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ORIGINAL ARTICLE

Morbidity and mortality of surgically treated proximal humerus fractures☆

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KEYWORDS
Morbidity;
Fracture;
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Abstract
Background: The aim of the present study is to analyze the factors associated with mortality and the capacity to perform daily life activities (DLA) in patients with surgically treated proximal humeral fractures.
Methods: A retrospective study was conducted on 94 patients with a surgically treated proximal humeral fracture, with a mean follow-up of 8 years (2–12 years). A correlation analysis was performed to determine the relationship between the type of fracture, surgical technique, comorbidities and mortality and DLA. The Student's *t* test was used for statistical analysis.
Results: A total of 72 patients were identified, 18.6% of them died during follow-up, all diagnosed with some comorbidity. There was no correlation between mortality, type of fracture or the technique used.

Most of the patients (85.4%) had comorbidities, and 79.5% were completely independent for DLA. Although there was no relationship with the type of fracture, there was a significant reduction in the performing of DLA in patients treated with hemiarthroplasty, and in patients with neurological disorders.
Conclusions: There was a mortality of 18.6% among patients with surgically treated proximal humerus fractures.

The majority of surgically treated patients were fully independent for DLA at long-term follow-up.

PALABRAS CLAVE
Morbilidad;
Fractura;
Húmero proximal;
Osteoporosis

Morbimortalidad en fracturas de húmero proximal tratadas quirúrgicamente

Resumen
Introducción: El objetivo de este estudio es analizar los factores que se correlacionan con la mortalidad y la capacidad para realizar actividades de la vida diaria (AVD) en las fracturas de húmero proximal tratadas quirúrgicamente.

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Métodos: Se estudiaron retrospectivamente a 94 pacientes con fractura de húmero proximal intervenidas quirúrgicamente con un seguimiento medio de 8 años (2-12 años). De la muestra, se estudió el tipo de fractura, el tratamiento aplicado y sus comorbilidades. Se correlacionan los parámetros con la mortalidad y el nivel de las actividades de la vida diaria.
Resultados: Se localizaron a 72 pacientes, de los cuales el 18,6% habían fallecido. Un 85,4% de los pacientes presentan comorbilidades. El 79,5% de los pacientes eran totalmente independientes para las actividades de la vida diaria. No encontramos correlación entre la mortalidad, el tipo de fractura y el tratamiento aplicado.

No se encontró relación significativa entre las AVD y las comorbilidades con el tipo de fractura, pero sí que se encontró una reducción significativa de la función de las actividades de la vida diaria en pacientes tratados con hemiartroplastia y en pacientes con trastornos neurológicos.
Conclusiones: Encontramos una mortalidad del 18,6% en los pacientes con fractura de húmero proximal tratada quirúrgicamente.

La mayoría de los pacientes intervenidos son totalmente independientes para las actividades de la vida diaria, con un seguimiento a largo plazo.

Introduction

Proximal humerus fractures have increased dramatically in the last 30 years. Not only has the total number of fractures risen, but also the mean age of patients has gone from 73 years in 1970–1978 years in 2002. Even the complexity of the fracture patterns has increased over this period.[1,2]

Despite the fact that most of these fractures are not displaced and can be treated conservatively, there is no consensus on the best treatment option in displaced proximal humeral fractures. While some authors are in favor of a conservative approach, others recommend surgical treatment.[3–9]

Most proximal humerus fractures in patients of advanced age can be attributed to osteoporosis. Those who suffer fractures of the proximal humerus most often present subsequent osteoporotic fractures. In spite of this knowledge, scarce attention has been paid to the diagnosis and treatment of the underlying osteoporosis.[10–12]

Proximal humerus fractures are associated to a higher mortality, especially among males. Nevertheless, very few studies to date have analyzed the mortality and capacity to carry out daily life activities (DLA) among patients suffering proximal humerus fractures and undergoing surgical treatment, compared to those suffering hip fractures.[13–23]

The objective of this study is to analyze the factors correlating mortality and the capacity to perform DLA among patients with proximal humerus fractures treated surgically.

Methods

We conducted a retrospective study after prospectively gathering data from 94 patients undergoing surgical treatment of proximal humerus fractures at our center, of which we were only able to locate 72. The sample included 20 males and 74 females, with a mean age of 72 years (range: 50–89 years), of which 17 patients were aged between 50 and 65 years, 35 between 66 and 80 years and 20 between 80 and 89 years. The right shoulder was affected in 56 cases and in the majority of cases (86.5%) it was the dominant arm.

The inclusion criteria considered in this study described patients arriving at our hospital between the years 2000 and 2001, with a diagnosis of proximal humerus fracture, undergoing surgical treatment and aged 50 years or over.

The exclusion criteria included all those patients who attended during the same period due to proximal humerus fractures which were treated conservatively and those aged less than 50 years.

All cases were diagnosed with fracture of the proximal humerus following a radiographic study in 2 projections (AP and profile in the plane of the scapula), as well as a computed tomography (CT) scan for correct classification. Fractures were classified according to the Neer classification,[24] resulting in the following distribution: 33 fractures in 2 fragments (17 fractures of the surgical neck, 9 fractures of the anatomical neck, 7 fractures of the greater tuberosity), 44 fractures in 3 fragments (40 fractures of the greater tuberosity, 4 fractures of the lesser tuberosity), 9 fractures in 4 fragments, 2 fracture-dislocations in 2 fragments, 2 fracture-dislocations in 3 fragments and 4 fracture-dislocations in 4 fragments.

The patients studied underwent different surgical treatments depending on the type of fracture, age and criteria of the surgeon. Of these, 40 were intervened through isolated transosseous sutures, 27 through transosseous sutures associated to Ender nails, 3 through placement of angular stability plates, 22 through hemiarthroplasties and 2 through inverted prostheses.

All patients were reviewed in order to obtain data on: (a) mortality, (b) subsequent fractures, (c) the level of satisfaction with the function of the affected shoulder (stratified into 3 categories: very satisfactory, satisfactory and not satisfactory) and d) the level of dependence or independence for DLA (assessed through 4 questions [Table 1] which established whether the patient was capable/incapable of DLA, with this variable being qualitative).

We also reviewed comorbidities (Table 2) at the time of the fracture. In total, 12 of the 72 patients did not present comorbidities at the time of the fracture, whilst the rest presented more than 1 comorbidity.