

LETTER TO THE EDITOR

Comparison of the Curative Effects between Early Rehabilitation and Convalescent Rehabilitation in Weightlifter after Elbow Fracture Surgery Based on Ecological Sports Concept

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To observe and analyze the curative effects of early rehabilitation and convalescent rehabilitation in weightlifter after elbow fracture surgery, with the purpose of providing valuable guidance for practical treatment. The subjects of this study were 160 weightlifters treated in our hospital. They were randomly divided into research group and control group, each containing 80. The patients in the control group were applied with convalescent treatment after elbow fracture surgery, also known as the convalescent rehabilitation group. In contrast, the patients in the research group were applied with early rehabilitation after elbow fracture surgery, also known as the early rehabilitation group. The therapeutic effects of the two groups were observed and compared. The recovery of elbow function was evaluated using Mayo scoring system. It can be seen that compared with the control group, the score advantage of the research group was more significant, $P < 0.05$. By comparing the curative effect of elbow joint between the two groups, the results showed that the score of the research group was superior to that of the control group, $P < 0.05$. After six months of follow-up, the elbow dysfunction of the patients was observed, and the non-dysfunction rate of the research group was significantly higher than that of the control group, $P < 0.05$. The early rehabilitation for weightlifters after elbow fracture surgery can improve the treatment effect to the maximum extent and prevent various adverse problems, which is worthy of being popularized and applied in clinics.

I Introduction

Ekoloji, 2019, Issue 107, Pages: 3913-3917, Article No: e107434. Buslaev published "Regional Sports Industrial Development Strategy in the Vision of "Healthy China 2030" on Issue: 107, Pages: 3913-3917, Article No: e107434, Year: 2019, in the article, As it raises the concept "Healthy China 2030", China has vigorously focused on promoting national health. This brings into opportunities for development of sports industry.

The elbow joint consists of the distal end of the humerus and the proximal facet of the radioulna. In terms of structure, it includes three joints, which are enclosed together in a joint capsule. Elbow joint is one of the most vulnerable parts of human body to dislocation, with an annual incidence of about 0.006%-0.008%, in which 49% can be combined with fracture (Huang et al. 2018). The weightlifters are prone to elbow fractures during the usual

training or competition, which belong to a population with high incidence of elbow fracture (Yayla et al. 2018).

After elbow fracture (as shown in figure 1 below), abnormal bone anatomical morphology, joint soft tissue damage, intra-articular adhesion, and scar formation after joint capsule and periarticular soft tissue damage may occur, which greatly increase the incidence of joint rigidity and cause serious adverse effects on the normal quality of life of patients (Mocellin et al. 2016). The main treatment of elbow fracture is surgery, and the different postoperative rehabilitation time is also an important factor affecting the treatment effect (Chen et al. 2017). This study observes and analyzes the curative effects of early rehabilitation and convalescent rehabilitation in weightlifters after elbow fracture surgery, with the purpose of providing valuable guidance for practical treatment.

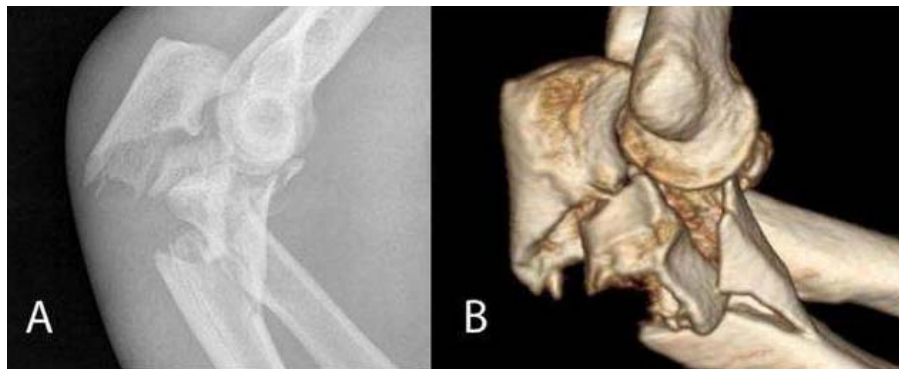


Figure 1. Elbow fracture

II Method

The subjects of this study were 160 weightlifters with elbow fracture who had been treated in our hospital from January 2015 to August 2018. The imaging examination picture of a patient is shown in figure 2 and figure 3 below. The content of this study was approved by the hospital ethics committee, and patients and their family members enjoyed the right to know and signed the formal informed consent. The patients were randomly divided into a research group and a control group, each containing 80. In the study group, there were 50 males and 30 females aged between 20 and 33 (28.9 ± 3.1 old). In the control group, there were 48 males and 32 females aged between 22 and 32 years (28.6 ± 3.9 years old). There was no significant difference in general data between two groups, $P > 0.05$.



Figure 2. Elbow fracture with dislocation



Figure 3. Elbow fracture - external fixation frame

III Personal View

The first day after the operation, the patient practiced equal length contraction exercises of the biceps brachii and triceps brachii of the affected limb, 20 times/group, 4 groups per day. Moreover, shoulder joint function training (forward flexion, back extension, inward extension, outward extension, outward rotation, etc.), wrist movement (active flexion and extension exercises of wrist) and finger joint active and passive ROM exercises (maximum fist and extension exercises of knuckle) were performed, with each activity degree training to the maximum range.

At the 4th to 5th day after surgery, CPM machine exercise of elbow joint was performed. The range of activity started from the range of painless activity, and the amount of exercise and range were gradually increased. The speed of movement was set to one cycle per minute, about 45 minutes of exercise per day. Ice compress was applied after completion of CPM machine exercise (Li et al. 2016). The active ROM training of elbow joint was performed within the range of pain tolerance, it should be noted that gentle and slow movements were required.

At the 7th to 10th day after surgery, fracture fixations were performed on passive ROM exercises, three to four times per group, and one group per day, and ice compress was applied after completion of passive exercise. At the same time, the CPM exercise was carried out to train the muscle strength of the biceps brachii and triceps brachii.

At the 14th day after the operation, the passive ROM training and CPM machine training were carried out. The operative position was disassembled, the passive ROM training was followed by corresponding wax treatment and dish wax, which was performed for half an hour every day to promote blood circulation, reduce swelling and relieve adhesion (Xiao 2015). At the same time, progressive resistance training was carried out in order to realize active or passive training of shoulder, Wrist, finger joints and make them into the normal state.

From week 4 to week 20 after surgery, the training of affected limb strength, ROM and ADL will be carried out according to the status of the patient. If the patient produces elbow joint adhesion, then the joint mobilization is carried out in time. After fracture healing, above treatments are strengthened.

For patient in the control group, all the fractures were healed at 3-5 months after surgery, but there still existed different degrees of elbow dysfunction. Then, the patients were given with arthrolysis after conducting wax treatment for half an hour. It should be noted that gentle manipulation were required. After manipulation, ice compress was applied to stop blood, relieve pain and prevent joint swelling. Ultrasonic treatment was conducted to soften scar and loosen adhesion. In addition, the active ROM and ADL training were carried out.

IV Results

As shown in table 1, the research was superior to the control group in terms of the curative effect of elbow joint, $P < 0.05$.

Table 1. Comparison of curative effect of elbow joint between two groups ($\bar{x} \pm s$)

Group	Elbow Flexion (°)	Elbow Extension Difference (°)	Forearm Pronation (°)	Forearm Supination (°)	Course of Treatment (week)
Research group (n=80)	129.06±2.36	15.40±4.57	90.48±0.92	90.28±0.63	12.10±4.26
Control group (n=80)	112.36±2.18	25.60±4.60	78.66±0.83	78.06±0.42	29.73±9.03
t	9.46	12.36	8.05	9.33	13.28
p	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

As shown in table 2, all the patients were subjected to follow-up examination for six months. Results showed that the elbow dysfunction rate of the research group was significantly lower than that of the control group, $P < 0.05$.

Table 2. Comparison of the joint dysfunction rate during the 6-month follow-up [n(%)]

Group	Case Number	Dysfunction	Non-dysfunction
Research group	80	2 (2.50)	78 (97.50)
Control group	80	16 (20.00)	64 (80.00)
X2		10.26	
p		< 0.05	

IV Discussion

The main treatment for elbow fractures is surgery. The surgical treatment after fracture is aimed at fracture reduction, internal fixation and recovery of the anatomical morphology of the joint. The open reduction and internal fixation of elbow fracture includes steel plate screw, kirschner wire tension band fixation and other modes (Yan et al. 2017). Since elbow fracture belongs to intra-articular fracture, orthopedists often pay more attention to the self-healing effect of the fracture, emphasize the postoperative fixation, and ignore the further postoperative rehabilitation treatment (Shao et al. 2017). However, with the continuous development of research, it has been gradually recognized that surgical internal fixation has created conditions for the fracture healing. However, in order to prevent the problem of elbow dysfunction, the rehabilitation treatment program focusing on joint motion treatment should be implemented as soon as possible.

V Conclusion

In this study, the elbow functional score system was adopted to evaluate the elbow functional recovery of patients, and the results showed that compared with the control group, the score advantage of the research group with early rehabilitation treatment was more significant. In addition, the curative effect and functional disorder of elbow joint in the research group were superior to the patients in control group accepting convalescent rehabilitation. The advantages of early rehabilitation therapy for elbow fracture were fully demonstrated. The advantages of early postoperative rehabilitation for elbow fracture are more, where the main is the elbow early active or passive ROM exercise, which can draft joint capsule and ligaments, tendons and joints surrounding soft tissue, avoid contracture, promote the secretion of intra articular synovial fluid and circulation, reduce the adhesion

rate in the joints, and relieve the pain of the patients, showing huge application value. In view of the limited sample size in this study, a large sample size study should be carried out in the future to fully support this result.

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