The Journal of Emergency Medicine, Vol. 47, No. 5, pp. 561–564, 2014

0736-4679/$ - see front matter

ELSEVIER

http://dx.doi.org/10.1016/j.jemermed.2014.06.040

Techniques and Procedures

INITIAL MANAGEMENT OF ANKLE FRACTURES IN THE OVERWEIGHT AND OBESE: THE PROVIDENCE PINCH

P. Kaveh Mansuripur, MD, Matthew E. Deren, MD, Roman Hayda, MD, and Christopher T. Born, MD

Division of Trauma, Department of Orthopaedic Surgery, Warren Alpert Medical School of Brown University, Rhode Island Hospital, Providence, Rhode Island

Reprint Address: P. Kaveh Mansuripur, MD, Department of Orthopaedic Surgery, 593 Eddy Street, Providence RI 02903

☐ **Abstract—Background: Obese and overweight people have higher rates of ankle injury, particularly operative ankle fractures. The initial management of unstable ankle fractures includes closed reduction and splinting to limit soft tissue injury and articular cartilage damage until definitive operative fixation can be performed. Adequate reduction can be more difficult in the obese patient due to the weight and additional padding provided by the larger soft tissue envelope. Discussion: A novel technique, described herein by the authors, may be useful in obtaining a suitable reduction of the ankle in the initial management of unstable ankle fractures in the overweight and obese. Conclusions: Obese patients have unique musculoskeletal injury profiles and special considerations in their management. The authors have found this technique useful in the management of their ankle fractures.** © **2014 Elsevier Inc.**

☐ **Keywords—ankle; fracture; dislocation; reduction; overweight; obese**

INTRODUCTION

Obesity currently affects one out of every three Americans, with projections to exceed 44% by 2030 (1,2). There are numerous special orthopedic considerations to account for when taking care of the obese patient; the obese patient also has a different risk profile for certain musculoskeletal injury patterns than the non-obese patients, including an increased risk of operative ankle fractures (3,4).

The initial management of operative ankle fractures includes prompt, provisional reduction and immobilization, both to stabilize the soft tissues and reduce damage to the articular cartilage (5). This reduction can be difficult to obtain and maintain in obese patients using traditional reduction technique and positioning, commonly known as "Quigley's maneuver" (6). The authors describe a novel reduction technique for certain fracture patterns that has been easier to obtain and maintain the initial reduction of the mortise in the obese and overweight patient. This technique can also be safely performed without an assistant.

TECHNIQUE

The patient is positioned supine and the stretcher lowered. After suitable analgesia is obtained, the ankle is provisionally reduced in the standard fashion: the hip and knee are flexed to 90° to relax the plantar flexors of the ankle, the ankle deformity is gently exaggerated and distracted to free any medial interposed tissue, then reduced with pressure over the lateral heel and medial calf. A posterior splint with side gussets is then applied. A standard three-point mold is held with the leg in neutral rotation and with the ankle in neutral dorsiflexion with the sole against the operator's chest; pressure is applied over the lateral heel, the medial tibia proximal to the plafond, and the lateral aspect of the proximal leg. This is held for approximately 1 to 2

RECEIVED: 21 November 2013; FINAL SUBMISSION RECEIVED: 10 February 2014;
ACCEPTED: 30 June 2014

Figure 1. Standard technique used in holding an ankle reduction and splint molding, often attributed to Quigley. Pressure is applied over the lateral calcaneus and medial malleolus to reduce the medial tibiotalar clear space, with a third point (often held with the operator's knee) lateral and proximal to control rotation. In our technique, this is held until early plaster hardening to establish the mold and neutral flexion of the ankle.

min, with the purpose of establishing the neutral flexion of the ankle (Figure 1).

Next, the patient's hip is externally rotated and the knee bent, and the lateral aspect of the heel moved to the operator's shoulder. The operator's arms are then folded over and under the splinted leg and interlocked (Figure 2). By standing up straight and levering down with the arms, the same three-point mold is reapplied in a more ergonomic and mechanically efficient manner, enabling the transmission of sufficient force to the mortise to keep it reduced while the plaster hardens, and imparting a better mold to maintain reduction afterwards.

DISCUSSION

Considering the trend of increasing prevalence of obesity in the United States, today's orthopedic surgeon may be treating more obesity-related fractures, including unstable ankle injuries (1,2). The obese ankle's larger soft tissue envelope functions analogously to an overpadded splint, dissipating the force applied with a three-point mold and requiring greater force during a reduction maneuver (Figure 3). Patients with a higher body mass index are three times more likely to result in loss of reduction (7). The maneuver attributed to Quigley, though very effective, often leaves the operator fatigued during the final moments of plaster hardening when molding is most essential (Figure 1). In these cases, we have found this technique, the "Providence Pinch," to be a useful adjunct (Figure 4). Although we have not observed any skin injury with the use of this technique, the skin should be inspected prior to surgical intervention. Although effective in the proper setting, our technique is not appropriate for some injuries. The operator must recognize the pattern of ankle fracture, as this method, though effective for supination-external rotation fractures, could result in worsening of deformity for adduction-type injuries as described by Lauge-Hansen (8). These are easily recognized by the medial displacement of the talus relative to the tibia.

Failure of reduction of the medial tibiotalar clear space may also be due to interposed soft tissue. The clinician must be cognizant of this possibility, as this injury cannot be completely treated without open reduction. Some fractures, particularly trimalleolar ankle fractures, may have multidirectional instability, which cannot be controlled by splint immobilization. In this instance, an external

Figure 2. The "Providence Pinch." The patient's leg is externally rotated and the heel placed on the operator's shoulder. By crossing the arms and levering down, the desired reduction and mold can be held as the splint hardens.