Modern American Journal of Medical and Health Sciences
ISSN (E): 3067-803X
Volume 2, Issue 5, May 2026
Website: usajournals.org

REHABILITATION AFTER HUMERUS FRACTURES

Mamatkulov Oybek Khalikovich
https://orcid.org/0009-0003-5839-9405

Juraev Ilhom Gulomovich
https://orcid.org/0000-0003-1173-8572
UDC 616.717.4-001.5-089.227.84-06

Samarkand State Medical University, Samarkand, Uzbekistan

Abstract
This article discusses the rehabilitation processes following humeral fractures. Statistical data on fractures in different parts of the humerus are presented: proximal part (up to 5%), diaphysis (18–32%), and distal part (0.5–2%). Particular attention is given to intra-articular fractures in the elbow joint, which are often misdiagnosed as other types of fractures. Such injuries require specialized treatment and an individualized approach. In addition, osteoporosis — the weakening of bone tissue — is highlighted as a major risk factor, especially in elderly patients. Anatomically, the elbow joint is a complex articulation of the humerus, ulna, and radius. Its injury often results from severe trauma, direct impacts, or indirect forces, and in many cases is combined with other types of injuries. Successful rehabilitation requires accurate diagnostics, an individualized strategy, and consideration of background conditions such as osteoporosis. The role of osteoporosis is particularly significant, as this pathology is common in older patients and reduces bone strength, making fractures possible even after minor trauma. Therefore, rehabilitation should aim not only to restore the injured bone but also to improve overall bone health.

Keywords: Elbow joint, intra-articular fracture of the humerus, osteoporosis, rehabilitation.

Modern American Journal of Medical and Health Sciences
ISSN (E): 3067-803X
Volume 2, Issue 5, May 2026
Website: usajournals.org

Relevance

Fractures of the proximal humerus account for approximately 5% of all fractures (Court-Brown C. M. et al., 2006; Gupta A. K. et al., 2015). Fractures of the humeral shaft constitute between 18% and 32% of all long bone fractures (Ilizarov G.A., 1982; Ledinnikov I.M., 1999; Bashirov R.S., 2002). Distal humeral fractures represent 0.5–2% of all skeletal fractures (Averkiev V.A., 1979; Wainwright A., 2000). The elbow joint is a movable articulation formed by the humerus, ulna, and radius. In essence, fractures involving the elbow joint are intra-articular fractures of the humerus, more specifically fractures of its transcondylar region. Patients frequently confuse the concept of a humeral fracture when referring to injuries localized within the elbow joint. Although elbow joint fractures are not among the most common injuries worldwide despite the increasing incidence of trauma, they require specialized approaches to treatment and rehabilitation, while various complications remain highly prevalent.

The causes leading to fractures include severe trauma and direct blows to the joint area, as well as indirect injuries, such as falls onto the elbow. In many cases, elbow joint fractures are associated with combined or multiple injuries. Osteoporosis, characterized by decreased bone density and softening of bone tissue, is considered a significant aggravating factor. Osteoporosis is more commonly observed in elderly individuals. In patients with this condition, the bones become fragile, and even minor trauma may result in fractures. **Figure 1.**

A. **B.**

Figure 1. A. Severe trauma. B. Osteoporosis.

Modern American Journal of Medical and Health Sciences
ISSN (E): 3067-803X
Volume 2, Issue 5, May 2026
Website: usajournals.org

It should be noted that rehabilitation of elbow joint fractures in patients with osteoporosis and other dystrophic bone disorders is particularly challenging and often requires prolonged treatment courses accompanied by additional pharmacological therapy lasting several months.

Humeral fractures may be classified as either open or closed. Closed fractures are generally associated with a more favorable prognosis. By definition, open fractures involve exposure of bone fragments through the surrounding soft tissues and skin, frequently accompanied by intra-articular involvement. In such cases, infection develops rapidly, making treatment considerably more complex. Furthermore, open fractures are often associated with extensive bone defects, which may subsequently require complex reconstructive and plastic surgical procedures.

Rehabilitation Conditions. Restoration of bone integrity depends on a number of general and local factors. Among the general factors, particular importance should be given to the patient's age, physical and psychological condition, body constitution, functional state of the endocrine system, metabolic processes, and other systemic characteristics. Local factors include accurate alignment of bone fragments and the adequacy of blood supply to the affected area. Radiological findings and clinical evidence of bone union must also be taken into consideration. In cases of open fractures, the presence of infection should additionally be assessed. All of these factors may significantly prolong the rehabilitation period, which in some cases may extend over several months or even years.

The average duration of bone healing varies depending on the anatomical location of the fracture. Fractures of the phalanges, ribs, and metacarpal bones generally heal within approximately 3 weeks; clavicular fractures require around 4 weeks; fractures of the forearm, elbow, metatarsal bones, humerus, and wrist typically heal within about 2.5 months; tibial fractures require approximately 3 months; femoral fractures around 4 months; and fractures of the femoral neck may require up to 6 months for complete healing.

Modern American Journal of Medical and Health Sciences
ISSN (E): 3067-803X
Volume 2, Issue 5, May 2026
Website: usajournals.org

Physical therapy is usually initiated 10–14 days after the fracture in the form of passive exercises, whereas active rehabilitation begins following immobilization removal (after removal of the fixation bandage) and generally continues for approximately one and a half months. Thus, when generalized, the overall duration of rehabilitation after fractures may range from 1 month to 1 year, depending on the type, severity, and location of the fracture.

Rehabilitation Techniques:

1. Proper nutrition. This is the first and most essential stage of recovery, as the regeneration of healthy bone tissue requires amino acids, antioxidants, vitamins, and minerals. The amino acids most necessary during the rehabilitation period following fractures include arginine, proline, glycine, and glutamine, which are important structural components of proteins involved in bone formation. Therefore, the protein content in the diet should be increased by approximately 10–20 mg per day.

Antioxidants possess the ability to reduce inflammation without slowing tissue healing processes. These include vitamins C, D, K, and B6. Such vitamins function as catalysts for the biochemical reactions involved in bone repair and regeneration. Minerals such as zinc, copper, calcium, phosphorus, and silicon are also essential for normal restoration of bone tissue.

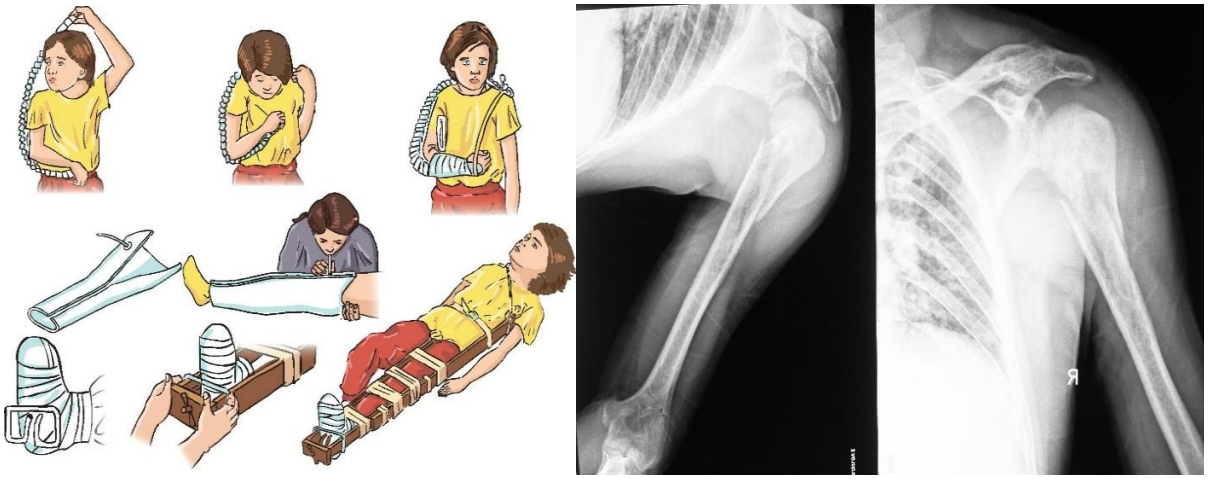
Consequently, the patient's diet should include dairy products (milk, cheese, cottage cheese, sour cream, kefir, and yogurt), foods containing natural gelatin (marmalade, fruit jelly, aspic, and gelatin-based dishes), as well as antioxidant-rich foods such as fruits, vegetables, and nuts. **Figure 2.**

Modern American Journal of Medical and Health Sciences
ISSN (E): 3067-803X
Volume 2, Issue 5, May 2026
Website: usajournals.org

A. **B.**

Figure 2. A. Meat, fish and dairy products. B. Fruits, vegetables and nuts.

2. Immobilization of the joint, limb. If mobility occurs (with improper fixation of the limb), the blood supply is impaired and the period of bone tissue fusion increases. As a result, various types of false joints develop. **Figure-3.**



A. **B.**

Figure 3. A. Improper immobilization. B. Atrophic pseudoarthrosis (nonunion).

1. Physiotherapy. During the period of limb immobilization and immediately after cast removal, it is important to undergo at least two courses of physiotherapeutic treatment. Physiotherapy is aimed at influencing the surrounding tissues in order to prevent muscle atrophy, reduce edema, improve blood circulation, and alleviate pain. The purpose of initiating physiotherapeutic

Modern American Journal of Medical and Health Sciences
ISSN (E): 3067-803X
Volume 2, Issue 5, May 2026
Website: usajournals.org

procedures immediately after removal of the fixation bandage is to gradually load the muscle tissues and prepare the limb for further rehabilitation in the exercise therapy unit.

2. **Therapeutic physical exercises (exercise therapy).** Exercises should begin approximately 10–14 days after immobilization. Initially, rehabilitation consists of passive гимнастика, which subsequently progresses to active exercises with gradually increasing load. The primary goals of exercise therapy are to restore the range of motion of the injured limb, improve tissue elasticity, and strengthen the muscular system.

3. **Massage therapy.** Massage constitutes an important component of the rehabilitation process and may be administered in several courses. Its main objectives are to prevent contracture formation, reduce edema, improve blood circulation, and accelerate bone tissue consolidation and healing. **Figure 4.**

A. **B.** **C.**

Figure 4. A. Physiotherapy. B. Therapeutic physical exercises. C. Massage therapy.

In all cases of fractures, it is extremely important to initiate rehabilitation measures as early as possible, since there is a significant risk of developing joint contractures and reduced range of motion, particularly in fractures involving the ankle and hand joints, which consist of small and anatomically complex bones.

Modern American Journal of Medical and Health Sciences
ISSN (E): 3067-803X
Volume 2, Issue 5, May 2026
Website: usajournals.org

References

1. Court-Brown C.M. Epidemiology of adult fractures: a review / C.M. Court-Brown, B. Caesar // Injury. – 2006. – N 37. – P. 691-697.
2. Gavriil Abramovich Ilizarov Treatment of Orthopedic and Trauma Patients in Hospital and Outpatient Settings Using the Method of Transosseous Osteosynthesis Developed at the Kurgan Scientific Research Institute of Experimental and Clinical Orthopedics and Traumatology (KNIIEKOT). Abstracts of the All-Union Scientific and Practical Conference (January 27–28, 1982, p. 237). Kurgan.
3. I. M. Ledinnikov Refractures of the Humerus. UDC 617.572-001.5-08. Smolensk, 1999.
4. R. S. Bashirov. Guide to Transosseous Compression-Distraction Osteosynthesis. Tomsk, 2002.
5. S. A. Dzhumabekov Our Experience in the Treatment of Intra-Articular Fractures of the Distal Metaepiphysis of the Humerus. Bishkek, 2012. Medicine of Kyrgyzstan.
6. O. Kh. Mamatkulov Surgical Treatment of Fractures of the Distal End of the Humerus. Problems of Biology and Medicine. 2024, № 4.
7. F. O. Kholikov Optimization of Surgical Treatment of the Distal Humerus. Tibbiyotda Yangi Kun. 2025. № 2.