

What is the most effective management of acute fractures of the base of the fifth metatarsal?

EVIDENCE-BASED ANSWER

For acute Jones' fractures in recreationally active patients, early intramedullary screw fixation results in lower failure rates and shorter times to both clinical union and return to sports than non-weightbearing short leg casting (strength of recommendation [SOR]: **A**, based on 2 randomized controlled trials (RCT)). Non-weightbearing short leg casting achieves union in 56% to 100% of patients

but can require prolonged casting (SOR: **B**, based on 2 prospective cohorts and multiple retrospective, follow-up studies). Stress fractures were not included in this review.

For avulsion fractures of the fifth metatarsal tuberosity, a soft Jones' dressing allows earlier return to pre-injury levels of activity than rigid short leg casting (SOR: **B**, based on a lower-quality RCT).

CLINICAL COMMENTARY

For athletes, surgical correction of all Jones-type fractures usually preferred

Fifth metatarsal fractures are frequently seen in clinical practice. When faced with a fifth metatarsal fracture, determine its exact location, which influences treatment. Acute fractures to the proximal end of the bone within the cancellous bone area, if nondisplaced, do very well with closed treatment.

Fractures between the insertion of the peroneus brevis and tertius tendons, which marks a transition from mostly cancellous to relatively avascular cortical bone, can be problematic. This injury, often called a Jones fracture, needs to be identified as a chronic stress injury, which uniformly does not heal well, an acute or chronic stress injury, or a

pure acute injury. For athletes, both young and old, I prefer surgical correction of all Jones-type fractures to ensure a more definitive return to athletics. For the non-athlete, I allow the patient to make an informed decision for immediate surgical correction or for an attempt at closed treatment if it is not a chronic stress failure of the bone. I find that patients who choose closed treatment and understand the possible prolonged treatment course are not upset if they need surgical treatment for nonunion and are pleased with the option and attempt of not having surgery.

Douglas F. Aukerman, MD

Family and Community Medicine, The Milton S. Hershey Medical Center, Penn State University

Evidence summary

Fractures within 1.5 cm of the fifth metatarsal tuberosity, without extension distal to the fourth-fifth intermetatarsal

articulation, occurring with less than 2-week symptom prodrome and without a history of previous fracture, are defined as "acute Jones' fractures" (**FIGURE**). In a

Davis Vu, MD, Todd McDiarmid, MD

Moses Cone Family Medicine Residency Program, Greensboro, NC

Marcy Brown, MLS

West Penn Hospital, Forbes Regional Campus, Monroeville, Pa

FIGURE

Acute fracture of the fifth metatarsal



Acute Jones' fractures are repaired with screw fixation of the broken bone using fluoroscopy. Patients may return to full activity when radiographs show that the bones were healing at the site of the fracture.

FAST TRACK

A Jones-type fracture needs to be identified as a chronic stress injury (which does not heal well), an acute stress injury, or a pure acute injury

recent RCT by Mologne et al,¹ 37 active-duty military personnel with acute Jones' fractures were randomized to either 8 weeks of no weight-bearing in a short leg casting, followed by a walking cast or hard-soled shoe until clinical union; or to early outpatient intramedullary screw fixation followed by no weight-bearing for 2 weeks, then weight-bearing as tolerated in a hard-soled shoe until clinical union. Screw fixation significantly reduced both time to clinical union and time to return to sports—by nearly 50% when compared with non-weightbearing short leg casting. Furthermore, at 26 weeks the casting group saw a significant 44% failure rate compared with only 5% in the surgical group (number needed to treat [NNT]=2.6). Six patients in the surgical group had mild discomfort from the screw head, and 3 needed the screw to be removed. Generalization of the results was limited by the mostly male military population.

The rates and times of union with short leg casting vary over a wide range in the research literature. The casting group in the RCT above had union rates of 56% and median time to union of 14.5 weeks (lower and upper quartile range, 10.5–18.5).¹ A prospective registry of 68 consecutive acute Jones' fractures in primarily young military service members showed a 72% union rate with non-weightbearing short leg casting with average time to union of 21.2 weeks.² A heterogeneous group of 5 retrospective follow-up studies of short leg casting reported wide ranges in union rates of 72% to 100%, and in time to healing of 7 weeks to 21 months.^{3–7} These studies varied in average age, sex, and athletic ability of their samples as well as type of immobilization and weight-bearing status during treatment.

Tuberosity avulsion fractures are proximal fifth metatarsal styloid fractures resulting from a forceful pull of the lateral band of the long plantar ligament or the peroneus brevis tendon during ankle inversion. A 12-week RCT in 89 consecutive patients presenting to an emergency department with fifth metatarsal tuberosity avulsion fractures compared a nonrigid, soft Jones' dressing consisting of alternating layers of cast padding and elastic bandages with a rigid short leg casting.⁸ The Jones' dressing had a significant 28% reduction in time to return to pre-injury levels of activity. Other outcomes—time in treatment modality, time to radiographic healing, and functional foot score—were not different between intervention groups. Validity was limited by the 32% lost to follow-up rate.

Recommendations from others

We were unable to locate any consensus statements or clinical guidelines regarding the treatment of Jones' fractures.

DeLee and Drez's Orthopaedic Sports Medicine recommends immobilization in a cast or below-the-knee boot with strict non-weightbearing for at least 6 weeks for acute Jones' fractures.⁹ It recommends

CONTINUED

surgical treatment, followed by 6 weeks of cast immobilization, then progression to weight bearing based on radiographic findings, for nonoperative treatment failures or with desire to return high-performance athletes to activity.

In *Fracture Management for Primary Care*, the authors recommend posterior splinting and non-weightbearing with crutches for acute Jones' fractures, followed by non-weightbearing short leg casting by non-weightbearing short leg casting application at 3 to 5 days from injury.¹⁰ After a minimum of 6 to 8 weeks of casting, they recommend options of 4 additional weeks of casting or internal fixation for clinical or radiographic nonunion.

For tuberosity avulsion fractures, the authors recommend use of a firm-soled shoe for 4 to 8 weeks. For patients with discomfort at an initial 4- to 7-day follow-up, they give an option of using a walking short leg casting for 2 weeks, with follow-up every 2 to 4 weeks until clinical healing.

REFERENCES

1. Mologne TS, Lundeen JM, Clapper MF, O'Brien TJ. Early screw fixation versus casting in the treatment of acute Jones fractures. *Am J Sports Med* 2005; 33:970-975.
2. Clapper MF, O'Brien TJ, Lyons PM. Fractures of the fifth metatarsal: Analysis of a fracture registry. *Clin Orthop Relat Res* 1995; 315:238-241.
3. Dameron TB. Fractures and anatomical variations of the proximal portion of the fifth metatarsal. *J Bone Joint Surg Am* 1975; 57:788-792.
4. Torg JS, Balduini FC, Zelko RR, Pavlov H, Peff TC, Das M. Fractures of the base of the fifth metatarsal distal to the tuberosity. *J Bone Joint Surg Am* 1984; 66:209-214.
5. Seitz WH, Grantham SA. The Jones' fracture in the non-athlete. *Foot Ankle* 1985; 6:97-100.
6. Josefsson PO, Karlsson M, Redlund-Johnell I, Wendeberg B. Closed treatment of Jones fracture: Good results in 40 cases after 11-26 years. *Acta Orthop Scand* 1994; 65:545-547.
7. Josefsson PO, Karlsson M, Redlund-Johnell I, Wendeberg B. Jones fracture: Surgical versus nonsurgical treatment. *Clin Orthop Related Res* 1994; 299:252-255.
8. Wiener BD, Linder JF, Giattini JF. Treatment of fractures of the fifth metatarsal: a prospective study. *Foot Ankle Int* 1997; 18:267-269.
9. Brodsky JW, Krause JO. Stress fractures of the foot and ankle. In: DeLee JC, Drez, D, Miller MD, eds. *DeLee and Drez's Orthopaedic Sports Medicine*. Philadelphia, Pa: Saunders; 2003:2403-2406.
10. Metatarsal fractures. In: Eiff MP, Hatch RL, Calmbach WL. *Fracture Management for Primary Care*. Philadelphia, Pa: Saunders; 2003:345-349.