义),OV/BV、OS/BS、dLs、OB%、OBI 等则呈不显著的上升趋势( $P < 0.05$ )。

中药治疗组(骨松Ⅱ号)在静力学参数方面,BV/TV 较造模组 OVX 显著增加( $P < 0.05$ ),OV/BV 较正常对照组(SHAM)和阳性对照组(尼尔雌醇)明显升高( $P < 0.05$ ),OBI 较其余三组显著升高(较 B、C 组, $P < 0.01$ ;较 D 组, $P < 0.05$ );OBI 及 OB/10cm 均较其余三组显著增加( $P < 0.01$ );在动力学参数方面,TeLs/BS 较正常对照组都有所增加表明其成骨活动可能较正常对照组(SHAM)显著增高( $P < 0.05$ ),dLs/BS、BFR(T)较正常对照组明显升高( $P < 0.05$ )。

阳性对照组(尼尔雌醇)在静力学参数方面,BV/TV、以及 OB% 较造模组(OVX)显著增加( $P < 0.05$ ),OBI 较治疗组明显下降( $P < 0.01$ ),而较造模组(SHAM)和正常对照组(OVX)显著升高(分别是  $P < 0.05$  和  $P < 0.01$ );在动力学参数方面,dLs/BS 较造模组(OVX)及正常对照组(SHAM)明显升高( $P < 0.01$ ),BFR(T)较正常对照组(SHAM)明显升高( $P < 0.05$ ),SIGMA(f)较中药治疗组(骨松Ⅱ号)明显减小( $P < 0.05$ )。

有关成骨细胞诸参数与骨量诸参数间,未发现有明显相关性。

## 讨 论

绝经后骨质疏松症是最常见的老年性疾病之一,其与绝经后性激素水平的变化存在显著的相关性,雌激素水平的明显下降是绝经后骨质疏松症的主要病因。目前一般都以摘除卵巢的大鼠作为绝经后骨质疏松症的实验动物模型。本实验由于实验阶段正值鼠病流行,故改用家兔。从实验结果分析,本实验造模是成功的。一方面,造模组在一些代表成骨活动的参数(如 OV/BV、OS/BS、dLs、OB%、OBI 等)上,较正常对照组活跃;另一方面,其 BV/TV 较正常对照组明显下降,MWT 也呈下降趋势,显示:最终骨形成量低于正常对照组,也即在成骨活动较为活跃的情况下,骨量仍有所下降,由此可以推测破骨活动必然也有所增加,而且较成骨活动更活跃。另外,在切片观察过程中发现造模组切片有破骨细胞 Howship 陷窝、切割锥等结构存在,而在另外三组切片中很少见到,可以推测造模组的骨量减少主要与成骨细胞和破骨细胞的生物行为(增生、分化或活性)变化有关。这与该症的大多数实验<sup>[1]</sup>、临床<sup>[5]</sup>研究是相吻合的,体现了该症的变化规律。

补肾中药对骨质疏松症的治疗是基于“肾主骨”的

理论。随着科学技术的发展对中医学所指“肾”的物质基础的研究日益深入,已有足够的证据说明,中医的“肾”与人体内分泌系统、免疫系统、微量元素等有密切的关系,“肾主骨”主要表现在肾的羟化酶系统、肾小管上皮细胞的浓缩功能、垂体分泌的生长激素、甲状旁腺激素以及降钙素等对骨的调节功能。有研究显示,肾虚证发病率随年龄的增长而增高,而肾虚患者的骨矿含量(BMC)较非肾虚者低<sup>[6]</sup>。补肾中药作用于下丘脑—垂体—性腺轴,可促进神经内分泌细胞的分泌功能,提高动物下丘脑对激素反馈以及性腺对促性腺激素的反应性<sup>[7]</sup>,调整机体中许多器官的异常变化,使之趋于正常,还延缓卵巢、子宫、睾丸等性腺组织的衰老趋势,提高老年人性激素水平,预防骨骼的退行性变化。因此临床大多运用被肾中药治疗骨质疏松症,如黔岭囊制剂<sup>[6]</sup>、骨愈灵胶囊<sup>[9]</sup>等,都显示了较好的疗效。它们最大的优点是调节整个机体的异常变化,没有顾此失彼之虞,毒副作用较小,可长期服用。骨松Ⅱ号胶囊就是基于这样的理论依据和动物实验研究成果研制的防治绝经后骨质疏松症的中药制剂。本方取义于魏指薪老中医“补养先后天”的理论,意在补肾健脾。方中仙灵脾补肾壮阳,旨在“补养先天”,其早已被证实为预防骨质疏松症的良药<sup>[8]</sup>。黄精味甘性平,健脾益气,以“补养后天”,其偏于滋阴,与仙灵脾同用,阴阳兼顾,相互滋阴而不膩滞,补阳而不燥散。其中加入牡蛎是出于补充钙质的考虑。

本实验研究显示,中药治疗组(骨松Ⅱ号)静力学参数 BV/TV 较造模组(OVX)显著增加,OV/BV 较正常对照组(SHAM)和阳性对照组(尼尔雌醇)明显升高,OB%、OBI 及 OB/10cm 较其余三组显著增加;动力学参数 TeLs/BS、dLs/BS 和 BFR(T)较正常对照组明显升高。四组切片的成骨细胞体积(OBV)无显著差异,推测各组成骨细胞活性也无明显差异,进而说明骨松Ⅱ号主要是通过增加模型兔的成骨细胞的数量,促进成骨,以维持模型兔的最终骨形成量,其增加成骨细胞数量的作用可能与促进成骨细胞募集和/或增殖有关。另外,其在 OV/BV、OB%、OBI 以及 OB/10cm 方面均明显高于阳性对照组(尼尔雌醇),说明骨松Ⅱ号促进成骨活动的作用优于尼尔雌醇。

## 参考文献

1. 邱明才,李松岭,孙贵连. 不脱钙甲苯胺蓝染色骨切片的制备. 中华病理杂志 1987;16(1):10.
2. Malluche HH, Sherman D, Meyer Wolfgang, et al. A new semiautomatic method for quantitative static and dynamic bone histology. Calcif Tissue Int 1982;34(2):439.

3. 西田三郎,高桥荣明. 骨生礁および骨の组织形态计測. 综合临床 1990;11:2196.

4. Takano-Yamamoto T, Rodan GA. Direct effects of 17beta-estradiol on trabecular bone in ovariectomized rats. Proc Natl Acad Sci USA 1990;87(8):2172.

5. Felson DT, Zhang YQ, Hannan MT, et al. The effect of postmenopausal estrogen therapy on bone density in elderly women. N Engl J Med 1993;329(2):1141

6. 刘玉槐,李泉玉,徐文贵等. 肾虚与骨矿物含量关系的研究. 刘忠厚主编:骨质疏松症. 第 1 版. 北京:化学工业出版社,1992:591~595.

7. 马立正,施玉华,汪丽亚等. 填精补肾中药对老年大鼠下丘脑-垂体-性腺-甲状腺轴的形态学研究. 中医杂志 1989;8(1):45.

8. 吴非,时光达. 补肾中药黔岭藿对去热大白鼠骨质疏松模型骨计量学参数的影响. 刘忠厚主编:骨质疏松症. 第 1 版. 北京:化学工业出版社,1992:604~607.

9. 何郁泉,秦汉娟,潘子昂等. 骨愈灵胶囊治疗骨质疏松症及各类骨折临床观察. 刘忠厚主编:骨质疏松研究与防治. 第 1 版. 北京:化学工业出版社,1994:369~372.

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## 手术加手法治疗孟氏骨折

浙江省宁波市中医院(315010) 李启运

自 1988 年至 1995 年,我们采用尺骨切开复位钢板内固定,桡骨小头手法闭合复位,治疗这部分的病人 21 例。随诊 8 个月至一年半,取得了较好效果。现介绍如下。

**临床资料** 本组病人 21 例,男 12 例,女 9 例;年龄 15 岁~60 岁;右前臂 13 例,左前臂 8 例;属伸直型 15 例,屈曲型 6 例;合并桡神经损伤 2 例;一周内整复 11 例,一周至二周内整复 10 例;均为闭合损伤。

**治疗方法** 臂丛阻滞麻醉下,行尺骨切开复位,四孔钢板内固定。然后手法稍加牵引,术者于桡骨小头脱位处加压,伸直型向后内方按捺,并逐渐屈曲肘关节,屈曲型向前内方按捺,并逐渐伸肘关节。在整复过程中,助手应来回小幅度旋转前臂,即能较完全的整复桡骨小头脱位。整复内固定完成后,以长臂石膏托固定,伸直型固定于前臂旋后位,屈肘 100 度;屈曲型固定于前臂中立位,屈肘 60 度。X 线拍片检查脱位纠正。半月后拆线改小夹板固定,但须放置压垫,伸直型应放在桡骨小头的前外侧,屈曲型放置在后外侧。并逐渐开展循序渐进的功能锻炼。一般约 1 月半待尺骨初步连接后,拆除夹板加大功能锻炼。

**治疗结果** 疗效评定,尺骨连接,肘关节屈伸正常或受限在 10 度内,前臂旋转正常或受限在 15 度内为优。尺骨连接,肘关节屈伸受限在 20 度内,前臂旋转受限在 30 度内为良。不及上述条件者为差。本组病例临床愈合,最短 5 周,最长为 15 周,平均愈合为 8 周。其中疗效属优者 18 例,良 2 例,差 1 例。其中差 1 例因尺

骨延迟愈合,外固定时间延长,前臂旋转功能影响。后行桡骨小头切除术,功能恢复。2 例桡神经损伤病例 2~3 月后恢复。

**讨论** 孟氏骨折中的伸直型和屈曲型,虽然大多数能通过手法复位,外固定治疗,但部分病人却难以做到完全复位和稳妥固定。常常是尺骨移位,成角。从而导致桡骨小头的再脱位。近年来随着对尺骨为轴心的前臂旋转功能认识的深化,尺骨的复位和固定的要求更高。尺骨的开放复位和钢板内固定,切实的解决了这个问题,而且便利了桡骨小头的复位,有效的避免了再脱位,并有利于早期开始功能锻炼。从而促进了前臂旋转功能和肘关节屈伸功能的康复。

一般认为孟氏骨折的桡骨小头脱位,宜切开复位及环状韧带修复或重建术。但本组临床说明闭合复位后,通过环状韧带的粘连、疤痕修复和功能锻炼的适合过程,结果前臂旋转功能和肘关节功能都得到较好的恢复。由于尺骨的固定,桡骨小头的复位就相对容易了,且损伤小,疗效可靠。这里还应着重说明桡骨小头整复时,在指按捺下,做小幅度的前臂旋转活动和肘关节的屈伸活动很重要,这样有利于桡骨小头的正确到位和破损的环状韧带的大致复位,以避免嵌顿。

采用了手术和手法并用,达到了准确的复位,及尺骨的良好固定,通过早期的石膏托固定及中后期小夹板固定,提高和提前了功能锻炼的质量和时,而收到了较好的治疗目的。

(收稿:1996-10-22)

## Abstract of Original Articles

**Traumatic Intransient Spinal Cord Damage without Compression** Zhao Kai, Xu Rongming, Zhang Jian. *Affiliated Sir Run Run Shaw Hospital, Zhejiang Medical University, Hangzhou* (310016)

The intransient spinal cord damage without compression is seldom occurred in spinal cord trauma. 22 cases with such damage, out of 423 spinal cord injury cases were followed up and their diagnosis, treatment, and probable etiology were analysed from 1984 to 1994. (1) MRI can reveal the early changes of spinal cord injury and it is important for estimating the prognosis and determining the treatment; (2) Such damage can be induced by hyperextension injury and other mechanism; (3) Vascular injury, hemorrhage, and intramedullary deposit of metabolic product are playing important roles in the process of such damage; (4) There is no significant difference of therapeutic effect between non-operative treatment and simple spinal canal decompression. The combination of intramedullary and extramedullary decompression under operating microscope is advantageous to the recovery of such damage. The active treatment could not be abandoned, even in the complete spinal cord damage.

**Key words** Spinal cord damage MRI  
Intramedullary and extramedullary decompression  
Metabolic product

(Original article on page 3)

**Thoracic Outlet Syndrome Induced by Sibson's Fascia** Tian Cunping, Wang Ruiqing, Yin Yunsheng, et al. *The First Affiliated Hospital of Shanxi Medical College* (030001)

45 cases of thoracic outlet syndrome were treated with operation and analysed from 1987 to 1995. The main causes of thoracic outlet syndrome were demonstrated with operation that in addition to the commonly mentioned cervical rib, pathological changes of scalene muscle, pectoral muscle and costoclavicular space, there was a kind of etiology, i. e. the thoracic outlet syndrome was induced by long time compression of suprpleural fascia (Sibaon's fascia) on the inferior trunk of brachial plexus. In the process of operative

exploration, it was found in seven cases that only a thin layer of fascia covered over the inferior trunk of brachial plexus, without any other factor of long compression. As this fascia had been relaxed, the syndrome was significantly eliminated. Therefore, it was considered that this fascia is a factor for long compression.

(Original article on page 6)

**Key words** Thoracic outlet syndrome Sibson's fascia

**Study on Biomechanics of Plane Triangle Needle for Treating Olecranal Fracture** Du Dongpeng, Yu Jinxiang, Li Yizhong. *The First Hospital of PLA, Lanzhou City, Gansu Province* (730030)

Good therapeutic effect was obtained in the treatment of olecranal fracture with plane triangle needles made with Kirschner pins. For comparing with other commonly used methods, 64 models of olecranal fracture, made with same material, were divided into 4 groups and fixed with plane triangle needle, tension band, screw, and steel wire with figure of 8 respectively. Based on the biomechanical test, the plane triangle needle fixation for olecranal fracture was the best in anti-tension and anti-shear among all four kinds of fixation. For this reason, we thought it was in the first place of methods for fixation of olecranal fracture.

**Key words** Olecranal fracture Plane triangle needle Biomechanics

(Original article on page 8)

**Histomorphometric Study on the Effect of Gusong II on Bone Turnover in Ovariectomized Rabbits** Shi Weibin, Du Ning, Fu Shicong, et al. *Shanghai Institute of Traumatology and Orthopaedics, Shanghai Second Medical University* (200025)

The effects of Gusong II on experimental postmenopausal osteoporosis in ovariectomized New Zealand white rabbits were assessed histomorphometrically and compared with that of nylestriol. The results demonstrated that BV/TV, OBI, dLs/BS and BFR increased in both group A (OVX—Gusong II) and group D (OVX—nylestriol) as compared with group B (OVX) and/or group C (Sham). Group A

showed a significant increase of OV/BV, OB% and OBI as compared with group D. It indicated that Gusong II can stimulate the recruitment and/or proliferation of osteoblasts to produce more bone matrix, converting the bone turnover of OVX rabbits to a positive balance. This effect may be superior to that of nylestriol to some extent.

**Key words** Chinese herb Gusong II Ovariectomy New Zealand white rabbit Bone histomorphometry

(Original article on page 11)

**Effect of Spinal Cord II on Axoplasmic Transport in Injured Spinal Cord of Rat** *Liu Weidong, Han Fengyue, Jing Xianghong. Institute of Orthopaedics and Traumatology, China Academy of Traditional Chinese Medicine, Beijing (100700)*

Experimental models of right hemitranssection of thoracic spinal cord were made in 18 Wistar rats and divided randomly into three groups; treated with Chinese herbs" Spinal Cord II" (SC II), hydrocortisone, and normal saline, respectively. 6 intact rats were fed as usual. One month later, horseradish peroxidase (HRP) was injected into experimental rats, and the HRP labelled neurons in the originating nuclei of ascending and descending nerve fiber bundles passing through the injured area were examined and counted under microscope. It was found that the number of HRP labelled neurons in SC II group was prominently greater than that in hydrocortisone group and saline group ( $P < 0.05$ ), and there was no prominent difference in the number of HRP Labelled neurons between SC II group and normal group ( $P > 0.05$ ). It was suggested that Spinal Cord II can promote the recovery of normal continuity of injured nerve fibers, the axoplasmic transportation, and the regeneration of neurons in injured spinal cord.

**Key words** Injury of spinal cord Axoplasmic transport Spinal Cord II (SC II)

(Original article on page 15)

**Experimental Research on Biomechanics of Three-dimensional Model of Femoral Neck Fracture** *Zhang Aiping, Qi Zhenxi, Chen Riqi. Fujian College of*

*Traditional Chinese Medicine, Fuzhou (350003)*

The regularity of stress distribution of the head, neck and shaft of normal adult femur was biomechanically measured on the advanced three-dimensional photoelastic model and the stresses of three-needle internal fixation with different positions of fixation (forming isosceles, equilateral and upside-down triangles, and fan-formed) were measured electrically in different postures of the femurs (neutral position, adduction, abduction). The results demonstrated the mechanical characteristics of femoral neck and three needles and the effect of three needle fixation for femoral neck fracture.

**Key words** Femoral neck fracture Photoelastic experiment Electrical measurement Biomechanics

(Original article on page 18)

**Effect of Small Splint Fixation on Microcirculation of Forearm — an Experimental Study** *Liu Zhenli, Gu Yunwu, Zhang Huisheng. The 251 Hospital, Zhangjiakou City, Hebei Province (075000)*

The effects of small splint fixation on the microcirculation of normal forearm were studied experimentally. The results showed that there was certain effect of small splint on local microcirculation, but no obvious influence on general blood circulation and blood viscosity. As the restraint force of bandages applied from 0 to 600 g, there were no evident changes in local microcirculation. After the local microcirculation was affected by restraint force, without usual dirigation of the arm on time, the local microcirculation as well as the local ischemia and hypoxia would be improved through the regulation of the autoregulation system of general blood circulation, but such improvement was far inferior to that through dirigation. Therefore, the appropriate adjustment of restraint force of bandages at due course and the dirigation of extremities can eliminate the influence of compression of splint on microcirculation more effectively.

**Key words** Small splint fixation Restraint force Microcirculation

(Original article on page 20)