Internal Compression Screw Exchange for Reduction of Distal Tibiofibular Syndesmotic Injuries

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Abstract: Traumatic injuries to the distal tibiofibular syndesmosis often accompany ankle fractures. Repair of the syndesmosis is critical for the normal function of the ankle joint. Conventional reduction of the diastasis is achieved with the use of a periarticular reduction clamp. The authors describe an alternative method for reduction of the syndesmosis using a screw exchange technique. This proposed procedure has the prospective of avoiding the multiple potential drawbacks to the use of a reduction clamp. [Orthopedics. 2016; 39(2):e377-e379.]

Ankle fractures are the most common fractures within the foot and ankle complex seen at major trauma hospitals in the United States. In the AO type B and C injuries, there is often a concomitant disruption of the distal tibiofibular syndesmosis (Figure 1). The syndesmosis comprises the anterior and posterior inferior tibiofibular ligaments, and the interosseous tibiofibular ligament. Surgical treatment is important because the syndesmotic ligamentous complex is vital for the dynamic stability and congruency of the ankle joint. Failure to identify and treat such injuries can result in ankle instability in the short term as well as long-term ankle arthritis, leading to significant morbidity. The standard surgical technique for the treatment of ankle...
fractures with distal tibiofibular syndesmosis injury involves first reducing and stabilizing the fractures with a combina-

tion of screws and plate(s). The use of a periarticular reduction clamp is commonly indicated and used with 1 prong on the fibula malleolus and the other on the tibial malleolus to compress and reduce the diastasis between the 2 bones. The use of a periarticular clamp is a widely accepted method of reduction (Figure 2). The use of a periarticular clamp may be relatively contraindicated in the presence of a comminuted malleolus fracture or osteoporotic bone. Furthermore, skin abrasions, bullae, or posttraumatic wounds medially should warn the orthopedic surgeon against the use of the reduction clamp. Also, the most common pitfalls associated with the use of the reduction forceps are (1) availability; (2) cumbersome manipulation, which may interfere with intraoperative fluoroscopy visualization and already present internal hardware; (3) potential iatrogenic fracture due to the powerful lever arm of the instrument; and (4) the additional medial full-thickness puncture wound, which is otherwise avoided with the authors’ proposed alternative technique.

The authors have described an alternative technique for the reduction of distal tibiofibular syndesmosis injuries. The authors’ technique is a unique, gentle method for reduction of the tibiofibular syndesmosis, with the use of a screw exchange system with 1 cannulated, partially threaded screws with the associated K-wires. Use of a periarticular forceps is not necessary. The authors’ technique is a unique, gentle method for reduction of the tibiofibular syndesmosis, with the use of a screw exchange system with 1 cannulated, partially threaded screws with the associated K-wires. Use of a periarticular forceps is not necessary.

**Discussion**

The authors have described an alternative technique for the reduction of distal tibiofibular syndesmosis injuries. The

**Surgical Technique**

After standard methods of reduction of the fibular and tibial fractures have been performed, 1 threaded guidewire is used at the level where the orthopedic surgeon would normally place the proximal syndesmotic screw during standard repair. A 5.0-mm cannulated, partially threaded screw is inserted along the guidewire, positioned in a quadrilateral fashion. When the screw engages the far (tibial) cortex, compression between the fibula and the tibia initiates and the syndesmosis is gradually reduced. The amount of correction can be easily controlled with tightening or loosening the partially threaded screw.

After fluoroscopic stress test confirmation of the syndesmotic reduction has been obtained, 1 fully threaded screw is inserted at the standard accepted distance above the ankle joint line. This fully threaded screw is inserted through 3 cortices and serves as a positional fixation, maintaining the reduction of the syndesmosis. The proximal partially threaded, cannulated screw can then be safely removed. A second fully threaded screw is finally inserted along the same thread hole (Figures 5-6).
use of the widely accepted periarticular clamp has multiple potential shortcomings, which motivated the authors to search for a different method of reduction. The screw exchange technique has become the authors’ primary method for stabilization of the syndesmosis. In the authors’ experience, this procedure provides a sound manner of achieving the goal of syndesmotic reduction while avoiding the potential morbidity associated with the use of the periarticular clamp.

REFERENCES