

CASE REPORT

# Humerus Fracture Secondary to Accidental Electrical Injury: A Case Report

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## ABSTRACT

*Humerus fracture after electrical injury is a very rare entity even in the young population. Low-tension electrical energy can produce burns of variable depth by flash or conduction. We report a 32-year-old male with humerus fracture after vibration of electric injury. We discuss the causes, mechanism and implications of this condition.*

**Key words:** Electrical injury, Humerus, Fracture

Received: May 05, 2011 • Accepted: June 07, 2011

## ÖZET

### Elektrik Yaralanması Sonrası Humerus Fraktürü: Olgu Sunumu

*Elektrik yaralanması sonrası humerus fraktürü seyrek görülen bir durumdur ve özellikle genç popülasyonda nadir görülür. Düşük gerilimli elektrik enerjisi ileti yoluyla değişik derinlikte yanıklara sebep olur. Biz bu olgu sunumunda 32 yaşında bir hastanın elektrik yaralanması sonrası titreme sonucu humerus fraktürünü, olası sebeplerini, mekanizmasını ve tedavisini tartıştık.*

**Anahtar kelimeler:** Elektrik yaralanması, Humerus, Kırık

Geliş Tarihi: 05 Mayıs 2011 • Kabul Ediliş Tarihi: 07 Haziran 2011

## INTRODUCTION

Electrical accidents usually cause burns, but musculoskeletal, neurological, renal, or cardiac injuries can also be seen. While high-voltage electrical injury can produce severe damage, low voltage is rarely associated with serious damage<sup>[1-3]</sup>. We report a case of shoulder fracture due to a low-voltage electrical accident. We review the literature and search the origin of such fractures. Missed or incomplete diagnosis in the initial physical examination is the most important characteristic of electrical injury.

## CASE REPORT

A 32-year-old male electrician was repairing an electrical failure in a private residence. The patient suffered a 220V current discharge when he manipulated the conduction wires. His hands were in contact with the wires for approximately half a minute. He did not fall or lose consciousness, but felt the shock pulling up his arms. He was admitted to our Emergency Department.

The symptoms noticed in the initial physical examination were pain in the right shoulder and both arms. The physical examination revealed restricted and painful movements in all ranges of the right scapulohumeral joint. No entry or exit burns were found. The elbow, wrist and hand joints were explored, and no pathological findings were recorded. Simple X-ray of the right shoulder revealed fracture of the right humeral head, including the anatomic head with impaction and posterior displacement (Figure 1).



**Figure 1.** X-ray of the right shoulder revealed fracture of the right humeral head, including the anatomic head with impaction and posterior displacement.

Orthopedic surgeons consulted the patient. Reduction of the fracture on the right shoulder was performed. After reduction, effectiveness of the procedure was checked with three-dimensional computerized tomography (CT) (Figure 2).

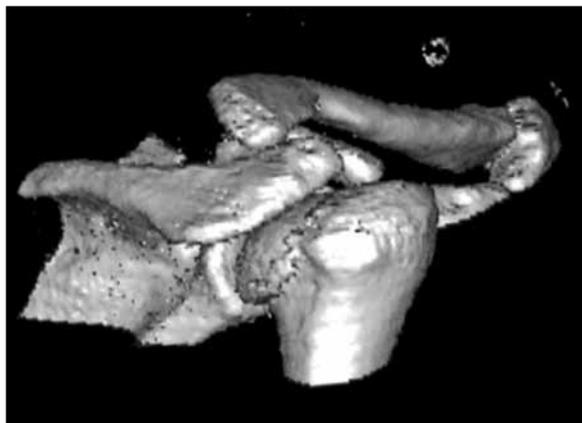
After reduction treatment, the patient was discharged. At an outpatient visit three weeks later, the patient was given rehabilitation treatment for four weeks. He had achieved full recovery two months later.

## DISCUSSION

Shoulder fractures are usually the consequence of a severe trauma, traffic accidents, falls, high-energy traumas, and domestic electrical burns<sup>[4]</sup>.

High-voltage electrical injuries can produce shoulder fractures by direct trauma secondary to a fall and severe muscle contractions. These electrical injuries usually have significant physical examination signs, such as entry and exit burns and loss of consciousness, and severe complications. Acute renal failure, associated skeletal and central nervous system injuries and cardiac alterations may be seen<sup>[5,6]</sup>.

Shoulder fracture due to low-tension electricity can be explained by tetanic contraction of the large muscle involving axial bones, e.g. the scapula, humerus, vertebrae, etc. The strong traction in different directions can break the weaker points of the scapulohumeral joint. Diagnosis of shoulder fractures requires a systematic clinical examination, and a simple X-ray exploration can confirm a clinical suspicion.



**Figure 2.** Effectiveness of the procedure was checked with three-dimensional computerized tomography after reduction.

Treatment of these fractures must be done by the orthopedic surgeon. The reduction of dislocation-fractures, stabilization and restoration of scapulo-humeral functionality are the main goals.

We searched the literature on this subject. Low-voltage electric currents that pass through the body have well-defined physiologic effects that are usually reversible following appropriate emergency care. We found that humerus fracture due to domestic electricity supply is a rare entity. Missed diagnosis is an important issue and a complete physical examination is required.

We conclude with the warning that low-voltage injuries can cause severe damage that may go unnoticed if the initial examination is not thorough.

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