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Original Article

Surgical treatment of femoral head fractures through previously controlled hip luxation: four case series and literature review☆

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ABSTRACT

Objective: To report a series of cases of patients treated by fracture of the femoral head through the Ganz pathway with controlled dislocation of the hip.
Method: All patients who were surgically treated with a Ganz access route for femoral head fractures were identified in a tertiary referral service for trauma. A review of medical records with X-rays and CT scans was carried out. The radiographic evaluation was classified according to Pipkin and the functional evaluation was performed through the application of the modified Harris Hip Score. Data regarding the quality of reduction, type of fixation, and postoperative complications were collected.
Results: The sample consisted of three men and one woman, with a mean age of 30 years (20–51). Regarding Pipkin's classification, two cases were type I, one type II, and one type IV. Regarding the Harris Hip Score, an average of 65.75 points was obtained (range: 20–86). All cases had anatomical reduction in the intraoperative period. One case presented post-traumatic sciatic nerve praxis and evolved with infection at the surgical site.
Conclusion: Surgical treatment of femoral head fractures through controlled hip dislocation is a viable option and can be considered an alternative to classical approaches.

Tratamento cirúrgico das fraturas da cabeça femoral através da luxação anterior controlada do quadril – Série de quatro casos e revisão da literatura

Palavras-chave:
Fraturas do quadril
Cabeça do fêmur
Luxação do quadril

RESUMO

Objetivo: Relatar uma série de casos de pacientes com fratura da cabeça femoral tratados através da via de Ganz com luxação controlada do quadril.
Método: Identificaram-se todos os pacientes tratados cirurgicamente com via de acesso de Ganz para fraturas da cabeça femoral em um serviço terciário referência em trauma. Fez-se

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uma revisão de prontuários com as radiografias e tomografias computadorizada. A avaliação radiográfica foi classificada de acordo com Pipkin e a avaliação funcional foi feita com o *Harris Hip Score* modificado. Foram coletados dados referentes à qualidade de redução, ao tipo de fixação e às complicações pós-operatórias.

Resultados: A amostra foi composta por três homens e uma mulher, com média de 30 anos (20-51). Em relação à classificação de Pipkin, dois casos eram do tipo I, um do tipo II e um do tipo IV. Em relação ao *Harris Hip Score*, observou-se uma média de 65,75 pontos (20 a 86). Todos os casos obtiveram redução anatômica no intraoperatório. Um caso apresentou praxia do nervo ciático pós-trauma e evoluiu com infecção do sítio cirúrgico.

Conclusão: O tratamento cirúrgico das fraturas da cabeça do fêmur através da luxação controlada do quadril é uma opção viável e pode ser considerada uma opção às vias clássicas de abordagem.

Introduction

Femoral head fractures are rare injuries; they are almost always associated with high-energy trauma, such as automobile accidents. Approximately 95% of the patients require hospital treatment, to treat the fracture itself or associated injuries.[1,2]

Traditionally, the Kocher-Langenbeck and the Smith-Petersen anterior approach are the two access routes used in femoral head fracture reduction and fixation.[3–5]

More recently, the controlled hip dislocation technique was introduced for the treatment of traumatic injuries of this joint. This approach was originally described in the early 1990s by Reinhold Ganz for the open treatment of femoroacetabular impact. It allows visualization of the entire circumference of the femoral head, with minimal risks of vascular supply injury. Another advantage is the facility to directly reduce the fragments and to secure them with appropriate implants. This access requires greater trochanter osteotomy and controlled anterior dislocation of the femoral head.[1] To date, few studies have described the results and the evolution of this approach for femoral head fractures.[4]

This study is aimed at reporting the cases of patients with femoral head fracture treated through the Ganz approach with controlled hip dislocation, assessing their radiographic and functional clinical evolution.

Methods

This project was submitted to the ethics committee in research of human beings and was approved on April 6, 2016 under the No. 54336716.2.0000.5225.

Based on the procedure codes, the records book of surgeries and medical charts, all patients surgically treated with Ganz approach for femoral head fractures in a tertiary referral unit for trauma were included.

Physical and electronic records were reviewed; the radiographs and computed tomography images of all cases were retrieved. The analysis consisted in identifying the patient's age at the time of trauma, gender, trauma mechanism, date of surgery, associated injuries, surgical time, complications during surgery, number and types of screws used, complications, and follow-up (range of motion assessment and follow-up duration). The radiographic evaluation, whether printed or in the database of images of the radiology department, was classified using the Pipkin classification.

Functional assessment was performed using the modified Harris Hip Score.[6]

The inclusion criteria comprised of cases surgically treated for femoral head fractures in which the Ganz approach was used. Patients with femoral head fracture treated by methods other than the controlled dislocation technique were excluded.

Surgical technique

The patient is placed in a lateral decubitus position. After routine asepsis, antisepsis and lower limb preparation, a 20 cm incision is made, centered on the greater trochanter apex. The subcutaneous tissue is dissected and the fascia lata is opened.

Superficial muscular dissection is made in the intermuscular plane between the fascia lata tensor and the anterior border of the gluteus maximus muscle. The internal rotation of the hip exposes the posterior border of the greater trochanter, the external rotators, and the posterior portion of the gluteus medius muscle.

The osteotomy demarcation is made from the posterosuperior border of the greater trochanter, extending to the border of the vastus lateralis. The trochanteric osteotomy is performed along this line. The bone is cut with an osteotome or electric saw, in a posterior to anterior direction. The thickness of the cut should be between 1 and 1.5 cm. The external rotators are preserved and remain inserted to the greater trochanter during the procedure. The main branch of the medial femoral circumflex artery is located distal to the