Hughston Health Alert

6262 Veterans Parkway, PO Box 9517, Columbus, GA 31908-9517 • www.hughston.com/hha

VOLUME 32, NUMBER 1 - WINTER 2020

Inside...

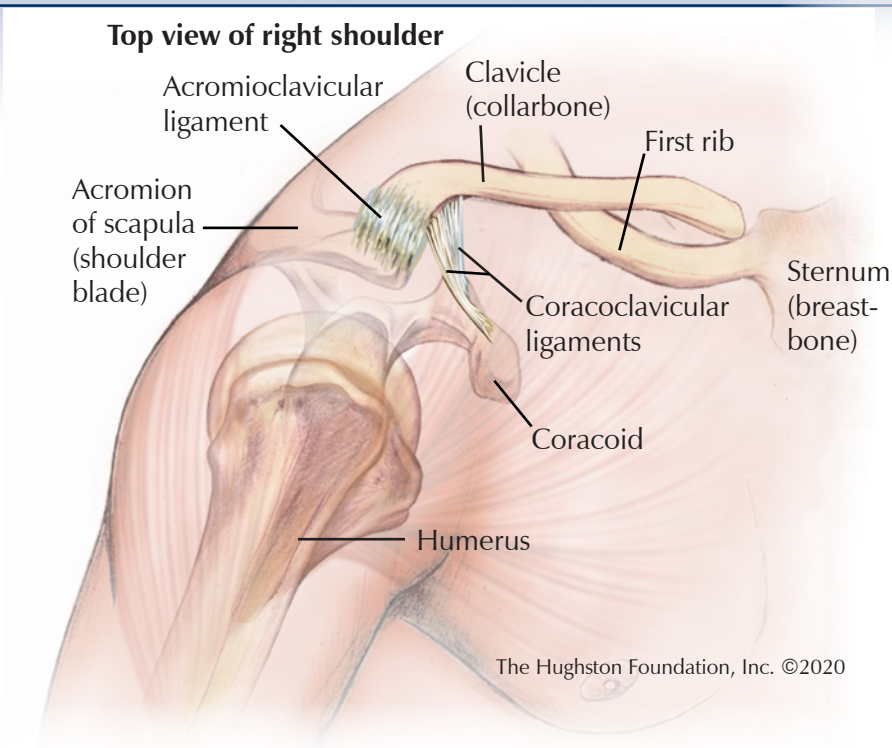


Fig. 1. **Above:** Anatomy of normal acromioclavicular (AC) joint. **Below:** An athlete experiencing a direct hit to the shoulder, which can cause AC joint injuries.

AC Joint Injuries

Injury to the acromioclavicular (AC) joint is common; in fact, it makes up approximately 9% of shoulder injuries. Injury of the AC joint is often referred to as an AC sprain or an AC separation with treatment ranging from nonoperative to surgical. Orthopaedists define this injury as stretching or tearing of the ligaments (tissues that connect bones) surrounding the acromioclavicular joint and the ligaments between the coracoid and the clavicle (**Fig. 1**). As part of the diagnosis, doctors label the injury as a type I through a type VI, depending on the severity of the injury.

The AC joint is the articulation in the shoulder between the clavicle (collarbone) and the acromion of the scapula (shoulder blade). The clavicle is the only bony connection between the arm and the axial skeleton (central bones of the chest). The AC joint is a small joint stabilized by the AC capsule, (multiple ligaments that encapsulate the joint) as well as the ligaments between the clavicle and the coracoid process (small bony projection of the scapula).

Risk factors

AC joint injuries are usually the result of a direct blow to the shoulder. The injury can occur after severe trauma, such as motor vehicle collision; but it more often happens after less severe activity such as sports participation. The injuries are prominent in contact sports, such as football, wrestling, rugby, or hockey, which may account for why male athletes are more prone to the injury than females. However, you can also experience AC joint pain from chronic irritation that results from repetitive overhead sports such as throwing a baseball, or work-related pain from doing repetitive movements on your job.

Symptoms

Patients often describe pain on top of the shoulder and can sometimes touch a specific tender area at the AC joint. You may experience increased pain while lying on your side or pain that increases with lifting or during overhead or across body movements. Upon examination, your doctor may find swelling and bruising along the shoulder, and a visible bump on the top of the shoulder. You may notice a decrease in strength and range of motion. During movement you may hear a popping sound and feel a catching sensation.

Screening and diagnosis

If you have had a shoulder injury and have either continued pain or pain with movement, you should see an orthopaedist for evaluation. Your doctor will take a thorough history, perform a physical exam, and order radiographs (x-rays) to evaluate the degree of separation. Your physician may also obtain magnetic resonance imaging (MRI scan that shows the bones, muscles, tendons, and ligaments) of the shoulder if other injuries are suspected. Injuries can range from a sprain (stretching of the ligaments) to complete tears of both the AC capsule and coracoclavicular ligaments. In the case of complete tears, the clavicle is usually significantly displaced (dislocated) from the acromion.

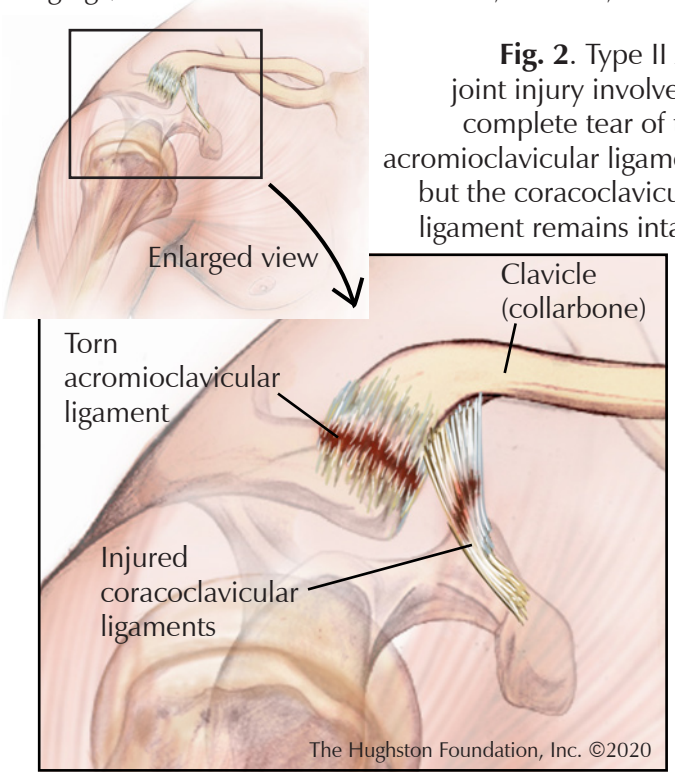


Fig. 2. Type II AC joint injury involves a complete tear of the acromioclavicular ligament but the coracoclavicular ligament remains intact.

Types of AC joint injuries

Your orthopaedist will label your injury as a type I, II, III, IV, V, or VI, depending upon the extent of injury and number of ligaments involved. The type of injury can usually be determined with a physical examination and x-rays.

Type I injuries involve a partial tear of the acromioclavicular ligament with no injury to the coracoclavicular ligament. This causes a tender AC joint that often has mild swelling and usually heals within a few weeks. Type II injuries involve a complete tear of the acromioclavicular ligament but the coracoclavicular ligaments are stretched, but remain intact (**Fig. 2**). This causes a tender AC joint, often with significant swelling that heals within a few weeks. Type III injuries involve a complete tear of both the acromioclavicular and coracoclavicular ligaments. The AC joint will appear abnormal, although swelling may obscure the degree of injury. Type III injuries often take several months to heal and there is debate among surgeons on whether or not these injuries need to be fixed.

Type IV, V, VI injuries are described as the most severe cases because with these injuries both the acromioclavicular and coracoclavicular ligaments are completely torn and the clavicle is displaced (**Fig. 3**). During these traumatic injuries the force applied to the shoulder creates a separation between the clavicle and the acromion. Doctors distinguish these injuries by the distance and direction of the displaced clavicle. To treat these injuries, surgeons use reduction and fixation surgical treatment techniques to repair the ligaments and hold the clavicle back in its original place.

Nonsurgical treatment

If you have a type I or II injury, you may start to feel better within a few days, but it can take 6 weeks before the ligaments heal. During that time you should take the pressure off the AC joint and protect it from stretching the immature scar tissue. This would include sling immobilization for approximately 1 to 2 weeks. At follow-up, your physician will obtain repeat radiographs (x-rays) and if there are no concerning changes, such as increase in separation, you can begin gentle physical therapy that focuses on shoulder range of motion.

For more severe injuries, your doctor will work with you and a physical therapist to develop a plan for your recovery. The goal of physical therapy is to reduce pain, improve range of motion, and then to improve strength and shoulder function. After 4 to 6 weeks, most patients see improvements and can progress to advance activities as tolerated.

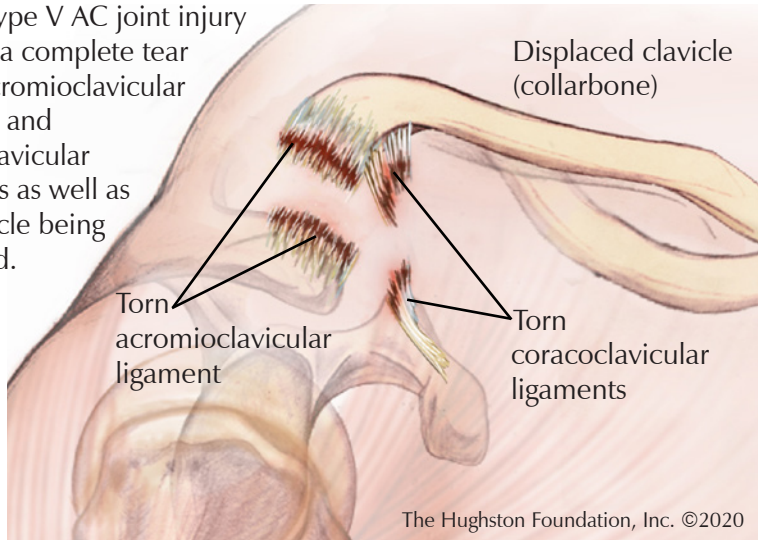


Fig. 3. Type V AC joint injury involves a complete tear of the acromioclavicular ligament and coracoclavicular ligaments as well as the clavicle being displaced.

Surgical treatment

Most AC injuries don't require surgery; however, more severe injuries that are associated with instability have better outcomes when operatively treated. Surgery focuses on reconstruction the coracoclavicular ligaments. Surgeons use different techniques; therefore, your surgeon will determine which treatment best fits your needs. These techniques involve suturing or using an allograft tendon (a tendon from a donor), or both, to go through or wrap around the coracoid and clavicle. Other treatments include using plates to put over the top of the clavicle and acromion. These plates can sometimes be prominent and are often removed a few months after the initial surgery. The goal of surgery is to reduce (place back into the original position) the clavicle to the acromion so that the ligaments can heal, creating scar tissue that holds the clavicle in place.

Complications

Outcomes for both nonsurgical and surgical treatments are favorable for AC joint injuries. However, complications can include chronic instability and pain if you do not seek treatment. Arthritis of the AC joint can erupt years after the injury causing residual pain between 30 to 50% of the time. Additionally, surgical fixation failure can happen, which includes loosening of the graft used to reconstruct the ligaments. Furthermore, fracture of the coracoid and clavicle can arise if tunnels are drilled within the bones during surgery.

Don't shoulder the pain alone

AC joint injuries often result from a direct blow to the shoulder and can cause significant pain. Because the injury often results after trauma, there is no foolproof prevention plan; however, you can reduce your risk considerably by wearing protective equipment during sporting activities. Simple treatments include a short period of immobilization for mild injuries while surgery may be required for more significant injuries. Chronic symptoms can be alleviated with therapy and activity modification. For some patients, early management can prevent late complications, such as arthritis; therefore, don't shoulder the pain alone, seek medical attention.

Roman Ashmyan, DO, and Ryan Mahoney, DO
Columbus, Georgia

Stress Fractures in Adolescent Athletes

More and more young athletes are participating in a single competitive sport year-round instead of multiple sports through different seasons. This change in athletic competition has led to an increase in overuse injuries in the pediatric population. Sports medicine physicians often attribute the cause of these overuse injuries to a combination of an underdeveloped musculoskeletal system, increased duration and intensity of competition, and early sports specialization. One type of overuse injury that can have a detrimental impact on sports performance and the overall health of an adolescent athlete is a stress fracture.

Stress fractures occur when abnormal stresses are placed on the trabecular bone (cancellous bone that is highly porous and located at the end of long bones) resulting in microfractures. Due to lack of adequate rest and recovery or underlying abnormalities in bone metabolism, these microfractures are unable to heal and remodel and can propagate over time. Continued repetitive loads exceeding the body's normal intrinsic bone healing can eventually lead to complete fracture through the affected bone. The most common site for a stress fracture is the anterior tibia (shinbone) (**Fig. 1**), but the injury can also occur in the femoral shaft (straight part of the thighbone), femoral neck (below the ball of the hip joint) and posterior ribs (back ribs). Stress fractures can occur on the compression side (pushing together) or the tension side (pulling apart) of bones. Physicians can treat stress fractures on the compression side without surgery because the site is stable and has an adequate blood supply. However, stress fractures that occur on the tension side of a bone have poor healing potential and usually require surgical intervention.

Who is at risk?

Two major risk factors for the development of stress fractures are rapid increases in high intensity activity and abnormalities in normal bone metabolism. High intensity athletes as well as new military recruits are subject to rapid increase in training intensity especially during conditioning periods and basic training.

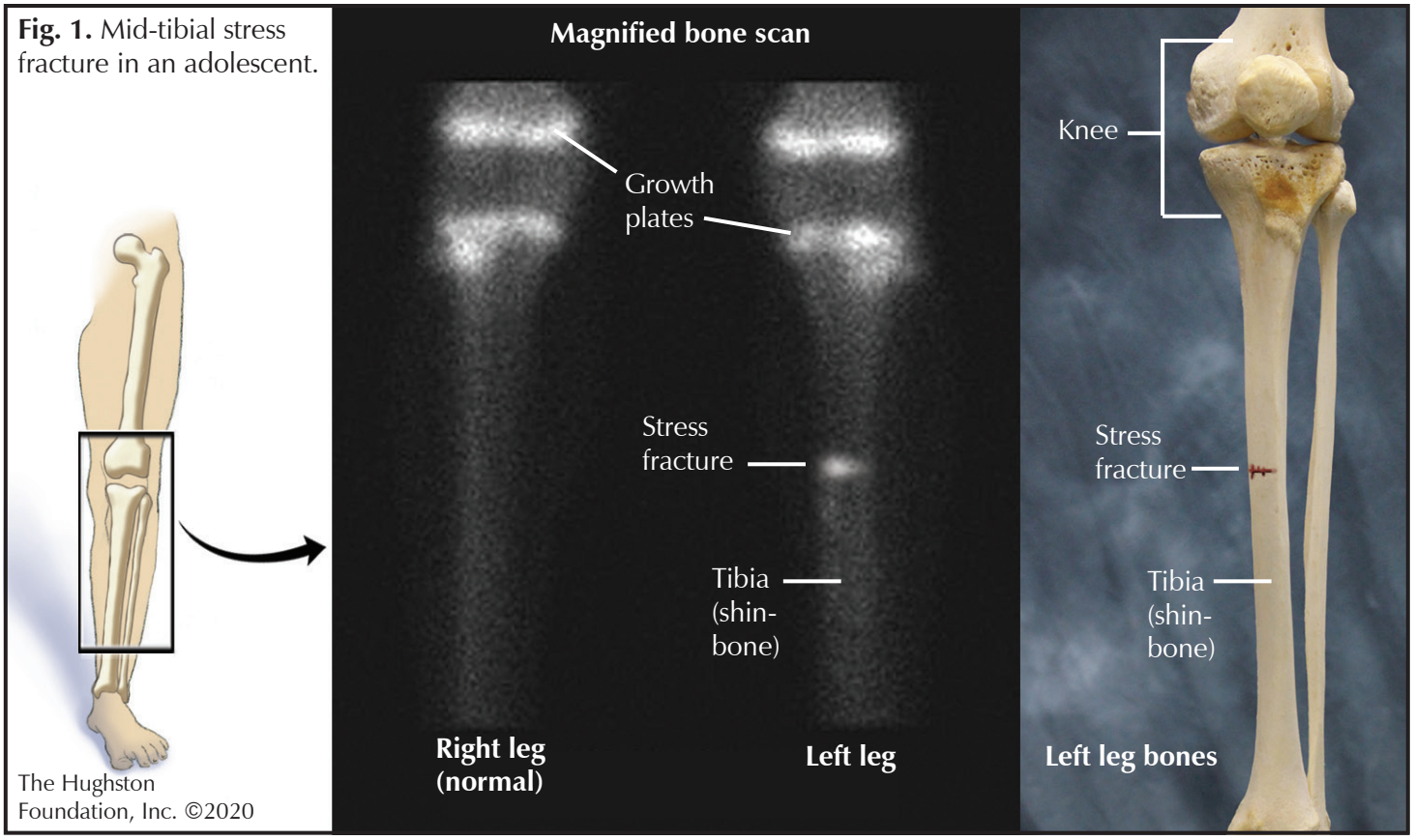


Fig. 1. Mid-tibial stress fracture in an adolescent.

The Hughston Foundation, Inc. ©2020

Pediatric and adolescent muscles are underdeveloped and subsequently subject to early fatigue causing compensatory gait changes with increased stresses applied to the bone. This loss of the body's ability to absorb shock from fatigued muscles combined with poor mechanics and improper training regimens can also cause overloading of these deconditioned muscles ultimately resulting in overuse injuries.

Ninety percent of a child's bone mass is attained by the age of 18. Essential vitamins, such as vitamin D and calcium, play a vital role in a child's developing skeleton. Athletes that are at risk of suboptimal bone mass and stress fractures include distance runners, gymnasts, and elite dancers. These sports require lean body mass and are often associated with disordered eating habits and irregular menstrual cycles in young female athletes. There has been a dramatic increase in the number of healthy children and adolescents who are at risk of vitamin D deficiency. Lifestyle changes that place children at risk for vitamin D deficiency include lack of outdoor activities, increased screen time, and poor diets. Inadequate oral intake of calcium and vitamin D, lack of outdoor physical activity, and abnormal estrogen levels can disrupt normal body homeostasis needed for appropriate bone growth and remodeling.

Symptoms, diagnosis, and treatment

Patients with lower extremity stress fractures most often present with complaints of pain in the anterior tibia, hip, or thigh that increases with running or physical activity. Over time pain can occur even with simple daily activities like walking or at rest. Symptoms usually develop insidiously and unrelated to a known injury.

Evaluation by a physician begins with a detailed history of symptoms and physical exam. The physician often orders radiographs (x-rays) which can demonstrate cortical thickening, or stress fracture. There may be signs on x-ray of bone healing, such as cloudy immature bone forming within 3 weeks of injury. If x-rays are negative, magnetic resonance imaging (MRI, a test that shows the bones, muscles, tendons, and ligaments) can help to evaluate the location of stress fractures as well as to assess the growth plate and surrounding soft tissues. A MRI can demonstrate subtle findings with exquisite detail of bone edema (fluid builds up as a response to injury) and fracture to confirm diagnosis without radiation exposure to the child.

First line treatment for compression-sided stress fractures is protected weight bearing on the affected extremity for 4 to 6 weeks or until the pain resolves. Doctors usually avoid prescribing nonsteroidal anti-inflammatory medications (NSAIDs), which reduce inflammation, such as aspirin, Aleve®, and Advil® because these medications interfere with the inflammation that your body uses for bone healing. Tension-sided stress fractures are less likely to heal with conservative management and often require operative fixation. Treatment also consists of a progressive return-to-play protocol to avoid recurrence of the stress fracture.

Don't confuse a stress fracture with shin splints

Stress fractures are commonly confused with tibial stress syndrome, also known as shin splints. Shin splints differ from stress fractures in that shin splints are an inflammation of the superficial portion of the bone called the periosteum (**Fig. 2**). The underlying periosteum becomes inflamed from the repetitive pull of the muscles originating in the anterior (front) or posterior (back) compartment of the lower leg. Patients most commonly report vague pain that runs along the middle to distal aspect of the tibia that increases during the start of exercise but improves with prolonged activity. Physicians often order x-rays for the patients to rule out stress fracture. Treatment for shin splints involves modifying activities until the pain subsides which can involve decreasing running distance, performing cross-training exercises, and avoiding running on hills or hard, uneven surfaces. Physicians sometimes order physical therapy as an adjunctive treatment to help with stretching and strengthening the ankle and leg muscles, tendons (tissues connecting muscle to bones), and ligaments (tissue connecting two bones).

Prevention is key

The most important factor for preventing stress fractures in young athletes and children is to recognize risk factors early. Young children should eat a healthy diet that consists of essential vitamins and protein for normal skeleton development. Children of all ages should also participate in at least 60 minutes of physical activity per day; this regular physical activity also helps to promote the development of bone strength. Additionally, coaches, parents, and athletic trainers can help identify athletes and children at risk for overuse injuries and stress fractures as well as encourage adequate recovery and rest. Furthermore, young athletes should be encouraged to seek treatment to prevent complications or need of surgical intervention from their overuse injuries.

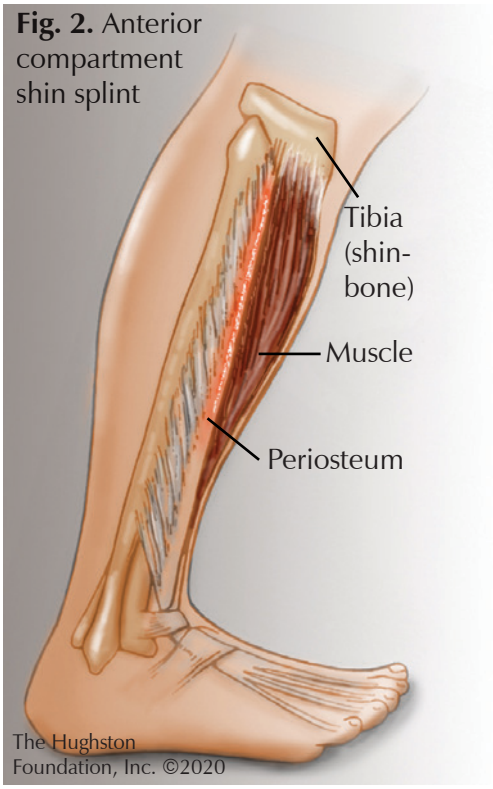


Fig. 2. Anterior compartment shin splint

Julia Fink, DO
Columbus, Georgia

Hallux Rigidus

In 1888, British surgeon J.M. Cotterill was first to describe hallux rigidus as an osteoarthritic condition of the metatarsophalangeal joint of the great toe. Today, orthopaedists recognize this condition as the most common form of osteoarthritis (a type of joint disease that results from the breakdown of joint cartilage and underlying bone) in the foot. It affects roughly 2.5% of all people over the age of 50, is more common in females, and can involve both the left and right great toes. Besides arthritis, the causes of hallux rigidus include previous injury, trauma, and various deformities of the great toe, including bunion, hypermobility of the metatarsophalangeal joint, and avascular necrosis.

Anatomy

Three bones of the foot, the metatarsal, proximal phalanx, and the distal phalanx, form the great toe. The space between the metatarsal and the proximal phalanx is the first metatarsophalangeal joint, which healthcare professionals often call the MTP joint (**Fig.**). This joint consisting of articular cartilage (smooth tissue that covers the ends of bones) and synovial fluid (reduces friction between articular cartilage in a synovial joint) allows significant motion of the great toe. The MTP joint is also surrounded by ligaments (tissues connecting bones), a joint capsule (a dense fibrous connective tissue), and small muscles, and tendons (tissues connecting muscles to bones) that allow the great toe to move up and down. In patients who have hallux rigidus, the articular cartilage of the joint wears down causing each bone to rub together during movement. Physicians often describe this as "bone on bone" osteoarthritis. As the joint space narrows, the joint becomes stiff or rigid. The process also leads to contracture (permanent tightening) of the surrounding soft tissues.

Evaluation and diagnosis

Patients who have hallux rigidus present with painful and limited range of motion at the MTP joint of the great toe. On physical examination, the orthopaedist may find the MTP joint swollen and enlarged with bone spurs at the metatarsal head. In moderate to severe cases, patients may alter gait patterns to compensate for their pain and stiffness, especially since walking or increasing physical activity can elicit the symptoms. Patients frequently complain of difficulty wearing high-heeled shoes and joint stiffness.(**Fig.**)

The diagnostic imaging of choice is weight bearing radiographs (x-rays) of the foot. Depending on the severity of disease, the x-rays can demonstrate joint space narrowing, subchondral sclerosis (hardening of bone), deformity of the metatarsal head, and osteophytes (bony projections, or bone spurs) surrounding the joint.

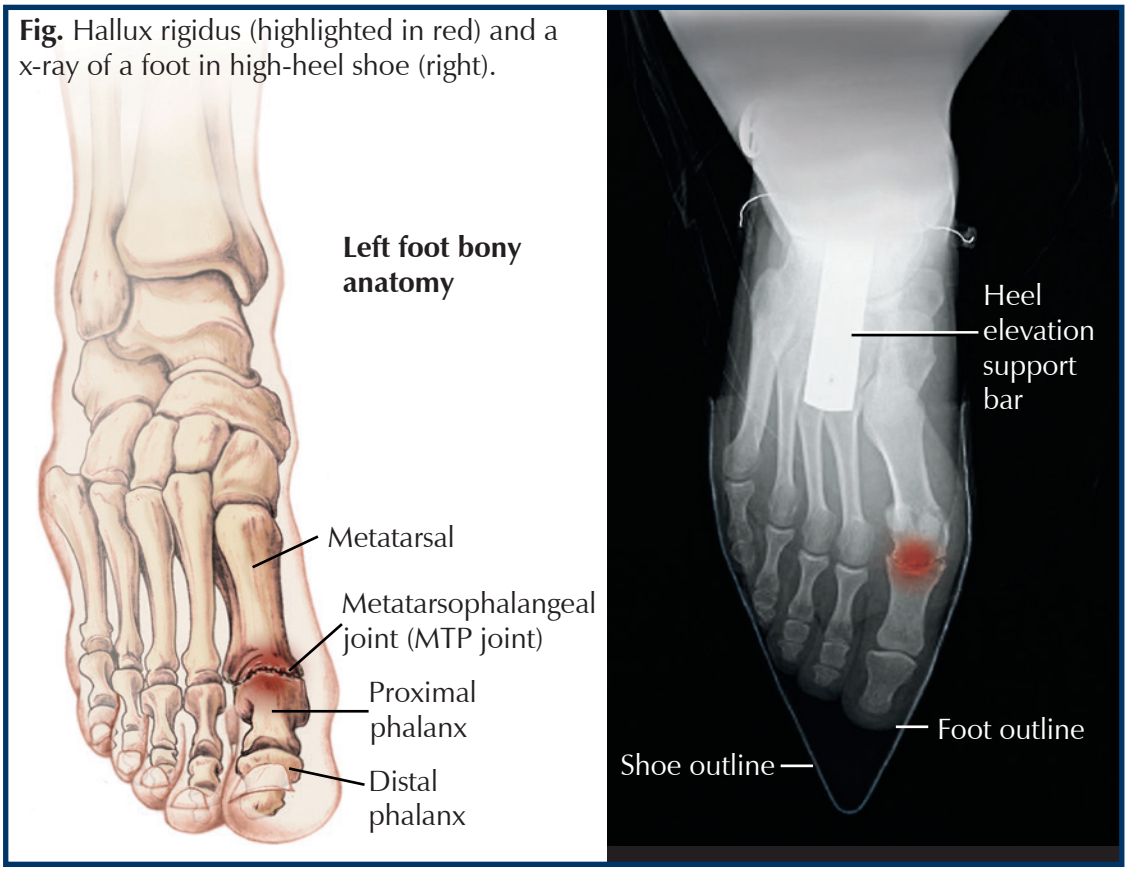


Fig. Hallux rigidus (highlighted in red) and a x-ray of a foot in high-heel shoe (right).

Treatment

Nonsurgical treatment for hallux rigidus is often the first option offered to patients. The treatment consists of activity modification, shoe modifications, and anti-inflammatory medicines. Generally, your orthopaedist will recommend a variety of shoe modifications including a Morton's extension orthotic, rocker bottom stiff soled athletic shoe, or shoes with high and wide toe boxes to take the pressure off the dorsal aspect of the joint. In conjunction with shoe modifications, your doctor may prescribe nonsteroidal anti-inflammatory medicines such as ibuprofen or naproxen to help decrease swelling and pain. Additionally, your physician can recommend a corticosteroid injection into the arthritic joint space to help with pain and swelling.

Unfortunately, 2 out of 3 patients who have moderate to severe disease will fail conservative treatment. After more than 6 months of nonsurgical treatment without results, your orthopaedist may recommend surgical management as your next option. Although there are numerous surgical treatments published in the medical literature, most orthopaedists focus on 3 procedures.

The first treatment, known as a cheilectomy, is ideal for patients who have mild to moderate arthritis and pain during the extremes of motion. Cheilectomy involves removing bone spurs from the metatarsal head and removal of about 30% of the articular surface. Overall, a review of the medical literature on the procedure shows satisfaction rates of 88% to 95% with an increase in range of motion by approximately 20 degrees.

An arthrodesis or fusion of the MTP joint is the most common procedure performed for the condition and represents the current gold standard for managing severe hallux rigidus. Arthrodesis involves removing the remaining articular cartilage of the MTP joint and fusing the proximal phalanx to the metatarsal to form a single bone. Often, surgeons use a metal plate and screws to hold the fusion together. The current medical literature reports significantly high patient satisfaction scores, pain relief, and durability for the procedure. One study published in *Foot and Ankle International* reports the activity levels of patients after undergoing MTP arthrodesis. The study showed that preoperative activities were reestablished in 92% of patients who hiked, 80% who played golf, 75% who jogged, and 75% who played tennis.

Lastly, researchers and surgeons have developed newer orthopedic technology regarding joint replacement surgery and synthetic cartilage. Many companies have advertised implants to replace the MTP joint of the great toe in order to preserve range of motion and provide pain relief. Medical device manufacturers make the implants from a variety of materials including metal or plastic or a combination of both. Short term studies have reported good outcomes with these implants; however, long term studies have reported high rates of implant removal and complications. Thus, orthopaedic surgeons offer this surgical option only when the patient meets strict criteria.

Seek treatment early

The management of hallux rigidus varies from conservative treatment to surgical options depending on disease severity. The key to a good outcome is to seek treatment early in the process. If you begin to experience pain and swelling and find it difficult to bend your big toe, see your orthopaedist. There are treatment options available to help relieve pain and get you back on your feet.

A. Gianni Ricci, DO
Columbus, Georgia

Fallen Arches

About 20 to 30% of people have pes planus, or fallen arches, which we commonly call flatfeet. Physicians divide arch types into 3 categories: fallen arch, neutral or medium arch, and high arch. When someone has a fallen arch, the entire sole of the foot touches the floor. Unfortunately, people with this condition are unable to absorb forces from the ground properly when walking, running, or landing from a jump, and the joint motions are not as efficient in the ankles, knees, and hips. Therefore, unnecessary stress is placed on the body's bones and soft tissues (muscles, tendons, ligaments) that are not designed to absorb the pressure.

What causes fallen arches?

All infants and toddlers have flatfeet because your foot arch does not develop until the age of 5 or 6. Causes of flatfeet include genetics, injury to the soft tissue in the arch of the foot, and other health conditions such as arthritis and nerve problems that can lead to the development of fallen arches. Flatfeet can simply develop over time as we age or it can develop after years of walking, running, and standing weakens the posterior tibial tendon (tendons attach muscles to bone). The posterior tibial tendon starts at the muscle in the calf, travels down the inside of the lower leg and attaches to the bones on the inside of the foot. The main function of the tendon is to hold up the arch and support your foot while you walk. If you tear the posterior tibial tendon or it becomes inflamed, the arch can collapse, causing a fallen arch.

Many people have fallen arches and experience no problems, but high levels of activity can lead to pain in the foot, ankle, lower leg, knees, hips, and even the lower back. Individuals with non-neutral foot types are at increased risk for pain and injury during activity; therefore, you should select the appropriate footwear and orthotics for your foot type to reduce the risk.

How to determine your foot type

Simple ways to determine your foot type at home are the "Wet Test" and "Wear Test." For the "Wet Test", wet your foot and step on a piece of paper to make a footprint. (**Fig. 1**). The "Wear Test" includes observing the wear pattern on the bottom of your frequently worn tennis shoe. If the sole of the shoe is worn away on the inside of the foot, you are more likely to have flatfeet. However, a more accurate evaluation can be completed if you have access to an athletic trainer at a local high school or can see another professional such as a physician or orthopaedist. These professionals use specific tools, instruments, and techniques to provide a more detailed assessment.

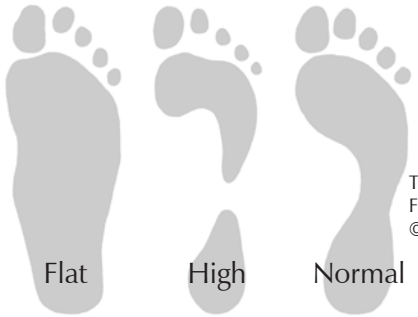
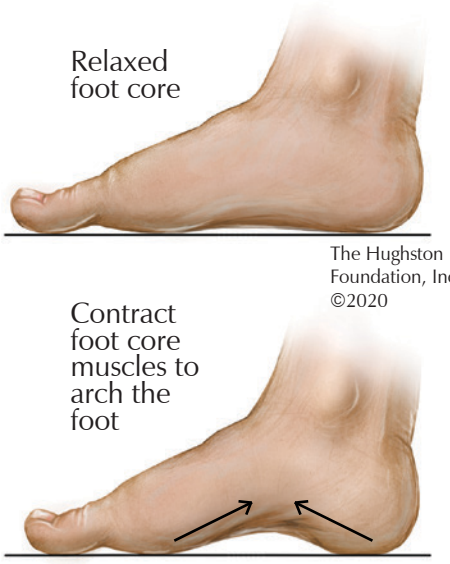


Fig. 1. "Wet Test" sample footprints to help classify foot type.

Fig. 2. Short foot exercise



Treatment & exercises

Whether you have inherited flatfeet or acquired it from age or injury, be sure to select the most comfortable shoe that provides the support you need to prevent the development of pain and injuries. Flatfeet can lead to painful, debilitating conditions including plantar fasciitis, Achilles tendonitis, medial tibial stress syndrome (shin splints), and pain in the knees, hips, and low back due to disruption of proper alignment and mechanics of the body. General treatment of these conditions includes anti-inflammatory medication, ice, rest, stretches of the calf muscles and Achilles tendon, and physical therapy exercises. Exercises that strengthen the arch and foot muscles and the posterior tibialis tendon and muscle include the short foot exercise (**Fig. 2**), towel scrunches, and marble pickups.

If you have flatfeet and increasing pain with activity, you may benefit from a different shoe selection or an orthotic insert. An athletic shoe with a wide sole, good arch support, and wide toe box can help alter the way your feet and ankles move to help reduce unnecessary stress on the area. Arch support orthotics should be considered for people who have a required or standard type of shoe, such as military personnel, athletes, and factory workers who are experiencing discomfort and problems associated with flatfeet.

A common problem

Flatfeet are more common than people think. You should know your foot type and arch height to determine if you are at increased risk of injury or development of certain chronic conditions of the feet and lower legs. Rest, ice, stretching, and rehabilitation exercises can help ease the symptoms that may develop due to flatfeet. If over the counter inserts do not improve symptoms or you have redness, soreness, or swelling in the foot that lasts more than a few days, seek medical advice from your physician.

Kathryn Boylan, LAT, ATC
Columbus, Georgia

Hughston Health Alert

The Hughston Foundation, Inc.
6262 Veterans Parkway P.O. Box 9517
Columbus, Georgia 31908-9517

WINNER 2019 APEX® AWARDS FOR PUBLICATION EXCELLENCE 2002-2019

NONPROFIT ORG
US POSTAGE
PAID
COLUMBUS GA
PERMIT NO 99

THE HUGHSTON FOUNDATION

GIVING TUESDAY
MAY 5, 2020

DONATE ANYTIME DURING MAY 2020 TO PROTECT THE ATHLETES

GA GIVES ON #GIVINGTUESDAY

HOW TO DONATE

Go to the Hughston Foundation page:
www.gagives.org/organization/The-Hughston-Foundation

HEALTH ALERT CALL FOR DONATIONS

Due to the COVID-19 crisis, like many nonprofits, the Hughston Foundation has had to be creative with our financial obligations.

We want to continue our mission of providing FREE accurate medical information to our community, but there are costs associated with producing these materials. That's why we need your **SUPPORT**.

Thank you for considering a gift to support the *Hughston Health Alert*, go to **hughston.com/hughston-foundation/donate**. Your gift will make a difference.

Send inquiries to Medical Writing, The Hughston Foundation, Inc., P.O. Box 9517, 6262 Veterans Parkway, Columbus GA 31908-9517 USA.

ISSN# 1070-7778

JACK HUGHSTON MEMORIAL HOSPITAL
4401 River Chase Drive
Phenix City, AL 36867
Phone: 334-732-3000
Fax: 334-732-3020

HUGHSTON CLINIC
6262 Veterans Parkway
P.O. Box 9517
Columbus GA 31908-9517
Appointments:
706-324-6661
1-800-331-2910

HughstonOrtho
HughstonClinic
HughstonClinic