

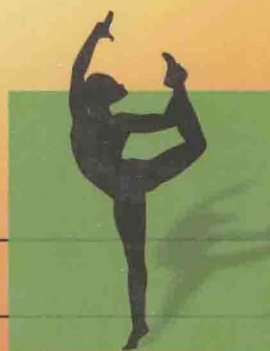
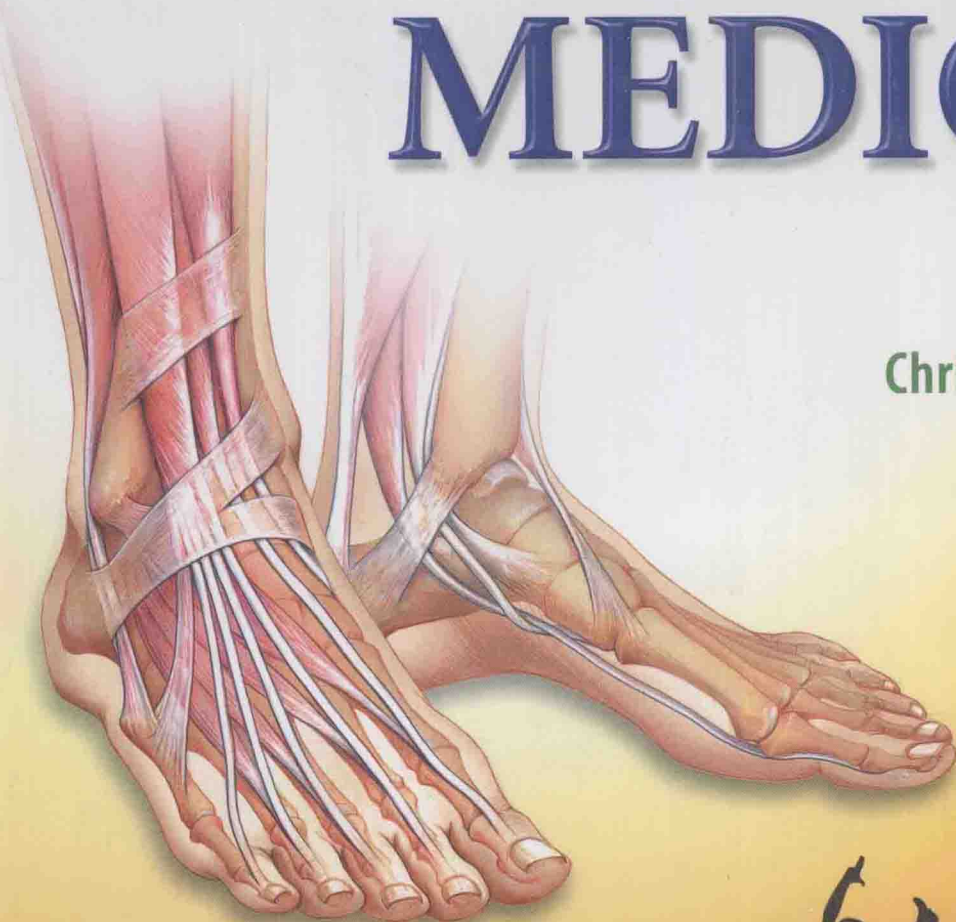
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FOOT AND ANKLE SPORTS MEDICINE

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Foot and Ankle SPORTS MEDICINE

To the person I most look up to in so many ways, my wife Sudie, and to my four wonderful boys Nicholas, Cameron, Peter-Luca, and William. I am incredibly fortunate to have each of you in my life every day, and I love you all.

—C.W.D.

To the residents, fellows, and medical students who constantly inspire me to be a better clinician, surgeon, and educator. And, to Kathryn, my parents, Allison and Humphrey . . . thank you for being the most loving, supporting family one could ask for.

—J.D.

To the iconic New York Yankee legend, Joe DiMaggio, whose famous heel spur injury inspired the development of the specialty of foot and ankle sports medicine and to the brilliant Neil Young for his numerous contributions to children's health, music, art, and mankind.

—R.G.P.

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“I must have confidence and I must be worthy of the great DiMaggio who does all things perfectly even with the pain of the bone spur in his heel . . . Do you believe the great DiMaggio would stay with a fish as long as I will stay with this one? . . . I am sure he would and more since he is young and strong. Also, his father was a fisherman.

But would the bone spur hurt him too much?”

The Old Man and The Sea

Ernest Hemingway-1952

Introduction

As all sports medicine professionals know, foot and ankle is the foundation of every athlete's performance.

Foot and ankle injuries in athletes are often difficult to diagnose and complex to treat.

This book, championed by Dr. Rock Positano, goes a long way to solve these difficult problems we all face in treating our athletic patients.

This book provides the coverage and details and the insights into the diagnoses and treatment of these issues.

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Anatomy of the Foot and Ankle

INTRODUCTION

This chapter will focus on aspects of anatomy that are relevant regarding common pathology often encountered by those treating sports-related foot and ankle conditions.

ANKLE AND HINDFOOT

BONY ANATOMY

The distal ends of the tibia and fibula form the scaffolding upon which the ankle is built. The lateral malleolus forms a pyramid, whose apex is most prominent posteriorly. It extends 1 to 1.5 cm more distal than the medial malleolus (1). The medial portion of the lateral malleolus is covered with articular cartilage distally and just above the joint line, this structure fits into the incisural notch of the distal tibia. The posterior border of the fibula serves as a conduit for the peroneal tendons as they make their way from the lower leg to their attachments in the foot. The contour of the distal fibula is variable with 82% of samples in one anatomic study having a sulcus for these tendons, while the remainder had either a flat or convex surface (2). This anatomic configuration may have implications regarding the surgical repair of dislocated or subluxated peroneal tendons.

The distal portion of the tibia is wider laterally than medially with the anterior border longer than the posterior. The lateral distal tibial angle, or the angle between the distal articular surface and the tibial shaft is normally 89 degrees (3) (Fig. 1.1). The lateral portion of the distal tibia forms the incisural notch.

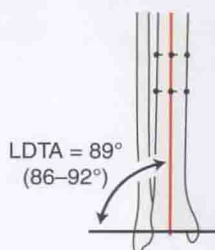


Figure 1.1. The lateral distal tibial angle. Adapted from Paley D. Principles of deformity correction. In: Browner B, Jupiter J, Levine A, Trafton P, eds. *Skeletal Trauma*. 4th ed. Philadelphia, PA: Saunders; 2009:2781.

The anterior portion of the tubercle of this notch is larger than the posterior, and tends to overlap the fibula, which is evident on anterior-posterior radiographs of the ankle. The medial malleolus is formed by the anterior and the posterior colliculus, of which the anterior colliculus descends lower. The superficial deltoid takes its attachment from the medial border of the anterior colliculus of the medial malleolus.

The talus is a complex bone that is tethered between the fibula and distal tibia. The body of the talus is wider anteriorly than posteriorly by an average of 4.2 mm in one series (1). This point should be considered when performing stabilization of the syndesmosis. The lateral portion of the body gives rise to the lateral process of the talus, which forms an articular facet with the distal fibula as well as a facet with the underlying calcaneus. This portion of the talus is often difficult to visualize on plain film and can cause persistent pain when injured. The posterior portion of the talar body is defined by the posterolateral and posteromedial processes that form a groove for the flexor hallucis longus (FHL) tendon. The posterolateral process is the larger of the two processes and may have an accessory bone, the os trigonum, associated with it. A large posterior talar process or a separate os trigonum can be a source of posterior ankle impingement and occult pain following injury. Injuries to the ankle may result in destabilization of a previously asymptomatic os trigonum or a fracture of the posterior talar process. A stenosing tenosynovitis of the traversing FHL tendon may cause pain and a triggering phenomenon referred to as hallux saltans. The talar neck slopes plantarly and medially away from the talar body and gives rise to the talar head that articulates with the navicular.

The calcaneus is the largest bone in the foot. Its axis is directed laterally. The lateral wall is relatively flat, however, and has a raised peroneal tubercle that divides the peroneus brevis tendon which runs superior to it from the peroneus longus tendon. The medial portion of the calcaneus contains the sustentaculum tali. Under this projection runs the FHL, which may be endangered with overly long screws used in lateral wall calcaneal fracture fixation (Fig. 1.2).

LIGAMENTOUS ANATOMY

The distal tibiofibular joint is stabilized by the anterior inferior tibiofibular (AITF) ligament, the posterior inferior tibiofibular (PITF) ligament, and the interosseous ligament. The AITF ligament runs from the anterior tubercle of the incisural notch to