TEAM REHABILITATION
PHYSICAL THERAPY

PT PRO-S

PT PRO-S is a monthly article for consumers of physical therapy services written by Michael Wachowiak, PT and staff therapist at the Farmington Hills 1 clinic on the southwest corner of 14 mile and Farmington Rd. This internal journal seeks to educate our community on injury, approaches to solving pain problems, and what may be causing your symptoms.

"Quit pulling my leg, doctor- IT HURTS!"

It began as a painful, pulling kind of feeling in your right thigh, maybe the day after you helped your friend move a new sofa into his house, but you're not exactly sure. It was a pain you noticed and didn't give much attention to; you figured it was a muscle strain that would go away, just as many little strains you had in the past had done.

But it didn't go away. It persisted, here and there, day after day, a pain shooting through your thigh when you stood up, or turned really fast, or rolled over in bed during the night. Then, one morning, you woke up with a ripping pain up and down your right leg, starting in your buttock, shooting down your thigh, then curling around the outside of the leg to your foot. You can barely get out of bed! Time to see the doctor. And after hearing your story and examining you, what is the doctor's verdict?

"It's your back."

My back?

"My back doesn't hurt," you tell the doctor. "I've never had a problem with my back."

"It's your back," the doctor repeats, and among the things the doctor does for you that day is give you a prescription for physical therapy. The prescription says you have a back problem, even though your back feels fine; rather, it is your right leg that feels like it has a sparking, writhing live wire inside of it.

This problem is very common, and it surely happens in doctor or physical therapy offices all over the world, every day. Its prevalence has been estimated to be 3-5% of the population, affecting both men and women.

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The problem is lumbar radiculopathy, or a "pinched nerve", and it involves inflammation of one or more of the nerve roots that extend from the spinal cord, travel through the spinal canal, then exit at one of the levels of the lumbar spine ("lumbar" is the region of the spine we generally refer to as "low back").

We have five lumbar bones, or vertebrae. Count them: 1, 2, 3, 4, 5. Put a capital "L" in front of them, and you can say "L1, L2, L3, etc…" just like a doctor or PT. We have a set of five lumbar nerve roots on each side, right and left, and these nerve roots pass behind each disc that is between the lumbar vertebrae. After passing behind the disc, the nerve roots come out of the spinal column through an opening called a foramen. The nerve roots then travel as peripheral nerves to supply sensation and stimulation to the muscles in the legs on their corresponding sides. The roots are each assigned specific areas of the legs to supply sensation to and make muscle groups in that area contract. For example, the fifth lumbar nerve root almost exclusively supplies sensation to the big toe and stimulates the muscle that makes the toe go up. Likewise, the fourth lumbar nerve root predominantly stimulates the muscles that move the ankle up, and it provides sensation to the inner part of the lower leg.

Because this apportioning of nerve roots to parts of the leg is very consistent among individuals, physical therapists can generally ascertain the spinal level(s) at which the problem is occurring. Using the previous example, a patient who presents with decreased sensation and strength of the right big toe, and possibly pain in the same toe, is most likely suffering from a L5 (lumbar/fifth nerve root) radiculopathy.

There are different reasons a lumbar nerve root might become inflamed or problematic. Generally, the usual culprits are either a protruding or herniated disc (the cushion between the spinal bones) or changes in the structures surrounding the nerve root caused by what is referred to as degeneration or, less precisely, "arthritis". Some of the changes are referred to as "bone spurs", "ligament hypertrophy", or "stenosis". These things can encroach on the nerve, irritating it and making it inflamed. They might also press directly on the nerve. Either way, they can interfere with the chemical transmission of signals up and down the nerve, signals that communicate feeling to the brain and send messages from the brain to the muscles to make them work.

But is also can hurt a lot! Nerve roots are very sensitive, especially when their outer sheath made up of what is called myelin has been affected to the point where it is a little worn.

Since nerves work through the propagation of electrical impulses created by a voltage potential, similar to the way electrical wires work, bothering them can have the effect of causing interference and random discharges up and down the path of the nerve. In electrical wires, this is manifested in the form of static, surging, or even worse, fire. In nerves, it is often manifested as pain, pain, PAIN!

Not so fast, says the body. This all sounds very simple: nerves exiting the spine get pinched or irritated, and this causes pain in the nerve root and along whatever path the nerve travels. Wrong! More often, there may be no pain in the low back, where the problem is actually occurring, and the traveling pain might decide to skip the thigh or the lower leg and go right to the foot, or it might just stop in the thigh or side of the lower leg and nowhere else.

The reason for this unpredictability is a little ambiguous and requires explanation of the membranes surrounding the nerve and concepts like pain referral, and it exceeds the scope of this article. It is helpful to know, however, that you can have a significant amount of leg pain that has nothing to do with your leg and everything to do with your low back, even if your low back feels fine.

And the good news is: physical therapy can help! Lumbar radiculopathy is one of the more common problems we treat, and we have a host of ways to treat it effectively. Physical therapy treatment can be helpful with this condition especially, because nerve pain tends not to respond as well to traditional pain and anti-inflammatory medications.

So, if you're having persistent leg pain, come to physical therapy, and we'll help get it better, wherever it's coming from!

References:

1) Berry J A, Elia C, Saini H S, et al. (October 17, 2019) A Review of Lumbar Radiculopathy, Diagnosis, and Treatment. Cureus 11(10): e5934. DOI 10.7759/cureus.5934