





Increasingly Common and Incredibly Challenging

Femoral Neck Stress Injuries



Maximizing Readiness Through Improved Health and Performance

- The views expressed in these slides and in today's discussion are my own
- My views may not be the same as Auburn University or the United States Military
- Participants must use discretion when using the information contained in this presentation



Experienced sports medicine professionals develop great instincts to identify musculoskeletal injuries (MSI) when they see/hear common symptoms



<http://www.auburntigers.com>



My goal today is just to make sure somewhere in the back of your head you consider FNSF an option....

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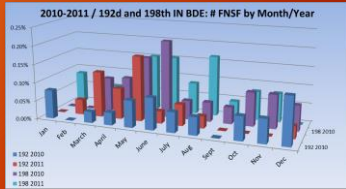
Why do I care about FNSFs?

- Typically we think of these injuries in post- menopausal women
- Then I started working with the military.....



Sample of yearly FNSFs in 2 brigades

- One year I had 85 FNSFs in one training location
 - Months of missed training
 - Often end of career
 - FNSF costs \$85K - \$150K
 - Army owns these Soldiers for the rest of their lives
- We developed screening, changes in training, and new diagnosis protocols



Another Soldier on Sticks?

- Soldiers come in unfit
- Nutrition is poor
- Poor diet impacts bone density and calcium levels
- Unaccustomed to physical activity/movement
- Rapid increase in physical activity
- Extensive daily 'foot time'



192d Prevention Initiative



- Reduce unnecessary time standing, especially in IBA
- Integrate PRT with foot marches, combatives, and other physical events
- Use transport to when possible
- Execute PRT with precision, progression, and integration with proper form and pace.
- Utilize approved corrective action, and repetitions/time-directed exercises prescribed
- Maintain foot march pace no faster than 3 mph for red, white, and blue phase, no faster than 3.5 mph for gold and black phases of IN OSUT.
- Use flat terrain when possible and emphasize finishing as a team.
- Minimum of seven hours of sleep/night in garrison.
- Consider increased injury rates caused by striving to exceed or maximize APTT scores
- Emphasize 4 for the Core and Hip Stability Drill to strengthen hip and core muscles and minimize injury.

FNSFs in Athletes

- Becoming more common in collegiate sports
 - AU Team Physician sees 3-5/year now
 - 2 women's cross country
 - 1 men's cross country
 - 1 women's BB
- Commonalities with other types of Stress Injuries
 - Often long distance athletes
 - Tall, lanky Soldiers and athletes more susceptible
 - Females, especially if not fueling properly are vulnerable
 - Rapid increases in training
 - Unfit athletes training too much
 - Poor lifetime nutrition



https://www.google.com/search?q=track+athletes+injury&rlz=1C1C81809128904819078490120180306128&bih=407&bihp=188&biw=800&bih=400

FNSFs in Athletes

- 5% of all SFs¹
 - May see comorbid with SF of the femoral head or pelvis
 - May be bilateral
- Delay in DX leads to high complication^{2,3}
 - 8-14 week delay common
 - Difficult to DX
- 60% of athletes that suffer complications never return to preinjury activity level¹



Femoral Neck Stress Fracture

Fracture due to repetitive bending load (stress) on bone angle over time



Femoral Neck Stress Fracture

- If injury is caught early, non-weight bearing rest followed by rehabilitation can be effective
- If not, surgery and pinning may be required



Femoral Neck Hip Stress Fracture



Typically surgical FNSFs result in hip replacement (20 yrs)

Femoral Neck Stress Fractures/Injury (FNSF)

- Are wickedly tricky
 - They hide
 - There may be no pain with an almost through/through injury
 - They mimic other common injuries
 - Impossible to predict, hard to prevent
 - Can occur as rapidly as 1-2 weeks of training
- Common symptoms³
 - Low back pain
 - Knee pain⁴
 - Lateral thigh pain
 - Glute pain, running down to the knee
 - Inner thigh pain⁵
 - Or no pain at all



• Signs/Symptoms¹

- Antalgic gait
- Pain
 - Deep-achy or sharp shooting
 - Pain occurs with activity, slowly becomes continuous
 - Often progresses to night pain
 - Esp. when leg rolls onto involved side⁶
- Decreased weight bearing
- Decreased stride length
- Decreased strength
- Decreased/painful ROM



• Missed FNSF can become emergency (femoral artery)

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Assessment

- Complete your normal assessment
 - It may not be obvious that it's a hip problem. If findings are inconclusive, clear the hip.
- Specifically:
 - Palpation
 - FN is too deep to palpate, area around hip joint may be tender, muscles may be tense and splinting
 - ROM
 - **FROM** - Pain at extremes of external/internal rotation
 - **RROM** - often painful, can be weak
- Axially loading pain
 - Supine, heel tap
- Functional
 - **Single leg standing** (single leg hop can create a through/through SF⁷)



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Orthopedic Tests

- Complete your normal hip assessment
 - FABER test often +
 - Scour test - determine if hip involvement, rule out labral tear
 - **Fulcrum test** - more specific for femur SF
 - <https://youtu.be/96RqZT3uKw>
- Differential DX¹
 - Hip flexor strain
 - Greater trochanteric bursitis
 - Adductor strain
 - Pubic ramus SF
 - Low back pathology
 - Knee pathology



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Thank you!



Questions?

References

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