

Femoral Neck Fracture Management in the Young Patient: A Case Review

Luis Berrios MS, Kevin Orellana MS, Michael Lago MD, Frank Gerold MD
University of Texas Rio Grande Valley Department of Orthopedic Surgery

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Introduction

The optimal management of femoral neck fractures in the young patient remains controversial. Although there are universally accepted principles, there remains some variability in the optimal timing of surgery and method of fixation. In general, surgery should be performed on an urgent or emergent basis when feasible to decrease peri-operative complications, length of stay, and most importantly the ultimate likelihood of avascular necrosis. However, it is important to note that the preference toward a specific method of fixation remains heterogeneous among orthopedic surgeons.(1)

The purpose of this study is to present our preferred technique for treatment of displaced femoral neck fractures in the young patient. We utilize a two-incision technique. First, an anterior approach (Smith-Peterson) to obtain an anatomic reduction, and a direct lateral approach for the definitive fixation using the Synthes Femoral Neck System (FNS). This technique for open reduction internal fixation (ORIF) is part of a larger case series that reports in more detail on specific outcomes and potential complications that once can expect when treating femoral neck fractures in young individuals. This is a case of a 39-year-old male who fell while playing soccer.

Materials and Methods

Inclusion Criteria

Our criteria includes all patients 50 years old and younger who are admitted and treated for displaced femoral neck fractures, diagnosed by x-ray and CT. All patient were treated by the senior authors, Dr. Frank Gerold or Dr. Michael Lago at the University of Texas Rio Grande Valley in affiliated hospitals. Additionally, the population of study includes mainly Hispanic, non-English speaking patients reflecting the demographics of the Rio Grande Valley. All patients in the study have were treated with ORIF as described above.

Surgical Technique and Post-operative Protocol

The surgical approach for reduction was the anterior Smith-Peterson approach and technique of internal fixation was via with the Synthes FNS. The patient is placed in the supine position on a fracture table with the leg draped free. A skin incision is made beginning 1 cm distal and lateral to the anterior inferior iliac spine (AIIS). The interval between sartorius and tensor fascia latae (TFL) is developed. The lateral femoral cutaneous nerve (LFCN) is identified and carefully retracted medially with sartorius. The tendinous portion of rectus femoris is identified and elevated off the hip capsule. The hip capsule is then opened to expose the femoral neck. Reduction is achieved with bone reduction forceps. A large threaded K-wire can be used as a joystick when placed in the proximal fragment to aid in reduction. Provisional fixation is obtained with smooth K-wires and definitive fixation is performed through a small lateral incision, typically less than 5 cm. Post operatively the patient is made non weight-bearing (NWB) for 6 weeks and transition to weight-bearing as tolerated (WBAT) thereafter.

Figures

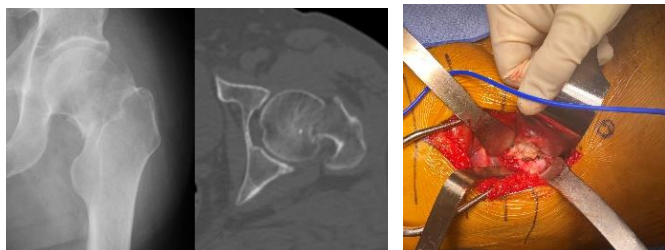


Figure 1: AP Hip X-ray and axial CT demonstrating a displaced left femoral neck fracture.

Figure 2: Displaced femoral neck fracture after exposure. Right is proximal and bottom is lateral for orientation purposes.

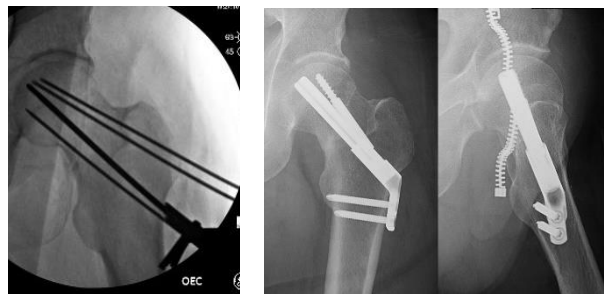


Figure 3: Intra-operative fluoroscopy with provisional fixation after open reduction and guidewire placement for the FNS.

Figure 4: AP and lateral hip x-ray at 4 months demonstrating fracture union.

Clinical Outcome

The patient went on to achieve union at 4 months post-op as evidence of imaging and clinical functional status. After use of this technique by mentioned surgeons over a span of 2 years, only one complication occurred. Avascular necrosis (AVN) was noted in one patient during follow up; however, patient had comorbidities including mental disability, which could have affected adherence to post operative weight-bearing restrictions.

Discussion

Treatment options for displaced proximal femoral fractures include closed reduction percutaneous pinning (CRPP), open reduction and internal fixation (ORIF), Hemiarthroplasty (HA), or total hip arthroplasty (THA). Selection of the appropriate implant for a particular patient requires individualized assessment of patient-related (eg, growth potential, activity level, life expectancy, and medical comorbidities) and fracture-related (eg, location, orientation, comminution) factors.

Traditionally implant choice in an open procedure for otherwise healthy active individuals has been between cannulated screws and sliding hip screw.(1) While both implant choices have unique advantages and disadvantages to one another, there remains no substantial evidence to recommend a particular implant or approach.(2-3) This has led to a heterogeneity in techniques and implant uses. Newer constructs such as the Synthes Femoral Neck System (FNS) build on the strengths of traditional methods of fixation, such as cannulated screws and the sliding hip screw, to allow for controlled compression of the fracture while achieving greater rotational stability to decrease the rate of failure and increase union rates.

Conclusion

In our case series, ORIF with the use of the Synthes Femoral Neck System for displaced femoral neck fractures and led to excellent outcomes with a low rate of complication. We recommend this technique as another option, particularly when taking care of the younger, more active sub-population. We strongly believe that anatomic reduction at time of fixation, which can be only achieved through an open approach, is the single most important factor in the decision-making algorithm for the treatment of proximal femoral fractures in the younger population.

References

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