



Original Article

Effectiveness of treatment of transtrochanteric fractures with Dynamic Hip Screws using minimally invasive access[☆]



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ABSTRACT

Objective: To analyze the short-term results from treating unstable intertrochanteric fractures with Dynamic Hip Screws (DHS), using a minimally invasive route, focusing on the functional aspects and complication and mortality rates of the method.

Methods: This was a prospective longitudinal study on 140 patients who underwent fixation of transtrochanteric fractures with the DHS system with a lateral minimally invasive access in the hip, between January and December 2013. The patients were evaluated pre and postoperatively (after six months of follow-up) by means of the Parker and Palmer mobility score. Women comprised 65.7% of the sample, and 54.3% of the fractures were on the right side. The patients' mean age was 80 years, ranging from 60 to 93 years.

Results: We observed an overall decrease in the mobility score and an increase in the degree of dependence over the short term. However, we encountered only two deaths in the study sample and there were no cases of infection or nonunion.

Conclusion: Despite the efficacy of the treatment with DHS, with high rates of fracture consolidation and a low mortality rate, we noted that the patients still showed significant functional limitation at the follow-up six months after the operation.

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Eficácia do tratamento das fraturas transtrocanterianas com Dynamic Hip Screw com acesso minimamente invasivo

RESUMO

Objetivo: Analisar os resultados do tratamento de fraturas transtrocanterianas instáveis com o Dinamic Hip Screw (DHS) por via minimamente invasiva e avaliar aspectos funcionais, taxas de complicação e óbitos do método, em curto prazo.

Palavras-chave:

Procedimentos cirúrgicos operatórios

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Fraturas do quadril
Fixação interna de fraturas

Métodos: Trata-se de um estudo longitudinal prospectivo, com 140 pacientes submetidos à fixação de fraturas transtrocantericas com sistema DHS, com acesso minimamente invasivo lateral do quadril, de janeiro a dezembro de 2013. Os pacientes foram avaliados pré e pós-operatoriamente (com seis meses de seguimento), de acordo com o escore de mobilidade de Parker e Palmer. A amostra apresentou 65,7% de mulheres, com o lado direito mais acometido (54,3%). A média de idade foi de 80 anos, variação entre 60 e 93.

Resultados: Notamos uma diminuição global no escore de mobilidade e aumento no grau de dependência desses pacientes em curto prazo. No entanto, obtivemos apenas dois óbitos na amostra estudada e nenhuma infecção ou falha na consolidação das fraturas.

Conclusão: Apesar da eficácia do tratamento com DHS, com elevados índices de consolidação e baixa taxa de mortalidade, notamos que os pacientes, ainda assim, apresentam uma limitação funcional significativa no seguimento até seis meses pós-operatórios.

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Introduction

Proximal fractures of the femur, among which transtrochanteric fractures can be highlighted, are a public health problem that especially affects the elderly population. They have a large social and economic impact. The incidence of these fractures has been increasing as the population becomes increasingly elderly, thanks to improvements in living conditions and greater attention to preventive medicine.¹ An exponential increase in the incidence of fractures of the proximal third of the femur has been recorded, with peak occurrence around the ages of 75–80 years.^{1,2}

These patients present chronic degenerative diseases with incapacities and deficiencies. They make use of medications that cause somnolence, balance problems and altered muscle tone, and they give rise to low blood pressure. Together, these are responsible for an increased risk of falls and this, along with varying degrees of osteoporosis, favor this type of injury.

Hip fractures account for 30% of hospital admissions in the United States³ and this percentage has been gradually increasing. It is expected that by 2040, the number of patients will reach around 329,000, with an annual treatment cost of around 16 billion dollars.⁴ According to Tronzo,⁵ these fractures can be classified as stable (types I and II) or unstable (III, IV and V), according to the degree of comminution of the posteromedial cortical bone. This is one of the principles that need to be understood in choosing the osteosynthesis method.

The ideal treatment is surgical and the fixation technique needs to be reproducible and non-aggressive, and to have a low complication rate and good functional results. In 1941 Jewet and Eugene⁶ conceptualized an implant with a static fixed angle that would allow early mobilization for the patient and reduce the incidence of deformities due to skewed varus consolidation.^{7,8}

However, this implant was often found to fail, due to uncontrolled collapse of the fracture and consequent cut-out. This led some authors such as Freitas et al.,⁹ Smith-Petersen et al.,¹⁰ Thornton,¹¹ Jewett and Eugene⁶ and McLaughlin¹² to seek new implant designs with compatible biomechanical principles. The Richards sliding compression screw was developed by Richards Surgical Ltd and this was subsequently

modified by Synthes Ltd, under the name Dynamic Hip Screws (DHS). This device was recommended by Schatzker¹³ and the AO group.¹⁴ Unlike the antiquated rigid implants, the DHS brought in the possibility of promoting continuous compression through the focus of the fracture, which hitherto had been impossible.¹⁵

Shortly after this, cephalomedullary nails emerged as a means for treating these fractures. This type of fixation gained many adherents because of the low degree of aggressiveness in implanting them, the shorter duration of the operation and hospital stay, and the consequent lower degree of morbidity in relation to traditional osteosynthesis methods that used extramedullary tutors, which required large-sized accesses for their installation.^{16,17} In addition, the DHS method has a major biomechanical advantage in treating fractures that present severe instability. However, with this system, these fractures require anatomical reduction or valgus reconstruction, like in the technique of Dimon and Hughston,¹⁸ in order to diminish the risk of failure of the synthesis. When these reconstructions are necessary, the duration of the operation required is longer and the morbidity of the treatment is greater.

The aim of this study was to prove the efficiency of the DHS system for fixation of unstable fractures, with anatomical or valgus reduction, by means of a minimally invasive surgical access, and to evaluate the consolidation rate and functional recovery among the patients.

Material and methods

A non-randomized open prospective longitudinal study was conducted among patients with transtrochanteric fractures who were admitted to and treated at a referral hospital for orthopedic trauma cases in a state capital in Brazil, between January and December 2013.

In this study, 140 patients were evaluated, of whom 65.7% were women (Fig. 1). The patients' mean age was 79 ± 9 years, with a range from 60 (minimum age) to 93 (maximum age). The relative frequency of patients between the ages of 80 and 84 years was 28.6% (Fig. 2).

The right side was affected in 54.3% of the cases and nine patients (6.4%) were affected bilaterally. All of these cases had

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