

ORIGINAL ARTICLE

**Type II olecranon fractures in patients over 65. Tension band or pre-formed plate? Analysis and results** ☆



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**KEYWORDS**

Olecranon fractures;  
Tension band;  
Plates;  
Functional results

**Abstract**

*Objective:* The objective of this study was to compare the clinical outcomes of surgical treatment using tension band with needles and preformed plates in type II olecranon fractures according to the Mayo classification in patients older than 65 years.

*Materials and method:* A descriptive, retrospective study of 49 patients with a mean age of 75.1 years who underwent surgery olecranon fracture using 2 different fixing systems. The Mayo classification was used to define them, excluding type I and III, and the VAS to assess postoperative pain. Patients were assessed functionally by the questionnaire Quick DASH. All measurement was performed with goniometer and joint balance serial radiographs at one month, 3, 6 and 12 months. Minimum follow-up was one year.

*Results:* In 26 patients the tension band was used and the preformed plates in 23. There were no statistically significant differences in functional outcomes, joint balance or postoperative VAS between the 2 groups. There were a greater proportion of patients who had to be operated because of problems related to osteosynthesis material in those in which preformed plates were used.

*Conclusion:* Treatment of olecranon fractures with tension band with needles and cerclage remains the surgery of choice in patients older than 65 years.

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**PALABRAS CLAVE**

Fracturas de  
olécranon;  
Banda a tensión;  
Placas;  
Resultados  
funcionales

## Fracturas de olécranon tipo II en mayores de 65 años. ¿Banda a tensión o placa preformada? Análisis y resultados

**Resumen**

**Objetivo:** El objeto de este estudio fue comparar los resultados clínicos del tratamiento quirúrgico mediante banda a tensión con agujas y las placas preconformadas en las fracturas de olécranon tipo II de Mayo en pacientes mayores de 65 años.

**Material y método:** Estudio descriptivo, retrospectivo, de 49 pacientes con una edad media de 75,1 años, intervenidos quirúrgicamente de fractura de olécranon mediante 2 sistemas distintos de fijación. Se empleó la clasificación de Mayo para definir las, excluyendo los tipos I y III, y la EVA para valorar el dolor postoperatorio. Los pacientes fueron evaluados funcionalmente mediante el cuestionario Quick DASH. A todos se les realizó medición del balance articular con goniómetro y radiografías seriadas al mes, 3, 6 y 12 meses. El seguimiento mínimo fue de un año.

**Resultados:** En 26 pacientes se empleó la banda a tensión y en 23, las placas preformadas. No hubo diferencias estadísticamente significativas en los resultados funcionales, el balance articular ni la EVA postoperatoria entre los 2 grupos. Sí destaca una mayor proporción de pacientes a los que hubo que intervenir por problemas relacionados con el material de osteosíntesis en aquellos en los que se emplearon placas preformadas.

**Conclusiones:** El tratamiento quirúrgico de las fracturas de olécranon tipo II en pacientes mayores de 65 años mediante el uso de placas preformadas no aportó mejores resultados que los obtenidos mediante la fijación con banda a tensión.

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**Introduction**

Olecranon fractures comprise at least 20% of all proximal fractures of the forearm.<sup>1</sup> Because these are intraarticular fractures they require anatomic reduction and restoration of articular congruence to obtain a good clinical outcome and prevent the development of osteoarthritis.<sup>2</sup> Stable fixation is also necessary to enable early mobilisation to prevent stiffness of the elbow. Several fixation systems are used, including tension bands, fixation plates and intramedullary nails.<sup>3</sup> However, there is some controversy regarding the outcomes and complications of surgery to these fractures in elderly patients, specifically precarious osteosynthesis, due to poor bone quality and problems with the surgical wound.<sup>4,5</sup> Excision of the fractured proximal fragment and advancement of the triceps for its reinsertion have been suggested as alternatives for these patients, although problems have been raised regarding weakness of elbow extension.<sup>6</sup> There are few papers on the conservative management of displaced fractures of the olecranon in elderly patients. However, there are some that show acceptable outcomes in those at more surgical risk.<sup>7,8</sup>

The aim of our study was to assess the long-term outcomes of surgical treatment by open reduction and osteosynthesis of olecranon fractures in patients aged over 65 years, and to compare clinical outcomes between the use of tension bands with cerclage wires and needles with fixation plates.

**Materials and method**

An observational, descriptive and retrospective study was undertaken of patients over the age of 65 years operated

in our hospital for isolated unstable olecranon fracture between January 2005 and December 2014, with a minimum follow-up of one year.

Out of a total of 66 patients, 17 were not included in the study as they had not completed minimum follow-up (change of hospital, death or lack of data), which reduced the number patients in the series to 49.

We used the Mayo classification of olecranon fractures as described by Morrey<sup>9</sup> based on different factors such as displacement, comminution and elbow stability. Only patients who presented type II (A and B) fractures were included in the study.

Mean follow-up was 14.8 months, during which time X-rays were taken at 1, 3, 6 and 12 months after surgery. Anteroposterior and lateral views were used in all cases.

Postoperative pain was assessed using the VAS scale and articular movement using a goniometer. The QuickDASH questionnaire in Spanish was used for functional evaluation.

The non-parametric Mann-Whitney *U* test was used to establish statistically significant differences ( $p < 0.05$ ) in functional outcomes.

A posterior elbow approach was used in all cases. Kirschner needles of 1.6–1.8 mm in diameter and 1–1.2 mm wire was used for fixation with tension bands. Synthesis was achieved leaving the intramedullary needles or nailing them to the anterior cortex of the ulna, making a figure-of-eight wire loop, which was manually tightened in the proximal part after passing through the distal orifice in the ulna (Fig. 1).

The plates used had a profile of 3.1 mm, with proximal locking screws of 2.7 mm and distal screws of 3.5 mm, which could be either locking or compression (Fig. 2).

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