

# Successful Treatment of a Complete Femoral Neck Stress Fracture After a Delayed Presentation

Babe Westlake, DO; Ciaran Smythe OMS; Todd Zeigler, MD

Samaritan Health Services; Western University of Health Sciences COMP-NW



Samaritan  
Health Services



College of Osteopathic Medicine of the Pacific  
COMP-Northwest

## Introduction

- Femoral neck stress fractures (FNSF) are rare injuries and are often misdiagnosed or diagnosed late
- FNSF account for ~3% of all stress fractures<sup>6</sup>
- FNSF most frequently occur in long-distance runners, professional athletes, ballet dancers, and military recruits<sup>2,4</sup>
- Compression sided FNSF can often be treated nonoperatively
- Tension sided and complete fractures require surgical stabilization<sup>5</sup>
- Delayed diagnosis is associated with a worse prognosis
- Complications include fracture displacement and avascular necrosis (AVN)<sup>6</sup>

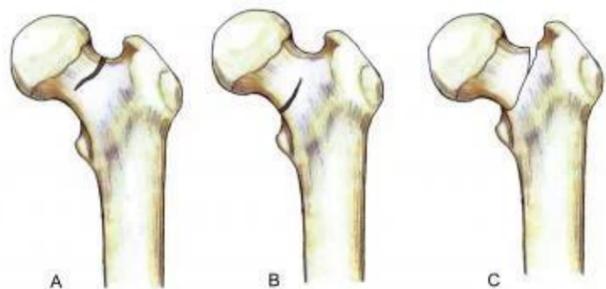


Fig. 1 Classification of femoral neck stress fractures. A) tension sided, B) compression sided, C) complete displaced

## Case Summary

Here we report a case of a 47-year-old female marathon runner with delayed presentation of a complete femoral neck stress fracture. She was running ~50 miles per week and her BMI was 20.37. She had several weeks of antecedent groin pain before a marathon. During the race she was forced to stop secondary to increased pain. She discharged home from the medical tent despite inability to weight bear. She presented to her primary care physician 2 days later and x-rays demonstrated a complete femoral neck stress fracture. The following day she underwent surgery with closed reduction and stabilization with a dynamic hip screw (DHS). Her fracture went on to union evidenced by x-ray at 5 months post op. She was able to return to running by 1.5 years post op and can run 2 miles without stopping.

## Clinical Radiographs

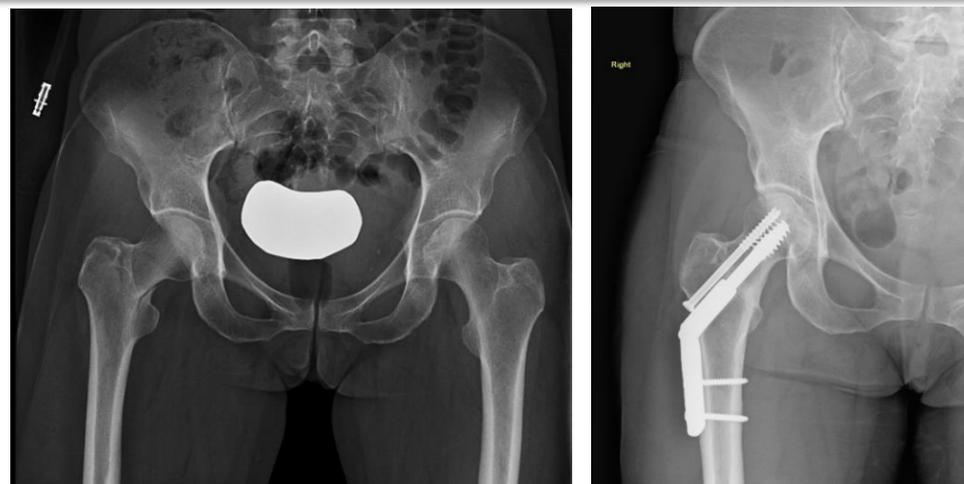


Fig. 2 AP pelvis radiograph demonstrates a minimally displaced complete basicervical femoral neck fracture.

Fig. 3 1.5 year post op AP right hip radiograph demonstrates a healed femoral neck fracture with DHS implant without evidence of avascular necrosis.

## Report of Literature

- Schweitzer et al reported on 29 patients with femoral neck fractures
  - Older individuals with low energy trauma had higher AVN rate (9/12 vs 2/17)
- Johansson et al reported on 23 athletes with FNSF
  - 30% complication rate, 13% AVN
  - All elite athletes' careers ended; most recreational athletes had to decrease activity
- Lee et al studied 42 military recruits with displaced FNSF
  - 24% AVN rate at mean follow-up of 5.6 years
- Upadhyay et al prospectively evaluated 92 patients with displaced femoral neck fractures and found no difference in rates of nonunion and AVN in open reduction internal fixation vs. closed reduction and internal fixation
- Biz et al reported a series of three FNSF patients treated with DHS that went on to union without AVN, who were each able to return to their prior level of activity

## Discussion

- This case represents a rare diagnosis. There have been certain factors associated with increased risk of FNSF including female sex, running, and low BMI.<sup>1,6</sup>
- Unfortunately, patients with FNSF are often diagnosed late. This patient had a delayed presentation. FNSF are associated with high rates of complications including AVN. This is a devastating complication for a young athlete as treatment often requires total hip arthroplasty.
- This patient did not have any major complications. She continued to progress and recover 1.5 years postoperatively including return to sport, albeit at a lower intensity.

## Conclusions

- This is a 47-year-old female that had a successful outcome after delayed treatment for a displaced FNSF.
- Prolonged recovery can be expected after this devastating injury in an athlete and this is not well described in the current literature.
- Expectations to return to prior level of sport should be guarded at best.
- FNSF should be included on a differential for hip/groin pain in at-risk adults to help avoid delay of diagnosis.

## References & Acknowledgements

- Biz, C., et al. "Management and Treatment of Femoral Neck Stress Fractures in Recreational Runners: A Report of Four Cases and Review of the Literature." *Acta Biomed* 88.4S (2017): 96-106.
- Hulkko, A., and S. Orava. "Stress Fractures in Athletes." *Int J Sports Med* 8.3 (1987): 221-6.
- Johansson, C., et al. "Stress Fractures of the Femoral Neck in Athletes. The Consequence of a Delayed Diagnosis." *Am J Sports Med* 18.5 (1990): 524-8.
- Lee, C-H., et al. "Surgical treatment of displaced stress fractures of the femoral neck: a report of 12 cases." *Archives of orthopaedic and trauma surgery* 123.10 (2003): 527-533.
- Moerenhout, K., et al. "Total Hip Arthroplasty for Bilateral Femoral Neck Stress Fractures: A Case Report and Literature Review." *Adv Orthop* 2019 (2019): 2720736.
- Robertson, G. A., and A. M. Wood. "Femoral Neck Stress Fractures in Sport: A Case Report." *Sports Medicine* 1.2 (2017): E58-E68.
- Schweitzer, D., et al. "Factors Associated with Avascular Necrosis of the Femoral Head and Neck in Patients Younger Than 65 years with Displaced Femoral Neck Fractures Treated with Reduction and Internal Fixation." *European Journal of Orthopaedic Surgery and Traumatology* 23.1 (2013): 61-5.
- Upadhyay, A., et al. "Delayed Internal Fixation of Fractures of the Neck of the Femur in Young Adults. A Prospective, Randomised Study Comparing Closed and Open Reduction." *J Bone Joint Surg Br* 86.7 (2004): 1035-40.