

## 临床论著

## 中西医结合治疗骨骺损伤的临床研究

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**摘要** 通过四肢九个部位骨骺损伤 363 例的临床和 X 线分析, 阐述了骨骺损伤发病、形态、类型、治疗和预后等问题。探讨了骨骺损伤的发病规律。提出了骨骺损伤的分类法。对治疗的理论依据和原则作了初步探讨。通过 216 例远期观察, 手法复位、夹板固定的疗效优良率为 91.1%。明显超过切开复位的效果 (71.9%)。中西医结合疗法适于不同年龄、部位和类型的多数骨骺损伤。

**关键词** 骨骺 创伤和损伤 中西医结合疗法

青少年是骨骺发育的旺盛时期, 也是骨骺损伤的多发年龄。骨骺损伤对青少年、儿童生长

发育有较大威胁, 直接影响长骨纵向生长和关节形态与功能。

## 临床资料

临床资料和异常 X 线表现见表 1、2。

表 1 骨骺损伤临床资料

部位	单纯滑脱型	滑脱骨块型	骨骺劈裂型	骺端劈裂型	骺端粉碎型	合计	%
肱骨上端	10	48			12	70	19.3
桡骨上端	14	36	3		8	61	16.8
桡骨下端	44	55	9	1	23	132	36.4
尺骨下端	2					2	0.55
股骨头	4					4	1.1
股骨下端	5	7	4	1		17	4.7
胫骨上端		1				1	0.27
胫骨下端	5	10	25	20	4	64	17.6
腓骨下端	12					12	3.3
合计	96	157	41	22	47	363	
%	26.4	43.3	11.3	6.1	12.9		

363 例为两周内闭合损伤。男 297 例, 女 66 例, 男女比例 4.5:1; 左侧 209 例, 右侧 154 例; 年龄 12~20 岁; 326 例采用非手术治疗, 37 例采用切开复位内固定。

随访 216 例, 平均 4 年 10 个月 (6 月~10 年 5 个月)。疗效评级分优: 无自觉症状, 功能和 X 线表现正常。良: 无自觉症状, 功能良好, 有程度不等的异常 X 线改变。差: 疼痛, 活动受限, 有明显异常 X 线改变。疗效优良率: 非手术疗法为 91.1%, 手术疗法为 71.9%, 总的优良率为 88.2%。程度不等的异常 X 线表现

占 31.4%, 其中有意义的表现 (即引起疼痛、功能障碍或生长障碍) 29 例, 占 13.4%。

## 讨论

1. 骨骺损伤的概念: 在解剖上, 骨骺二次骨化中心 (骨骺), 骨骺滋养血管和 Ranvier 区均参与了骨骺的生长发育, 这些部位的伤害均可造成骨骺损伤。在形态上, 骨骺损伤是生长发育要害处的骺板和二次骨化中心的损伤, 即骨折线必须波及到骺板或骨骺。这样才能说明: ①骨骺损伤的主要形态特征。②鉴别其他干骺端骨折。③有发生生长障

表 2 异常 X 线表现

部位	随访例数	异常例数	成角	短角	关节面不对称	骨骼变形	发育不良	骨骼硬化
肱骨上端	38	9	4	6	2	1		
桡骨上端	43	22	6	3	6	11	2	6
桡骨下端	68	17		3	8	6	2	1
尺骨下端	2	0						
股骨头	4	2		2	1	2		2
股骨下端	9	4		1	1	1		1
胫骨上端	1	1	1					
胫骨下端	39	13	2	3	7	6	4	3
腓骨下端	12	0						
合计	216	68	13	18	25	27	8	13
%		31.4	12.5	17.3	24	25.9	7.6	12.5

生长障碍之虞, 而予重视。

2. 骨骺损伤机理与形态、分型的关系: 造成骨骺损伤主要是两种外伤应力: 横向扭转力, 造成水平损伤的形态特征是骨骺分离, 是单纯滑脱型和滑脱骨块型的主要病理改变; 纵向冲击力, 造成垂直损伤的形态特征是骺端劈裂, 是骨骺劈裂型、骺端劈裂型和骺端粉碎型的主要病理改变。在扭转应力中往往存在着纵向挤压的损伤因素, 因此每一类型都可能发生骨骺和骺板的局限性挤压损伤。

3. 骨骺损伤的发病规律: ①发病趋势随年龄增长而下降, 好发年龄为 13~15 岁。②损伤以滑脱为主要特征, 趋向年幼, 以骨折为主要形态, 趋向年长。③男性发病高于女性 4.5 倍。④桡骨下端骨骺损伤遥居首位。⑤滑脱骨块型最多见。

4. 骨骺损伤的形态特征: ①单纯骨骺分离多见于较年幼的儿童, 骨骺分离合并骨折多见年长的青少年。②骨骺分离伴干骺端骨折是最常见的损伤形态, 占 62.5%。③干骺端骨折有三角状、片状和粉碎状三种形态, 其中三角状骨块(Thurston Holland's 征)是最突出的特征, 占 49.4%。④骨骺骨折多为纵行, 移位较轻。⑤未见到典型的 Salter-Harris V 型, 但骨骺或骺板局限性压缩并非少见。

5. 骨骺损伤的分型: 本组以 363 例骨骺损伤的 X 线形态, 参照 Salter-Harris 分类<sup>[1]</sup>, 提出以下分型(见图): I 型(单纯滑脱型)骨折线沿着骺板而引起骺板一侧张嘴或骨骺完全分离(占 26.4%); II 型(滑脱骨块型)骨折线沿着骺板一段后进入干骺端, 形成骨骺分离和干骺端三角状或片状骨折, 或干骺端骨折波及骺板, 但无骨骺分离(占 43.3%); III 型(骨骺劈裂型)骨骺骨折, 骨折线波及骺板和关节面, 骨骺常呈纵向劈裂, 移位轻, 骨骺可能有或没有分离(占 11.3%); IV 型(骺端劈裂型)骨折线通过关节面、骨骺, 贯穿骺板至干骺端, 形成三角状或片状骨折, 有时不一定伴有骨骺分离(占 6.1%)。V 型(骺端粉碎型)干骺端或骨骺为粉碎骨折, 骨折线多处波及骺板, 常伴有骨骺分离(占 12.9%)。

6. 骨骺损伤治疗的理论依据和治疗原则: 恢复骨骺的正常解剖, 尤其是骺板和关节面的平整是防止生长障碍和畸形发生的关键, 复位要求比其它骨折更严格, 尽可能达到良好的复位。治疗以不同年龄和部位的生长能力、再塑能力和损伤类型来具体分析: ①生长旺盛和生长能力强的部位, 强调保护骨骺, 警惕生长障碍所致的畸形发生, 避免反复暴力手法和手术创伤。骺闭前期和生长能力弱的部位, 骨

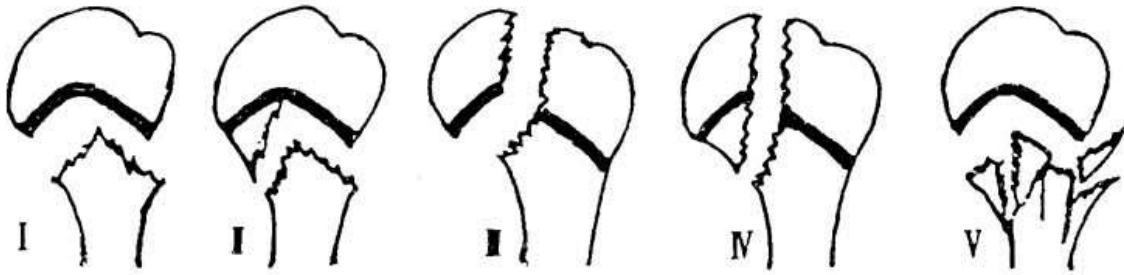


图 骨骺损伤分型

骺发育趋于成熟,再塑能力减弱,畸形多因复位不良而不是生长障碍引起,则强调良好的复位,必要时手术整复。Bright 指出:13岁以下的骨折达到力线满意就不必手术,13岁以上要求准确复位<sup>[2]</sup>。②以滑脱为主要损伤形态(I、II型),预后良好,尽量闭合复位。以骨折为主要的损伤形态(III、IV、V型),伤及了骺板和关节面,对位不良会形成骨桥或骺板早闭,产生生长畸形,应争取解剖复位,必要时手术整复。骺端粉碎型因骨折线处波及骺板,为不加重骨骺和血运损伤,宜闭合复位。③各型损伤可发生骨骺或骺板嵌插挤压,多见桡骨下端和胫骨下端骨骺损伤。复位时先充分牵引矫正成角,解除嵌压,避免生长障碍发生,整复宜尽早进行,手法轻柔准确,避免反复与暴力,忌用纵向扣挤和旋转手法。

手术仅适于:①闭合复位失败病例。②某些移位大极不稳定的III、IV型、胫骨下端三面骨骺骨折和闭合复位困难的桡骨上端、股骨下端骨骺翻转严重的病例。③疑有肌腱、骨膜或关节囊嵌压骨折端时。

7. 影响预后的因素:①发病年龄 受伤年龄说明骨骺的生长与再塑能力。年龄越小,这些能力越强,预后越好。反之,出现的畸形难以塑形矫正。本组68例异常X线改变的病例63.7%发生于14岁以后。②损伤类型 它说明了骨骺原始损伤的严重性。I、II型骨骺分离在软骨生长不太活跃的肥大细胞层,III型骨折移位多不严重,这三型预后较好。IV、V型骨

折线波及全骨骺,损伤重,预后常较差。③损伤部位,桡骨下端和肱骨上端骨骺再塑能力强,预后好,胫骨下端和桡骨上端骨骺再塑能力弱,预后较差。容易复位的桡骨下端骨骺损伤比难以复位的桡骨上端,预后要好。④治疗方法:本组手法复位优良率接近切开复位,但疗效优良率明显高于手术效果。⑤复位质量,本组复位好,疗效优良率高(91.1%),生长障碍发生率低(8.9%),体征少而轻;复位差,优良率低(62.8%),生长障碍发生率高(37.2%),有较多较明显的生长障碍体征。因此复位不良是影响青少年骨骺损伤预后的主要原因。值得注意的是:复位好也有8.9%的生长畸形。这与骺板、血供和治疗创伤有关。正如Spiegel指出:严重的骨骺损伤日后出现的生长紊乱,不仅取决于复位效果,良好的复位只能防止骨骺与干骺端的畸形愈合,即使切开复位,也不能改善骨骺本身的损伤状态<sup>[3]</sup>。

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## Abstract of Original Articles

### **Clinical study on epiphyseal injury treated by integration of traditional Chinese and modern medicine**

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A new classification of epiphyseal injury was suggested through clinical and X-ray analysis of nine positions in epiphyseal injury on extremities in 363 cases, in the meanwhile pathogenesis of epiphyseal injury, morphology, classification, treatment and prognosis etc. problems were clarified. A preliminary exploration of therapeutic theoretical basis and principles were made via a remote observation of 216 cases, the rate of therapeutic excellent and good with maneuver reduction and splint fixation was 91.1%. It was prominently superior than open reduction of which the efficacy was 71.9%. Integration of traditional Chinese and modern medicinal therapy fits to various age, position and kinds of most epiphyseal injuries.

**Key words** Epiphysis Trauma and injury

Integration of traditional Chinese and modern medicinal therapy

(Original article on page 5)

### **Multinuclear giant cells and osteoclasts in callus - histological and ultrastructural observation**

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The morphology of multinuclear giant cells (MGC) and osteoclasts (Oc) in rabbit's radius callus had been observed by light microscopy and transmission electron microscopy. It showed that both MGC and Oc participated in bone resorption, but MGC mainly resorbed dead bone and bone chips through phagocytosis and extracellular degradation at the early stage of fracture healing, and Oc mostly resorbed calcified cartilaginous callus and new formed trabecular bone by extracellular resorption to accomplish the remodeling of callus. It is suggested that the filopods on the surface of MGC and ruffled border on the surface of Oc are closely related to extracellular degradation of bone mineral. Their difference in the mechanism of degradation is waiting or further study.

**Key words** Callus Histology Ultrastructure

(Original article on page 8)

**Influence of ultrastructure of rabbit skeletal muscle mimic mountain-climbing myalgia treated with Yue Ji Ling lotion**

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Exploration of the pathology of mountain-climbing myalgia and observation of therapeutic action of Yue Ji Ling Lotion on rabbit with over burden motion mimic human mountain-climbing action were carried out. The results indicated that the functional state of rabbit extremities is similar to human mountain-climbing myalgia and the ultrastructure of skeletal muscle showed prominent traumatic changes. Yue Ji Ling lotion bears the function of inhibition the traumatic changes effectively and restoration the normal function of the limbs as well.

**Key words** Skeletal muscular system Yue Ji Ling lotion Ultrastructure  
(Original article on page 10)

**Dr. Shi Weizhi's experience in treating cervical spondylotic myelopathy**

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Old traditional Chinese medical doctor Shi Weizhi holds that the pathogenesis of cervical spondylotic myelopathy is due to insufficiency of liver and kidney, emptiness of Du meridian, blockade of the meridian due to wind-dampness, obstruction of flowing of Qi and blood. Better results were obtained after application of the therapeutic principles of invigorating the liver and kidney, warming the meridian, invigorating of Qi and activating of blood circulation, and expelling of wind and dredging the meridian passage.

**Key word** Cervical spondylosis Pathogenesis  
Traditional Chinese medicinal therapy  
(Original article on page 12)

**Study and clinical application on frame-style ladder form enhanced steel plate**

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Based on the principle of bio-mechanics and starting point on the stability of internal fixation, double arm frame-style ladder form enhanced steel plate was designed. The therapeutic effect was satisfactory after 37 cases had been used clinically. No one case of break wire, pulling out wire and refracture phenomenon on the fractured end was found during withdrawing the steel plate.

**Key words** Fracture fixation Frame-style ladder form enhanced steel plate  
(Original article on page 27)