



Original Article

Evaluation of the surgical treatment of humeral shaft fractures and comparison between surgical fixation methods[☆]

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ABSTRACT

Objective: The objective of this study is to analyze the surgical results of humeral shaft fracture treatment and describe its epidemiology.

Methods: Retrospective study that identified all patients treated with surgical fixation of humeral shaft fractures between December of 2014 and June of 2016 in a trauma reference center. All medical records were reviewed in search of epidemiological data referent to the trauma and post-operative results, including radiographic healing of the fracture and related complications.

Results: Fifty-one patients were included, mostly male (78.4%), with an average age of 35.02 years. The most common trauma mechanism was a traffic accident (56.9%) followed by same-level falls (17.6%). No statistically significant difference was found between healing time comparing surgical fixation techniques, including open reduction and internal fixation, minimally invasive technique, intramedullary nailing, and external fixation.

Conclusion: Although each technique has inherent advantages and disadvantages, all fixation methods proved to be adequate options for the surgical treatment of humeral shaft fractures with high rates of healing and low rates of post-operative complications.

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[☆] Study conducted at Hospital do Trabalhador, Curitiba, PR, Brazil.

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Avaliação das fraturas diafisárias do úmero tratadas cirurgicamente e comparação entre os métodos de fixação cirúrgica

R E S U M O

Palavras-chave:

Epidemiologia

Úmero

Fraturas do úmero

Fixação de fratura

Osteossíntese

Fixação intramedular de fraturas

Consolidação da fratura

Objetivo: Descrever o perfil dos pacientes com fraturas diafisárias do úmero, bem como analisar os resultados das diferentes modalidades cirúrgicas.

Método: Estudo retrospectivo baseado na identificação de todos os casos de fraturas diafisárias de úmero submetidas a tratamento cirúrgico entre dezembro de 2014 e junho de 2016 em um serviço de referência em trauma, bem como na análise dos respectivos prontuários, e que buscou dados epidemiológicos referentes ao trauma e resultados pós-operatórios, inclusive tempo de consolidação e complicações relacionadas.

Resultados: Foram incluídos 51 pacientes, dos quais a maioria do sexo masculino (78,4%), com média de 35,02 anos. O mecanismo de trauma mais prevalente foram acidentes de trânsito (56,9%), seguidos de quedas de mesmo nível (17,6%). Não foi encontrada diferença significativa entre o tempo de consolidação dos diferentes métodos, inclusive redução aberta e fixação interna com placa e parafusos, técnica minimamente invasiva com placa em ponte, haste intramedular e fixação externa.

Conclusões: Todos os métodos cirúrgicos avaliados mostraram-se adequadas opções para o tratamento cirúrgico das fraturas da diáfise do úmero, ainda que tenham vantagens e desvantagens inerentes a cada técnica, com altas taxas de consolidação e poucas complicações relatadas.

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Introduction

Humeral shaft fractures represent up to 3% of all skeletal fractures¹ and approximately 20% of fractures involving the humerus.² Its incidence is bimodal, with a first peak near the third decade of life, mainly in men, and a second most prominent peak in women, around the seventh decade.³

Classically, the treatment of choice is conservative, but the morbidity and the related complications, as well as lower tolerance of the surgeon and the patient to what is considered an acceptable residual deformity, have led to a greater indication for surgical treatment.³

The main surgical methods include plate and screw fixation, including open reduction and minimally invasive techniques, intramedullary nails (IMN), and external fixation; all these methods present high rates of consolidation in the literature.¹

The usual indications for surgery include exposed fractures, associated neurovascular injury, joint fracture extension, polytrauma, extensive associated soft tissue injury, pathological fractures, and failure of conservative treatment. Relative indications are those regarding obese patients, cases associated with brachial plexus injury and muscular atrophy, and patients who did not adhere to conservative treatment.^{1,3}

This study is aimed at performing a retrospective analysis of surgically treated humeral shaft fractures in order to evaluate and compare types of surgical fixation, consolidation rate, main complications, and to draw an epidemiological profile of the patients who underwent this surgery in a large hospital.

Methods

This was a retrospective, observational, and quantitative study, based on the identification of all patients who underwent surgical treatment of humeral shaft fractures from December/2014 to June/2016, based on the procedure code found in the surgical registry book of this medical facility. The study was approved by the Ethics Committee for Human Research under no. 58374316.0.0000.5225 on September 29, 2016.

The hospitalization and outpatient follow-up records of all patients retrieved were analyzed, including the imaging tests performed during this period. Humeral shaft fractures were defined as those in the area between the surgical neck of the humerus and the area immediately above the condyles. The collected data included: age at the trauma, gender, trauma mechanism, side, presence of bone exposure, presence of associated lesions, AO/OTA classification, hospitalization time, intensive care unit (ICU) stay, time to bone consolidation, and complications. Patients with incomplete medical records, pathological fractures, loss to follow-up, or death during the study period were excluded.

After hospital discharge, outpatient follow-up was performed according to the routine of this medical facility, at two weeks, six weeks, three months, six months, and one year postoperatively. Cases with complications or associated lesions returned to the clinic according to the need for follow-up. The minimum follow-up time was six months for patients with bone consolidation, and one year for patients with delayed consolidation or pseudarthrosis.

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