Simultaneous femoral neck fracture and anterior hip dislocation: A case report.


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Received: 15 June 2014/ Revised 3 August 2014/ Accepted 12 September 2014 / Published online 12 September 2014.

ABSTRACT

Traumatic anterior hip dislocations associated with ipsilateral displaced femoral neck fractures are rare. There are few reports in the literature, most of them associating femoral neck fracture and posterior hip dislocation. Management of this severe lesion is controversial between emergent reduction and internal fixation versus total hip arthroplasty.

We present the case of a 48-year-old male motorcyclist who was transferred to the Emergency Department following a traffic accident. Radiographic examination revealed a displaced femoral neck fracture associated with anterior dislocation of the left hip. A reduction and internal fixation with an endomedullary nail was performed and cutting-out of the lag screw occurred after 3 months. A revision surgery was performed using a new endomedullary nail and adding bone allograft. The reconstruction failed 17 months after, due to a symptomatic nonunion of the femoral neck, and a non-cemented total hip arthroplasty was performed. Twelve months after this last surgery, the patient has resumed his daily routines without pain scoring 35 out of 48 according to Oxford Hip Score.

The present case illustrates the unfavorable evolution of an anterior dislocation of the hip with a femoral neck fracture treated by emergent reduction and internal fixation.

The experience available from previous reports suggests that primary hip arthroplasty provides the best predictable outcomes. However the course of action must be tailored to each case, considering emergent reduction an internal fixation for the very young patient.

KEYWORDS

Hip dislocation, femoral neck fracture, simultaneous, complication, allograft, endomedullary nail, nonunion, cut-out, total hip arthroplasty.

INTRODUCTION

Traumatic hip dislocations result from high-energy trauma commonly associated with life-threatening conditions. Anterior traumatic hip dislocations are the least common form of the condition [1], and its association with femoral neck fracture is rare. Further, just few cases have been reported in the literature. We report the case of a patient suffering from anterior hip dislocation associated with femoral neck fracture, as well as the treatment and results.

CASE REPORT

A 48-year-old male who suffered a motorcycle accident was transferred to the Emergency Department. He was

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conscious, hemodynamically stable, and complained of pain in his left hip. Upon examination, he presented with externally-rotated lower limb abduction with adequate peripheral pulses. while the patient was maintained in supine. The femoral head and neck were fixed using a standard endomedullary nail with a 130° diaphyseal neck angle (Gamma3® Stryker) (Fig.1B).

Examination of plain anteroposterior pelvic (AP) radiograph revealed anterior-inferior hip dislocation associated with fracture of the femoral neck (Fig. 1A). No other associated injuries or life-threatening conditions were observed.

We performed an urgent surgical fixation within three hours of the accident. On a Judet table we failed to attempt a closed reduction by gentle axial traction. We then succeed by opening the capsule through a Hardinge lateral approach,

Three months after the surgery the patient presented with non-weight-bearing capacity due to groin pain. Plain radiographs revealed a cut-out of the nail and nonunion of the femoral neck fracture. We performed a salvage procedure involving the removal of the implant, addition of corticocancellous allograft bone in the defect and fixation of a new endomedullary nail with a lower diaphyseal-neck angulation of 120° (Gamma3®, Stryker) (Fig. 2).
After the surgery, the patient progressively improved his weight-bearing ability and had no pain. Fourteen months after the second procedure, the patient started limping and complained of groin pain. Radiographs showed a persistent nonunion of the femoral neck and fracture of the femoral head (Fig. 3A).

We proceeded to perform a total hip replacement by Hardinge lateral approach implanting a 52/32mm Exceed© cup with an E-Poly© liner and a Taperloc Complete® stem (Biomet) (Fig. 3B). Two and a half years after the accident, the patient is pain free, is not limping, and is able to perform all his daily life activities. Current Oxford Hip Score is 35/48.

DISCUSSION

Reports of anterior traumatic hip dislocations are uncommon, and their association with fractures of the femoral neck is even more infrequent; only a few cases have been reported [2,3]. Furthermore, a recent review study analyzed hip dislocations with femoral neck fractures in 30 patients: only 8 of them were found to be anterior [4].

The mechanism of injury corresponds to a high-energy trauma and an externally-rotated lower extremity in abduction. The degree of hip flexion determines whether superior pubic or inferior (obturator) dislocation results. In the event of femoral head dislocation, in which the femoral neck is intact or incompletely fractured, unless it is dissipated at the time of dislocation, a continuing force will result in complete break of the femoral neck, thus displacing the fragments and compromising the femoral head vascular supply [2,5].

In our case, a primary osteosynthesis was performed. Three months later, femoral neck nonunion persisted and cutting-out of the nail followed. Several procedures have been described for the treatment of nonunion femoral neck fractures, such as valgus osteotomies or muscle pedicle bone grafts [6]. We performed another osteosynthesis adding bone allograft to the femoral head channel. Lastly, a femoral head osteonecrosis developed. This required a salvage procedure involving a total hip replacement.

It is important for orthopedic surgeons to establish the best course of treatment available for this type of injury so as to avoid future unnecessary surgeries. Starting an early rehabilitation program and limiting possible repercussions is also paramount. Since this is a rather uncommon injury pattern there are no established guidelines. However, some points must be taken into consideration when facing traumatic hip dislocations, involving femoral neck fractures.

Closed reduction is not a viable option as a femoral head fragment was trapped by the hip capsule. Opening the capsule allowed for the easy reduction of the dislocated hip. Closed reduction is not recommended as such manipulation could damage vascularization of the femoral head [7]. A trochanteric flip osteotomy, which seems to provide complete visualization of the femoral head and acetabulum, thus decreasing the risk of avascular necrosis of the femoral head is an alternative approach [8]. However it is a highly demanding surgical procedure and its use has not been described an emergency context.

Figure 3. 3.A. Radiology showing a failure of the endomedullary nail (persistent femoral neck non-union and femoral head fracture); 3.B. Final radiology result after revision surgery with a non-cemented total hip arthroplasty 30 months after the motorcycle accident.
In the event of anterior hip dislocation with femoral neck fracture, the prognosis is poor. In eight cases involving patients who were initially treated with open reduction and internal fixation, avascular necrosis developed [4]. Further, viability of the femoral head can be tested during surgery. Classical signs of vascularization are bleeding of the head fragment [9], intactness of the medial circumflex femoral artery and its retinacular vessels and the presence of the round ligament. Nevertheless, these findings are based on reported cases [4,10].

Another factor to take into account when choosing treatment is the age of the patient. When dealing with young adults or middle-aged patients, the primary approach would involve preserving the hip joint unless a clear predictable bad prognosis is suspected. In older patients with sings of hip arthritis, total hip arthroplasty would be the first choice.

According to previous reports, the best results were obtained in the initial primary hip arthroplasty, yet scores were not established to reflect the patients’ overall health or satisfaction after treatment.

Considering all of the above, the optimum choice of treatment for femoral neck fractures after traumatic hip dislocations will depend on many factors, such as time to surgery, surgical findings, technique used to reduce and fix the fracture and patient’s age. The best available evidence suggests that primary hip arthroplasty provides the best predictable outcomes, but the course of action must be tailored to each case.

REFERENCES