

What's in a name?

Shin splints encompass a broad range of lower-leg ailments

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Allison is a 27-year-old scientist and runner who comes to the office complaining of shin pain. "Doc, my shins hurt when I run," she says. When asked, she describes a tightening pain in the soft, outside, muscular part of the shin.

"Do your shins hurt more during exercise?" I ask. "Yes, once I get past 10 minutes or so, I get this tightening feeling in my shins. It has become so bad that I can't run anymore. The weird thing is that 20 minutes after I stop running, the pain goes away, but it comes back the next time I try to run."

Jennifer, a 25-year-old physician's-assistant student and triathlete, comes in also complaining of shin pain. "I've been building my running mileage, and over the past few weeks, my shins have been aching like crazy."

When asked, she describes a pain on the bony part of the shin, the tibia, which not only hurts during exercise but also hurts when she pushes on her shin. "Ouch, that's the spot", she says, when I push on the inside of her tibia, the bigger bone in the lower leg (the smaller is the fibula).

So what do these two stories tell us about shin pain? Although both are characterized as shin splints, pain in the shin from running, the pathophysiology, meaning the biological cause of the pain, is quite different with these two stories.

Exertional compartment syndrome

Allison, the first patient, is describing muscular shin pain known as exertional compartment syndrome (ECS). ECS can occur in the front, the side or the back of the lower leg and is characterized by a tightening in the shin that worsens during exercise.

Eighty percent of ECS cases happen in the front (anterior) part of the shin, as is the case with Allison. When the region is palpated, there's no specific location of pain, and the leg is pain free except during activity.

Treatment

The treatment of ECS is initially manual therapy, using a physical therapist or certified athletic trainer to manually loosen the fascia, or wrapping around the muscle, combined with a good stretching program.

Orthotics (arch supports) and motion-control running shoes can be used to correct any existing biomechanical problems in the feet. In some cases, despite these measures, the pain with exertion simply doesn't go away. With these patients, the sports-medicine doctor will perform an

exertional-compartment test, a test using a needle to measure the pressure inside the leg before and after exercise, looking for a large pressure buildup, which confirms the diagnosis.

When the pressure difference is high, and when the other treatments don't work, a surgical procedure called a fasciotomy is performed to open the wrapping of the muscle and give it room to expand. Patients can generally return to running within two months of this operation.

Bone-related shin pain

Jennifer, the second patient, is describing bone-related shin pain. Bone-related shin pain can cover a broad spectrum of ailments from a stress injury, irritation of the bone, to a stress fracture - an actual crack inside the bone. Bone pain in the shin is different from muscular pain in that it hurts during and, especially, after exercise, and the tibia actually hurts when it's touched or tapped in the affected region.

Bone-related shin pain is more common than muscular shin pain and generally is the result of three variables: body mechanics, amount of activity and bone density.

Body mechanics, how someone is built, encompass the largest set of variables. These include foot type, often corrected with orthotics or by switching to a shoe type that limits pronation, as well as running style, which can be influenced by hip and core muscle strength.

The volume or intensity of activity can be problematic if the athlete builds either too quickly. Follow the 10-percent rule: Don't increase mileage by more than 10 percent per week.

Lastly, bone density is very important. Softer bones break more easily, so if you develop a stress fracture that can't be explained by poor mechanics or rapidly increased training, bone density might be the problem. Low bone density is called osteopenia, and very low bone density is called osteoporosis.

The causes of low bone density include genetics (it tends to run in families), poor dietary calcium intake (more than 1,300 mg per day is the recommended amount) and a history of menstrual disorders (i.e., not getting a period for more than six months in a row causes low levels of circulating estrogen).

Treatment

An MRI is often used to diagnose the severity of the injury, since stress fractures don't show up on x-rays unless they're very severe or healing. However, catching these early, especially in the stress-injury phase, is optimal.

Once the diagnosis is made, fixing the problem, and preventing the next one, is the primary concern. This might mean correcting foot mechanics with a pair of orthotics, tweaking your training schedule or getting a bone-density test called a DEXA, which scans for low bone density as a cause of the injury.

Shin splints are more complicated than they might appear at first glance. Figuring out the correct diagnosis, and then instituting the best treatment, can make all the difference.