

CHAPTER FIVE

The Adolescent Runner

In the past several years, running as a sport has become increasingly popular among children and adolescents of both sexes. Consequently, running injuries in children and adolescents have become more common.

The majority of pediatric running injuries are due to overuse and involve the apophyses. The apophyses are growth plates under tension from a musculotendinous insertion. Patellofemoral pain is another common problem among adolescent runners. Some of these injuries result from parents' and coaches' pressure to excel, as well as lack of knowledge about injury prevention.

It is safe for children to run. Children have been running in sports such as basketball and soccer for decades without too many problems. Guidelines for children's sports participation in running as a sport should be proper footwear, gradual progressive increase in distance and speed, and realistic and reasonable goals for children such as local competitions and shorter distances. Children should not run in marathons, for instance.

Some of the general treatment guidelines for children's running injuries are to modify the activity level, change to alternative exercises temporarily, and obtain better support for the legs and feet. Thermal treatments such as ice or heat and medications such as vitamins and nonsteroidal antiinflammatory drugs (NSAIDs) or acetaminophen may be tried. In addition, a good surface and proper equipment help child runners return more readily to running as a sport. Healthful nutrition and appropriate adequate fluids are also necessary for these young athletes.²

The following sections describe specific running injuries in adolescents and children and highlight their treatment.

OSGOOD-SCHLATTER DISEASE

Osgood-Schlatter disease⁵⁻⁹ should not be called a disease. It is a traction apophysitis of

the tibial tubercle caused by repetitive traction trauma to the apophysis with a resulting tender prominence of the tibial tubercle. A lateral radiograph of the knee reveals this prominence, and a separate ossicle formation is often noted (Fig. 5-1). Treatment consisting of temporary activity moderation, icing after running, and optional use of a Chopat knee strap is usually adequate. Severe recalcitrant cases can occasionally be treated in a knee immobilizer or cylinder cast. Very painful lesions persisting into adulthood sometimes re-



Figure 5-1

Separate ossicle formation and prominence of the tibial tubercle in a 16-year-old patient with Osgood-Schlatter disease.

quire surgical removal of the ossicle through a patellar tendon-splitting approach. In the majority of cases, all pain is resolved by skeletal maturity.

SINDING-LARSEN-JOHANSSON SYNDROME

Sinding-Larsen-Johansson syndrome⁵⁻⁹ is a traction apophysitis of the inferior patellar pole. Radiographically, slight separation and elongation of the inferior patellar pole is seen on the lateral view of the knee (Fig. 5-2). Nonsurgical treatment is essentially the same as that of Osgood-Schlatter disease. All of these lesions adequately resolve by skeletal maturity without any need for surgery.

ADOLESCENT HIP POINTER

Adolescent hip pointer¹⁰ is an avulsion injury of a musculotendinous origin from its pelvic apophysis (Fig. 5-3). It may be either



Figure 5-2

Elongation of the inferior patellar pole in an adolescent with Sinding-Larsen-Johansson syndrome.

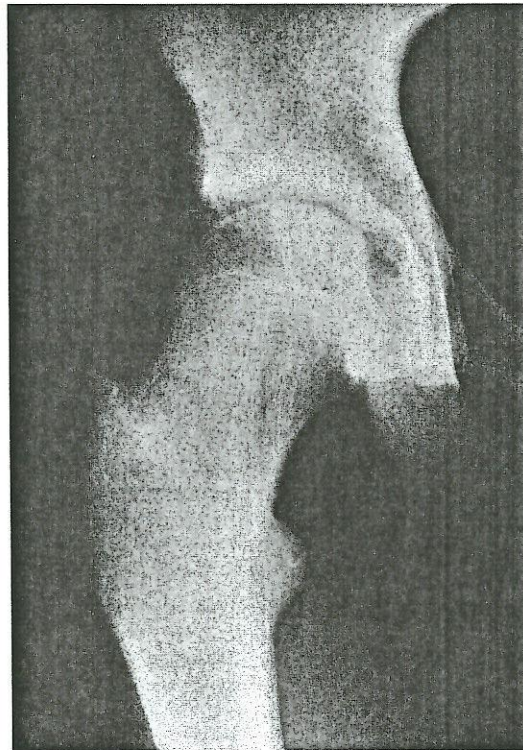


Figure 5-3

Acute avulsion fracture at anterior inferior iliac spine (adolescent hip pointer).

an acute or chronic injury. Treatment consists of rest, NSAIDs, and physical therapy modalities. These lesions heal at varying rates without the need for surgery. They are at times painful enough to require crutches temporarily.

PATELLOFEMORAL PAIN SYNDROME

Patellofemoral pain syndrome¹ presents as generalized complaints of anterior knee pain without any history of trauma. This condition is particularly prevalent in female cross-country runners. Malalignment of the lower extremity is related to the development of patellofemoral pain syndrome. The malalignment findings typically are a constellation of foot pronation, external tibial torsion, genu valgum, and increased internal rotation at the hips. This malalignment causes the patella to track abnormally laterally.

Runners with patellofemoral pain syndrome typically complain of anterior knee

pain, patellar instability, painful cracking from the patella, and the knee giving way. Their pain is increased by climbing stairs and hills.

Physical examination should evaluate patellar tracking with active knee flexion and extension. When the patella is passively pushed laterally, patients usually have apprehension from a sensation that the patella will subluxate or dislocate. The previously mentioned malalignment findings are usually present. The Q angle is greater than 20 degrees. Patellofemoral compression elicits pain.

Radiographic examination may reveal lateral tilting or subluxation on the patellar views (Fig. 5-4). A lateral radiograph may demonstrate patella alta. The normal ratio of patellar length to patellar tendon length is no greater than 1:1.2. Increased patellar tendon length indicates patella alta, and a decrease indicates patella baja.

An appropriate physical therapy program should be faithfully pursued for at least 3 months before surgery is considered. Temporary use of a patellar stabilizing brace may allow patients to remain more asymptomatic during conservative treatment. Patients with pronated feet may find benefit from orthotics.

For the occasional patient who fails to respond to conservative management, surgical intervention is considered. Arthroscopic lateral release is usually the primary procedure of choice for a runner. The rehabilitation time is much shorter than with more extensive procedures. However, the surgeon and patient must be aware that lateral release has a high rate of failure (20%) and complications. Contraindications to lateral release are patella alta and excessive passive medial glide on examination.

For those runners for whom lateral release surgery fails or for whom it is contraindicated, proximal realignment procedures may be

considered even for skeletally immature patients. Distal realignment procedures are contraindicated in skeletally immature patients but may be required for mature patients. Rehabilitation and a return to running are much more difficult for patients who undergo realignment procedures.

Adolescent and child runners also may be candidates for an additional procedure that is different from that in adults because of a child's open growth plates. Several of my patients with the malalignment syndrome and genu valgum have been successfully treated for their patellofemoral pain by distal medial femoral physeal stapling. Obviously, this technique cannot be useful in skeletally mature patients.

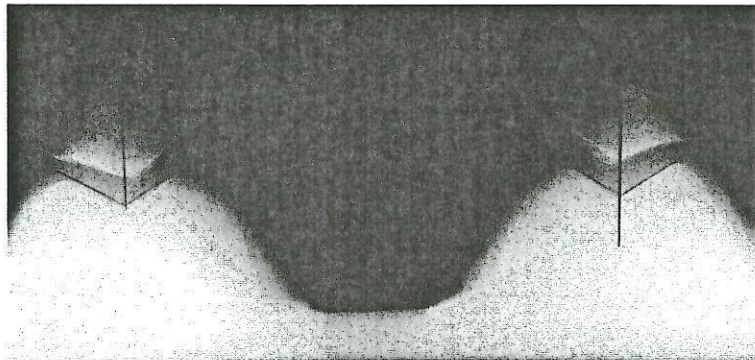
Three staples are placed, bridging the distal medial physis extraperiosteally without damage to the perichondral ring or growth plate or to the joint surface. The staples are removed after adequate correction or slight overcorrection is obtained. Some rebound genu valgum may occasionally occur after staple removal.

SEVER'S APOPHYSITIS

Sever's apophysitis^{5, 6, 9} is a painful inflammatory condition of the apophysis of the calcaneal tuberosity. The pain may also extend into the plantar fascia or tendo Achillis. Sever's apophysitis may be unilateral but most often occurs bilaterally. Heel pain occurs with weight-bearing activities. Tenderness on palpation of the calcaneal apophysis is noted on examination. An element of Achilles tendon contracture is often observed. Radiographs are essentially nondiagnostic and are taken to rule out other pathologic conditions. Treatment consists of rest or activity modifi-

Figure 5-4

Laterally tilted, mildly subluxated patellae in an adolescent girl with malalignment and patellofemoral pain syndrome.



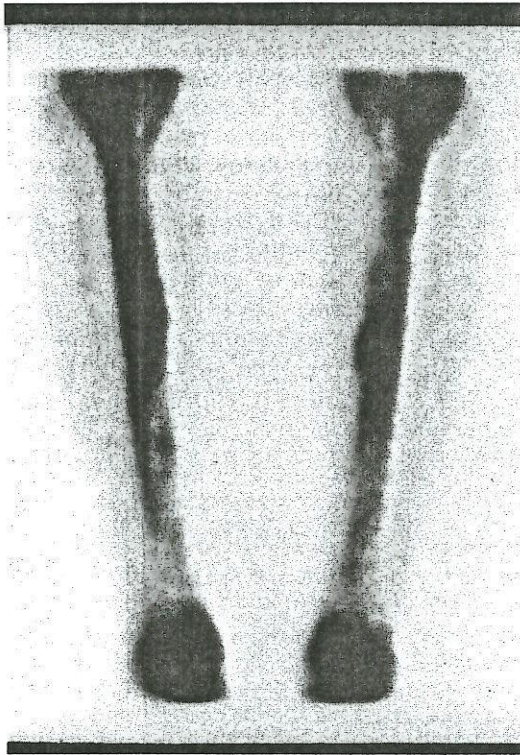


Figure 5-5

Bilateral tibial stress fractures, seen as areas of increased uptake on bone scintigraphy, in an adolescent girl.

cation, the use of viscoelastic heel cups or pedorthotics, NSAIDs, icing, tendo Achillis stretching, and in severe recalcitrant cases walking casts. Sever's apophysitis invariably resolves with closure of the calcaneal apophysis at skeletal maturity.

STRESS FRACTURES

Stress fractures are rare in young runners and not uncommon in adolescents.^{3, 4, 9} Tibial or metatarsal sites are the most common. Runners often report a history of a recent increase in miles. Bone scan is the best early

diagnostic tool because radiographs are often nondiagnostic (Fig. 5-5). Rest is required until the symptoms resolve. This typically takes 4 to 6 weeks. Orthotics and proper shoes, both for better shock absorption, help prevent recurrence, particularly in runners with flat feet.

CONCLUSION

As running continues to grow in popularity for young patients, overuse injuries will continue to become more prevalent. In general, all of the conditions described in this chapter are alleviated by modification of activity and other conservative measures. In many cases, as Frank Shorter has noted, "children are wonderfully self limiting." However, as running for sport becomes more important to young athletes and to their parents and coaches, orthopedists will continue to see increasing numbers of young runners with injuries and musculoskeletal problems.

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