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Case Report

Complex Right Forearm Fracture

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Abstract

Background: road accidents cause many lesions affecting significantly bone and joints sys- tem; the forearm is one of the most involved structures.

Objective: to show a clinical case of a patient with a complex fracture of the right forearm and the used treatment modality to ensure functional recovery.

Clinical Case: a 23 years-old, white man, without illness record who suffer a traffic accident and was taken to emergency room of Orthopedics and Traumatology complaining of pain, swelling and limitation of movement of the right forearm and left ankle which stopped him from movement in the affected areas. Simple imaging examination showed wrist and proximal shaft right radial fracture and left ankle fracture, based on clinical and imaging elements, immediate surgical treatment was indicated to reduce and fix fractures.

Conclusions: Segmental and open fractures of the forearm associated to ulnar bone lost is a complex fracture. There is no a standard treatment for this condition so external fixation and AO plates achieve acceptable functional results.

Keywords: *Forearm Injuries; Orthopedic Fixation Devices; External Fixators; Young Adult; Case Reports*

Introduction

Traffic accidents contribute a great variety of injuries, especially those that affect the osteomyoarticular system. Forearm fractures (AF) are one of the diseases derived from high-energy traumas and are more frequent in children, than in adults in general [1-3].

According to Streubel PN., *et al*. [4] the incidence of AF in males occupies 63% to 91% of traumatic conditions of the upper limb. The age range ranges from 24 to 37 years, which shows a clear predominance in the first four decades of life.

On the other hand, high-energy trauma results in open, segmental fractures with great comminution and contamination, as well as other associated traumas in the body. Due to the magnitude of the trauma, general and local complications such as delayed consolidation, pseudoarthrosis and infections occur [5,6].

The clinical presentation is varied and is expressed by pain, functional impotence, crepitation and wounds that communicate or not with the fracture site. The physical examination must be exhaustive, to detect all injuries at the first moment of the trauma and take appro-

priate and immediate behavior. Special care should be taken in patients with a condition of the level of consciousness, as usually occurs in associated head trauma or hypovolemic shock [5,7].

The treatment is immediate and simultaneous, consists of cleaning the wound, reducing the fracture either conservatively or surgically, in this last modality it highlights the use of external fixation (FE), which allows damage control and stabilization temporarily or definitively [3,8].

Due to the infrequent nature of the injury that occurs at work, the authors aim to publicize the clinical case of a patient with a complex fracture of the right forearm and the behavior taken with this patient, who managed to recover his ability to a large extent. functional.

Clinical Case

23-year-old white male patient with no morbid health history, who suffers a traffic accident and is brought to the emergency department of Orthopedics and Traumatology for presenting pain and inflammation at the level of the right forearm and left ankle, which prevents him the march and movements of the affected areas.

On physical examination, a wound was detected in the flying face of the right forearm, with irregular edges, of about 10 centimeters, which extends to deep planes with the presence of the fractured ulna and free of approximation two thirds of its length without attached soft parts and contaminated (Figure 1).

Figure 1: *Open fracture at the level of the right wrist with exposure of the cubito about two thirds of its extension Observe the large contamination of the cubito and the wound.*

It was also detected in the same forearm crepitation and abnormal mobility at the level of the wrist and proximal third. On the other hand, joint deformity and total functional impotence were found at the level of the left ankle.

The simple radiographic examination of the right forearm in anteroposterior and lateral projections showed a solution of continuity of the bone tissue at the level of the right distal radius and upper third, which evidenced an open segmental fracture in its distal focus (Figure 2).

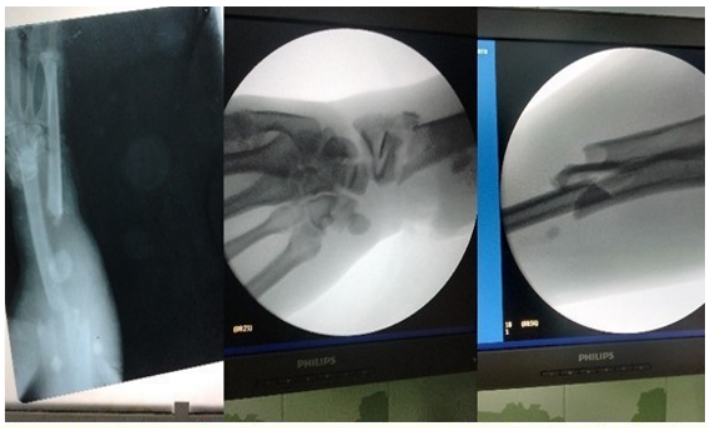

Figure 2: *Radiographic evidence of segmental fracture of the right radius (right) comminuted fracture of the distal radius (center) and proximal fracture of the radius (left) Note the marked displacement of the cubito.*

Simple radiography of the left ankle in anteroposterior and lateral projections confirmed the presence of tibia-astragaline dislocation (Figure 3).

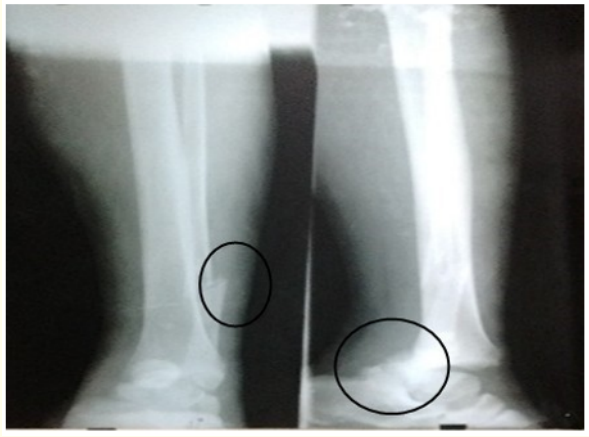

Figure 3: *Observe dislocation of the left tibia-astragaline joint and fracture of the period.*

Urgent analytical studies showed: 0.35% hematocrit, blood group and Rh O + factor.

Taking into account all the above elements, it is decided to take the patient to the operating room, for surgical treatment, cleaning and debridement of the wrist wound that communicated with the focus of the distal fracture of the radius was performed, the extraction of the completely ulna without soft tissue attached. RALCA® type monopolar external fixation was placed in order to stabilize the wrist (Figure 4).

Figure 4: *External fixation of the right wrist.*

Then immobilization was applied to stabilize the fracture of the proximal radius, which in 15 days later was fixed with plaque and screws of the Association for Osteosynthesis (AO) of 4.5 millimeters. In relation to the left ankle, in the same emergency surgical act, the closed reduction and its verification by simple anteroposterior and lateral radiography were performed.

Despite the severity of the injury, due to segmental fracture of the right forearm, open in its distal and highly contaminated focus, loss of about two thirds of the ulna was obtained an acceptable functional result at six months, which allowed flexion movements (110 degrees, normal value: 0-150 degrees) and extension (five degrees, normal value: 0 to 10 degrees) of the elbow, in addition to pronosupination of the forearm (160 degrees, normal value: 180 degrees). The ankle did not show functional impairment (Figure 5).

Figure 5: *Functional capacity of the patient at six months.*

Discussion

The AFs have four modalities of presentation: both bones which is the most common, of the ulna with dislocation of the head of the radius, of the radius with disjunction of the distal radiocubital joint and those isolated. According to Cho SP., *et al* [9]. The incidence of open forearm fracture is 11.7% and those of segmental type predominate in the radius.

The treatment of this trauma is usually surgical, the conservative modality is only justified in case of isolated displacement of the cube less than 50% of its diameter and angulation less than 10 degrees [10-12].

Open fractures require immediate intervention, where debridement, cleaning and stabilization are performed, as well as the exploration of the wound in search of neuro-vascular lesions [13,14].

Although some authors advocate fixing the radius first in case of fracture of both bones, others propose 1.4 stabilize the bone first with less comminution, to guarantee the length of the affected forearm. However, when there is an open and segmental fracture of one of the bones of the forearm, it is preferred to first fix the focus with exposure to the outside and in a second surgical time place 4.5 mm AO sheet in the proximal fracture, elements these led to out in the clinical case that was presented [10-12].

The complexity of the patient shown, is given not only by its condition in the radius, but also by the loss of about two thirds of the length of the ulna, which affects the vertical and horizontal stability of the forearm, before this dilemma it is preferable to keep the longest possible radius length and preserve pronosupination, in this way an acceptable functional result is achieved, as occurred in this patient.

Although the known surgical methods have specific advantages and disadvantages, the use of 3.5 mm and 4.5 mm AO plates are the most used, in addition to the FE in case of open fractures, especially of the wrist [15].

The clinical case reported at work occurs as a consequence of a combined production mechanism, generated by high energy trauma and does not have a standardized behavior reported in the literature. The indirect mechanism is the most reported in the consulted bibliography, but not the combined one that is infrequent [7-10].

Conclusions

The segmental fracture of the radius, open and with loss of part of the ulna is a complex lesion of the forearm, where there is no standardized pattern for medical behavior. The immediate FE and subsequent stabilization with plates and screws achieve satisfactory results.

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