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手法复位石膏外固定与切开复位钢板内固定对骨质疏松性桡骨远端骨折患者腕关节功能和生活质量的影响*

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摘要 目的:比较手法复位石膏外固定与切开复位钢板内固定对骨质疏松性桡骨远端骨折(RDOF)患者腕关节功能和生活质量的影响。**方法:**按照随机数字表法将2015年6月至2017年6月我院收治的76例RDOF患者分为观察组和对照组,每组各38例。对照组给予手法复位石膏外固定治疗,观察组给予切开复位钢板内固定治疗,比较两组治疗效果、骨折愈合时间、腕关节功能恢复情况、生活质量改善情况及并发症发生情况。**结果:**观察组患者治疗优良率高于对照组($P<0.05$)。治疗后1个月,观察组关节背伸、关节曲度高于对照组($P<0.05$),治疗后3个月比较差异无统计学意义($P>0.05$);治疗后1个月、3个月观察组掌倾角、尺偏角、握力、桡骨高度均高于对照组,尺骨移位低于对照组,另外,观察组骨折愈合时间短于对照组($P<0.05$);观察组患者治疗后3个月的躯体健康、躯体角色功能、疼痛、心理功能、情绪角色功能、活力、社会功能、总体健康评分均高于对照组($P<0.05$);观察组患者并发症总发生率低于对照组($P<0.05$)。**结论:**切开复位钢板内固定治疗RDOF疗效优于手法复位石膏外固定,可有效改善患者腕关节功能和生活质量,并发症较少。

关键词:骨质疏松性桡骨远端骨折;手法复位石膏外固定;切开复位钢板内固定;腕关节功能;生活质量

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Effects of Manual Reduction and Plaster External Fixation and Open Reduction and Internal Fixation on Wrist Function and Quality of Life in Patients with Osteoporotic Distal Radius Fractures*

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ABSTRACT Objective: To compare the effects of external fixation and open reduction and internal fixation on the wrist joint function and quality of life in patients with osteoporotic distal radius fracture (RDOF). **Methods:** 76 patients with RDOF who were treated in our hospital from June 2015 to June 2017 were divided into the observation group and the control group according to the random number table method, 38 cases in each group. The control group were treated with manual reduction plus plaster external fixation. The observation group were treated with open reduction and internal fixation. The treatment effect, fracture healing time, wrist function recovery, quality of life improvement and complications were compared between the two groups. **Results:** The excellent and good rate in the observation group was higher than that in the control group ($P<0.05$). At 1 months after treatment, the joint dorsiflexion and joint curvature in the observation group were higher than those in the control group ($P<0.05$), there was no significant difference at 3 months after treatment ($P>0.05$). At 1 months and 3 months after treatment, the palmar angle, the ulnar angle, the grip strength and the height of the radius were higher than those of the control group, and the ulna displacement was lower than that of the control group, and the fracture healing time was shorter than that of the control group ($P<0.05$). The scores of physical health, somatic role function, pain, psychological function, emotional role function, vitality, social function and overall health score of the observation group at 3 months after treatment were higher than those of the control group ($P<0.05$). The incidence of complications in the observation group was lower than that in the control group ($P<0.05$). **Conclusion:** The effects of open reduction and plate fixation for RDOF is superior to manual reduction and plaster external fixation. It can effectively improve wrist joint function and quality of life, and it has fewer complications.

Key words: Radius distal osteoporosis fracture; Manual reduction plus plaster external fixation; Open reduction and internal fixation; Wrist joints function; Quality of life

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前言

骨质疏松是中老年人群中常见疾病,以骨质吸收增多、骨密度下降为典型表现,好发于胸椎、腰椎、髌骨、桡骨远端和踝骨等部位,随着患者骨骼强度的下降上述部位骨折风险明显增加^[1,2]。骨质疏松性桡骨远端骨折(Radius distal osteoporosis fracture, RDOF)在临床上较为常见,较非 RDOF 患者骨折块粉碎程度高、稳定性差,因此增大了治疗难度^[3,4]。手法复位石膏外固定与切开复位钢板内固定均为临床治疗 RDOF 的常用手段,其中手法复位石膏外固定因无需进行切开复位和置入内固定钢板,从而操作更为简单,也不会造成较大的手术创伤,复位效果十分明确^[5-7]。但调查研究显示,手法复位石膏外固定因早期限制了患者的活动,无法有效开展功能锻炼,不利于腕关节功能的恢复,治疗后畸形愈合等不良情况的发生率也较高^[8]。而切开复位钢板内固定则可以达到良好的解剖学复位效果,术后早期也可以进行功能锻炼,利于患者术后腕关节功能恢复^[9]。但由于切开复位钢板内固定属于有创操作,术前也需要进行麻醉,因此适应症和禁忌症要严格把握^[10]。关于手法复位石膏外固定与切开复位钢板内固定在骨折治疗效果和术后腕关节功能恢复等方面的具体差异尚需要进一步研究比较。鉴于此本研究两种治疗方案的实际临床效果进行了比较,以期为 RDOF 治疗方案的优化提供参考,阐述如下。

1 资料与方法

1.1 一般资料

将 2015 年 6 月至 2017 年 6 月我院收治的 76 例 RDOF 患者纳入本研究。纳入标准:(1)经常规影像学检查确诊为新鲜桡骨远端闭合性骨折;(2)经骨密度仪测量明确为骨质疏松;(3)符合手法复位石膏外固定或切开复位钢板内固定治疗指征;(4)患者及其家属对本研究知情同意,并签署知情同意书。排除标准:(1)骨折后出现神经或血管损伤者;(2)开放性骨折或陈旧性骨折者;(3)有严重感染或合并其他急慢性疾病者;(4)依从性差者。按照随机数字表法分为观察组和对照组,每组各 38 例,观察组男性 20 例,女性 18 例;年龄 45-78 岁,平均(62.17±6.55)岁;致伤原因:交通事故 24 例、意外跌倒 9 例、高处坠落 5 例;骨折分型:B2 型 8 例、B3 型 7 例、C1 型 11 例、C2 型 7 例、C3 型 5 例;对照组男性 21 例,女性 17 例;年龄 43-77 岁,平均(61.59±6.61)岁;致伤原因:交通事故 23 例、意外跌倒 11 例、高处坠落 4 例;骨折分型:B2 型 6 例、B3 型 9 例、C1 型 12 例、C2 型 6 例、C3 型 5 例。两组患者的性别、年龄、致伤原因、骨折分型等一般资料比较差异无统计意义($P>0.05$),具有可比性。本研究已通过我院伦理委员会审批。

1.2 方法

对照组给予手法复位石膏外固定治疗,麻醉方法选择 2% 利多卡因(东北制药集团沈阳第一制药有限公司,国药准字:H21021148,规格:20 mL:0.4 g)局部浸润麻醉,根据术前 X 线检查结果明确骨折块所在位置的情况,将患者骨折肢外展,手背朝上,由助手将肘上握住,医师持患者腕部进行牵引、按压等复位操作,复位后复查 X 线明确复位良好后使用石膏进行外固定,1 周后再次复查 X 线,若存在骨折移位则需再次手法复位。定期复查,骨痂形成后方可进行石膏拆除。

观察组给予切开复位钢板内固定治疗,麻醉方法选择臂丛神经阻滞麻醉,以 X 线检查结果为依据选择入路位置和钢板大小。将患者骨折肢外展置于手术台,掌侧缘向上,由掌侧入路,逐层解剖使骨折断端充分暴露,直视下进行牵引、撬拨、旋转等复位操作,对存在骨缺损或关节面塌陷者需进行植骨,解剖复位良好后使用克氏针临时固定。将准备好的 T 型或 L 型钢板置入桡骨远端掌侧,调整好位置后在 C 型臂 X 线机透视下观察复位是否满意,满意则进行锁定钉加压固定与创面冲洗,逐层缝合。早期指导患者进行腕关节功能锻炼。

1.3 观察指标

指导患者术后定期复查骨折恢复情况,直至骨折完全愈合。根据 Mcbridge 腕关节功能复查结果评估两组患者治疗效果^[11],具体如下:优:Mcbridge 腕关节功能评分为 90 分及以上;良:Mcbridge 腕关节功能评分为 80-89 分;可:Mcbridge 腕关节功能评分为 60-79 分;差:Mcbridge 腕关节功能评分低于 60 分。优良率=(优+良)/总例数×100%。于治疗后 1 个月、治疗后 3 个月比较两组腕关节功能恢复情况,其中腕关节功能指标包括关节背伸、关节曲度、掌倾角、尺偏角、握力、桡骨高度、尺骨移位,并统计两组患者的骨折愈合时间。治疗前、治疗后 3 个月的生活质量采用健康调查简表(SF-36)进行评价^[12],共包括 36 项问题,涉及躯体健康、躯体角色功能、疼痛、心理功能、情绪角色功能、活力、社会功能及总体健康 8 个维度,每个维度总分为 100 分,评分越高表示该项状况越好。

1.4 统计学方法

使用 SPSS 19.0 进行统计学处理,疗效、并发症等计数资料以百分率表示,组间比较用 χ^2 检验,腕关节功能指标及生活质量评分等计量资料以均数±标准差($\bar{x} \pm s$)表示,组间比较用 t 检验,检验标准设置为 $\alpha=0.05$ 。

2 结果

2.1 两组治疗效果对比

观察组患者治疗优良率较对照组升高($P<0.05$),见表 1。

表 1 两组治疗效果对比[n(%)]

Table 1 Comparison of treatment effect in two groups[n(%)]

Groups	Excellent	Good	Tolerableness	Poor	Excellent and good rate
Observation group(n=38)	27(71.05)	8(21.05)	3(7.89)	0(0.00)	35(92.11)
Control group(n=38)	14(36.84)	14(36.84)	9(23.68)	1(2.63)	28(73.68)
χ^2			4.547		
P			0.033		

2.2 两组腕关节功能指标及骨折愈合时间对比

治疗后 1 个月, 观察组关节背伸、关节曲度高于对照组 ($P < 0.05$), 治疗后 3 个月比较差异无统计学意义 ($P > 0.05$); 治疗后 1 个月、3 个月观察组掌倾角、尺偏角、握力、桡骨高度均高于对

照组, 尺骨移位低于对照组 ($P < 0.05$), 见表 2。观察组患者骨折愈合时间为 (6.71 ± 1.16) 周, 短于对照组的 (8.15 ± 1.33) 周, 差异有统计学意义 ($t = 3.241, P = 0.014$)。

表 2 两组腕关节功能指标对比 ($\bar{x} \pm s$)Table 2 Comparison of wrist joint function indexes of two groups ($\bar{x} \pm s$)

Groups	Time	Joint dorsiflexion ($^{\circ}$)	Joint curvature ($^{\circ}$)	Palmar angle ($^{\circ}$)	Ulnar angle ($^{\circ}$)	Grip strength (kg)	Radial height (mm)	Ulna displacement (mm)
Observation group (n=38)	1 month after treatment	44.06 $\pm$ 8.24*	38.85 $\pm$ 6.26*	10.33 $\pm$ 1.67*	18.66 $\pm$ 5.17*	10.06 $\pm$ 3.03*	8.62 $\pm$ 1.10*	1.47 $\pm$ 0.51*
	3 months after treatment	46.62 $\pm$ 8.85	41.25 $\pm$ 7.33	12.16 $\pm$ 2.17*	21.55 $\pm$ 3.08*	13.71 $\pm$ 3.16*	9.89 $\pm$ 1.16*	1.30 $\pm$ 0.47*
Control group (n=38)	1 month after treatment	40.08 $\pm$ 7.95	35.62 $\pm$ 5.81	7.16 $\pm$ 1.08	12.12 $\pm$ 2.31	7.26 $\pm$ 1.88	6.86 $\pm$ 1.12	1.85 $\pm$ 0.33
	3 months after treatment	44.17 $\pm$ 8.28	39.38 $\pm$ 8.05	9.15 $\pm$ 1.88	17.64 $\pm$ 2.87	9.83 $\pm$ 2.62	7.30 $\pm$ 1.45	1.63 $\pm$ 0.41

Note: compared with the control group, * $P < 0.05$.

2.3 两组治疗前、治疗后 3 个月生活质量对比

两组患者治疗前躯体健康、躯体角色功能、疼痛、心理功能、情绪角色功能、活力、社会功能、总体健康评分比较并无统

计学差异 ($P > 0.05$); 两组患者治疗后 3 个月上述评分均高于治疗前, 且观察组高于对照组 ($P < 0.05$), 见表 3。

表 3 两组治疗前、治疗后 3 个月 SF-36 评分对比 (分, $\bar{x} \pm s$)Table 3 Comparison of SF-36 scores between two groups before treatment and 3 months after treatment (scores, $\bar{x} \pm s$)

Groups	Time	Physical health	Somatic role function	Pain	Psychological function	Emotional role function	Vitality	Social function	Overall health
Observation group (n=38)	Before treatment	46.07 $\pm$ 4.46	50.15 $\pm$ 4.33	41.33 $\pm$ 5.07	72.02 $\pm$ 4.88	59.02 $\pm$ 6.25	49.77 $\pm$ 4.38	51.62 $\pm$ 5.02	43.47 $\pm$ 5.11
	3 months after treatment	68.86 $\pm$ 5.25	76.33 $\pm$ 6.18	57.13 $\pm$ 5.65	81.65 $\pm$ 6.85	77.74 $\pm$ 8.15	75.62 $\pm$ 7.44	72.35 $\pm$ 8.02	63.66 $\pm$ 7.15
		Δ^*	Δ^*	Δ^*	Δ^*	Δ^*	Δ^*	Δ^*	Δ^*
Control group (n=38)	Before treatment	45.11 $\pm$ 4.52	51.24 $\pm$ 4.85	40.35 $\pm$ 5.12	70.89 $\pm$ 4.75	58.06 $\pm$ 6.11	49.75 $\pm$ 5.22	51.57 $\pm$ 5.38	42.52 $\pm$ 5.66
	3 months after treatment	60.96 $\pm$ 5.30	70.15 $\pm$ 5.95	49.62 $\pm$ 7.06	75.23 $\pm$ 8.77	70.27 $\pm$ 7.53	68.28 $\pm$ 6.31	65.96 $\pm$ 8.23	58.08 $\pm$ 7.81
		Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ

Note: compared with before treatment, $\Delta^* P < 0.05$, compared with the control group, $\Delta^* P < 0.05$.

2.4 两组并发症发生情况对比

观察组患者并发症总发生率低于对照组 ($P < 0.05$), 见表 4。

表 4 两组并发症发生情况对比 [n(%)]

Table 4 Comparison of the incidence of complications in the two groups [n(%)]

Groups	Radial nerve injury	Malunion	Nonunion of fracture	Total
Observation group (n=38)	1(2.63)	0(0.00)	0(0.00)	1(2.63)
Control group (n=38)	3(7.89)	2(5.26)	1(2.63)	6(15.79)
χ^2			3.934	
P			0.047	

3 讨论

骨质疏松症是一种以骨密度和骨质量下降、骨微结构受到

破坏为主要特点的骨科疾病, 随着我国老龄化的加剧, 骨质疏松症的发病率逐年升高, 导致髌部、胫骨平台、桡骨远端等骨质疏松症好发部位骨折风险显著升高^[13-15]。RDOF 的主要治疗原

则是重建桡骨远端解剖结构,最大程度恢复患者腕关节功能^[16]。目前,传统的手法复位石膏外固定以及切开复位钢板内固定治疗手段均在临床上应用较多^[17,18]。手法复位石膏外固定主要由经验丰富的骨科医师采取中医手法进行复位,在达到解剖复位或近似解剖复位效果后进行石膏外固定。此种治疗方式治疗花费少、创伤不明显且患者痛苦小,但临床实践表明经手法复位石膏外固定治疗者初始效果良好,但骨折愈合期间容易因骨质量问题而出现骨折移位或缩短的情况,而且由于外固定时间较长,对患者的活动有明显限制,无法在早期开展关节功能锻炼,导致腕关节僵硬或纤维化,不仅容易加剧骨量丢失,也会影响腕关节功能恢复^[19]。

随着近几年生物力学研究越来越成熟,桡骨远端切开复位钢板内固定的效果也得到了相关学者的认可^[20,21]。切开复位钢板内固定主要通过切开骨折部位,在直视下恢复骨折部位的解剖关系,促使桡骨高度、掌倾角、尺偏角以及关节面完整性得到恢复,再使用钢板进行加压固定,内固定稳定性良好,使得骨与钢板形成一个整体,防范移位的情况出现,大大降低了畸形愈合的风险^[22,23]。同时患者切开复位钢板内固定术后,其在术后早期便可进行康复锻炼,从而可更早的进行腕关节功能的恢复,避免腕关节僵硬或纤维化^[24]。本研究结果也显示,观察组患者治疗优良率高于对照组,观察组治疗后1个月、3个月掌倾角、尺偏角、握力、桡骨高度均高于对照组,尺骨移位低于对照组,且骨折愈合时间短于对照组,分析原因主要为切开复位钢板内固定在骨折部位解剖学复位方面效果更明确,术后早期进行康复锻炼有利于腕关节功能的恢复,同时也促进了骨折的良好愈合^[25,26]。另外,观察组患者桡神经损伤、畸形愈合、骨折不愈合等情况的发生风险更低,这主要是因为切开复位钢板内固定为患者骨折愈合提供了稳定的固定作用,避免了骨折移位、缩短等愈合不良情况的发生^[27,28]。而在生活质量方面,观察组患者治疗后3个月SF-36各项评分均高于对照组,主要是因为切开复位钢板内固定患者腕关节功能恢复更快、更好、术后并发症少,且患者活动功能恢复更好,从而心理状态更佳^[29,30]。需要注意的是,切开复位钢板内固定创伤较大,术前也需要进行相应的麻醉操作,而RDOF多为中老年人群,需要谨慎考虑患者的耐受性,严格把握手术适应症。对于耐受性不佳者可根据实际情况推荐手法复位石膏外固定进行治疗。

综上所述,切开复位钢板内固定治疗RDOF疗效显著,在改善患者腕关节功能和生活质量方面效果优于手法复位石膏外固定,安全有效。

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