

ORIGINAL ARTICLE

## Total elbow arthroplasty for the treatment of distal humeral fractures<sup>☆</sup>



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### KEYWORDS

Distal humeral fracture;  
Supracondylar fracture;  
Total elbow arthroplasty;  
Older patients

### Abstract

**Objective:** To report the clinical–functional outcomes of the treatment of humeral distal fractures with a total elbow prosthesis.

**Material and methods:** This retrospective study was performed in two surgical centres. A total of 23 patients were included, with a mean age of 79 years, and of which 21 were women. The inclusion criteria were: patients with humeral distal fractures, operated on using a Coonrad–Morrey prosthesis, and with a follow-up of more than one year.

According to AO classification, 15 fractures were type C3, 7 C2 and 1 A2.

All patients were operated on without de-insertion of the extensor mechanism.

The mean follow-up was 40 months.

**Results:** Flexor–extension was 123–17°, with a total mobility arc of 106° (80% of the contralateral side). Pain, according to a visual analogue scale was 1. The Mayo elbow performance index (MEPI) was 83 points. Excellent results were obtained in 8 patients, good in 13, medium in 1, and poor in 1. The mean DASH (disability) score was 24 points.

**Conclusion:** Treatment of humeral distal fractures with total elbow arthroplasty could be a good treatment option, but indications must be limited to patients with complex fractures, poor bone quality, with osteoporosis and low functional demands. In younger patients, the use is limited to serious cases where there is no other treatment option.

**Level of Evidence:** Level of Evidence IV.

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**PALABRAS CLAVE**

Fractura de húmero distal;  
Fractura supracondílea;  
Prótesis total de codo;  
Pacientes ańosos

**Artroplastia total de codo para el tratamiento de fracturas del húmero distal****Resumen**

**Objetivo:** Reportar los resultados clínico-radiológicos del tratamiento de las fracturas del húmero distal (FHD) con prótesis total de codo.

**Material y métodos:** Este trabajo retrospectivo fue realizado en 2 centros quirúrgicos. Se incluyeron: pacientes con FHD, operados con prótesis total de Coonrad-Morrey y con seguimiento > 1 año. Se incluyeron 23 pacientes. Veintiuno de los pacientes eran mujeres con una edad promedio de 79 años.

Según la clasificación AO, las fracturas eran: 15 del tipo C3, 7 del tipo C2 y una A2.

Todos los pacientes fueron operados sin desinserción del aparato extensor.

El seguimiento promedio fue de 40 meses.

**Resultados:** La flexoextensión fue de 123–17°, con un arco de movilidad de 106° (un 80% con respecto al lado sano). El dolor según EVA fue de un punto. El SCM promedio fue de 83 puntos: 8 pacientes tuvieron resultados excelentes, 13 buenos, uno regular y otro malo. El DASH promedio fue de 24 puntos.

No se evidenciaron aflojamientos en 15 pacientes. Se observaron 10 complicaciones: 2 desgastes del polietileno, un desensamble protésico, 3 parestesias postoperatorias del nervio cubital, una necrosis de piel que necesitó un colgajo braquial, 2 aflojamientos protésicos, y una falsa vía intraoperatoria.

**Conclusiones:** El tratamiento de FHD con prótesis total de codo puede ofrecer una opción razonable de tratamiento, pero las indicaciones deben estar limitadas a fracturas complejas donde la fijación interna puede ser precaria, en pacientes con osteoporosis y con baja demanda funcional. En pacientes jóvenes la utilización está limitada a casos graves donde no exista otra opción de tratamiento.

**Nivel de evidencia:** Nivel de evidencia IV.

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**Introduction**

Distal humeral fractures (DHF) are rare injuries<sup>1,2</sup> that usually occur in elderly women.<sup>3,4</sup> The number of such fractures has increased over recent decades. Palvanen et al. reported an increase in them of 11/10,000 in 1970 to 30/10,000 in 1995, above all in patients older than 80 years old, and with a tendency to increase.<sup>5</sup>

In this age group poor bone quality plays a major role when deciding on the best treatment. The results of osteosynthesis are variable, although it has a high number of complications.<sup>2,6</sup> In young patients the indication of prosthesis is restricted to those cases when there is no other option for treatment.

Several authors have reported good results using total elbow arthroplasty.<sup>7–16</sup>

The aim of this work is to report on the clinical–radiological results of a series of patients with DHF treated using total elbow arthroplasty.

**Material and methods**

A retrospective study was undertaken in 2 surgical centres. The inclusion criteria were: patients with DHF operated using the Coonrad–Morrey total prosthesis (Zimmer®, Warsaw, IN, USA), with a time between trauma and surgery of

<2 months and a follow-up >1 year. Pathological fractures were excluded.

No patient was lost to follow-up. Two patients died in the year after their surgery and they were excluded. 23 patients were included, of which 21 were women and 2 were men, with an average age at the moment of trauma of 76 years (ranging from 43 to 87 years). The right arm was involved in 12 cases and the left arm in 11, and corresponded to the dominant limb in 12 of these cases.

All of the patients were studied using frontal and profile X-rays, and computerised axial tomography was used in the case of intra-articular fractures. According to the AO<sup>17</sup> classification, 15 fractures were of the C3 type, 7 of the C2 type and one was A2. The average time from the trauma to surgery was 14 days (ranging from 5 to 60 days) (Table 1).

**Surgical technique**

Under local anaesthesia and in dorsal decubitus the affected arm is placed over the thorax of the patient and a pad is placed under the scapula. An incision of approximately 15 cm is made in the back of the elbow, centring on the end of the olecranon. The medial edge of the triceps and the cubital nerve are identified and protected during the whole procedure. The articulation is exposed through a posterior approach, luxating the olecranon laterally and exposing the

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