What Causes Knee Pain? Ligaments, Tendons, and Muscles Explained Transcript

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Introduction to Ligaments and Tendons

What is a ligament? A ligament is connective tissue that suspends the knee. So it holds it together and holds it in position. This is similar to the hinge on a door.

So ligaments will hold the joint together, in this case the knee, and tendons connect muscles to the bones to move the joint. So for you to move your leg, to straighten it, to flex it, that's done with the muscles and tendons.

But the ligaments hold the knee together. Welcome to the Natural Facts Podcast. I'm your host, Dr. David Wickenheiser. I'm a naturopathic physician with over 30 years of clinical experience.

I have a focus on natural and regenerative medicine. Through this podcast, I will be your guide, helping you to make sense of conflicting healthcare choices.

Welcome to the Natural Facts. I'm Dr. David Wickenheiser, naturopathic physician and your host of the Natural Facts Podcast.

Podcast Introduction and Episode Setup

This is the first of four interviews I recorded with Dr. Sharon Livingston for the Verve Podcast. Episode 1 is on the causes of knee pain. Hello and welcome to The Verve with your host, Dr.

Sharon Livingston. In this special series of interviews, Dr. Sharon talks with Dr. David Wickenheiser. Dr. Wickenheiser is a board-certified neuropathic physician and an expert on natural remedies for better health and disease prevention.

And now, here's Dr. Sharon. Welcome back. This is the knee pain series that we're conducting. This is Sharon Livingston. I'm here with Dr. Wick, who is a phenomenal naturopath in British Columbia in Kelowna.

And we're talking today about what are the actual parts that become injured and cause knee pain? There are three different parts. Is that correct?

Knee Pain Series and Joint Structures

There are a number of parts, Doc Sharon, and the interesting thing here with the knee is that you can have some parts that are injured not causing pain and others that are injured and do cause pain.

So let's start with the top. If you've got trauma and you've got a tear of, say, a ligament or a tendon, What is a ligament? A ligament is connective tissue that suspends the knee.

So it holds it together and holds it in position. This is similar to the hinge on a door. So ligaments will hold the joint together, in this case the knee, and tendons connect muscles to the bones to move the joint.

So for you to move your leg, to straighten it, to flex it, that's done with the muscles and tendons. But the ligaments hold the knee together. Yes, so let me make sure I understand.

So the ligaments are like the hinge on the door. The ligament is attached to the knee and also attached to? It's attached to the upper leg bone and the lower two leg bones and to the kneecap.

So the ligaments hold all of those parts in the right position, just like hinges on a door. So they're holding the bones together. Is that correct? in fact they're not just holding it together this is an oddity but this is very important they

support the joint but they'll hold the bones apart so when the ligaments of the knee are in the right position and when they are not stretched out of proportion they will actually support the knee and this is hard to understand but it'll actually hold it apart because they intersect in a certain way and when someone has got knees that the bones are too close and a doctor will say you've got bone on bone you need to replace the knee perhaps they do if the bones are broken down but what they really need is the ligaments that hold the knee in position they need them regenerated so that the knee will be in the right position What I understand is the bone connection, which I didn't quite get before.

And tell me if I'm correct about this. Tendons are connecting muscle to what?

Ligaments, Tendons, and Joint Support

There's tendons at each end of a muscle that will attach to an anchor point bone at both ends. So when a muscle contracts, it will move a bone in relationship to another one.

So if you're moving your knee joint, you're moving your lower two leg bones relative to your upper femur bone in your upper thigh. So the ligament keeps the knee in the right position, holding the bone together, but also making space.

The tendon connects the muscle to the bone, which is then connected to the knee through the ligament. Exactly. And this is a really important distinction because when we get stretched in a joint, the ligaments are stretched, muscles that were only designed to move the joint, now try to suspend the joints, try to hold it together, which it can't do, but you'll still get muscle spasm and then pinching nerves and then you'll pinch more muscles and a lot of people that have got especially low back pain may have stretched a ligament, the muscles are trying to compensate and then they start spasming and that spasm will not be fully solved until you tighten up the supporting ligaments.

So interesting. So another injury area is the muscle itself, is that correct? Oh yeah, a lot of people have got injured muscles. I have some really neat toys.

I've been told they're not toys, they're medical equipment. I love working with certain toys and one of them is my ultrasound machine because I'm able to look in to a joint.

Now, I can't look through bones, of course, that's what an x-ray is for, but I can look at the attachments of ligaments, I can look at the muscle, and there's a certain shape to the muscle fibers down within the muscle that you can see with the ultrasound.

I can actually see tears in the muscle, which may be affecting the joint. Well, how would someone get a muscle injury, for example? Well, the most common, especially in sports, is direct impact.

So if you've got a Charlie horse, did someone else knee you in the thigh? Did you hit something? Did you fall off your bike? We're watching the Tour de France road race and people are crashing their bikes and hitting the ground and hitting other bikes.

Muscle Injuries and Charlie Horses

If you've got a direct trauma to a muscle, that can cause a spasm. Another is someone is dehydrated, doesn't have the right mineral balance. They can go into having a Charlie horse.

So there's a number of different ways that you can get problems within the muscle. So tell me more about that. What is a trolley horse? Since we're there, it sounds like an interesting topic.

Your muscles are designed to contract and there's fibers that are pulling on each other's little what they call dynein arms. They reach up, grab a hold of a location and then pull up.

So you've got this system of muscle fibers that are contracting and pulling on each other with these little arms. They require energy and in the scientific world that's an energy three dollar bill if you want to think of it.

Adenosine triphosphate, so three phosphates. That little energy storage molecule, you need one to have those little arms contract. You need another to relax.

So someone can have enough energy to contract, but not relax, meaning that they'll go into muscle spasms. They may need more magnesium in their diet. They may need better circulation.

There's a number of different factors that lead to muscle tension and Charlie horses. You said something about hydration. I was curious about that. I hadn't heard that before.

What does hydration have to do with muscle cramps? We work in our body on a basis of little minerals. So you've got ions of, if you want to call it salt, then that's fine.

But this would be blood tests, your electrolytes. If you have a balance between calcium, magnesium and other minerals, you're going to be in good shape, but those minerals are held in water.

So if someone is dehydrated, if they have enough minerals, they won't be active. And that's not meaning that you drink water on Sunday and go out and play Ultimate Frisbee.

It means you need to drink enough water on the Saturday, the day before you're out there. Interesting, really interesting. So we're going to be talking more about how we handle these different issues.

Why is it important to know whether it's a ligament, a tendon, or a muscle, or all three? Well, it's important to identify wherever the injury is because that's where you need to direct the therapy.

And there's groups of therapies, but which one is the best? And this is the challenge because you can't do everything with every patient.

Hydration, Minerals, and Muscle Cramps

You need a full assessment of different diagnostic imaging. You need to look inside. You need to examine the person in a certain way. When you know if it's a ligament tear, okay, well that will take certain therapies.

If it's a tendon, it's similar but not quite. And if it's muscle, hey, we need to do that as well. So it directs the treatment and also gives us an idea of how fast the person is going to heal and get back to their life.

Oh, say a little bit about that. So if you know it's a ligament problem versus a tendon versus a muscle, what's the healing time on those various causes?

Well, let's talk a little bit about people going into gyms They want to go and lift weights or they want to go into an exercise program that they haven't been doing for a long time.

So they're getting started. There's different parts of your body that have got levels of circulation, blood supply. For example, your muscles have got great blood supply or they should when you're healthy.

And so muscles respond and heal quickly because they've got good supply. The next challenge is going to be your tendons and ligaments. They heal slower and they grow slower so your muscles can respond in days to weeks.

Your ligaments and tendons can respond sometimes in weeks up to months. I've had people that have been treated that improved in a knee.

Why Injury Location Matters for Treatment

three to four months after treatment. They continue to heal and regrow. And with the people in the gym, the third area is going to be their internal organs, their lung, their heart, their liver.

That will respond to the training, but that will take months for them to heal. Right. That makes sense. So if an injury is not getting better, why might that be?

Well, you've got to go back to the basics of why they would heal in the first place. Is it a nutrition issue? Is the body well fed? We have to evaluate that because some people respond so much quicker when they're fed well and that may be direct nutrition for the ligament, the muscle, the tendons, various parts that are injured.

So nutrition. The next is circulation. Are they getting enough blood flow into the area? Then there's another question about nerves. Nerves are very important.

They signal our movement, allow us to control our body, but also to know through the brain what's happening. We've got a fibrous covering over our bones called periosteum and it's full of nerves.

Both the tendons and the ligaments in a joint will anchor into the bone through the periosteum. If there's an injury through trauma, through wear, infection, food allergies, if that periosteum is aggravated, those nerves can affect your healing.

And what happens? Well, it can limit your healing dramatically.

Healing Timelines for Muscles, Tendons, and Ligaments

And so there are times when people need that area treated. Now, there's another part here. You may have already healed the torn ligament tendon, maybe the muscle.

That may have already happened, but you're not aware of it because you've adapted to the pain. your nerves are still misdirecting your body is where people are moving funny even after they feel for an injury in those cases we need to do treatments to reset those nerves whether it's in the period ostium maybe it's in the muscle maybe it's in the ligament or tendon there's ways of resetting so you may have already healed but your body doesn't know what we have to assess that.

And you might have healed in a way that put you out of alignment and you need to get back into alignment. Is that what I'm hearing? Oh, that's huge. Doc Sharon, you wouldn't believe how many people I've seen who have had various types of therapies that was intended to turn on healing, but actually increase the scar tissue, reduce the elasticity of the knee and predisposes that person to future injuries.

I mean, there's therapies to recover and regenerate scar tissue so that it becomes more elastic tissue the way it should be. There's ways of doing all that, but it has to be done.

You can't just keep scarring an area. And this is a challenge for me where people keep injuring the same part of their knee.

Why Some Injuries Do Not Heal Properly

They're saying, well, it's okay. I just recover. Yeah, but you're forming scar tissue and you're going to land up healing slower and slower and increasing your risk of re-injury.

Okay. This makes a lot of sense to me. I think this is a good stopping place for now. And next time I want to ask you about inflammation because a lot of people that I've heard talk about knee pain, for example, talk about swelling and pain and things that might be called inflammation.

Would that be okay if we talk about that next time? Dr. Sharon, that would be very good. Okay. So next time, what I would love to talk to you about is the idea of inflammation.

A lot of people that I know who've had knee pain and I just know anecdotally will talk about swelling and pain that they call inflammation. Could we talk about that, what inflammation really means and what to do about it?

Would that be okay for our next topic? Absolutely. You have to understand what the purpose of inflammation is. It's not just a bad guy. The inflammation has its purpose and that would be an excellent thing to talk about next.

Yes. Okay. Well, I look forward to our next talk. And folks, you can contact Dr. Wick. You can see the information below. And also, if you have questions or comments, please add them below this podcast.

Scar Tissue, Alignment, and Closing Remarks

Okay? And we look forward to talking to you soon. Bye, Dr. Wick. Talk to you soon. Thank you. I hope you enjoyed this episode of the Natural Facts Podcast.

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This is Dr. David Weckenheiser, naturopathic physician, guiding you to better health with the natural facts.