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双钢板治疗肱骨远端 C 型骨折的疗效及影响预后的相关因素分析

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摘要 目的:研究双钢板治疗肱骨远端 C 型骨折的疗效,并探讨影响预后的相关因素。**方法:**选取 2009 年 1 月至 2013 年 8 月 86 例我院收治的肱骨远端 C 型骨折患者,按知情同意原则随机分为双钢板固定组(43 例)及 Y 型钢板固定组(43 例),2 组患者均给予经尺骨鹰嘴截骨入路切开复位内固定术后再分别行双钢板及 Y 型钢板固定,记录两组患者的改良 cassebaum 肘关节评分、骨折愈合时间及并发症情况,并分析影响患者预后的相关因素。**结果:**双钢板固定组治疗的优良率高于 Y 型钢板固定组($P<0.05$),骨折愈合时间及并发症发生率均低于 Y 型钢板固定组,差异均有统计学意义($P<0.05$);骨折类型、合并损伤、内固定方法、术后功能锻炼是影响预后的因素($P<0.05$)。**结论:**双钢板的经尺骨鹰嘴截骨入路切开复位内固定术在治疗肱骨远端 C 型骨折患者时有良好的疗效,合并伤、内固定方法、骨折类型、术后锻炼是影响预后的因素,应针对性地采取措施。

关键词:双钢板;Y 型钢板;肱骨远端 C 型骨折;相关因素

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Research of Efficacy of Dual Plate in C-type Distal Humerus Fracture and Influencing Factors of the Prognosis

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ABSTRACT Objective: To study the efficacy of dual plate in treating the C-type distal humerus fracture and to explore the influencing factors of the prognosis. **Methods:** 86 cases of C-type distal humerus fracture patients who were treated in our hospital from January 2009 to August 2013 were collected and divided into dual plate group (43 cases) and type-Y plate group (43 cases) randomly according to the principle of informed consent. Open reduction and internal fixation of olecranon osteotomy were given to both groups, the dual plate and Y plate immobilization were given to corresponding group, improved cassebaum elbow score, incidence of complications and fracture healing time of both groups were recorded, and the influencing factors of prognosis were analysed. **Results:** The rate of excellent and good of dual plate group was higher than that of the type-Y plate group, the fracture healing time and incidence of complications of dual plate group were lower than those of the type-Y plate group, the differences were all statistically significant ($P<0.05$); The fracture type, combined injury, internal fixation methods and function exercises were the factors affecting the prognosis. **Conclusions:** Open reduction and internal fixation of olecranon osteotomy of dual plate presents effectiveness in treating C-type distal humerus fracture, and the fracture type, combined injury, internal fixation methods and function exercises are the factors affecting the prognosis, according to which measures should be taken appropriately.

Key words: Dual plate; Type-Y plate; C-type distal humerus fracture; Correlation factors

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前言

肱骨远端属于肘关节的一部分,其发生骨折的发生主要在暴力的作用,C 型骨折是其中的一种类型,主要包括单纯干骺端骨折、干骺端粉碎性骨折及关节粉碎性骨折三种类型,由于其解剖学特点骨折的损伤常伴有有关节囊或者神经损伤^[1,2],因此手法复位治疗肱骨远端 C 型骨折效果不佳,临床推荐行切开复位内固定的方式进行治疗^[3-5],以往研究表明切开入路的方式有多种,常见的有肱三头肌劈开入路、肱三头肌舌型肌瓣入路、尺

骨鹰嘴截骨入路和肱三头肌两侧入路,临床现今默认的入路方式为经尺骨鹰嘴截骨入路^[6,7]。但是临床上对于固定材料的选择仍有争议,Y 钢板及双钢板是近年最常用的两种固定材料^[8],为探讨这两种固定材料的优劣,本研究分别利用两种钢板进行肱骨远端 C 型骨折进行治疗,分析其疗效情况,为临床上选择治疗方法提供参考。

1 临床资料

1.1 一般资料

选取 2009 年 1 月至 2013 年 8 月 86 例我院收治的 X 线确诊的肱骨远端 C 型骨折患者,其中男 47 例,女 39 例,年龄 18-67 岁,平均年龄(47.50 ± 16.23)岁。其中车祸伤 28 例,跌落伤 39 例,重物砸伤 12 例,其他原因 7 例。单纯干骺端骨折 24

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例,干骺部粉碎性骨折 42 例,关节粉碎性骨折 20 例。按知情同意原则随机分为双钢板固定组(43 例)及 Y 型钢板固定组(43 例),2 组患者在性别构成、年龄分别及骨折类型等方面无显著差异($P>0.05$)。详见表 1。

表 1 两组患者一般情况比较
Table 1 Comparison of general data between two groups

指标 Indexes		双钢板组(n=43) Dual plate group (n=43)	Y 型钢板组(n=43) Type-Y plate group(n=43)	χ^2	P
年龄(岁) Age(years)	<60	29	33	0.925	0.336
	≥ 60	14	10		
性别 Gender	男 Male	23	24	0.047	0.829
	女 Female	20	19		
	单纯干骺部骨折 Simple metaphysis fractures	11	13	0.262	0.959
类型 Types	干骺部粉碎性骨折 Metaphyseal comminuted fracture	22	20		
	关节粉碎性骨折 Joint comminuted fracture	10	10		
	车祸伤 Traffic accident	14	14		
	跌落伤 Fall injury	18	22		
原因 Reason	砸伤 Injured	6	6	2.948	0.424
	其他 Other	5	1		
合并损伤 Combined injury	有 Yes	30	29	0.054	0.816
	无 No	13	14		

1.2 方法

2 组患者均给予经尺骨鹰嘴截骨入路切开复位内固定术后再分别行双钢板及 Y 型钢板固定,操作步骤为:(1)行后正中切口,暴露皮肤浅筋膜及深筋膜后游离皮瓣至内外上髁,于鹰嘴切迹中点截骨;(2)对于双钢板固定组,固定肱骨髁间骨折后用克氏针从外上髁钻入内上髁,按克氏针方向将松质骨拉力螺丝钉拧入,使弯曲的钢板与内外髁相贴后螺钉固定;(3)对于 Y 型钢板固定组,首先进行内外髁的复位,然后利用 2 枚克氏针暂时固定,将 Y 型钢板的两叉脚固定于内外髁处,固定好骨折近端;(4)术后均给予石膏托外固定并行肌肉收缩锻炼,3 周时行肘关节的功能锻炼。治疗完成后记录两组患者的改良 cassebaum 肘关节评分并随访观察骨折愈合时间及并发症情况,并分析影响患者预后的相关因素。cassebaum 肘关节评分分为四个等级:屈肘幅度可超过 130° 且伸肘幅度小于 15° 为优,屈肘幅度可达 120° -130° 且伸肘幅度达 15° -30° 为良,

屈肘幅度可达 90° ~120° 且伸肘幅度达 15° 40° 为可,屈肘幅度小于 90° 且伸肘幅度为小于 40° 为差。随访方式为门诊定期复查及电话随访,时间为 6 个月。

1.3 统计方法

计量资料以均数±标准差($\bar{x} \pm s$)表示;两组资料比较时采用 t 检验、卡方分析或者 Fisher 确切概率法。采用 SPSS 18.0 统计软件进行数据录入及统计分析,检验水准 $\alpha = 0.05$ 。

2 结果

2.1 两种固定方式其 cassebaum 肘关节评分、骨折愈合时间及并发症情况比较

由表 2 可知:双钢板固定组治疗的优良率高于 Y 型钢板固定组($P<0.05$),骨折愈合时间及并发症发生率均低于 Y 型钢板固定组,差异均有统计学意义($P<0.05$)。

表 2 两种固定方式其 cassebaum 肘关节评分及并发症情况比较($\bar{x} \pm s$)
Table 2 Comparison of the cassebaum elbow score and complications of two fixation methods

指标 Indexes		双钢板组(n=43) Dual plate group (n=43)	Y 型钢板组(n=43) Type-Y plate group(n=43)	χ^2	P
	优 Excellent	27	21	144.016	<0.001
cassebaum 肘关节评分 Cassebaum elbow score	良 Good	13	12		
	可 Fair.	3	10		
	差 Poor	0	0		
骨折愈合时间(d) Fracture healing time(d)		121.2± 24.2	139.5± 52.4	2.079	0.042
并发症 Complications	有 Yes	4	12	4.914	0.027
	无 No	39	31		

2.2 影响肱骨远端 C 型骨折远期预后的因素分析

锻炼是影响预后的因素($P<0.05$)。

由表 3 可知:骨折类型、合并损伤、内固定方法、术后功能

表 3 影响肱骨远端 C 型骨折远期预后的因素分析

Table 3 Analysis of factors influencing the prognosis of the C-type distal humerus fracture

指标 Indexes	优良(n=73) Excellent and good(n=73)	可差(n=13) Fair and poor(n=13)	χ^2	P
年龄(岁)Age(years)	<60 53	9	-	0.750*
	≥ 60 20	4		
性别 Gender	男 Male 38	9	-	0.367*
	女 Female 35	4		
类型 Type	单纯干骺部骨折 Simple metaphysis fractures 23	1		
	干骺部粉碎性骨折 Metaphyseal comminuted fracture 38	4	12.918	0.002
	关节粉碎性骨折 Joint comminuted fracture 12	8		
合并损伤 Combined injury	有 Yes 46	13	-	0.007*
	无 No 27	0		
固定方法 Fixation methods	双钢板 Dual plate 40	3	4.440	0.035
	Y 型钢板 Type-Y plate 33	10		
术后功能锻炼 Function exercises	完成 Finished 66	5	-	<0.001*
	未完成 Unfinished 7	8		

注: *Fisher 确切概率法。

Note: *Fisher exact probability method.

3 讨论

肱骨远端骨折按照分型可分为 A、B 和 C 型, 其中 C 型骨折是一种少见但严重的肘关节损伤, 一般在有强暴力的作用下发生, 且由于其特殊的生理结构导致其成为最难治疗的一种骨折, 又分为 C1、C2、C3 型三种亚型, 肱骨远端 C 型骨折一般伴有严重的并发症如尺神经损伤等, 导致临床治疗困难, 复位治疗效果欠佳, 严重影响患者的生活质量^[9-11]。临床上的主要治疗方式为手术治疗, 目前主张的手术形式为切开复位内固定术^[12-14]。手术治疗由于其特殊的生理结构很难恢复平整导致各种并发症的发生, 从而使得预后不佳^[15]。本次研究主要在于比较双钢板和 Y 型钢板在治疗肱骨远端 C 型骨折时其疗效的不同, 并探讨影响肱骨远端 C 型骨折手术治疗后预后的因素, 进而指导临床治疗。

本次研究结果发现, 双钢板固定组治疗的优良率高于 Y 型钢板固定组, 骨折愈合时间及并发症发生率均低于 Y 型钢板固定组($P<0.05$), 提示在治疗肱骨远端 C 型骨折时双钢板固定的方式较 Y 型钢板的固定方式疗效要好, 主要原因可能是由于 Y 型钢板有固定的分叉角度, 不适用于所有的肱骨远端的解剖关系, 且钢板置于肱骨后方不能有效加压使得固定效果受损, 其术后需使用的石膏托使得患者不能尽早进行功能恢复锻炼。双钢板将内侧钢板置于内侧柱内缘, 外侧钢板置于外侧柱后缘从而起到良好的固定作用, 而且早期可进行功能锻炼促进了关节功能的恢复。由于双钢板固定牢靠且适应于肱骨远端的解剖学特点, 因此其导致的骨不连、肘内翻等并发症的发生率低于 Y 型钢板^[16-18]。另外发现骨折类型、合并损伤、内固定方法、术后功

能锻炼是影响预后的因素($P<0.05$), 在治疗过程中, 应针对有合并损伤 C3 型骨折患者, 且应尽早进行功能恢复锻炼, 对条件允许者应尽量性经尺骨鹰嘴截骨入路双钢板内固定术^[13, 19, 20]。

总而言之, 双钢板的经尺骨鹰嘴截骨入路切开复位内固定术在治疗肱骨远端 C 型骨折患者时有良好的疗效, 合并伤、内固定方法、骨折类型、术后锻炼是影响预后的因素, 应针对性的采取措施。

参考文献(References)

- [1] Lawrence T M, Ahmadi S, Morrey B F, et al. Wound complications after distal humerus fracture fixation: incidence, risk factors, and outcome[J]. J Shoulder Elbow Surg, 2014, 23(2): 258-264
- [2] 黄普高. 手术内固定治疗肱骨髁间骨折 21 例[J]. 广西医学, 2008, 30(5): 726-728
Huang Pu-gao. Operation internal fixation for the treatment of humeral intercondylar fracture in 21 cases [J]. Guangxi Medical Journal, 2008, 30(5): 726-728
- [3] Koh K H, Lim T K, Lee H I, et al. Surgical release of elbow stiffness after internal fixation of intercondylar fracture of the distal humerus [J]. J Shoulder Elbow Surg, 2013, 22(2): 268-274
- [4] Peivandi M T, Ashraf H, Shahpari O, et al. Ipsilateral traumatic fractures of the proximal and distal parts of the humerus (floating arm) with fracture of distal clavicle: a case report [J]. Iran Red Crescent Med J, 2013, 15(6): 534-535
- [5] Pidhorz L, Alligand-Perrin P, De Keating E, et al. Distal humerus fracture in the elderly: does conservative treatment still have a role? [J]. Orthop Traumatol Surg Res, 2013, 99(8): 903-907

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本组研究结果显示与采用截肢术治疗的患者相比,采用微波射频保技术治疗的胫骨远端骨肉瘤患者生存率、局部复发率及并发症的发生率并无明显升高,但MSTS功能评分显著提高,提示微波射频保技术治疗胫骨远端骨肉瘤患者不会降低患者的生存几率,且可能提高患者的生存质量,在改善患者的关节功能方面有明显的优势,值得临床深入研究和推广应用。

参考文献(References)

- [1] Ritter J, Bielack SS. Osteosarcoma [J]. Annals of oncology : official journal of the European Society for Medical Oncology / ESMO, 2010,21(Suppl 7):320-325
- [2] Ebeid W, Amin S, Abdelmegid A, et al. Reconstruction of distal tibial defects following resection of malignant tumours by pedicled vascularised fibular grafts[J]. Acta orthopaedica Belgica, 2007,73(3): 354-359
- [3] Lee SH, Kim HS, Park YB, et al. Prosthetic reconstruction for tumours of the distal tibia and fibula [J]. The Journal of bone and joint surgery British volume, 1999,81(5):803-807
- [4] Campanacci DA, Scoccianti G, Beltrami G, et al. Ankle arthrodesis with bone graft after distal tibia resection for bone tumors [J]. Foot & ankle international / American Orthopaedic Foot and Ankle Society [and] Swiss Foot and Ankle Society, 2008,29(10):1031-1037
- [5] Stephane S, Eric M, Philippe W, et al. Resection arthrodesis of the ankle for aggressive tumors of the distal tibia in children [J]. Journal of pediatric orthopedics, 2009,29(7):811-816
- [6] Laitinen M, Harges J, Ahrens H, et al. Treatment of primary malignant bone tumours of the distal tibia [J]. International orthopaedics, 2010,29(4):255-259
- [7] Puri A, Subin BS, Agarwal MG. Fibular centralisation for the reconstruction of defects of the tibial diaphysis and distal metaphysis after excision of bone tumours [J]. The Journal of bone and joint surgery British volume, 2009,91(2):234-239
- [8] Ramseier LE, Malinin TI, Temple HT, et al. Allograft reconstruction for bone sarcoma of the tibia in the growing child [J]. The Journal of bone and joint surgery British volume, 2006,88(1):95-99
- [9] Yan TQ, Guo W, Yang RL, et al. The survival and functional outcome of primary bone sarcomas in distal lower extremity [J]. Chinese journal of surgery, 2010,48(20):1550-1555
- [10] Broders AC. Squamous-cell epithelioma of the skin: A study of 256 cases[J]. Annals of surgery, 1921,73(2):141-160
- [11] Enneking WF. A system of staging musculoskeletal neoplasms [J]. Clinical orthopaedics and related research, 1986,20(4):9-24
- [12] Pesce CE, Liederbach E, Czechura T, et al. Changing surgical trends in young patients with early stage breast cancer, 2003 to 2010: A report from the national cancer data base [J]. Journal of the American College of Surgeons, 2014,(1):11-22
- [13] Cain JD, DiNucci K. Revisional peripheral nerve surgery [J]. Clinics in podiatric medicine and surgery, 2009,26(1):11-22
- [14] Osborne TS, Khanna C. A review of the association between osteosarcoma metastasis and protein translation [J]. Journal of comparative pathology, 2012,146(2-3):132-142
- [15] Picci P. Osteosarcoma (osteogenic sarcoma)[J]. Orphanet journal of rare diseases, 2009,2(6):75-78
- [16] Ta HT, Dass CR, Choong PF, et al. Osteosarcoma treatment: State of the art[J]. Cancer metastasis reviews, 2009,28(2):247-263
- [14] 戴连生,荆浩,程飞,等.切开复位内固定术与闭合复位内固定术治疗肱骨髁上骨折的临床对比研究[J].宁夏医科大学学报, 2013, 35(9): 1010-1012
- [15] Dai Lian-sheng, Jing Hao, Cheng Fei, et al. Clinical comparative study of open reduction and internal fixation with the closed reduction and internal fixation for treatment of supracondylar fracture of humerus [J]. Journal of Ningxia Medical University, 2013, 35(9): 1010-1012
- [16] Kleck C J, Seidel M J. Epithelioid hemangioma of the distal humerus with pathologic fracture[J]. Orthopedics, 2012, 35(1): e116-e119
- [17] Sen R K, Tripathy S K, Kumar A, et al. Metaphyseal-diaphyseal junction fracture of distal humerus in children[J]. J Pediatr Orthop B, 2012, 21(2): 109-114
- [18] Hildebrand G R, Wright D M, Marston S B, et al. Use of a fibular strut allograft in an osteoporotic distal humerus fracture: a case report [J]. Geriatr Orthop Surg Rehabil, 2012, 3(4): 167-171
- [19] Namba J, Tsujimoto T, Tempurin K, et al. Medial condyle fracture of the distal humerus in an adolescent with pre-existing fishtail deformity. A case report[J]. Emerg Radiol, 2011, 18(6): 507-511
- [20] Baker A, Methratta S T, Choudhary A K. Transphyseal fracture of the distal humerus in a neonate[J]. West J Emerg Med, 2011,12(2):173

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- [6] Li J, Zhou Y, Jing J H. [Comminuted fracture of distal humerus by arm wrestling: a case report] [J]. China Journal of Orthopaedics and Traumatology, 2013, 26(7): 611-612
- [7] Sabalic S, Kodvanj J, Pavic A. Comparative study of three models of extra-articular distal humerus fracture osteosynthesis using the finite element method on an osteoporotic computational model [J]. Injury, 2013, 44(3): S56-S61
- [8] Lee T J, Kwon D G, Na S I, et al. Modified combined approach for distal humerus shaft fracture: anterolateral and lateral bimodal approach[J]. Clin Orthop Surg, 2013, 5(3): 209-215
- [9] Muller L P, Wegmann K, Burkhart K J. Fracture endoprosthesis of distal humerus fractures[J]. Unfallchirurg, 2013, 116(8): 708-715
- [10] Bukvic N, Kvesic A, Brekalo Z, et al. The problem of post-traumatic varization of the distal end of the humerus remaining after the recovery of a supracondylar fracture [J]. J Pediatr Orthop B, 2013, 22(4): 372-375
- [11] Kazmierczak M, Pyszel K S, Surdziel P H. Total elbow arthroplasty in complicated distal humerus fracture--a case report [J]. Pol Orthop Traumatol, 2013, 78: 91-96
- [12] Zha Y J, Jiang X Y, Gong M Q. Choices to treat fracture of distal humerus in the elderly patients[J]. China Journal of Orthopaedics and Traumatology, 2012, 25(9): 773-778
- [13] Worden A, Ilyas A M. Ulnar neuropathy following distal humerus fracture fixation[J]. Orthop Clin North Am, 2012, 43(4): 509-514