Tools and techniques in the rehabilitation of athletic hand injuries are best understood when presented in the context of individual case management. Ongoing reevaluation of deformity, stability, active and passive range of motion, edema, and nerve and tendon function is foremost of the rehabilitation principles applied in these cases.

The hand is one of the regions of the body least forgiving to over-treatment. Therefore, constant surveillance of pain, tenderness, and stiffness is required, especially as new variables in the treatment program are introduced. Pain must be respected throughout all phases of rehabilitation. Any intervention that results in escalating the athlete’s pain profile is not only ineffective but also might ultimately set the stage for increased joint stiffness. There are many pathways that lead to joint stiffness, as Figure 1 emphasizes.

The goals of rehabilitation are to preserve joint mobility and stability while restoring the hand to its prior capacity for athletic activity. This can only be achieved by controlling inflammation and its manifestations: edema, pain, and stiffness. Immobilization must be used judiciously to provide proper biomechanical protection while minimizing its deleterious effects of tissue stasis. This requires a well-supervised rehabilitation program to prevent the oftentimes long-term disability resulting from the “it’s just a finger” (Combs, 2000) short-term perspective in athletic injury management. This can be challenging, as the following cases demonstrate.

**Key Points**
- Constant surveillance of pain, tenderness, and stiffness is required for hand injuries.
- Judicious use of immobilization is important in protecting the injury without causing undue stiffness.
- Pain must be respected through all phases of care.
- Athlete compliance with care is critical to optimal functional outcome.
- Key Words: upper extremity injury, rehabilitation compliance, upper quarter injury management

**Figure 1** Multiple pathways leading to joint stiffness.
Case I: Proximal Interphalangeal Joint Contracture

Case I involves a 15-year-old high school basketball player who incurred a radial collateral and proximal volar plate injury of the proximal interphalangeal (PIP) joint of her fifth finger from ball impact. The athlete reduced the resulting hyperextension and lateral dislocation on the court. The long lever arm of the middle phalanx and the stability of the metacarpophalangeal joint make the PIP joint susceptible to injury, which is common to ball handlers.

This athlete self-applied buddy taping and immediately returned to play. After 2 weeks her attempts to play without support resulted in her reproducing the lateral dislocation while passing the ball. Disruption of the volar plate led to lateral joint instability in extension. The athlete then sought medical attention and presented with a diffusely edematous fifth finger with resolving ecchymosis. Evaluation included circumferential finger girth documentation, as well as active and passive motion measurement. Tendons including the central slip of the extensor mechanism were intact, and X rays were negative for fracture.

The athlete was instructed to use Coban wrapping distally to proximally and retrograde massage throughout the day to control edema and pain. At all other times the athlete wore a dorsal aluminum splint, which blocked the joint from the last 30° of extension while allowing full flexion. The athlete was allowed to return to sport with a padded splint and buddy taping. She failed to return 1 week later for reevaluation, at which time the splint would have been revised to recover an additional 10° of extension, allowing the volar plate to heal while minimizing joint contracture (McElfresh, Dobyne, & O’Brien, 1972). The athlete continued the fixed dorsal splint and buddy taping for 3 months.

Unlike a true boutonniere deformity caused by a lesion to the extensor mechanism, resulting in a PIP-joint flexion contracture and distal interphalangeal (DIP) joint hyperextension position, the athlete presented with a pseudoboutonniere deformity on eventual return. She had a fixed flexion contracture of the PIP joint of 35° and could not passively extend the joint. The DIP joint was mildly hyperextended. Swelling had subsided, but tenderness remained along the radial collateral and volar plate. Although the joint was stable, the volar structures—normally lax in flexion and which move away from the PIP joint during flexion—had scarred down, preventing full extension. A lateral radiograph was suggestive of proximal volar-plate calcification.

Treatment of the resultant flexion contracture involved nonsurgical intervention. The athlete was to perform active PIP- and DIP-extension exercises with the wrist in neutral and the metacarpophalangeal joints in flexion throughout the day (normally instituted 5 weeks postinjury). A dynamic splint was to be worn at all other waking hours to provide low-load, long-duration stress, encouraging tissue remodeling. Gradually, a collagen scaffolding afforded recovery of range of motion previously lost to joint contracture. A static night splint was fabricated and remolded to meet extension gains (Figure 2).

Strengthening exercises to assist function recovery included putty exercise emphasizing opposition and flexion of the fifth finger, as well as active extension, and abduction and adduction against rubber-band resistance both proximally and distally to the PIP joint.

Basketball activity could continue with a molded thermoplastic splint designed to protect the PIP joint from hyperextension and collateral-ligament injury (Benaglia, Sartorio, & Ingenito, 1996). Although effective and reliable, it was discontinued in favor of buddy taping because of ball-handling demands. Buddy taping was discontinued once pain-free range of motion was regained. The athlete has a residual 10° flexion contracture.

Figure 2  Plast O Fit® (North Coast Medical, San Jose, CA).