Common Sports Injuries Seen by the Primary Care Physician Part II: Lower Extremity

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Sports medicine is the science of caring for the medical and surgical needs of athletes and their injuries. Injuries of the upper extremity were dealt with in Part I in a previous article. Part II deals with injuries of the lower extremity.

Trochanteric bursitis and hamstring strains are treated with rest, rehabilitation, and correction of training errors.

Patellofemoral pain syndromes require accurate diagnosis and usually a rehabilitative program. Injuries to the medial collateral ligament are very common, but can be associated with tears of the meniscus and cruciate ligaments. The latter two often require surgical intervention.

Ankle sprains are graded by severity. The most severe can result in chronic pain or instability, but most respond well to functional bracing and progressive return to activity.

Trochanteric bursitis

This condition is seen most commonly in female runners with a wide pelvis. The patient characteristically complains of pain with running, or walking. The diagnosis is often made when there is pain present at the greater trochanter that is aggravated with resisted abduction of the hip. Initial treatment should consist of rest and ice to the greater trochanter region. If pain persists, a steroid injection into the bursa is considered, and a stretching program is usually instituted. In recalcitrant cases, a formal physical therapy program may be prescribed for modalities, such as ultrasound, stretching, and further exercise. Proper stretching and warm-up prior to exercise and sports can prevent recurrence.[1,2]

Hamstring Strain

The hamstring group consists of three muscles: the biceps femoris, the semitendinosus, and the semimembranosus. These muscles span two joints, the hip and the knee, which predisposes them to injury. The hamstrings flex the knee and extend the thigh. They are often injured with explosive bursts of speed as seen in soccer, football, track and field, and rugby. Poor warm-up, poor flexibility, and fatigue contribute to the probability of injury. In football and other team sports, hamstring injuries may occur either early in the game, when the athlete is not fully warmed up; or late in the game, when fatigue is a factor.

The diagnosis of hamstring strain is based on the history of pain in the posterior thigh following an explosive burst of speed, and physical findings of pain in the posterior thigh. There may sometimes be swelling and occasionally a palpable defect. The pain can usually be reproduced with flexion of the knee against resistance. The initial treatment on the sidelines is rest, ice, and compression. Crutches may be required in more severe cases or in the initial phases. The majority of these injuries resolve spontaneously with comfort measures only. Specific strengthening may begin when pain subsides. An elastic thigh support may aid in return to sports. Thorough warm up and stretching are keys for prevention. Hamstring strains rarely require surgical intervention unless there is avulsion of the hamstring origin near the proximal bone-tendon junction.[1,3]

Runner's Knee, or Chondromalacia Patella

These terms are often used to describe pain in the front of the knee joint in running athletes. These are nonspecific diagnoses and really represent a constellation of causes of anterior knee pain involving the patellofemoral joint.

Involved athletes commonly complain of pain in the front of the knee, under the kneecap. The discomfort may occur with running, with climbing or descending stairs, or with sitting with a bent knee for a prolonged period of time.

On physical examination, one should note the overall alignment of the patient's leg. Factors which contribute to excessive pressure under the lateral patella should be noted. These factors may include lateral patellar tracking, a shallow patellar groove, relative weakness of the vastus medialis obliquus muscle, and a combination of relatively wide hips with genu valgum, or "knocked knees". The diagnosis is made following the usually characteristic presentation described above, especially if the pain can be reproduced with quadriceps contraction while compressing the patella.[4-6]

X-rays are often helpful. Always include a sunrise view, which can show lateral patellar tilt, joint space narrowing, osteophytes, or a shallow patellar groove. The main-stay of treatment is an exercise program. Straight leg raising exercises selectively build up the

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Fig 1.—Straight leg raising exercises build the vastus medialis muscle, which functions to stabilize the patella. These are often helpful for treating knee pain of patellofemoral origin.

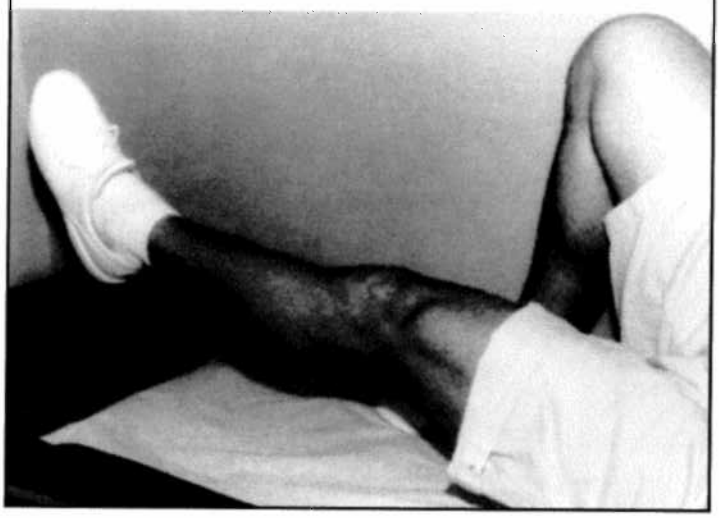

Fig 2.—The Lachman's test is performed with the knee flexed 20 degrees. The tibia is pulled forward while the femur is stabilized. This tests for a torn anterior cruciate ligament.

vastus medialis muscle, which is a key component of patellar alignment (Figure 1). Short arc leg extensions, taking the knee through the last 20 degrees of extension, also selectively build up the vastus medialis obliquus. A Palumbo style knee brace may be used for return to sports participation.[7]

Physical therapy may be useful to assist with those patients who are refractory to a home exercise program, and to instruct in patella taping for sports participation. Referral to an orthopedic surgeon is indicated if the diagnosis is in doubt, or if there is no response to conservative measures.

Iliotibial Band Friction Syndrome

This condition commonly affects runners and cyclists. Characteristically, there is lateral knee pain where the iliotibial band rubs over a prominent lateral epicondyle of the femur just above the knee. The patient often complains of pain with activities while the knee is flexed. The knee may "creak" audibly. A diagnostic test may be performed with the knee flexed 90 degrees. The examiner should press on the lateral epicondyle of the femur. This becomes painful as the knee is gradually extended, especially at about 30 degrees. The treatment should include decreasing the training mileage and avoiding downhill running. Nonsteroidal anti-inflammatory drugs may be useful. If these measures do not give relief, the physician should consider a local corticosteroid injection. Other causes of lateral knee pain, such as a lateral meniscus tear, should be excluded.[1,8]

Medial Collateral Ligament Sprains

Medial collateral ligament sprains are the most common knee injuries seen in surfers and in snow skiers. In surfers, the injury occurs with the bottom turn, particularly if the surfer loses his footing at that point. This injury is also very commonly seen in football and soccer players. The precipitating event is a valgus stress injury to the knee. The patient presents with a painful knee, and on physical exam the knee is noted to be tender medially. The pain is usually aggravated with valgus stress, and localizes to the medial collateral ligament. Medial collateral ligament sprains may be graded as follows: Grade I is a mild sprain with no gross laxity. Grade II is a moderate sprain with some laxity noted; however, with a definite end point. A Grade III sprain demonstrates marked instability with no well defined end point. Meniscus tears and anterior cruciate ligament injuries are often associated with medial collateral ligament sprains, particularly grade II and grade III. The knee exam should therefore always include evaluation of the integrity of these structures.

The treatment for a mild medial collateral ligament tear initially is rest, ice, compression, and elevation. A hinged or lateral stabilizing brace may be used to protect the medial collateral ligament while still allowing range of motion. Progressive rehabilitation should then follow, as recovery progresses.[9,10]

Torn Anterior Cruciate Ligament

The anterior cruciate ligament is the central stabilizing ligament of the knee. It prevents forward translation of the tibia relative to the femur. As previously mentioned, the anterior cruciate ligament may be injured in association with medial collateral ligament injuries or meniscus injuries. The "terrible triad of O'Donoghue," is the constellation of a torn medial collateral ligament, a torn medial meniscus, and a torn anterior cruciate ligament.[11]

Anterior cruciate injuries may present to the physician's office during their acute phase, or following a chronic history. Acutely, the athlete may present with a history of the sudden onset of pain and giving out following deceleration and rapid change of direction. It may be part of the "clipping injury" in football. The athlete often feels or hears a "pop" at the time of the injury. This bit of history is highly significant, and should be specifically inquired about. The knee becomes painful, and usually swells rapidly.[10]

In chronic cases, there is usually a history of a previous injury. The athlete now complains of his knee frequently buckling or giving out. Pain and swelling are often associated with these injuries. Many patients have modified their activities to prevent these episodes. Some will have given up sports entirely.

On physical examination there is pain if the injury is acute. Often there is an effusion. This is usually bloody on aspiration, especially

Fig 3.—The anterior drawer test is conducted with the knee flexed while the proximal tibia is pulled forward relative to the femur. This tests for a torn anterior cruciate ligament.

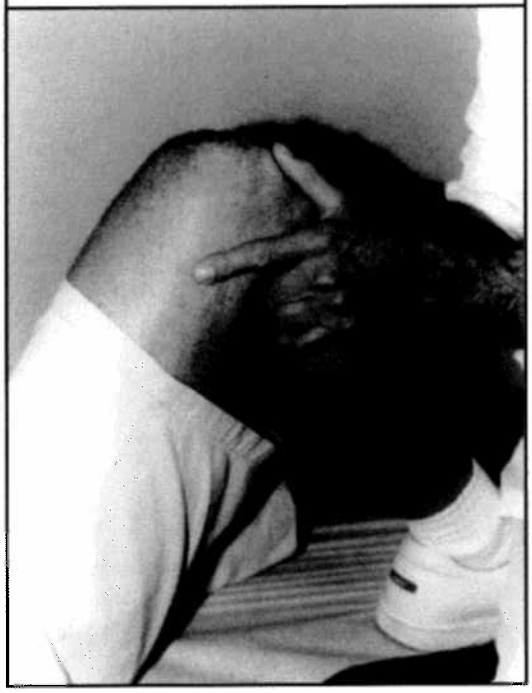

Fig 4.—The Apley's grind test is performed with the athlete in the prone position. Downward pressure and rotation are applied to the foot. This tests for a torn meniscus.

in the acute phase. The Lachman's test, the anterior drawer test, and the pivot shift test, all specifically evaluate the stability of the anterior cruciate ligament. The Lachman's test is performed with the knee in 20 degrees of flexion. The tibia is pulled forward while the femur is stabilized with the examiner's opposite hand (Figure 2). The anterior drawer test is conducted with the knee flexed 90 degrees. The examiner's thumbs are placed on the femoral condyles, and the proximal tibia is gripped and pulled forward relative to the femur (Figure 3). The pivot shift test may also be used to evaluate the degree of instability. All of these tests may be equivocal secondary to guarding, especially in the acute situation where the patient is painful and unable to fully cooperate.

In most cases of acute knee injury of sufficient magnitude to cause a knee effusion, an x-ray is indicated to rule-out associated fracture or avulsion of bone fragments. In most cases, the diagnosis can be determined by a thorough history and physical examination.[12] In cases where the diagnosis is unclear, an MRI may sometimes be indicated. In the case of the acute knee injury with a post traumatic effusion, or in the patient with a previous knee injury now experiencing pain, recurrent instability, or recurrent effusions, referral to an orthopedic surgeon is indicated. Early surgical reconstruction of the anterior cruciate ligament is usually recommended in young or active individuals. Occasionally, conservative management is indicated, particularly in older or sedentary individuals.[13]

Torn Meniscus

A torn meniscus should be suspected and looked for in major twisting, giving away, clipping, or other injury to the knee, especially if an effusion occurs initially. While the anterior cruciate ligament tear is usually characterized by an immediate effusion, in the case of an isolated torn meniscus the effusion often appears more gradually and may take 24 hours to develop. Meniscus tears in young athletes often occur with significant trauma as described above, but in older individuals they may occur following simply day-to-day activities such as gardening or getting up from a crouching position. If the injury is chronic, the patient may experience pain at the joint line, effusions, a sensation of something "catching" in the knee, or a sensation of the knee "locking", or "sticking", in one position.

On physical examination one should check for a McMurray's "click." With the knee flexed 90 degrees, the lower leg is moved in a circular motion while the examiner listens or feels for a "clicking" or "clunking" sensation. An Apley's grind test is performed by having the patient lie in the prone position with the knee flexed 90 degrees. Downward pressure is applied to the foot in a grinding motion. This will often reproduce the patient's knee pain if a meniscus tear is present (Figure 4). The patient will often experience pain with a deep squat. An effusion may be present, and there is usually pain along the joint line.

As with most injuries of the knee, the diagnosis should be apparent after a history and physical examination is performed by an experienced examiner. If the diagnosis is unclear, one may consider an MRI. In most cases where a meniscus tear is suspected, referral to an orthopedic surgeon is indicated.[1,14-16]

Shin Splints

Shin splints are characterized by pain occurring in the tibial region due to repetitive running or other overuse. This often occurs after an increase in training, such as when a recreational runner begins to

Fig 5.—A typical functional ankle brace.

prepare for a race or marathon and rapidly increases his or her mileage. The athlete typically presents with pain at the medial border of the tibia. Swelling is sometimes present, and pain on palpation is usually noted. An x-ray may demonstrate a periosteal reaction, particularly in chronic cases. Characteristic bone scan findings can help to differentiate shin splints from stress fracture of the tibia.

The cornerstone of treatment for shin splints is to decrease the patient's mileage to the level at which the patient was asymptomatic, and then resume training more gradually. Ice after training sessions should be used. The patient's foot should be examined, and an orthotic should be used if the patient has a pronating foot. The athlete should also wear well cushioned shoes and run on a softer running surface if possible. Heel cord stretching should be prescribed if the patient has tight heel cords, and nonsteroidal anti-inflammatory drugs are helpful symptomatically.[17]

Ankle Sprains

Ankle sprains are one of the most common sports injuries seen in the primary care practitioner's office. Ankle sprains may involve the medial (deltoid) ligament of the ankle, or the lateral ligaments of the ankle. Lateral ankle sprains are more common and occur with inversion injuries. Ankle sprains are the most common injuries seen in soccer. The diagnosis is made when the patient is noted to have pain and swelling of the ankle after a twisting injury. One should evaluate for associated fractures, neurovascular injuries, foot injuries, and torn tendons. An x-ray should be performed in all but the most mild sprains, especially if there is swelling, pain or ecchymosis.

Ankle sprains, like sprains of the medial collateral ligament, are graded. Grade I ankle sprains are histologically characterized by microtears of the ligament fibers. On physical exam there is no instability of the joint, and there is usually minimal swelling and pain. Grade II ankle sprains are those in which ligament fibers are completely torn, but overall stability is intact. Pain, edema, and ecchymosis are present. Grade III sprains are the most severe, with complete tearing of ligament fibers, and gross instability. Marked swelling, ecchymosis, and severe pain are present. The diagnosis of the milder ankle sprain is rest, ice, compression, and elevation. Functional treatment with early mobilization and weight bearing in a protective brace are important (Figure 5). Return to activity following a grade I sprain may occur in as little as one to two weeks. After a grade II sprain, recovery may occur in two to six weeks. A grade III sprain, on the other hand, may require greater than six weeks of recovery time. Twenty to forty percent of athletes may have chronic pain after a grade III sprain. The reasons include incomplete rehabilitation, chronic instability, reflex sympathetic dystrophy, lateral impingement lesions, osteochondral lesions, and post traumatic arthritis. The patient with a suspected grade III ankle sprain, or with chronic pain following an ankle sprain, should be referred for further evaluation and possible treatment by an orthopedic surgeon.[18-19]

Summary

The injured athlete will often turn to his primary care physician for care of his injuries. A thorough history of the mechanism of injury and careful physical examination of the injured structures will usually lead to the diagnosis. Radiographic examination of the injured structures is often required to rule-out associated fractures or dislocations. While many sports injuries are appropriately treated in the primary care physician's office, others should be referred. Consultation should always be considered if the examiner is uncomfortable with the diagnosis or treatment of the injury at hand.

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