

纤维结合蛋白在创伤愈合中的动态研究

——“偎脓长肉”作用机制研究之四

天津骨科研究所(300211) 李秀兰 师宜健 徐尔真* 赵凤仪

摘要 本文选用 32 只家兔,制造感染创面模型。观察在创伤愈合中血浆纤维结合(Fn)和创面 Fn 含量的动态变化,以及外用中药对其影响。实验结果表明,血浆 Fn 与创面愈合时间呈显著性正相关。创面 Fn 则为显著性负相关。外用中药可使创面 Fn 明显增高,且与对照组有显著性差异($P < 0.01$)。提示,外用中药是创面 Fn 的良好调节剂;在创面愈合中可提高创面 Fn 含量,进而增强局部抗感染和损伤修复能力而达到加速创伤愈合。

关键词 外用中药 纤维结合蛋白 创伤愈合

本文通过复制感染创面的家兔实验模型,动态观察血浆 Fn 和创面 Fn 在创面愈合过程中的动态变化。试图阐明血浆 Fn 和创面 Fn 在创伤愈合中的相关性;探讨 Fn 对创伤愈合的积极作用;为外用中药加速创伤愈合机理的研究提供可靠的实验依据。

材料与方 法

1. 材料:选用纯种大耳白兔 32 只(天津动物实验中心)。随机分为两批,每批分为两组,实验组和对照组。每组样本 8。

生肌膏作为 Fn 激活剂(由 10 余种中草药制备成膏剂)。Fn 抗血清(90091)上海生物制品研究所;Fn 标准血浆(901201)上海生物制品研究所;金黄色葡萄球菌,全国质控菌球。

2. 方法:(1)感染创面模型:将家兔在 2% 普鲁卡因局麻下,于后背部作一圆型切口,直径为 4cm。去除表皮、真皮和皮下结缔组织,深至肌层。填入 15 亿/ml,1ml 金黄色葡萄球菌浸渍的直径为 4cm 圆型小纱布,包扎伤口。48 小时后换药。对照组在无菌条件下换凡士林油纱,实验组换生肌膏,隔日换药一次。(2)取材:在创伤后 4、7、14、21 天分别取耳静脉血 500 μ l,放入加有 3.8% 枸橼酸钠 50 μ l 的试管内,以 1000rpm 离心 10 分钟,分离血浆,同时用 0.9% NaCl 1ml 冲洗创面,收取创面渗出液。同血浆分离法,收集上清液。(3)Fn 火箭电泳:将 Fn 参考标准血浆用生理盐水稀释成 8、16、24、

32 倍作标准曲线。按常规法电泳,测火箭电泳峰高,绘制标准曲线,查取结果。样品血浆作 1:4 稀释,创面渗出液取原浓度作试验。

结果

1. 血浆 Fn 在创面愈合中的动态观察:

创伤后血浆 Fn 明显下降。创伤后 4 天时仅为 5.75mg/L,以后随创伤愈合而逐渐上升,最后达正常水平。创伤后 4、7 天血浆 Fn 与创面 Fn 比较有显著性差异, t 检验结果($P < 0.01$)。(见图 1)

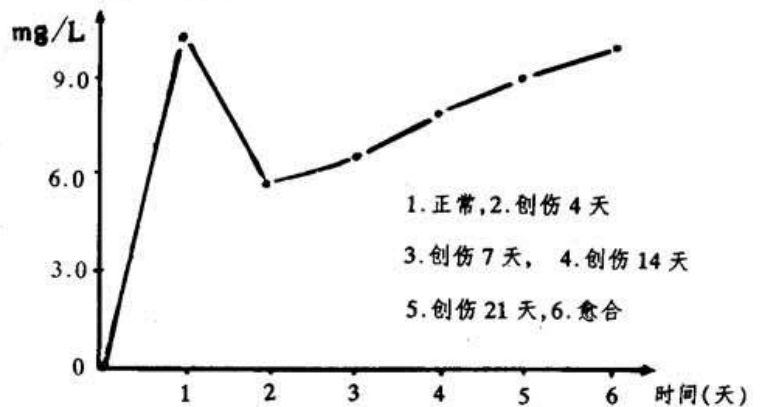


图 1. 血浆 Fn 在创面愈合中的动态变化

外用中药生肌膏组血浆 Fn 含量与对照组比较, F 检验结果表明组间差异($P > 0.05$);组内差异($P < 0.05$)。相关检验结果显示血浆 Fn 含量与创伤时间呈显著性正相关 $\gamma = 0.998, P < 0.01$ 。(见图 2)

2. 创面 Fn 在创面愈合中的动态研究:

家兔感染创面在换药后 2 天开始出现脓液,以外用中药生肌膏组为多。我们将此脓性

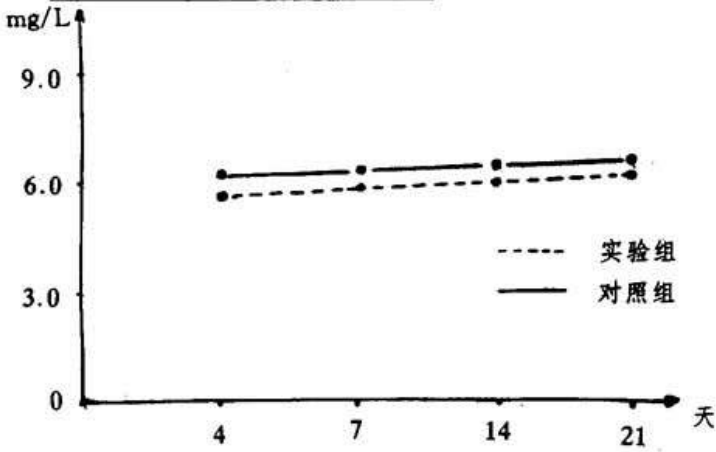


图 2 外用中药对血浆 Fn 动态影响

$$\hat{y}_1 = 5.675 + 0.101X_1 \quad \hat{y}_2 = 5.239 + 0.128X_2$$

渗出液作 Fn 检测发现, 创伤 4 天时创面 Fn 含量最高, 以后迅速下降, 21 天时降为 0.125mg/L, 与创伤后 4、7、14 天 Fn 含量比较呈极显著差异, t 检验结果 $P < 0.01$ 。(见图 3)

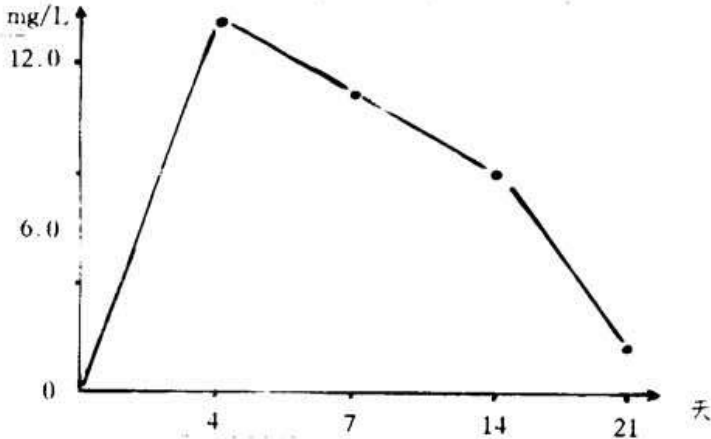


图 3 创面 Fn 在创面愈合中的动态变化

应用外用中药生肌膏的创面 Fn 与对照组创面 Fn 含量比较, 创伤后 4、7、14 天均有显著性差异, 两组创面 Fn 含量与创伤时间呈显著性负相关, $\gamma = -0.9001, P < 0.01$ 。(见图 4)

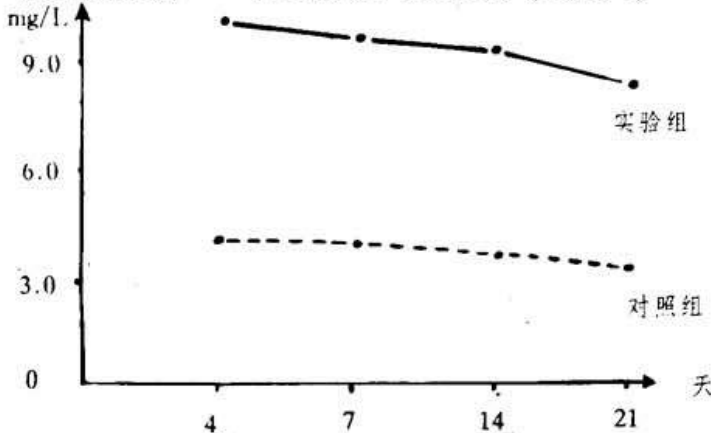


图 4 外用中药对创面 Fn 动态影响

$$\hat{y}_1 = 8.062 + 0.339X_1 \quad \text{讨论} \quad \hat{y}_2 = 3.780 + 0.180X_2$$

Fn 是近年来被广大研究者所关注的一种多功能蛋白质^[1]。Fn 在创伤愈合中起着十分重要的作用。它作为趋化因子可诱导外周血单

核细胞、中性粒细胞和局部吞噬细胞, 成纤维细胞向伤口处运动。^[2]。作为非特异性调理素与细菌和组织碎片特异性结合而招引吞噬细胞净化伤口。作为细胞运动的基质, 促进细胞的迁移。作为基质形成的基础, 参与基质的产生和组装。作为生长因子, 有强烈促进细胞生长的活性^[3]。可见 Fn 参与了创伤愈合的许多重要过程。被认为是重要的创伤愈合因子^[4]。近年来国内对血浆 Fn 已有多方面的研究, 而创面 Fn 尚未见报道。

我们的实验表明, 在创面愈合中血浆 Fn 和创面 Fn 具有不同的动态变化规律。创伤初期血浆 Fn 水平迅速下降, 随伤口愈合而上升。并达到正常水平。这一结果与 David 报道的一致。血浆 Fn 下降的原因可能首先是在创伤这一病理过程中, Fn 覆盖于组织碎片和细菌颗粒, 在招引巨噬细胞清除其颗粒的过程中而自身被消耗。其次是微血管通透性改变, 可使 Fn 伴随其它大分子游出血管。最后创伤引起巨噬细胞和内皮细胞等对 Fn 的分泌抑制, 以及溶酶体酶的释放, 导致包括 Fn 在内的组织蛋白分解。致使血浆 Fn 下降。其下降水平与损伤程度有关。

我们还发现创面 Fn 动态规律与血浆 Fn 相异。在创伤初期创面 Fn 含量居于各期之首; 而近达愈合期时创面 Fn 基本消失。

生肌膏是一种以祛腐生肌, 假脓长肉为主要特征的外用中药, 具有促进创面愈合的功效。基础研究表明, 该药的抗感染作用不是直接抑菌而是提高机体的免疫功能。其基础是启动巨噬细胞膜表面的 Fc 和 C₃b 受体, 进而增强巨噬细胞功能^[5]。业已证明, 吞噬细胞功能与 Fn 密切相关。血浆 Fn 可激活网状内皮系统, 调节内皮细胞、成纤维细胞和吞噬细胞大量分泌 Fn, 使创面 Fn 大增。创面 Fn 调理吞噬细胞清除细菌和组织碎片; 趋化成纤维细胞进入肉芽; 传递肌成纤维细胞促进创面收缩; 构成表皮细胞增生和爬行的骨架; 进而加速创伤愈合。可见外用中药促进伤口愈合与 Fn 的功能密切相关。

参考文献

1. R. A. F clork. The Molecular and Cellular Biology of Wound Repair. 1st ed. New York. A Dirision of Plenum PUBLISHING CO. 1988;405-426.

2. M. A chernousox, et al. Studies of Extracellular Fibronectin Matrix Formation with Fluoresceinated Fibronectin and Fibronectin Fragments. Fed of Eur Biochem soci 1985;183(2):365.

3. A. H Redd, et al. Extracellular Matrix: structure and Function, 1st ed, New York, Alan R Inc. 1985;1—9.

4. P. Roth; et al. Lipopolysaecharida Enhences Monocyte Adherence to Matrix—Bound Fibronectin, Clin Immun and Immuno—path 1990;57:363—373.

5. 李秀兰,等. 活化的小鼠腹腔巨噬细胞膜 Fc 受体和 C₃b 受体的观察, 中国免疫学杂志. 1987; 63(2): 125—127.

(收稿:1993—06—31)

全麻下推拿治疗腰椎间盘突出症 117 例

中国中医研究院广安门医院(100053) 孙宝全

我科自 1975 年~1985 年在全麻下推拿治疗重症腰椎间盘突出症 117 例, 现总结如下。

临床资料

117 例中男 66 例, 女 51 例; 年龄最小 18 岁, 最大 56 岁; 病程最短者 7 天, 最长者 20 年; 本组腿痛者 112 例, 单纯下肢痛者 3 例, 双侧下肢痛者 2 例; 脊柱侧弯 91 例, 腰部压痛伴放射痛 98 例, 直腿抬高试验阳性 109 例, 伸拇肌力减弱 59 例, 本组病例的诊断主要依据临床主客观体征和 X 线平片检查及脊髓腔造形。

治疗方法

1. 术前禁食水, 术前半小时皮下注射阿托品 0.5mg。麻醉推拿采用一次静脉给药法, 将硫喷妥钠粉剂 0.5g, 用生理盐水配成 2.5% 的溶液, 一般用量 10~20ml。男 15ml 以上, 女 12~15ml 即可, 用静脉缓慢连续注射, 约 1 分钟内注射完毕。在患者达到麻醉三期一级时, 即可施行推拿手法。

2. 麻醉成功后, 病人俯卧位, 将准备好床单叠成长条状, 经背部套住两侧腋下, 固定在床头或由助手牵拉住, 双下肢各由 2~3 名助手握踝及小腿部分先做对抗平行牵引的约 1 分钟, 力尽量大。

3. 术者立于患侧, 双手掌重叠放于腰部, 在牵引情况下, 双手用力向下做压颤手法, 并逐渐抬高双下肢至 30~40 度, 压颤手法反复 10 次, 用力大小根据病人体质情况掌握。

4. 扳法: 斜扳或侧扳手法。①斜扳法: 放松牵引, 术者一手掌放于腰部侧凸部位, 另一只手将对侧下肢抬起, 双手同时用力, 此时有的可听到响声, 转换位置, 搬对侧下肢。②侧扳法: 将病人翻起侧卧位, 以左侧为

例, 病人左侧卧, 左下肢伸直位, 右下肢屈曲位放在左下肢上, 术者站在病人的前方, 一肘放在病人肩部, 另一肘放于臀部, 两臂同时向相反方向用力, 此时可听到腰部清脆响声。将病人翻向右侧重复以上手法。

5. 直腿抬高及足背伸法: 病人仰卧位, 术者一手放在膝部, 一手托足跟将患者下肢抬高, 停留片刻, 然后助手将足做背伸, 以上手法一般在 5 分钟内结束。

6. 术后平卧硬板床休息 7~10 天, 神经根压迫症状明显好转者, 可延长卧床时间。无明显好转者尽早起床, 准备行第二次推拿。术后有大部分病人感腹部痛及腹胀, 前者可能是腹肌受到牵拉所致, 无需处理, 一般 2~3 天恢复, 后者是胃肠植物神经紊乱所致, 一般采用对症处理。

7. 本法对脊柱滑脱或骨质疏松者、较严重的心脏病、高血压及脊柱骨质病变者禁忌。有马尾神经压迫症者不宜推拿。

治疗结果

1. 疗效评定标准: 优: 腰腿痛完全消失, 脊柱侧凸消失, 直腿抬高在 80 度以上, 恢复原工作; 良: 腰腿痛基本消失或明显减轻, 直腿抬高在 70 度以上, 恢复原工作或改换轻工作; 可: 腰腿痛部分减轻, 客观体征较推拿前有所改善; 无效: 主观症状和客观体征无好转。

2. 疗效分析: 优 34 例, 良 66 例, 可 11 例, 无效 6 例。有 30 例随访 4~12 年, 优 22 例, 良 5 例, 可 3 例。

讨论

我们采用全麻下俯卧位实施大重量对抗牵引, 使椎间隙增宽利用椎间隙内负压的增加及纤维环后纵韧

(下转 30 页)

Abstract of Original Articles

Application of integration of TCM and modern medicine in elevation of operative effect in treating prolapse of lumbar intervertebral disc

Liang Ke-yu(梁克玉)

Affiliated Hospital of Hubei College of TCM(430061)

Operative treatment of prolapse of lumbar intervertebral disc is not difficult, but reoperation of part of the cases were carried out due to improper master of indication, incorrect localization, improper operative style or technical fault ect. In elevation of operative therapeutic result, better effects were obtained after proper indication being mastered, applying Chinese herbs postoperatively and early physical exercise being used. One hundred and ten cases were operated, no one case needs reoperation. The rate of excellent and good was 98.1%.

Key words Prolapse of lumbar intervertebral disc Indication of operation Integration of traditional Chinese and modern medicine

An analysis on biomechanics in fixation of fracture of clavicle with steel wire perforating and annular ligating method

Pan Tao(潘滔) Zhu Qing-an(朱青安) Li Zhong-hua(李中华)

Guangzhou Hospital of Air Force(510602)

Based on characteristics of anatomy and types of fracture of clavicle, steel wire perforating annular ligating method was designed, i. e. two wholes at one level were perforated on two ends of fractured clavicle, then a diameter of 0.3mm steel wire was passed through them and fixed with annular ligation, And it was compared with Kirschner's pin based on biomechanics. It was realized that the former bears advantages of antiwinding effect and anti-torsion strength. The mechanism of steel wire perforating annular ligating method was discussed.

Key words Steel wire perforating annular ligating method Clavicle

Experimental observation of rabbit osteo myelitis treated with Sheng Ji Xiang Pi Gao chain

Yang Mi-xiong(杨米雄) Zhou Lin-kuan(周林宽) Wang Wei-jia(王维佳) Ren Yong-bao(任永葆) Xu Lin-wei(许林薇)

Zhejiang College of TCM(310009)

Models of chronic osteo myelitis in bilateral upper epiphyseal end of tibia of the rabbits were treated with debridement of the lesion, then Sheng Ji Xiang Pi Gao chains were implanted in the left bone marrow, the right side served as control. Through gross and pathological slice observation, the results showed that there were less and quick disappearance of blood clot within the marrow, and the granulation grew abundantly and healthy, very less formation of multiple abscesses in the experimental side. The local pus formation as increased on the experimental side, it was most prominent at 5th-10th day. The pus was decreased immediately after removal of the chain, then the wound was healed afterwards.

Key words Sheng Ji Xiang Pi Gao chain Chronic myelitis Rabbit

Motive study of fibrin binding protein in wound healing-Mechanism of Wei Nong Zhang Rou (IV)

Li Xiu-lan(李秀兰) Shi Yi-jina(师宜健) Xu Er-zhen(徐尔真) Zhao Feng-yi(赵风仪)
Tianjin Institute of Orthopaedics(300211)

Thirty-two rabbits were selected to make infected wound surface models to observe the motive changes of fibrin binding protein and contents of it at the wound surface, and the influence of external application of Chinese herbs. The results of experiment indicated that there were positive correlation of fibrin binding protein and wound surface healing time, but there were evident negative correlation with wound fibrin. Application of Chinese herbs can elevate prominently in wound surface fibrin, there were significant difference($P < 0.01$) as compared with the control. This suggested that external application of chinese herbs is a good regulation of wound surface fibrin. It can elevate contents of wound surface fibrin, increase local anti-infective and repairing ability of injury and reach the aim of accerelate wound healing.

Key words External application Chinese herb Fibrin binding protein Wound healing

Thirty nine cases of fracture of clavicle treated with fixator

Lin Jue-rong(林爵荣) Chen chu(陈础)
Yongding County hospital, Fujian Province(364100)

Thirty nine cases of fracture of clavicle were treated with self-designed fixator with better results. Among them, three cases were failure due to operation and another therapeutic method had to be used. Thirty six cases were discharged at 4th-6th week postoperatively. Among them, 8 cases were reduced anatomically, 16 cases near anatomically, one case had displacement evidently, and one was mild dislocated, with a rate of excellent and good of 89.2%. A follow-up of 3 months to 3years postoperatively were carried out, all cases were healed in good condition. Two bone holding forceps were used to hold the fractured ends of two sides subcutaneously, then moved the forcep according to the position of two ends, regulating the screw to check if any displacement was found to obtain accurate reduction. The fixator was fixed on the chest wall by means of crossed wood splint and pressed-screw action. Due to the instrument is light and small, so it wouldn't influence the patient to wear clothes and action. Exercise was taken to improve healing. It was due to strong fixation, so it offers a googcondition in bone healing.

Key words Fracture of clavicle External fixator External fixation