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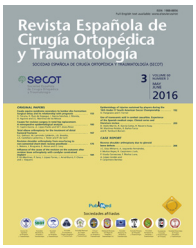

ORIGINAL ARTICLE

Surgical treatment of extra-articular distal-third diaphyseal fractures of the humerus using a modified posterior approach and an extra-articular plate☆

P. Páramo-Díaz*, M. Arroyo-Hernández, V. Rodríguez Vega, M. Aroca-Peinado, J.L. León-Baltasar, P. Caba-Doussoux

Unidad de Traumatología, Servicio de Cirugía Ortopédica y Traumatología, Hospital Universitario 12 de Octubre, Madrid, Spain

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KEYWORDS
Extra-articular distal humerus fractures;
Modified posterior approach;
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Abstract
Purpose: To evaluate the clinical and radiological outcomes of these fractures treated through a modified posterior approach with a distal humerus plate.
Material and methods: Between 2013 and 2015 we performed a retrospective study of these fractures surgically treated in our centre. Inclusion criteria: older than 18 years old, no pathological fractures, follow-up 1 year at least. 23 patients underwent surgery, mean age 45 years old, with an average follow-up of 18 months.

Patient characteristics, aetiology and type of fractures were recorded. The surgery was performed using Gerwin modified posterior approach with a posterolateral distal humerus plate. Clinical results were evaluated using Quick DASH, MEPS, VAS. Radiological results were also evaluated. Complications associated with treatment and radial nerve palsy incidence were recorded as well.
Results: Type of fracture according AO/OTA: six 12-A, seven 12-B, ten 12-C. 23 patients progressed to union.

After one year: QD 6.43, VAS 0.66, MEPS 88.88. No failure of internal fixation. Two superficial infections. 15 excellent results, 5 good, and 3 fair, with no poor results.
Conclusion: Surgical fixation of these fractures through a modified posterior approach with a posterolateral plate minimises iatrogenic nerve injury, provides better visualisation of the proximal humerus, provides stable fixation of these injuries and results in high union rates and overall excellent functional results.

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* Corresponding author.
E-mail address: pabloparamodiaz@gmail.com (P. Páramo-Díaz).

PALABRAS CLAVE
Fracturas diafisarias húmero distal;
Abordaje posterior modificado;
Placa extraarticular húmero distal

Tratamiento de las fracturas diafisarias extraarticulares de húmero distal por abordaje posterior modificado y placa extraarticular

Resumen
Objetivo: Evaluar los resultados clínicos y radiológicos del tratamiento quirúrgico de las fracturas diafisarias extraarticulares de húmero distal tratadas mediante un abordaje posterior modificado con una placa extraarticular preconformada de húmero distal.
Material y métodos: Realizamos un estudio retrospectivo entre los años 2013 y 2015 de 23 pacientes mayores de 18 años, 45 años de media, con diagnóstico de fractura extraarticular de húmero distal que fueron intervenidos quirúrgicamente en nuestro centro mediante abordaje posterior modificado de Gerwin y placa extraarticular de húmero distal con seguimiento mínimo de un año y seguimiento medio de 18 meses. Se excluyeron las fracturas patológicas.

Se recogieron los datos demográficos, el tipo de fractura, la lateralidad, el mecanismo de producción y la presencia de parálisis radial. Se evaluó el resultado clínico-funcional con las escalas Quick-Dash (QD), MEPS y EVA, el resultado radiológico y el tiempo hasta la consolidación. Se recogieron la satisfacción (sí o no) y las complicaciones.
Resultados: Seis pacientes presentaban fractura tipo 12-A, 7 tipo 12-B y 10 tipo 12-C.

Todos los pacientes presentaron consolidación al año de la intervención (media 12 semanas). Nueve pacientes presentaron parálisis radial prequirúrgica y uno posquirúrgica. No hubo complicaciones relacionadas con fracasos de material y se observaron 2 infecciones de herida quirúrgica. La puntuación media de las escalas fue la siguiente: QD 6,43, EVA 0,66, MEPS 88,88; 12 resultados fueron considerados como excelentes, 3 como buenos y 3 como suficientes.
Conclusión: La osteosíntesis de este tipo de fracturas con placa extraarticular empleando el abordaje de Gerwin presenta una tasa de complicaciones muy baja, permite la exploración del nervio radial con una buena exposición proximal del húmero, permite reducción anatómica con montaje rígido y estabilización absoluta de la fractura, dejando libre las articulaciones, obtiene altas tasas de consolidación con excelentes resultados funcionales y una rápida vuelta a la actividad de los pacientes.

Introduction

Distal third diaphyseal fractures of the humerus are difficult lesions to treat due to their location close to the joint, which conditions a small distal fragment (Fig. 1). Conventional straight plates are problematic as they only allow for diaphyseal anchorage, and they may be insufficient on occasions. Treatment with intramedullary nails presents the same problem. Soft tissue injuries also present as does association with radial nerve palsy as it passes through the torsion channel. There is no universally recognised treatment for these fractures. Both conservative and surgical treatments have been proposed[1] with surgery being preferred by the majority of surgeons today. Surgery may entail osteosynthesis with differently configured plates and intramedullary nailing.[2]

The Basel study used conservative treatment and obtained high consolidation rates. Some of the problems associated with this treatment are the difficulty of controlling angular deformities and greater rates of non-union, misaligned consolidations and a decrease in articular range of the elbow, principally caused by prolonged immobilisation.[1]

Surgical treatment of extra-articular distal-third diaphyseal fractures of the humerus provides a more predictable alignment and potentially a more rapid return to daily activity, thanks to the possibility of early rehabilitation and the avoidance of soft tissue problems caused by orthoses.[3]

Several approaches have been used for this surgery, including trans-tricipal, direct lateral, percutaneous and the modified posterior approach described by Gerwin et al.[4] The latter permits excellent humeral exposure, is anatomical and enables exhaustive exploration of the radial nerve.

The proposal of this article was to assess the clinical and radiological outcomes obtained in our centre after surgical intervention of the extra articular distal humerus fractures using a modified posterior approach as described by Gerwin et al., with posterior osteosynthesis using a posterolateral extra articular distal humerus preformed plate.

Material and method

We performed a retrospective study of patients over 18 who had undergone surgery in our centre for extra-articular distal-third diaphyseal fractures of the humerus, 12-, subgroups A, B and C according to the Arbeitsgemeinschaft für Osteosynthesefragen/Orthopaedic Trauma Association Committee for Coding and Classification (AO/OTA), through a modified posterior Gerwin approach[4] and a posterolateral extra articular preformed 3.5 mm LCP plate (DePuy Synthes, West Chester, PA, U.S.A.) in its most distal region, between the years 2013 and 2015. These patients had not presented with a pathological fracture and follow-up had been at least one year. After applying these inclusion and exclusion criteria we obtained a total of 23 patients. The group under study