

MANAGEMENT OF SPORTS INJURIES: From on the Field to Return to Competition

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INTRODUCTION

Podiatrists are becoming increasingly involved in sports medicine teams at all levels of competition from the recreational league to professional sports. Whether it is during the event or in the office, it is important for the physician to evaluate the injury and develop a plan that will allow the athlete to return to competition quickly and safely. The intent of this article is to outline an efficient plan to provide this care.

The initial phase of managing a sports injury should begin long before the injury occurs. A sports physician should develop a program to improve the awareness of sports injuries, emphasize prevention, provide counseling, and promote interactions that help reduce injuries. The athletes, parents, and especially the coaches should be educated about prevention with proper training, braces, taping, and orthotic devices in order to reduce the potential for injuries to occur.

ON THE FIELD ASSESSMENT

With proper preparation, management of the athletic injury on the field begins before the actual injury occurs. Depending on the location and the level of the event, resources at times can become very limited. The initial assessment should always begin with a primary survey, which should be performed on the field before moving the patient. The most common approach is the ABCDE approach: airway, breathing, circulation, disability, exposure, and environment.¹

The purpose of this survey is to identify probable life-, limb-, or organ-threatening injuries that need immediate attention. It is important to be clear in each step before moving the player off the field. The secondary survey will then be performed on the sidelines. As a lower extremity physician, it is important to be sure that all other serious injuries have been ruled out prior to concentrating on the lower extremity injuries. The initial examination will consist of looking for any gross anatomic deformities such as dislocations, open wounds, fractures, and possible impairment of vascularity to the distal limb.

Secondary to this, the stability of the leg and foot will then be assessed to determine what type of sideline transfer may be possible. At this point, it should be decided whether the patient can go to the sideline on his own ability or if he needs additional assistance.

The initial evaluation of the injury is usually very difficult because diffuse pain is usually experienced. The player often has a very difficult time specifically identifying the exact area of injury. It is also helpful to know the emotional and psychological state of the athlete and their ability to deal with the pain in order to properly evaluate potential severity of the injury. The initial survey should determine if severity of the injury warrants immediate transfer to the hospital or if the player can be taken to the sideline and allowed time for re-evaluation. In cases where there is joint dislocation or there is a neurovascular compromise, immediate reduction should take place in the field, if necessary.

One must recognize that it is the responsibility of the sports medicine physician, and not the coach, to determine further management for the fallen athlete. Options include:

- 1) Sending the patient to the hospital for treatment and further evaluation.
- 2) Taking the player out of play for the rest of the contest and arranging for follow up evaluation.
- 3) Observing the patient on the sidelines and potentially returning the athlete to play. Factors that determine whether a player may return to participation involve assessing whether the player can participate in sports safely, can play efficiently, and can perform relatively pain-free.

SIDELINE CARE

Once arriving to the sideline, the limb is placed in an elevated position and ice is immediately applied to the injured area. After a period of time, the patient is then reassessed for evaluation of extent and severity of the injury. It is at this time, after a period of settling down, that a more pinpoint evaluation of the problem can be evoked. Injuries can be categorized into ankle injuries, heel injuries, plantar fascial injuries, midfoot injuries, and metatarsal and digital injuries. The ankle can further be

divided into medial/lateral or anterior/posterior injuries.

The examination of the ankle foot complex should be preformed with a thorough palpation technique. A systematic and clockwise evaluation should be performed, in order to prevent overlooking a specific injured area.² The examination should begin with the anterior/inferior tibiofibular ligament and carried down next to the anterior talofibular ligament. In sequence, the dorsal calcaneocuboid area, fifth metatarsal (base and tuberosity) and inferior calcaneocuboid area are then palpated. Next, the inferior fibular areas are then palpated as well as the distal fibula itself and the calcaneofibular ligament. Lastly, the physician should focus on the entire fibula as well as the peroneal tendons. Attention is then directed medially, if pain exists. The medial malleolus, deltoid ligament area, as well as talonavicular complex, and navicular metatarsal complex are evaluated.

Due to the high incidence and potential for non-detection, the Lisfranc's fracture dislocation should be considered in any athlete with pain extending out to the mid foot and dorsal arch with characteristic swelling through that area. Further on, the first metatarsophalangeal joint complex including the sesamoid apparatus is examined for fracture or sprains. Because of the potential of extension injuries at the joint and the disabling nature, turf toe problems should be addressed early. It is at this point, that the initial plan (acute phase) is developed for this patient.

Depending on the findings of the evaluation, the patient may return to play, require more time on the bench

with subsequent evaluation before returning to activity, or possibly discontinue the activity completely.

Treatment for most injuries, at this point, will get the typical RICE (rest, ice, compression and elevation) program. Depending on the severity of the injury further splinting of the limb and non-weight bearing will be employed. Prior to further evaluation, the patient will remain in a splint, keeping the extremity elevated, and remain non-weight bearing on the affected limb. It is at this point that we determine if the patient needs immediate radiographs or other ancillary tests for evaluation, or if they can be seen several days later for follow up. If there is any question as to the severity of the injury, it is always best to initiate radiographic evaluation in order to properly evaluate the severity of the injury.

OFFICE EVALUATION AND DEFINITIVE PLAN

The patient should then be seen in the office setting, usually 48-72 hours at most, after the injury. At this time, the amount of swelling and ecchymosis will be assessed. The patient will be evaluated again with a thorough sequential examination as previously described. If not obtained already, a radiographic evaluation will then be performed. Based on the evaluation and radiographs, the course of treatment will then be determined. At this time, it may be appropriate to recommend further studies, such as magnetic resonance imaging, ultrasound, or computed tomography scan to better asses the complexity of the injury (Figure 1).

Conservative as well as surgical treatment for the injury will be discussed. It is at this point that the complete care plan should be developed and initiated in



Figure 1A. AP radiograph of an unusual first metatarsal base fracture that warranted further computed tomography evaluation.

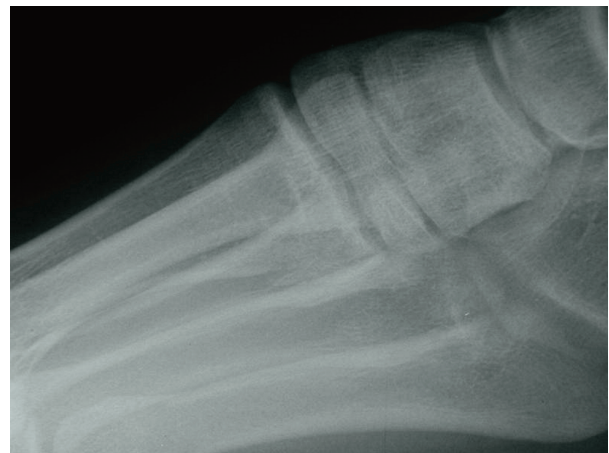


Figure 1B. Lateral view.

order to minimize the amount of time that the athlete will be inactive from participation in training and events. Most athletes are anxious and desire to return to their activities as soon as possible, in order not to miss significant practice time as well as event time. Therefore, initial therapy should be geared to aggressively treat the injury to maximize healing, followed by thorough rehabilitation of the injury.

Surgical management should be strongly considered if significant deformity exists. (Figure 2). The goal of surgical reconstruction should be to return the injured part to “near anatomic” position and minimize posttraumatic sequelae (Figure 3). Surgical management should not be ignored in an effort to get the athlete back to the field sooner. The decision should be based on the extent of the injury and the potential for complications if conservatively treated.



Figure 2A. Preoperative radiograph of unstable spiral-oblique fifth metatarsal neck fracture with fragment and significant shortening necessitating open reduction internal fixation.



Figure 2B. Postoperative radiograph of unstable spiral-oblique fifth metatarsal neck fracture.



Figure 3A. Preoperative radiograph of a fifth metatarsal base fracture that allowed anatomic reduction and early rehabilitation.



Figure 3B. Postoperative radiograph.

Almost all patients undergo a period of splintage during the acute or initial phase of inflammation, followed by a rehabilitative phase in order to efficiently allow the patient to return to play. Osseous injuries are more easily evaluated and regimens are more predictable. Fractures can be visualized during the healing process. Soft tissue injuries, ligamentous and tendons, are more difficult in order to predict when the patient can return to play due to the inability to always evaluate the extent of the injuries to these areas and to accurately visualize them during the healing process.

Therefore, it is necessary for patients with these soft tissue injuries to be evaluated sequentially in short periods of time, in order to allow them to graduate to the next phase of healing or rehabilitation. This ensures that the patient returns to activity as quickly and safely as possible. During

the rehabilitation phase, early functional rehabilitation should include range of motion activities and isometric and isotonic strengthening exercises. In the intermittent stage of rehabilitation, progressive proprioception training should be incorporated. Advancing rehabilitation should focus on sports specific activities to prepare the athlete to return to competition at near peak performance levels. Although it is important to individualize rehabilitation, a well-structured detailed routine should be employed.^{3,4} It is important to take note that during the rehabilitation phase and early phases of the injury, there is a significant psychological component to most of the athletes.⁵ It is important that we remember this, in order to keep a positive spin on their injury as well as recovery period. It is important to maintain encouragement during these phases in order to allow these patients to recover to their greatest potential.

RETURN TO PLAY

The majority of athletes will push to return to the competition sooner than they should. Returning earlier than they should can result in immediate re-injury to the area or delay in the overall healing time for the injury. If the injured part is aggravated enough, an acute injury can turn into a chronic injury.³

Return to play for most musculoskeletal injuries is based on a set of objective measurements. These objective elements include range of motion, strength, power, and functional ability as compared to the non-injured side.⁵ All of these criteria must also be compared with the sports-specific requirements of the injured part for the sport that the athlete is returning to.

Functional ability is probably the most difficult criteria to assess. In general, can the athlete perform the functions necessary to perform the skills required for his sport? Simple agility tests can be developed in order to specifically reflect the type of movements that are required for that athletic event. The skill should begin at 50% intensity and gradually increase to full speed. If the athlete can perform the necessary skills specific to his or her sport, then he or she is ready to return to play.⁵

Most lower extremity injuries can be evaluated for return to play efficiently, by utilizing the following testing criteria: These tests are performed at 10-20 yard intervals. If the athlete cannot perform the task without significant discomfort or obvious limp then they will not advance to the next level or return to field.

1) The player is asked to perform a straight-line jog at 50% effort.

2) The patient is then asked to do at least S-curves at 50% effort.

3) The patient is then asked to sprint at approximately 80% of his speed.

4) The athlete is then required to do sharp zigzag turns.

5) The patient is asked to do a double toe raise.

6) Patient is then asked to perform a single toe raise on the affected side.

7) Following this, the patient is then asked to hop on the affected side.

If the patient is able to pass these criteria, they are then given a sports specific skill set to perform. Following accomplishment of this, the patient is then deemed ready to be returned to play.

It is extremely important, following the decision for allowing the patient to return to play that the patient is properly equipped in order to prevent further injuries. Bracing and taping, although controversial as compared to each other, overall, perform an important role in preventing injury.⁴

In addition to this, continued strengthening of the area should be encouraged to continue during the return to play. Proprioception exercises, as well as balancing, should also be employed in order to prevent further injury. The patient should also be encouraged to maintain an off-season fitness program, which includes strengthening, with consideration to prevention of further injuries to the affected side.

The foot and ankle surgeon performs an important role as being the expert in these areas, helping these athletes return from injury. The ankle sprain is still the most common injury seen in athletics. With this being said, it is important to adequately assess and treat the injury and enable the athlete to return to the field as quickly and as safely as he or she can, in order to enjoy his or her particular sport.

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