

## Study of the Treatment of Complex Elbow Fractures.

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### Introduction

Some elbow fractures are very complex with inadequate bone stock, so it is not possible to perform a stable fixation. However, loss of basic elbow function can severely affect daily living activities. There are few alternatives to internal fixation, but arthroplasty can be a reasonable option. The aim of this case report is to evaluate the role of primary total elbow arthroplasty in the treatment of complex elbow fractures

A 54-year-old male patient presented at our emergency department in the sequence of a motorcycle accident, which caused an open fracture of the left elbow, classified as type IIIB of Gustilo and Anderson. The X-ray showed comminuted fractures of distal humerus and proximal ulna with bone loss from both epiphysis. He started antibiotherapy and was submitted to immediate surgical debridement, provisional fixation with an external fixator and skin closure. The external fixator was removed 2 months after, when the patient presented with great elbow instability. The X-ray and the Computed Tomography showed signals of malunion and bone loss, which prevented any kind of fixation. Therefore, 3 months after, the patient was submitted to elbow joint replacement. A posterior approach was used, in which the triceps was reflected and was applied a linked arthroplasty - Coonrad-Morrey total elbow arthroplasty. On the second week after surgery, passive motion was started and by the fourth week, progressed to active motion. Six months after, he presented without significant pain and with a range of motion of 0° to 135°.

Although rarely used, total elbow arthroplasty may be the choice in selected patients with elbow fractures with loss of bone. As shown in this case, this treatment can lead to a satisfactory functional recovery. Despite having some complications, more recent studies encourage its use in the future.

In the past, the indications for elbow arthroplasty were quite limited and included cases of rheumatoid arthritis and post-traumatic arthrosis. Even in those cases, it was recommended in elderly patients with a low functional demand, due to its low durability. Nevertheless, in the last few years, a reasonable evolution has occurred in terms of its indications and outcomes. Nowadays, the use of elbow arthroplasty may be necessary in selected cases of complex fractures of the elbow, with good functional results. The aim of this case report is to evaluate the role of elbow arthroplasty as a primary option in complex fractures of the elbow.

We describe the case of a 54-year-old male patient, waiter of profession, who presented to our Emergency Department with a left elbow trauma in the sequence of a motorcycle accident. He presented an open fracture classified as type IIIB of Gustilo and Anderson. The X-ray revealed comminution of the distal humerus and proximal ulna with important bone loss of the articular surface of both. He began antibiotherapy with Gentamicin and Ceftriaxone and was submitted to immediate surgery. In what concerns soft tissue injury, he presented a great destruction of the medial and lateral collateral ligaments while nervous and vascular structures were intact. It was classified as type II of Tscherne. We performed surgical debridement, provisional fixation with an external fixator and skin closure. Favorable wound healing was verified and he finished the monitorized protocol two weeks later.

In order to exclude possible infection, we monitorized the C-reactive protein levels, which decreased gradually. Two months later, the X-ray and the Computed Tomography showed signals of malunion and the external fixator was removed. In the postoperative period we noticed important elbow instability and reduced mobility. We considered multiple treatment options and concluded that internal fixation would not be possible given the absence of adequate articular surfaces. In this sense, we decided to perform a total elbow arthroplasty three months after the accident. By a posterior approach, the triceps was externally reflected, the distal humeral extremity was regularized, the bone sequestra were removed and the ulna was prepared. A linked arthroplasty was applied - Coonrad-Morrey total elbow arthroplasty. The extensor apparatus was inserted directly over the prosthesis. Ulnar nerve transposition was not necessary.

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