

## LETTER TO THE EDITOR

## Combine Therapy of External Fixator with Joint and Limited Internal Fixation in the Treatment of Complex Elbow Fracture Dislocation in Basketball Player based on Ecological Science Theory

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To observe and explore the therapeutic effects of external fixator with joint and limited internal fixation in the treatment of complex elbow fracture dislocation in basketball player. Methods: A total of 180 basketball players with complex elbow fracture dislocation (from January 2015 to June 2018) were randomized into research group and control group, with 90 cases in each group. The patients in the control group underwent internal fixation, while the patients of the research group were subjected to external fixator with joint and limited internal fixation. And the therapeutic effects were compared between both groups. Results: By comparing the Mayo score of elbow function and VAS score of pain degree after therapy, results showed that the research group had more obvious improvement than the control group ( $P < 0.05$ ). And the total efficacy of clinical treatment of the research group was significantly higher than that of the control group ( $P < 0.05$ ). Moreover, compared with the control group, the research group had significantly less time of hospital stay after surgery and recovery time of elbow function ( $P < 0.05$ ). Conclusion: Compared with other regimens, combine therapy of external fixator with joint and limited internal fixation exert superior effects, reduce the time of hospital stay and promote recovery.

### 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.

Surgery is an important treatment of complex elbow fracture dislocation, with primary aims to repair broken

bone and soft tissue structure, help patients do joint functional exercise as soon as possible, improve prognosis and obtain higher quality of life (Wroblewska et al. 2015, Abdel et al. 2016, Hazra et al. 2015). This study observed and explored the effectiveness of external fixator with joint and limited internal fixation in the treatment of complex elbow fracture dislocation in basketball player, aiming to provide valuable reference for clinical practice. The report is listed as follows (Li et al. 2018).

## II Data and Methods

A total of 180 basketball players suffered from complex elbow fracture dislocation (as shown in Figure 1) and treated at our hospital from January 2015 to June 2018 were enrolled. All cases were definitely diagnosed clinically. Among those patients, the cases of elbow dislocation complicated with radius head fracture, elbow dislocation complicated with radius head fracture and ulna coracoid process fracture, elbow dislocation complicated with radius head fracture and capitellum humeri fracture, elbow dislocation complicated with ulna coracoid process fracture, elbow dislocation complicated with olecranon fracture and radius head fracture, elbow dislocation complicated with ulna coracoid process fracture and humeral media epicondyle fracture were 28, 33, 40, 22, 19 and 38, respectively.



**Fig 1. The image examination of a case of complex elbow fracture dislocation**

All patients and their family 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 90 cases in each group. Of those, there were 62 male patients and 28 female patients in the research group. And the average age of the research group was  $(27.0 \pm 3.2)$  years, ranging from 22 to 32. Moreover, there were 58 male patients and 32 female patients in the control group. And the average age of the control group was  $(28.5 \pm 3.6)$  years, ranging from 22 to 33. Data obtained from both groups was comparable ( $P > 0.05$ ).

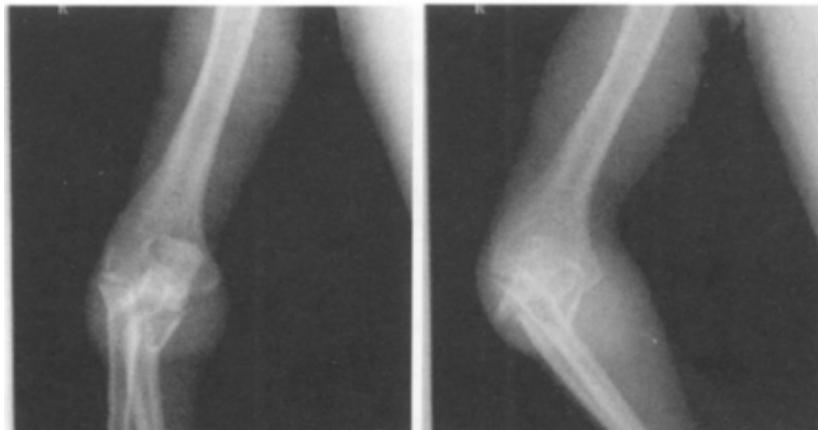
## III Results

As shown in Table 1, the total efficacy of clinical treatment of the research group was significantly higher

than that of the control group ( $P < 0.05$ ). The images of a case in the research group before and after treatment were shown in Figure 2 and Figure 3.

**Table 1. Comparison of the total therapeutic efficacy between both groups[n(%)]**

Groups	Excellent	Good	Fair	Poor	The rate of excellent and good
Research group (n=90)	55	30	3	2	85(94.44)
Control group (n=90)	23	49	12	6	72(80.00)
X2					8.52
p					< 0.05



**Fig 2. The images of a patient before treatment (anterioposterior and lateral film showed elbow fracture dislocation before surgery)**



**Fig 3. The images of a patient after treatment (anterioposterior film after surgery, external fixator and plate fixation were adopted)**

As shown Table 2, there was no significant difference in the Mayo score of elbow function and VAS score of pain degree between both groups before treatment ( $P > 0.05$ ). After different treatment, the research group had more obvious improvement than the control group ( $P < 0.05$ ).

**Table 2. Comparison of the Mayo score of elbow function and VAS score of pain degree between both groups ( $\bar{x} \pm s$ )**

Groups	Mayo score of elbow function(points)		VAS score of pain degree(points)	
	Before treatment	After treatment	Before treatment	After treatment
Research group (n=90)	50.29±6.54	88.90±4.37	7.83±0.40	3.02±0.23
Control group (n=90)	51.55±7.01	71.22±4.35	7.60±0.21	5.16±0.58
t	0.83	9.11	0.46	8.72
p	> 0.05	< 0.05	> 0.05	< 0.05

As shown in Table 3, compared with the control group, the research group had significantly less time of hospital stay after surgery and recovery time of elbow function ( $P < 0.05$ ).

**Table 3. Comparison the time of hospital stay after surgery and recovery time of elbow function between both groups ( $\bar{x} \pm s$ )**

Groups	Cases	Recovery time of elbow function (d)	Time of hospital stay (d)
Research group	90	90.25±15.26	11.88±2.05
Control group	90	118.36±19.03	18.94±3.72
t		18.03	15.22
p		< 0.05	< 0.05

#### IV Discussion

Complex elbow dislocation is relatively common in basketball players, causing severe damage to elbow stability. None surgical treatment is adopted on some patients. But there are relative complications like recurrent elbow dislocation, stiffness and limited range of activity, which greatly reduce the therapeutic effects. Therefore, surgical treatment is still our predominant choice.

In this study, combine therapy of external fixator with joint and limited internal fixation exert superior effects. By comparing the Mayo score of elbow function and VAS score of pain degree after therapy, results showed that the research group had more obvious improvement than the control group ( $P < 0.05$ ). And the total efficacy of clinical treatment of the research group was significantly higher than that of the control group ( $P < 0.05$ ). Moreover, compared with the control group, the research group had significantly less time of hospital stay after surgery and recovery time of elbow function ( $P < 0.05$ ).

During the treatment of external fixation with joint and limited internal fixation, kirschner wire, screw and tension band were used to firmly immobilize the bony structure. Meanwhile, the soft tissue such as medial and lateral collateral ligament were repaired with suture line with rivet. Because the support material is carrying joints, it is possible for the patient to perform elbow joint function exercise as early as possible (Man et al. 2018). Moreover, the elbow joint stiffness and soft tissue contracture rate can be reduced. In this study, a trans-articular external fixation support was adopted and installed strictly according to the instructions. It was ensured that a kirschner wire (with a diameter of 2 mm) was drilled in the center of the trochlea. Then the rotation axis of the

external fixation support was determined, so that the patient can perform elbow joint function exercise as early as possible. The bone and soft tissue structure of the elbow joint would not be affected by the external fixation support, which exerts reliable protective effect. The results of this study are in line with some researches (Attari et al. 2016, Feng et al. 2016).

## V Conclusion

To sum up, compared with other regimens, combine therapy of external fixator with joint and limited internal fixation exert superior effects in the treatment of complex elbow fracture dislocation in basketball player, reduce the time of hospital stay and promote recovery. External fixator with joint is firm to ensure the stability of elbow, and prevention of early stress on the elbow bone structure and collateral ligaments could lead to repair. Combine therapy of external fixator with joint and limited internal fixation exert good effects, which could significantly elevate the total rate of excellent and good in therapy, obtain rather good quality of life as soon as possible and reduce the pain. Therefore, this regimen is worth promotion. However, there are certain limitations in this study. The sample size is rather small and more large-sample researches are needed in the future. At the same time, the follow-up time of this study is rather short. More rigorous researches are needed to fully support this result.

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