

# **Metatarsal Shaft Fractures**

See also Metatarsal Fractures (Ortho)

## **Background**

1. Acute vs. chronic (stress) fracture
2. Metatarsal stress fracture ("march fracture")
  - 2nd/ 3rd metatarsals most frequent involved
  - 25% of all stress fractures

## **Pathophysiology**

1. First metatarsal
  - Bears one third of body wt through sesamoids
  - Rarely injured d/t size & strength
2. Risk factors
  - High-performance, recreational athletes, military recruits, ballet dancers, runners
  - Acute or repetitive trauma
3. Injury mechanism
  - Acute fractures
    - Direct: heavy object dropping of foot
    - Indirect: twisting when forefoot planted
  - Stress fractures
    - Sudden incr in activity intensity/ duration

## **Diagnostics**

1. Edema may impair exact site of fracture
2. X-Ray
  - AP, lateral, oblique
  - Wt bearing films if tolerated
  - Often negative for metatarsal stress fractures
  - Serial radiographs, bone scan or MRI

## **Therapeutics**

1. Acute treatment
  - First metatarsal fracture
    - Minimally displaced and isolated
      - Short leg cast, non wt bearing for 4-6 wks
    - Significant displacement/ instability
      - Surgical referral
  - Lesser (second to fifth) metatarsal fracture
    - Non displaced
      - Post operative shoe
    - Most diaphyseal fractures can be reduced
      - Then short leg cast
      - But ensure adequate reduction
    - Significant displacement or failure of closed reduction
      - Surgical referral
  - Stress fracture
    - Relative rest

- Post-operative shoe may give some pain relief
2. Potential complications
    - Arterial injury
    - Compartment syndrome
    - Regional pain syndrome
    - Delayed healing and nonunion
    - Osteomyelitis (w/open fractures)

### **Follow-Up**

1. Repeat X-rays 1 wk/ 4-6 wks after injury to ensure proper alignment/callus formation
2. Pt should follow-up sooner if paresthesias or incr pain occur

### **Prognosis/ Return to Play**

1. Excellent overall prognosis w/proper tx

### **Patient Education**

1. [http://www.emedicinehealth.com/broken\\_foot/article\\_em.htm](http://www.emedicinehealth.com/broken_foot/article_em.htm)
2. <http://www.mayoclinic.com/health/broken-ankle/DS00951>

### **References**

1. Eiff MP, Hatch RL, Calmbach WL. Fracture Management for Primary Care. 2nd ed. Philadelphia, Pa.: Saunders, 2003:331-52.
2. Fetzer, GB, Wright RW. Metatarsal shaft fractures and fractures of the proximal fifth metatarsal. Clin Sports Med 2006; 25(1):139-50.
3. Greene WB. Essentials of Musculoskeletal Care. 2nd ed. Rosemont, Ill.: American Academy of Orthopaedic Surgeons, 2001:453-5.
4. Hatch RL, Rosenbaum CI. Fracture care by family physicians. A review of 295 cases. J Fam Pract 1994; 38:238-44.
5. O'Malley MJ, Hamilton WG, Munyak J. Fractures of the distal shaft of the fifth metatarsal. "Dancer's fracture." Am J Sports Med 1996; 24:240-3.
6. Rooks YL, Corwell B. Common urgent musculoskeletal injuries in primary care. Prim Care Clin Office Pract 2006; 33:751-777.
7. Sanderlin BW, Raspa, RF. Common stress fractures. Am Fam Physician 2003; 68:1527-32.
8. Wall J, Feller JF. Imaging of stress fractures in runners. Clin Sports 2006; 25(4):781-802.
9. Zenios M, Kim WY, Sampath J, Muddu BN. Functional treatment of acute metatarsal fractures: a prospective randomized comparison of management in a cast versus elasticated support bandage. Injury 2005; 36:832-5.

### **Evidence-Based Inquiry**

1. What role does a tuning fork have in the diagnosis of stress fractures?

**Authors: Jonathan Chan, DO, Manual Diaz, DO, & Tiffany Barnett, MD**

**Editor: Carol Scott, MD, University of Nevada Reno FPRP**