The Journal of Foot & Ankle Surgery 55 (2016) 151–156

Contents lists available at ScienceDirect

The Journal of Foot & Ankle Surgery

journal homepage: www.jfas.org

Tips, Quips, and Pearls

*"Tips, Quips, and Pearls" is a special section in* The Journal of Foot & Ankle Surgery®, *which is devoted to the sharing of ideas to make the practice of foot and ankle surgery easier. We invite our readers to share ideas with us in the form of special tips regarding diagnostic or surgical procedures, new devices or modifications of devices for making a surgical procedure a little bit easier, or virtually any other "pearl" that the reader believes will assist the foot and ankle surgeon in providing better care.*

# Use of a Percutaneous Pointed Reduction Clamp Before Screw Fixation to Prevent Gapping of a Fifth Metatarsal Base Fracture: A Technique Tip

Eric W. Tan, MD, Ezequiel Cata, MD, Lew C. Schon, MD

*Orthopaedic Surgeon, Department of Orthopaedic Surgery, MedStar Union Memorial Hospital, Baltimore, MD*

ARTICLE INFO

*Keywords:*
Jones fracture
malunion
nonunion
percutaneous reduction
trauma

ABSTRACT

Intramedullary screw fixation has become widely accepted as the standard of care for operative treatment of Jones fractures, allowing not only accelerated rehabilitation but also reduction of the risk of repeat fracture. The unique anatomy of the fifth metatarsal—mainly its inherent lateral curvature—makes fixation technically challenging. In general, surgical fixation should be performed with the largest screw possible, in both diameter and length, which will provide the strongest possible construct. However, an increased screw length and width have been associated with complications, including lateral gapping and distraction of the fracture site and malreduction of the fracture. The use of a pointed reduction clamp is a simple, yet effective, method of preventing iatrogenic displacement and gapping at the fracture site during placement of an intramedullary screw. Percutaneous reduction and stabilization of the fracture using this technique could help limit the complications associated with large screw fixation of Jones fractures.



Described in 1902 by Sir Robert Jones (1) in a series of 4 fifth metatarsal fractures, including his own, a Jones fracture is a transverse fracture at the metaphyseal-diaphyseal junction of the fifth metatarsal that does not extend into the metatarsocuboid articulation. The injury typically occurs when an adduction force is applied to the forefoot with the ankle plantarflexed (2). Non-weightbearing with cast immobilization has been the mainstay of treatment of acute, nondisplaced Jones fractures (3). However, this treatment has been associated with nonunion rates of 7% to 28% (2,4).

In the recreational or professional athlete, early operative intervention with an intramedullary screw is believed to facilitate earlier union and a rapid return to sport (5,6). However, the optimal surgical technique has not been determined. Open reduction and internal fixation with bone grafting has been previously described with good results (3). Alternatively, percutaneous fixation using an intramedullary screw has been advocated, avoiding the use of a long incision and fracture site exposure, which might hinder postoperative recovery (7–9).

The effect of the length and diameter of the screw on the rates of delayed union, nonunion, iatrogenic fractures, and repeat fracture remains unclear. Intramedullary screw fixation of Jones fractures should be performed with the largest screw possible, both in diameter and length, which will provide the strongest possible construct. However, an increased screw length and width increases the risk of lateral gapping and distraction of the fracture site because of the inherent lateral curvature of the fifth metatarsal (10). Percutaneous reduction and stabilization of the fracture using a pointed reduction clamp is an effective method to prevent iatrogenic displacement and gapping at the fracture site during placement of an intramedullary screw. This technique could help to limit the complications associated with large screw fixation of Jones fractures.

## Surgical Technique

Radiographs show a minimally displaced Jones fracture (Fig. 1). The patient is placed in the supine position on the operating room table with a bump under the ipsilateral hip or beanbag positioner used to internally rotate the surgical foot. The fifth metatarsal is outlined to serve as a guide for the trajectory for the intramedullary implant (Fig. 2).

A stab incision is then made 10 to 15 mm proximal to the base of the fifth metatarsal. Blunt dissection is performed using a hemostat, taking care to avoid damage to the sural nerve. The guidewire is

**Financial Disclosure:** None reported.
**Conflict of Interest:** None reported.

Address correspondence to: Lew C. Schon, MD, c/o Lyn Camire, Editor, Department of Orthopaedic Surgery, MedStar Union Memorial Hospital, 3333 North Calvert Street, Suite 400, Baltimore, MD 21218.

*E-mail address:* lyn.camire@medstar.net (L.C. Schon).

1067-2516/$ - see front matter © 2016 by the American College of Foot and Ankle Surgeons. All rights reserved.
http://dx.doi.org/10.1053/j.jfas.2015.04.011


**Fig. 1.** Anteroposterior (*A*), oblique (*B*), and lateral (*C*) views of the foot demonstrating a fracture at the base of the fifth metatarsal involving the metaphyseal-diaphyseal junction.

placed "high and inside," medial to the tip of the base of the fifth metatarsal to maximize the length of the screw (11). The starting point is confirmed with anteroposterior, 30° oblique, and lateral fluoroscopic views (Fig. 3).

Provisional fixation of the fracture is performed using a percutaneous pointed reduction clamp. A Kirschner wire can be used to create a hole in the metatarsal shaft to allow adequate purchase of the clamp (Fig. 4). One tyne of the clamp is placed proximal to the fracture at the tuberosity at the base of the fifth metatarsal, and the other tyne is placed distal to the fracture site, along the metatarsal shaft (Fig. 5). Provisional reduction and compression of the fracture is confirmed by fluoroscopy (Fig. 6).

The guidewire is advanced across the fracture along the intramedullary canal until it passes at least twice the length of the fracture. Next, a cannulated drill bit is placed over the guidewire. Then, the canal is tapped to the appropriate screw size. The drilling and tapping