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Original Article

Reproducibility of the Tronzo and AO classifications for transtrochanteric fractures☆

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ABSTRACT

Objective: To analyze the reproducibility of the Tronzo and AO classifications for transtrochanteric fractures.
Method: This was a cross-sectional study in which the intraobserver and interobserver concordance between two readings made by 11 observers was analyzed. The analysis of the variations used the kappa statistical method.
Results: Moderate concordance was found in relation to the AO classification, while slight concordance was found for the Tronzo classification.
Conclusion: This study found that the AO/Asif classification for transtrochanteric presented greater intra and interobserver reproducibility and that greater concordance was correlated with greater experience of the observers. Without division into subgroups, the AO/Asif classification was shown, as described in the literature, to be acceptable for clinical use in relation to transtrochanteric fractures of the femur, although it did not show absolute concordance, given that its concordance level was only moderate. Nonetheless, its concordance was better than that of the Tronzo classification.

Reprodutibilidade das classificações de Tronzo e AO para fraturas transtrocanterianas

Palavras-chave:
Fraturas do quadril
Fraturas do colo femoral/classificação
Reprodutibilidade dos testes

RESUMO

Objetivo: Analisar a reprodutibilidade das classificações AO e de Tronzo para fraturas transtrocanterianas.
Método: Estudo transversal que analisou a concordância entre duas leituras feitas por 11 observadores, intraobservadores e interobservadores. A análise das variações usou o método estatístico Kappa.

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Resultados: Verificou-se concordância moderada para a classificação AO enquanto a classificação Tronzo mostrou concordância leve.
Conclusão: O trabalho evidenciou maior reprodutibilidade da classificação AO/Asif inter e intraobservador para as fraturas transtrocanterianas de fêmur, o que tem relação com o aumento da predominância de concordância com a experiência dos observadores. A classificação AO/Asif sem divisão em subgrupos mostrou-se, assim como descrito na literatura, aceita para o uso clínico nas fraturas transtrocanterianas de fêmur. No entanto, não mostrou concordância absoluta, uma vez que seu nível de concordância é apenas moderado, mas superior quando comparada com a classificação Tronzo.

Introduction

Transtrochanteric fractures are extracapsular and are characterized as occurring in the area between the greater and lesser trochanters of the femur.[1] This area of the femur is predominantly spongy and vascularized.

Elderly patients are more vulnerable to this type of fracture because of their bone fragility. In these patients, falling to the ground is a relatively common mechanism.[1,2] In surveys conducted between 1941 and 1971 that were cited by DeLee,[3] it was noted that patients with transtrochanteric fractures were on average 10–12 years older than patients with fractures of the femoral neck (which are intracapsular), with a mean between 66 and 76 years. It was also noted that cases among females predominated over cases among males, with ratios of 2:1–8:1.

Transtrochanteric fractures also affect young adults, especially through mechanisms of high-energy trauma.[1] The incidence of these fractures is increasing, along with the costs involved in treating them. In Brazil, in a survey conducted by the Ministry of Health, it was observed that 90% of the financial resources destined for orthopedic diseases are consumed by nine diseases, and transtrochanteric fractures were one of these.[4]

Another problem that is faced is that one-third of the patients die within the first year after the injury and that approximately 50% of the patients because incapable of walking alone or going up stairs, and 20% require full-time home care.[5]

The principal method for precisely determining the diagnosis of these fractures is radiography, but shortening of the limb and its positioning in external rotation are important clinical findings that corroborate the diagnosis of this type of injury.[6] The treatment is surgical and involves use of plates with a sliding screw, cephalomedullary nails or fixed-angle plates, with a view to achieving patient rehabilitation as quickly as possible.[6]

There are several classification systems for transtrochanteric fractures. However, the main characteristic of a classification system is that it should contain valid information that helps to describe the nature of the fracture, such as topography, configuration of the fracture, degree of stability and severity. Another characteristic is that it should aid in planning for osteosynthesis and in predicting the prognosis after definitive synthesis, with the objective of achieving stable anatomical primary reduction.[2,7] It is also important that any classification system should be reproducible between different observers and also by the same observer on different occasions.[7]

The Tronzo classification for transtrochanteric fractures[8] was created in 1974 and is still one the systems most used today. It was based on the classification of Boyd and Griffin,[9] who classified fractures according to the possibility of achieving and maintaining reduction (four types: I– stable in two parts; II– unstable and comminutive; III– unstable and reverse oblique; and IV – intertrochanteric–subtrochanteric with two fracture planes). In 1949, Evans[7] classified fractures after surgical treatment as stable or unstable.

Tronzo[8] (Fig. 1) modified the classification of Boyd and Griffin,[9] and this resulted in five types. This classification system is greatly used today.

The AO (Arbeitsgemeinschaft für Osteosynthesefragen) classification[10,11] was initially created by Müller et al.[10] in the 1980s and has periodically undergone updates with the aim of standardizing the classification of fractures for worldwide coverage, through a system for locating the bone and the type of involvement (letter and number), such that an alphanumeric code would make it possible for professionals to promptly know what had happened, which would facilitate communication between orthopedic services. For this reason, this system is the one currently most used in studies. In this system, trochanteric fractures are represented by code 31-A. They are subdivided into three groups base on the obliquity of the fracture line and the degree of damage (bone fragmentation).[11]

Group 1 presents a fracture line that starts in any region of the greater trochanter and extends as far as a point above or below the lesser trochanter. There are only two fragments and the medial cortex is fractured in only one locality. These fractures are stable after reduction and fixation, since there is good contact between the fragments, without bone loss. The lesser trochanter is intact.[11]

In group 2, the fractures are multifragmented and the fracture line starts laterally in the greater trochanter and continues to the medial cortical bone, as a two-part fracture. There is then a third fragment, which is the lesser trochanter. In this group, only fractures in subgroup A2.1 are considered to be stable, given that this third fragment is small and the greater trochanter is intact.[3]