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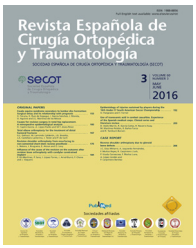

ORIGINAL ARTICLE

The limited anterior approach of the elbow for open reduction and internal fixation of capitellum fractures. Surgical technique and clinical experience in 2 cases with more than 2 years follow-up☆

J.R. Ballesteros-Betancourt[a,b,*], J.A. Fernández-Valencia[a], R. García-Tarriño[a], A. Domingo-Trepat[a], S. Sastre-Solsona[a], A. Combalia-Aleu[a], M. Llusá-Pérez[a]

[a] *Servicio de Cirugía Ortopédica y Traumatología, Hospital Clínico de Barcelona, Barcelona, Spain*
[b] *Departamento Anatomía Humana y Embriología, Facultad de Medicina, Universidad de Barcelona, Barcelona, Spain*

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KEYWORDS
Capitellum fracture;
Kocher approach;
Lateral exposure of the elbow;
Open reduction and internal fixation;
Anterior approach of the elbow;
Radial nerve

Abstract
Objective: Fractures involving the *capitellum* can be treated surgically by excision of the fragment, or by reduction and internal fixation with screws, with or without heads. The lateral Kocher approach is the most common approach for open reduction. We believe that the limited anterior approach of the elbow, could be a valid technique for treating these fractures, as it does not involve the detachment of any muscle group or ligament, facilitating the recovery process.
Material and method: A description is presented of the surgical technique, as well as of 2 cases with a Bryan–Morrey type 1 fracture (Dubberley type 1A). Two different final quality of life evaluation questionnaires were completed by telephone: the EuroQol Five Dimensions Questionnaire (EQ-5D), and the patient part of the Liverpool Elbow Score (PAQ-LES) questionnaire.
Results: The 2 patients showed favourable clinical progress at 36 and 24 months, respectively, with an extension/flexion movement arc of −5°/145° and −10°/145°, as well as a pronosupination of 85°/80° and 90°/90°. The 2 patients showed radiological consolidation with no signs of osteonecrosis. The EQ-5D score was 0.857 and 0.910 (range: 0.36–1), and a PAQ-SLE of 35 and 35 (range: 17–36), respectively.

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* Corresponding author.
E-mail address: jrballes@clinic.ub.es (J.R. Ballesteros-Betancourt).

Conclusions: We believe that the limited anterior approach of the elbow is a technical option to consider for the open surgical treatment of a *capitellum* fracture, although further studies are needed to demonstrate its superiority and clinical safety compared to the classical lateral Kocher approach.

PALABRAS CLAVE
Fractura de *capitellum*;
Abordaje de Kocher;
Abordaje lateral de codo;
Reducción abierta y fijación interna;
Abordaje anterior de codo;
Nervio radial

Abordaje anterior limitado del codo para la reducción abierta y fijación interna de las fracturas del capitellum. Técnica quirúrgica y experiencia clínica en 2 casos con más de 2 años de seguimiento

Resumen
Objetivo: Las fracturas que afectan al *capitellum* pueden ser tratadas quirúrgicamente mediante escisión del fragmento, o mediante reducción y fijación interna con tornillos con o sin cabeza. El abordaje lateral de Kocher es el más usado para la reducción abierta. Creemos que el abordaje anterior limitado del codo podría ser una opción válida para tratar este tipo de fracturas, ya que no implica la desinserción de ningún grupo muscular ni de ningún ligamento y facilita la colocación anteroposterior de los tornillos, que ha demostrado ser biomecánicamente superior.
Material y método: Describimos la técnica quirúrgica y evaluamos los resultados en 2 casos clínicos con una fractura de tipo 1 de Bryan y Morrey (tipo 1A de Dubberley) mediante evolución clínica y radiológica. Dos cuestionarios diferentes sobre calidad de vida fueron realizados por teléfono: el EuroQol Five Dimensions Questionnaire (EQ-5D) y la porción contestada por el paciente del Liverpool Elbow Score (PAQ-LES).
Resultados: Los 2 pacientes presentaron una evolución clínica favorable a los 36 y 24 meses, respectivamente con un arco de movimiento de extensión/flexión de −5°/145° y −10°/145°, así como una pronosupinación de 85°/80° y de 90°/90°. Los 2 pacientes presentaron consolidación radiológica sin signos de osteonecrosis, con el EQ-5D de 0,857 y 0,910 (rango: 0,36-1) y el PAQ-LES de 35 y 35 (rango: 17-36), respectivamente.
Conclusiones: Creemos que el abordaje anterior limitado del codo es una opción técnica que tener en cuenta en caso de decidirse un tratamiento quirúrgico abierto de una fractura de *capitellum*, si bien necesitamos de estudios posteriores que demuestren su superioridad y seguridad clínica con respecto al abordaje clásico lateral de Kocher.

Introduction

Fractures affecting the capitulum can be treated through excision of the fragment (by means of arthroscopy or a Kocher minimal lateral approach) or else through open reduction and internal fixation. These fractures are technically demanding. The Kocher lateral approach is the most commonly employed for the open reduction and internal fixation of fractures affecting the capitulum. It is frequently associated with the de-insertion of the extension and supination musculature in order to increase the exposure of the capitulum and to perform anteroposterior fixation using cannulated or uncannulated screws.[1–7] In some cases, it may even be necessary to de-insert the lateral ligament complex from its origin.[3,7–9] This approach and its prolongation are not innocuous: the de-insertion of extension and supination musculature and the origin of the collateral lateral ligament require re-insertion (with transosseous sutures or harpoons) and they therefore require extra recovery time because of the morbidity created.[1,2] Arthroscopy also has a role to play in the handling of these injuries: it helps when reducing the fracture before finally performing the fixation by means of screws implanted in posteroanterior direction.[10–12] We believe that the limited anterior approach of the elbow could be a valid option for the treatment of fractures of this type as it does not imply the de-insertion of any muscle or ligament group, thus facilitating the recovery process. Moreover, the working position is with the elbow extended, which facilitates reduction of the fracture and, in addition, it enables the screws to be implanted in a truly anteroposterior direction as this has been shown to be biomechanically superior.[13] We present here the surgical technique proposed along with our experience in 2 clinical cases with over 2 years of follow-up.

Material and method

Surgical technique

1. The patient is placed in supine decubitus position on the surgical table, with the arm at 90° abduction and supported on an auxiliary table placed beside the patient. Following the anaesthetic procedure