

doi: 10.13241/j.cnki.pmb.2018.04.038

CPM 结合早期康复训练在儿童肘部骨折术后肘关节功能障碍的康复疗效*

张志华 杨小林[△] 吴松林 张建凤 沈一梅

(解放军第 252 医院 河北 保定 071000)

摘要 目的:探讨 CPM 结合早期康复训练对儿童肘部骨折术后肘关节功能恢复临床疗效。**方法:**选取我院 2015 年 12 月~2017 年 2 月期间骨科收治的儿童肘部骨折患者 122 例为研究对象,根据患者术后康复模式的不同将其分成了研究组(给予 CPM 结合早期康复训练)和对照组(给予早期康复训练),每组各 61 例。对两组患儿治疗前后的肘关节功能评分结果和综合疗效进行观察和比较。**结果:**(1)治疗后,研究组患儿的各项肘关节功能评分均明显优于对照组,且差异具有统计学意义;(2)治疗后优良率组间比较,研究组高于对照组,且差异具有统计学意义。**结论:**CPM 结合早期康复训练能够有效的促进儿童肘部骨折术后肘关节功能恢复,是临床实际中的理想选择之一。

关键词:CPM;早期康复训练;儿童肘部骨折术;关节功能障碍;康复疗效

中图分类号:R683 **文献标识码:**A **文章编号:**1673-6273(2018)04-771-04

The Effect of CPM Combined with Early Rehabilitation Training on Elbow Joint Dysfunction in Children with Elbow Fracture*

ZHANG Zhi-hua, YANG Xiao-lin[△], WU Song-lin, ZHANG Jian-feng, SHEN Yi-mei

(252 hospital of PLA, Baoding, Hebei, 071000, China)

ABSTRACT Objective: To explore the clinical effect of CPM combined with early rehabilitation training on the functional recovery of elbow joint in children with elbow fracture. **Methods:** 122 children with elbow fractures in our hospital from December 2015 to February 2017 were chosen as the research object. According to the differences of postoperative rehabilitation model, they were divided into the study group (CPM combined with early rehabilitation training) and the control group (given early rehabilitation training), and 61 cases in each group. The results of the elbow function score and the comprehensive curative effect were observed and compared between the two groups before and after treatment. **Results:** (1) After treatment, the elbow function score of the study group was significantly better than that of the control group, and the differences were with statistical significance. (2) After treatment, the excellent rates compared between the two groups, the study group was higher than the control group, and the differences were with statistical significance. **Conclusion:** CPM combined with early rehabilitation training can effectively promote the recovery of elbow joint function in children with elbow fracture, which is one of the ideal choices in clinical practice.

Key words: CPM; Early rehabilitation training; Children's elbow fracture; Joint dysfunction; Rehabilitation effect

Chinese Library Classification (CLC): R683 **Document code:** A

Article ID:1673-6273(2018)04-771-04

前言

与成人相比,儿童的肘部骨质结构较为脆弱,骨密度和强度均不如成人。因此,儿童肘部较成人来说更容易发生骨折显著^[1]。并且近年来儿童骨折发病率呈现出了一定的升高趋势^[2]。儿童一旦并发肘部骨折,不仅对其正常的生活、学习带来较大不方便,同时可在一定程度上影响儿童后续的生长发育,甚至能够带来一定的心理问题^[3]。目前临床上针对儿童肘部骨折的治疗以手术、内固定及外固定为主^[4-5],患儿术后康复过程尤为重要。有效的康复措施和方法对于患儿肘部功能的恢复意义重大。鉴于此,本次研究以儿童肘部骨折术后康复为研究对象,选

取我院骨科收治的儿童肘部骨折患者 122 例,给予其不同康复措施和方法,对其肘关节功能恢复效果进行了如下比较研究和报道。

1 资料和方法

1.1 临床资料

研究对象共计 122 例,均为我院骨科 2015 年 12 月~2017 年 2 月期间收治的儿童患者。患儿中男性患儿 69 例,女性患儿 53 例,年龄 4~12 岁,平均年龄(8.16±1.20)岁,左侧骨折患者 57 例,右侧骨折患者 65 例。纳入标准:(1)年龄大于 4 岁;(2)采用切开复位内固定手术治疗;(3)术后骨折愈合良好,但伴有不

* 基金项目:国家自然科学基金青年基金项目(30901795)

作者简介:张志华(1984-),研究方向:康复医学,E-mail: zzhuhua0123@163.com

△ 通讯作者:杨小林(1978-),E-mail: 1449349041@qq.com

(收稿日期:2017-08-28 接受日期:2017-09-22)

同程度的功能障碍。排除标准:(1)骨化性肌炎;(2)年龄大于 12 岁;(3)骨折延长愈合。根据患者术后康复模式的分成研究组和对照组,每组各 61 例。两组基线资料见表 1。

表 1 两组患儿基线资料比较

Table 1 Comparison of baseline data between the two groups

Groups	N	Male	Female	Average age	Left elbow fracture	Right elbow fracture
Study group	61	34	27	8.11± 1.23	28	33
Control group	61	35	26	8.20± 1.19	29	32
Statistics	—	0.0334		0.4107	0.0329	
P value	—	0.8551		0.6820	0.8560	

1.2 康复训练方法

1.2.1 对照组的康复训练方法 本组 61 例患儿给予常规的早期康复训练措施和方法。

1.2.2 研究组的康复训练方法 本组 61 例患儿在给予常规的早期康复训练措施和方法的基础上,给予持续被动活动(CPM)模式进行干预,具体措施如下:(1)给予患儿以及患儿家属早期的健康宣教,并对患儿以及患儿家属出现的不良心理情绪进行积极干预,不断提升其治疗的信心;(2)按照常规的早期康复训练方案对患儿的肘关节实施定期的活动,同时在此基础之上要对其相关的关节进行充分的活动,这样可以整体上不断提升患儿关节的活动度,最大限度的减轻关节活动障碍;(3)在实施 CPM 的过程中,要结合患儿个体的差异和耐受度情况进行针对性的调整,若出现相关不适感,要注意训练期间的间隔和休息,有效的控制训练强度,从而防止关节粘连;(4)结果训练效果的提升以及患儿相关关节功能的不断恢复,可适当增加活

动角度,确保训练效果和康复效果。

1.3 观察指标

以两组患儿治疗前后的肘关节功能评分结果和综合疗效为观察指标。

1.4 统计学方法

采用 spss19.0 进行统计学分析。采用 t 检验和 χ^2 检验。当 $P < 0.05$ 时,差异有显著。

2 结果

2.1 治疗前后肘关节功能进行评分结果比较

治疗前,两组患儿的屈曲评分、欠伸评分、旋前评分和旋后评分等各项肘关节功能评分结果差异不大,无统计学意义;治疗后,研究组的各项肘关节功能评分均明显优于对照组,且差异显著。见表 2。

表 2 治疗前后肘关节功能进行评分比较

Table 2 Comparison of the elbow function score before and after treatment

Groups	N	Flexion score		Less stretch score		Pronation score		Rotary score	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Study group	61	80.34± 4.34	136.42± 8.34	40.34± 5.44	6.43± 1.00	68.33± 6.55	98.34± 4.33	70.34± 2.33	90.33± 7.66
Control group	61	80.88± 4.63	100.23± 19.23	40.88± 5.01	20.33± 5.93	67.99± 6.03	70.34± 7.66	70.43± 2.51	80.54± 8.33
T value	—	0.6646	13.4849	0.5703	18.0524	0.2983	24.8533	0.2052	6.7567
P value	—	0.5076	0.0000	0.5696	0.0000	0.7660	0.0000	0.8377	0.0000

2.2 两组患儿疗效比较

治疗后研究组 61 例患者中,优良患者共计 50 例,优良率为 81.97%,治疗后对照组 61 例患者中,优良患者共计 34 例,

优良率为 55.74%。优良率组间比较,研究组高于对照组,且差异显著。见表 3。

表 3 患儿疗效比较

Table 3 Comparison of the curative effect of the two groups

Groups	N	Excellent(n)	Good(n)	Fair(n)	Poor(n)	Excellent and good rate(%)
Study group	61	33	17	10	1	81.97
Control group	61	22	12	17	10	55.74
Statistics	—					9.7845
P value	—					0.0018

3 讨论

肘部骨折在儿童骨关节损伤中最常见。儿童处于生长期,儿童期软骨板的强度远不如韧带和关节囊,有研究证明软骨板的强度比肌腱弱 2~5 倍,从高处跳下、摔倒、玩滑板、滑旱冰等均能造成肘部骨折。儿童肘部骨折患儿在给予手术治疗后,会不同程度的出现患儿关节功能障碍。不仅影响患儿的生活质量,同时在一定程度上会影响患儿的生长发育^[7]。对儿童肘部骨折不仅要求解剖复位而且要不遗留功能障碍。调查显示骨折患者在出院时对康复锻炼的指导时间、次数和方法、定期复查的时间和方等知识的需求明显上升。肘关节的功能位是屈曲 1°~90° 其最有用的活动范围在 60°~120° 之间前臂的功能位是旋前旋后中立位,其最有用的活动范围是旋前旋后各 45°。在上肢损伤的功能锻炼中最容易出问题的是肘关节伸屈和旋转功能的恢复程度,而这又直接关系到手的灵活性。因此,针对于肘部骨折患儿术后关节功能恢复的相关研究具有重要的社会意义和临床价值。

既往文献研究认为^[8-11]:针对于儿童肘部骨折患儿术后功能恢复以早期康复训练措施为主。随着医学理论和观点的不断发展,近年来持续被动活动观念在临床术后关节功能的恢复实践中得以广泛推行和认可^[12]。持续被动活动的主要原理就是通过给予肘关节功能障碍患儿肌肉一定的锻炼,从而确保其肌肉力量能够在一定时间内得到加强或者恢复^[13]。从目前的临床实践应用效果上分析,这种康复措施和方法较好的提高了患儿术后关节的恢复效果。

同时,进一步对相关临床实践进行总结后我们发现^[14-15]:CPM 能够显著的促进患儿术后肘关节早期功能的恢复,但是被动运动最终仍然要被关节的主动活动所替代。因此,对于患儿术后的 CPM 来说,这仅仅是一个过渡阶段。在 CPM 计划实施结束后,相关患儿还要进行主动锻炼,这样才能彻底改善关节功能,最终确保恢复效果达到满意状态。

此外,除了 CPM 以外,其他众多临床辅助疗法也被证实能够有效促进关节功能恢复。这些方法主要包括:微波、热敷及按摩等,这些辅助疗法的基本原理就是通过改善血液循环功能,从而促进微循环系统的通畅,进而实现有效缓解关节周围粘连,促使组织再生等目的,最终促进关节功能恢复^[16-20]。

从本文研究的比较结果上看:治疗后研究组 61 例患者中,优良患者共计 50 例,优良率为 81.97%,治疗后对照组 61 例患者中,优良患者共计 34 例,优良率为 55.74%。优良率组间比较,研究组高于对照组,且差异显著。这不仅说明 CPM 的临床比较优势,同时也证实了上述的观点和说法。

因此,综上所述,CPM 结合早期康复训练能够有效的促进儿童肘部骨折术后肘关节功能恢复,是临床实际中的理想选择之一。

参考文献(References)

- [1] 陈玲, 蒋林峻. CPM 结合早期康复训练在儿童肘部骨折术后肘关节功能障碍的康复疗效[J]. 重庆医学, 2016, 45(6): 823-825
Chen Ling, Cai Lin-jun. The effect of CPM combined with early rehabilitation training on elbow joint dysfunction after elbow fracture in children [J]. Chongqing Medicine, 2016, 45(6): 823-825
- [2] Chen H, Wu K, Wang M, et al. A standard mastectomy should not be the only recommended breast surgical treatment for non-metastatic inflammatory breast cancer: A large population-based study in the Surveillance, Epidemiology, and End Results database 18 [J]. The Breast: official journal of the European Society of Mastology, 2017, 35: 48-54
- [3] 毕丹. CPM 锻炼结合护理康复对膝部骨折术后膝关节功能的影响分析[J]. 中国医药指南, 2017, 15(9): 271-272
Bi Dan. CPM exercise combined with nursing rehabilitation in improving the knee joint function after surgery for fractures of the knee[J]. Guide of China Medicine, 2017, 15(9): 271-272
- [4] 张国辉, 张冬喜. 骨片钉内固定术治疗儿童肘部骨折[J]. 中国中医骨伤科杂志, 2014, 9: 019
Zhang Guo-hui, Zhang Ding-xi. Treatment of children's elbow fracture with bone screw fixation [J]. Chinese Journal of Traditional Medical Traumatology & Orthopedics, 2014, 9: 019
- [5] Abbott M D, Buchler L, Loder R T, et al. Gartland type III supracondylar humerus fractures: outcome and complications as related to operative timing and pin configuration [J]. Journal of children's orthopaedics, 2014, 8(6): 473-477.
- [6] Wall A, Board T. The biological effect of continuous passive motion on the healing of full-thickness defects in articular cartilage. An experimental investigation in the rabbit [M]. Classic Papers in Orthopaedics. Springer London, 2014: 437-439
- [7] Krettek C, Clausen J, Omar M, et al. Two-stage late reconstruction with a fresh large osteochondral shell allograft transplantation (FLOCSAT) for a large osteochondral defect in a non-union after a lateral tibia plateau fracture 2-year follow up [J]. Injury, 2017, 48(7): 1309-18
- [8] 蔡金秀, 陈潇, 韩廷成, 等. 加味海桐皮汤熏蒸联合 CPM 机在膝关节术后功能康复中的应用[J]. 齐鲁护理杂志, 2017, 23(2): 66-68
Cai Jin-xiu, Chen Xiao, Han Ting-cheng, et al. Application of modified erythrina decoction fumigation combined with cpm machine in functional rehabilitation of knee arthroscopy [J]. Journal of Qilu Nursing, 2017, 23(2): 66-68
- [9] 杜玉萍, 刘长丕. CPM 机配合对人工全康复锻炼膝关节置换术后功能恢复的疗效观察[J]. 中国医药指南, 2016, 14(29): 9-10
Du Yu-ping, Liu Chang-pi. The Efficacy Observation of Functional Recovery of CPM Machine with Artificial Total Knee Rehabilitation Exercises[J]. Guide of China Medicine, 2016, 14(29): 9-10
- [10] 冯瑞连. 护理干预对肱骨髁上骨折后肘关节功能恢复的影响[J]. 中外医疗, 2014, 33(6): 145-145
Feng Rui-lian. Effect of nursing intervention on functional recovery of elbow joint after supracondylar fracture of humerus [J]. China Foreign Medical Treatment, 2014, 33(6): 145-145
- [11] Feng Z, Wu Z, Jia-yue L I. Application of early rehabilitation training for postoperative fracture around the elbow joint [J]. Medical Journal of West China, 2013, 8: 018
- [12] 张维民, 沙淑艳, 徐翌平, 等. 膝关节周围骨折术后持续被动活动治疗时间窗对膝关节功能康复的影响 [J]. 护理研究, 2012, 26(7): 636-637
Zhang Wei-min, Sha Shu-yan, Xu Yi-ping, et al. Influence of therapeutic time window of postoperative continuous passive motion

- on rehabilitation of knee joint function in patients with around the knee fracture surgery [J]. Chinese Nursing Research, 2012, 26(7): 636-637
- [13] 张雪, 罗汉华. 持续被动运动在临床康复中的研究进展[J]. 医学综述, 2010, 16(3): 420-422
- Zhang Xue, Luo Han-hua. Research Progress on Continuous Passive Motion in Clinical Rehabilitation [J]. Medical Recapitulate, 2010, 16(3): 420-422
- [14] 黄勇, 王鑫灵. TKA 术后医生指导下患者自主化康复训练与 CPM 机训练的早期疗效比较[J]. 实用医学杂志, 2015, (7): 1120-1122
- Huang Yong, Wang Xin-ling. Early efficacy comparison between independent exercises under the doctors guidance and passive exercises by using CPM in rehabilitation after TKA[J]. The Journal of Practical Medicine, 2015, (7): 1120-1122
- [15] 王芳, 刘红侠. 护理康复指导训练配合持续性被动运动锻炼在膝部骨折术后的应用 [J]. 检验医学与临床, 2015, (13): 1866-1867, 1870
- Wang Fang, Liu Hong-xia. Application of nursing rehabilitation guidance training coordinated by CPM exercise after knee fracture operation[J]. Laboratory Medicine and Clinic, 2015, (13): 1866-1867, 1870
- [16] Tougher S, Hanson K, Goodman C. What happened to anti-malarial markets after the Affordable Medicines Facility-malaria pilot? Trends in ACT availability, price and market share from five African countries under continuation of the private sector co-payment mechanism[J]. Malaria journal, 2017, 16(1): 173
- [17] 陈苗. CPM 机在全膝关节表面置换术后康复训练中应用最佳时间的研究[J]. 护士进修杂志, 2015, (21): 1931-1933
- Chen Miao. Study for the best time of continuous passive motion machine applied in rehabilitation training after total knee arthroplasty [J]. Journal of Nurses Training, 2015, (21): 1931-1933
- [18] 芦盛贞, 彭夏红. 中药薰洗湿热敷对胫骨平台骨折术后恢复的效果观察[J]. 上海医药, 2014, 23: 007
- Lu Sheng-zhen, Peng Xia-hong. Observation of the effect of the fumigation and wet hot compress of traditional Chinese medicines on the postoperative recovery of tibial plateau fracture [J]. Shanghai Medical & Pharmaceutical Journal, 2014, 23: 007
- [19] 许弄章, 储文军, 陈萍萍, 等. 中医外治法治疗踝关节扭伤进展[J]. 海南医学, 2015, 26(24): 3671-3673
- Xu Nong-zhang, Chu Wen-jun, Chen Ping-ping, et al. Treatment of ankle sprain by external treatment of traditional chinese medicine[J]. Hainan Medical Journal, 2015, 26(24): 3671-3673
- [20] Nekouei P, Sadeghi-Demneh E, Mahdavi-nejad R, et al. The effects of aquatic exercise and joint supplements on pain and function of women with knee osteoarthritis[J]. Archives of Physical Medicine and Rehabilitation, 2015, 96(10): e104-e105
- [21] Koman L A, Smith B P, Williams R, et al. Upper extremity spasticity in children with cerebral palsy: a randomized, double-blind, placebo-controlled study of the short-term outcomes of treatment with botulinum A toxin [J]. The Journal of hand surgery, 2013, 38(3): 435-446
- [22] Myrhaug H T, Østensjø S, Larun L, et al. Intensive training of motor function and functional skills among young children with cerebral palsy: a systematic review and meta-analysis [J]. BMC pediatrics, 2014, 14(1): 292
- [23] Groenestijn A C, van de Port I G L, Schröder C D, et al. Effects of aerobic exercise therapy and cognitive behavioural therapy on functioning and quality of life in amyotrophic lateral sclerosis: protocol of the FACTS-2-ALS trial [J]. BMC neurology, 2011, 11(1): 70
- [24] Mang CS, Campbell KL, Ross CJD, et al. Promoting neuroplasticity for motor rehabilitation after stroke: considering the effects of aerobic exercise and genetic variation on brain-derived neurotrophic factor[J]. Physical therapy, 2013, 93(12): 1707-1716
- [25] Koskinen A, Vuolteenaho K, Moilanen T, et al. Resistin as a factor in osteoarthritis: Synovial fluid resistin concentrations correlate positively with interleukin 6 and matrix metalloproteinases MMP-1 and MMP-3 [J]. Scandinavian journal of rheumatology, 2014, 43(3): 249-253

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- [14] Ibraheem RF, Iqbal W, Fawad-ur-Rehman. Role of posterior sub-tenon triamcinolone acetate in patients of refractory macular oedema[J]. J Pak Med Assoc, 2016, 66(12): 1602-1605
- [15] Ozge G, Ayyildiz O, Kucukciliglu M, et al. Comparison of intracameral dexamethasone and intracameral triamcinolone acetate injection at the end of phacoemulsification surgery [J]. Indian J Ophthalmol, 2015, 63(3): 287
- [16] Lee SJ, Kim YD, Kyung H. Pseudophakic glaucoma after management of posterior capsule rupture using intracameral triamcinolone injection in cataract surgery[J]. Korean J Ophthalmol, 2014, 28(4): 356-357
- [17] Sarenac Vulovic TS, Pavlovic SM, Jakovljevic VL, et al. Nitric oxide and tumour necrosis factor alpha in the process of pseudoexfoliation glaucoma[J]. Int J Ophthalmol, 2016, 9(8): 1138-1142
- [18] Wang B, Dong N, Xu B, et al. Efficacy and safety of intracameral triamcinolone acetate to control postoperative inflammation after phacotrabeculectomy [J]. J Cataract Refract Surg, 2013, 39(11): 1691-1697
- [19] Sabzevari A, Adibkia K, Hashemi H, et al. Improved anti-inflammatory effects in rabbit eye model using biodegradable poly beta-amino ester nanoparticles of triamcinolone acetate [J]. Invest Ophthalmol Vis Sci, 2013, 54(8): 5520-5526
- [20] Wang L, Zhang Z, Koch DD, et al. Anterior chamber interleukin 1 β , interleukin 6 and prostaglandin E₂ in patients undergoing femtosecond laser-assisted cataract surgery [J]. Br J Ophthalmol, 2016, 100(4): 579-582