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CASE REPORT

Bilateral elbow dislocation in relation to Essex-Lopresti Injury[☆]

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KEYWORDS

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Abstract Elbow dislocation is second in frequency, after the shoulder, whereas bilateral dislocation is uncommon, even less than dislocations with concurrent associated fractures.

One of the least frequent associations is the Essex-Lopresti injury which consists of a fracture of the radial head affecting the distal radioulnar joint with injury to the interosseous membrane.

This is a case of bilateral elbow dislocation, one of the elbows associated with the Essex-Lopresti injury. During treatment, the premature closed reduction prevails, previously making sure that the elbow is stable, the premise which will determine the orthopaedic or surgical treatment of the injury.

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PALABRAS CLAVE

Codo;
Luxación;
Fractura;
Essex-Lopresti

Luxación bilateral de codo asociada a lesión de Essex-Lopresti

Resumen La luxación de codo es la segunda en frecuencia, tras la de hombro; en cambio, la luxación bilateral es poco común, siéndolo aún menos las que presentan fracturas concomitantes asociadas.

Una de las asociaciones menos frecuentes es la lesión de Essex-Lopresti, la cual consiste en fractura de cabeza radial más afección de articulación radiocubital distal con lesión de la membrana interósea.

Se presenta un caso de luxación bilateral de codo, presentando uno de los codos asociada una lesión de Essex-Lopresti. En el tratamiento de la luxación de codo aislada prima la reducción cerrada precoz, comprobando posteriormente la estabilidad del codo; premisa que decidirá el tratamiento ortopédico versus quirúrgico de la lesión.

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Introduction

Elbow dislocation is a common injury that represents 10% of trauma in this joint. It normally occurs in sporting accidents in young people. Its most frequent complications are rigidity and instability.^{1,2}

However, bilateral elbow dislocation is rare, as there have been only 14 reported cases in the medical literature,²⁻⁵ of which only 5 presented an associated bone fracture.³ These associations with fractures could be: radial head fracture, coronoid fracture and olecranon fracture (most common in anterior elbow dislocation). If the elbow fracture is found to be associated with a radial head fracture and a coronoid fracture with medial collateral ligament injury, it is included in what is known as Hotchkiss' "terrible triad". Sometimes the radial head fracture is accompanied by an inter-osseous membrane lesion affecting the distal radioulnar joint and is given the name Essex-Lopresti injury.⁵

Essex-Lopresti injury is rare and is even less common when associated to elbow dislocation. There have been no cases where an Essex-Lopresti injury is part of bilateral elbow dislocation reported in the medical literature.

Material and methods

We present a case of bilateral elbow dislocation, associated to a unilateral Essex-Lopresti injury.

The subject was a 43-year-old male, a medical radiologist, who went to the emergency department of our hospital due to pain and deformity in both elbows after an accidental fall from a bicycle. In the clinical examination, we noted a deformity in both elbows with functional impotency and he also presented a pain in the right wrist; there were no distal neurovascular disorders.

In the radiological study, we observed a posterior dislocation of the left elbow with a type 1 mason radial head fracture (Fig. 1) and an Essex-Lopresti injury in the right elbow accompanied by a type B1 fracture of the third distal radius in the same limb, according to the AO International classification (Fig. 2).

As emergency treatment, we performed a closed reduction on both dislocations under local anaesthetic and with X-ray control (Fig. 1), later placing a posterior braquiopalmar splint on both upper limbs. After the reduction, the neurovascular examination continued to be normal.

A computerised tomography (CT) was carried out on both elbows. On the left elbow, we saw a coronoid process fracture of the ulna and a partial radial head fracture (Fig. 1). On the right upper limb, we saw a multi-fragmentary fracture displaced from the radial head (Fig. 2).

The patient was admitted for surgery, which was carried out under general anaesthetic:

Left upper limb

He was examined with a radiological image intensifier, showing elbow valgus instability accompanied by a stable radial head fracture (Mason type I). Due to this situation, we

decided on orthopaedic treatment with a posterior brachio-palmar splint.

Right upper limb

For the radial head fracture, using the Kocher approach, we performed an open reduction and an inter-fragmentary fixation with three screws. For the third distal radius fracture, we carried out an osteosynthesis with cannulated screws; the distal radioulnar joint was stabilised with a Kirschner wire (which was removed 4 weeks later) due to an inter-osseous membrane lesion (Fig. 3).

Results

Six months after the injury and after 2 months of rehabilitation (which consisted of kinesiotherapy, occupational therapy, thermotherapy and placing an active orthosis on the hand and fingers), mobility in the right elbow was -15° for extension and 100% for flexion; in the right wrist, flexion was 30° and extension was 20° ; and in the left elbow, mobility was -10° for extension, with a flexion of 120° . Both elbows were completely stable in their mobility range, gripping strength was 37.6 kg for the right hand and 39 kg for the left and grasping strength was 10.3 kg for the right hand and 10.16 for the left.

The patient returned to work with no complications.

Discussion

After the shoulder, the elbow is the joint that most commonly dislocates¹ and the posterior type is the most frequent (90%). As indicated, there are very few reported cases of bilateral elbow dislocation. These cases, except for 1, are for posterior dislocations; therefore bilateral dislocations follow a distribution similar to unilateral ones.³

The aetiology of unilateral or bilateral elbow dislocation is the same, although the trauma to produce a bilateral one requires greater force.

They are usually injuries with a good outcome, as long as early orthopaedic treatment together with correct rehabilitation is carried out. Once the reduction is obtained, elbow stability assessment is imperative. The elbow is considered stable if it remains reduced in a mobility arch from -60° of extension to complete flexion.³ In exceptional cases where the elbow is unstable, some authors recommend surgical ligament repair, together with or without an external joint fixator^{6,7}; others prefer to use the external fixator on its own, as this allows early mobilisation.³

An incomplete immobilisation or not knowing about the associated injuries means there could be significant after-effects, such as rigidity and instability. Vascular and neurological complications are unusual but possible, even leading to ulnar nerve interposition in the fracture. Consequently, we recommend a thorough neurovascular examination before and after the reduction.¹

Every time we diagnose a radial head fracture, we should examine the mobilisation of the ipsilateral wrist, as pain in this could indicate an Essex-Lopresti injury. This type of fracture is rare and can be missed in the emergency

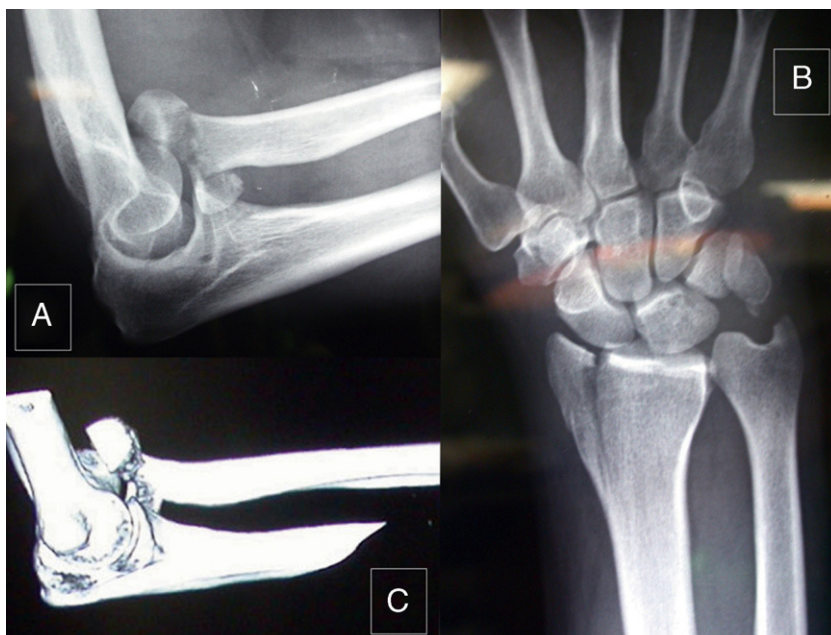


Figure 1 Right elbow: (A) X-ray of elbow profile; (B) AP X-ray of the wrist; (C) computed tomography (CT) scan.



Figure 2 Left elbow: (A) AP X-ray; (B) computed tomography (CT) scan.

department if we do not carry out the aforementioned examination.⁸

Treatment for an Essex-Lopresti injury is based on the stabilising the radial head (through open reduction and osteosynthesis in the cases where it can be reduced or conservative treatment if there is no fragment displacement), reducing the distal radioulnar dislocation by placing the forearm in maximum supination and immobilising it with a brachio-palmar splint for about 3 weeks.² Distal radioulnar

joint stabilisation has also been described by using surgical methods such as a percutaneous Kirschner wire for 6 weeks (as in our case),^{2,4,8-11} or by repairing the triangular ligament and the joint. However, the latter method is controversial,^{2,4} and is only carried out in the case of a fracture in the base of the ulnar styloid. When there is an irreparable chip fracture on the radial head, the majority of authors recommend removing it and substituting a radial head prosthesis, in order to prevent shortening of the radius.⁴ Isolated removal of the radial head is contraindicated. It is therefore necessary to carry out a prosthetic substitution of the radial head to allow the inter-osseous membrane to heal properly and thus avoid the proximal migration of the radius, which causes pain in the wrist.⁸

The repair of the central band of the inter-osseous membrane has been demonstrated, but it is currently markedly experimental, as there are no significant clinical series. It consists of performing reconstructive plasty using the flexor carpi radialis, the pronator teres, Achilles tendon allografts, bone-tendon-patellar bone grafts and even synthetic materials.^{9,10} This type of technique is carried out if we cannot get the distal radioulnar joint stabilised with a splint in supination of the forearm or fixing it in this position with a Kirschner wire or screws for 4–8 weeks. Although some authors advocate its repair in the acute phase, supporting this with the poor capability of inter-osseous membrane healing.¹⁰

Evidence level

Evidence level IV.

Protection of people and animals

The authors declare that no experiments were carried out on human beings or animals for this research.

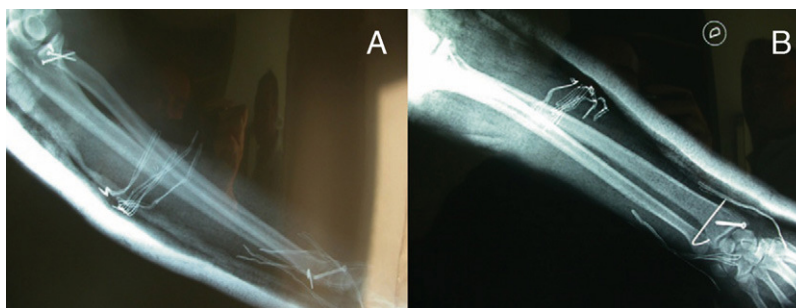


Figure 3 Post-intervention radiological image of the upper right limb. (A) AP X-ray; (B) lateral X-ray.

Data confidentiality

The authors declare that they have followed their working centres' protocols regarding patient data publication and that all the patients included in this study received sufficient information and gave their written informed consent to take part in this study.

Right to privacy and informed consent

The authors have obtained the informed consent of patients and/or subjects referred to in this article. This document is filed with the consent of the corresponding author.

Conflict of interest

The authors have no conflict of interest to declare.

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