

ORIGINAL ARTICLE

## Diaphyseal forearm fractures, 20 years after surgical treatment. Is there still an indication for percutaneous fixation?☆



M.R. Fernández-Marín\*, M. Hidalgo-Pérez, G. Arias-Rodríguez, A. García-Mendoza, E. Prada-Chamorro, G. Domecq-Fernández de Bobadilla

Servicio de Traumatología y Cirugía Ortopédica, Hospital Universitario Virgen del Rocío, Sevilla, Spain

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### KEYWORDS

Intramedullary osteosynthesis;  
Forearm fractures;  
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Dynamic osteosynthesis forearm fractures

### Abstract

**Objective:** This is a retrospective study of 98 diaphyseal forearm fractures in adults, treated by a percutaneous technique with intramedullar Kirchner wires.

**Materials and method:** We reviewed 64 patients with 98 forearm fractures with a radiographic follow-up, assessing the presence of pseudoarthrosis or delayed bone union and evaluating functional outcomes with the Anderson and the Disability of the Arm, Shoulder and Hand scale.

**Results:** Clinical and radiological bone union was achieved in an average of 12 weeks. We obtained 77% of excellent and good results following Anderson's scale. There were 4 cases of pseudoarthrosis and 6 cases of delayed bone union.

**Conclusion:** This surgical technique provides several advantages, such as a low incidence of complications and a total absence of infections, refractures and iatrogenic neurovascular injuries. It allows a lower hospital stay and a shortening of the surgery time compared with other techniques such as plates and intramedullary nails, that have similar results, in terms of bone union and functional outcomes, as we have verified from the published literature.

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\* Corresponding author.

E-mail address: [reyesfernandezmarin@gmail.com](mailto:reyesfernandezmarin@gmail.com) (M.R. Fernández-Marín).

**PALABRAS CLAVE**

Osteosíntesis endomedular; Fracturas antebrazo; Osteosíntesis percutánea; Osteosíntesis dinámica fracturas antebrazo

**Fracturas diafisarias de antebrazo, 20 años después. ¿Está indicada la osteosíntesis percutánea?****Resumen**

**Objetivo:** Estudio retrospectivo de 98 fracturas diafisarias de antebrazo en adultos tratadas mediante osteosíntesis percutánea intramedular con agujas de Kirchner.

**Materiales y método:** Se revisan 64 pacientes que presentaban 98 fracturas de antebrazo con un seguimiento clínico-radiológico, evaluando la presencia de pseudoartrosis o retardo de la consolidación y valorando los resultados funcionales mediante la Escala de Anderson y el *Disability of the Arm, Shoulder and Hand*.

**Resultados:** La consolidación clínica y radiológica se consiguió con una media de 12 semanas, obteniendo un 77% de excelentes y buenos resultados con los criterios de Anderson. Se registraron 4 casos de pseudoartrosis y 6 casos de retardo de consolidación.

**Conclusión:** La osteosíntesis percutánea presenta una serie de ventajas con respecto a otras técnicas como son una baja incidencia de complicaciones, ausencia de infecciones, refracturas y lesiones yatrogénicas vasculonerviosas. Se consigue una menor estancia hospitalaria y un acortamiento del tiempo quirúrgico, con unos resultados similares al tratamiento con placas y clavos endomedulares en cuanto a consolidación y resultados funcionales, como comprobamos al consultar la bibliografía publicada.

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**Introduction**

The aim of treating diaphyseal forearm fractures in adults is to obtain suitable axial and rotational stability,<sup>1</sup> and this is why plates are still considered to be the *treatment of choice*.<sup>2,3</sup>

In 1957 Smith<sup>4</sup> invented intramedullary fixation, underlining its eminently periostic consolidation and the non-aggressive nature of the operation. High rates of pseudoarthrosis and its long immobilisation time made this method unpopular, although this has now been overcome with newly designed pins.<sup>5-8</sup>

Our hospital has traditionally been a promoter of percutaneous treatment for diaphyseal fractures of the forearm, using Kirschner needles (KN). This is largely due to the works by Morote and Pérez Sicilia<sup>9</sup> on forearm fractures in children and adolescents, and it is now recognised internationally as the treatment of choice.

Before osteosynthesis using plates became widespread, fractures of this type in adults were treated using intramedullary KN. It gave good results in spite of the data in some studies.<sup>1,4,5</sup> This method has continued to be used in our hospital to date, as although it is not considered to be the standard technique, it is often used under certain circumstances to treat forearm fractures in adults.

Although this treatment has many detractors, there are currently no recent studies which compare its results with those obtained using other osteosynthesis techniques.

The results obtained in our series show that it is a totally valid alternative treatment for fractures of this type, on condition that it is accompanied by careful indication and exquisite surgical technique. The aim of this study is to describe surgical technique using intramedullary needles and to evaluate its efficacy and the results obtained in our series in the surgical treatment of adults with fracture of

the radius, ulna or of both. These results are then compared with those described in the published literature on treatment with plates and intramedullary pins.

**Material and method****Patients and method**

All of the cases of forearm fracture treated in our hospital from January 1995 to March 1999 were evaluated retrospectively.

The study inclusion criteria were diaphyseal fracture of the radius, ulna or both, including closed fractures as well as all degrees of open ones. Patients had to be over the age of 18 years old and had to have been treated only by percutaneous osteosynthesis with KN. Patients who had proximal or distal radius and ulna dislocations were excluded from the study (Monteggia or Galeazzi), as were those with intrajoint fractures of the distal epiphysis of the radius or ulna, and fracture of the olecranon or head of the associated radius.

**Surgical technique**

General anaesthesia or blockage of the brachial plexus. Patient in supine decubitus. The affected limb with the shoulder in abduction at 90° and elbow in 90° flexion, held by a lateral support at the level of the elbow. Traction is applied by bandages around the bottom of the first 4 fingers, which are tied to the waist of the surgeon while he reduces the fracture with the aid of radiocopy.

This technique is not considered indicated when it is not possible to restore the length due to defects in reduction or comminution, or when neighbouring joint surfaces are affected.

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