

## LETTER TO THE EDITOR

## The Application and Effectiveness of Single-Arm Hinged External Fixator in Complex Elbow Fracture Dislocation of Basketball Players Based on Ecological Science Theory

Liang Li\*

School of Physical Education, East China Jiaotong University, Nanchang 330013, China

Email of corresponding author: 664257664@qq.com

To observe and compare the therapeutic efficacy of single-arm hinged external fixator in the treatment of complex elbow fracture dislocation in basketball players. Methods: A total of 200 basketball players with complex elbow fracture dislocation were enrolled. And the patients were divided into research group and control group, with 100 cases in each group. The patients in control group were treated with internal fixation and plaster fixation, while the patients in research group were subjected to single-arm hinged external fixator. The therapeutic efficacy was compared between both groups. Results: Compared with the control group, the patients in the research group had higher rate of excellent and good by comparing the Mayo scores ( $P < 0.05$ ). Also, the patients in the research group had better prognosis than those of the control group ( $P < 0.05$ ). Conclusion: Application of single-arm hinged external fixator in basketball players with complex elbow fracture dislocation has advantages over traditional treatments.

### I Introduction

Guangyu Zhang, Yang Yu. Buslaev published “Research on Model Construction of Technical Test and Evaluation of Youth Basketball Players Based on Ecological Sports Concept” on Issue 107, Pages: 3617-3622, Article No: e107404, Year: 2019, in the article. The development of modern basketball requires comprehensive qualities of basketball players. We strive for standardization and scientificity of the technical test and evaluation of youth basketball players. The model construction of technical test and evaluation of youth basketball players should follow the principle of goal, development and scientificity from the perspective of ecological sports. By the means of questionnaire survey and literature analysis, the index system of teaching quality of distance education, including four first-level indicators (index of shot, index of pass, index of dribble and index of move) and sixteen second-level indicators, is given in this paper. The weights of all the second level indexes of technical test and evaluation of youth basketball players are calculated based on AHP.

Complex elbow fracture dislocation (as shown in Figure 1 below) is a relatively complicated type of elbow trauma. The primary goal in therapy is to maintain the stability of elbow joint while recovering. Compared with the other traumas, the incidence of the elbow stiffness would be significantly elevated due to the inherent anatomical characteristics and immobilization (Tao et al. 2018). With the development of medical care, the application of single-arm hinged external fixator in the treatment of complex elbow fracture dislocation has been widely accepted,

exerting relatively ideal effects (Abdel et al. 2016, Hazra et al. 2015) .This research aims to observe and compare the therapeutic efficacy of single-arm hinged external fixator in the treatment of complex elbow fracture dislocation in basketball players, and the report is listed as follows.



**Fig 1. Complex elbow fracture dislocation**

## **II Data and Methods**

A total of 200 basketball players definitely diagnosed as complex elbow fracture dislocation (as shown in Figure 2) and treated at our hospital from January 2015 to September 2018 were enrolled. All patients enjoyed the right to know, and formal consent forms were obtained. This study was approved by the ethic committee of our hospital. All patients were randomized into research group and control group, with 100 cases in each group. Of those, there were 78 male patients and 22 female patients in the research group, with an average age of  $(29.5\pm 3.1)$  years. Among those patients, 22 of them were left trauma, 50 of them were right trauma and 28 of them were bilateral trauma. Moreover, there were 70 male patients and 30 female patients in the control group, with an average age of  $(27.8\pm 3.6)$  years. Among those patients, there were 33 cases of left trauma, 46 cases of right trauma and 21 cases of bilateral trauma. Data obtained from both groups (age, education background, gender, economic status, etc.) was comparable ( $P > 0.05$ ).



**Fig 2. The image of a patient**

### III Results

As shown in Table 1, the rate of excellent and good of the research group was significantly higher than that of the control group ( $P < 0.05$ ). The images of a case before and after treatment were shown in Figure 3 and Figure 4.

**Table 1. Comparison of the Mayo scores between both groups [n (%)]**

Groups	Excellent	Good	Fair	Poor	The rate of excellent and good
Research group (n=100)	60	35	3	2	95(95.00)
Control group (n=100)	45	25	20	10	70(70.00)
X <sup>2</sup>					17.90
p					< 0.05



**Fig 3. The image before treatment**



**Fig 4. The image after treatment**

After treatment, the mean healing time of bone fracture of the control group was (14.02±0.8) weeks, while this value of the research group was (20.04±1.02) weeks. Compared with the control group, the mean healing time of bone fracture was significantly reduced in the research group ( $P < 0.05$ ). Meanwhile, the patients in the research group had significantly better life quality ( $P < 0.05$ ). The data was shown in Table 2.

**Table 2. Comparison of the life quality between both groups ( $\bar{x} \pm s$ )**

Groups	Mental function	Social function	Body function	Emotion	Total scores
Research group (n=100)	79.80±6.45	80.19±9.04	80.25±7.23	78.05±8.38	80.25±7.03
Control group (n=100)	64.33±7.03	70.26±8.26	65.98±9.26	62.46±9.50	65.48±8.31
t	10.29	8.93	11.22	9.03	8.59
P	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

#### IV Discussion

Complex elbow fracture dislocation involves the instability of the elbow joint caused by the structural damage of the surrounding joint capsule and ligament (Gao et al. 2018, Cakici et al. 2019). The main principles of treatment are to restore the normal anatomical relationship between humerus, radius and ulnar, effectively promote the recovery of injured ligament and joint capsule, help patients exercise the elbow joint as soon as possible in order to reduce the rate of elbow stiffness (Liu 2015, Ofori-Kwakye et al. 2016).

#### V Conclusion

To sum up, complex elbow fracture dislocation is a relatively complicated type of elbow trauma. The primary goal in therapy is to maintain the stability of elbow joint while recovering. There are more principles in clinical treatment, namely to restore the normal anatomical relationship between humeroradial joint and humeral-ulnar joint, perform functional exercise of the elbow joint as soon as possible and prevent joint stiffness to maximum degree. Compared with traditional immobilization therapy with plaster, single-arm hinged external fixator could help patient exercise the elbow joint earlier, thus improving the total efficacy, obtaining higher life quality as well as reducing the time of hospital stay. Therefore, application of single-arm hinged external fixator has significant superiority, which is worthy of clinical promotion. However, there is limitation in this study, such as small sample

size and insufficient exploration of the patient's satisfaction. Larger sample researches are needed in the future to conduct comprehensive evaluation of these indexes and validate the effectiveness of single-arm hinged external fixator in basketball players with complex elbow fracture dislocation.

### References

- Abdel MS (2016) Design and synthesis of some substituted thiazolo [3,2-a] pyrimidine derivatives of potential biological activities. *Saudi Pharmaceutical Journal* 24 (2): 119-32.
- Cakici N, Akcali A, Demirel Zorba NN (2019) Antibiotic resistance pattern and spa types of *Staphylococcus aureus* strains isolated from food business and hospital kitchen employees in Canakkale, Turkey. *Turkish Journal of Medical Sciences* 49 (2): 675-682.
- Gao X, Zhang W, Yao L, Xiao Y, Liu L, Liu J, Li S, Tao B, Shah C, Gong Q, Sweeney JA, Lui S (2018) Association between structural and functional brain alterations in drug-free patients with schizophrenia: a multimodal meta-analysis. *Journal of Psychiatry & Neuroscience* 43 (2): 131-142.
- Hazra M (2015) Designing polymeric microparticulate drug delivery system for hydrophobic drug quercetin. *Saudi Pharmaceutical Journal* 23 (4): 429-36.
- Liu CG (2015) Miniature external fixation with joint for the treatment of hand joint fracture. *The World's Latest Medical Information Abstracts* 15 (82): 46-47.
- Ofori-Kwakye K (2016) Development and evaluation of natural gum-based extended release matrix tablets of two model drugs of different water solubilities by direct compression. *Saudi Pharmaceutical Journal* 24 (1): 82-91.
- Tao L, Huang M, Saroj-Thapa, Wang J, Wu S, He F, Huang K, Xue Y, Lingwei-Jin, Liao L, Tang J, Ji K (2018) Effects of macrophage migration inhibitory factor on cardiac reperfusion injury in mice with depression induced by constant-darkness. *Journal of Affective Disorders* 229: 403-409.

