

Prolotherapy and the Athlete

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Prolotherapy is a medical procedure designed to trigger the body's strongest healing system. This form of treatment can be applied to a wide variety of injuries and other forms of bodily damage, since it can produce significant healing in ligaments, tendons, cartilage, meniscus tissue, labrum tissue, fascia and other connective tissues. How can this form of treatment be used to treat connective tissue problems that athletes commonly encounter?

First, let us briefly examine some of the body's structures, how they become damaged, and how they heal (or do not heal). We will also examine the effect of the 'standard treatments' applied to the healing system and see why these treatments are often ineffective. Then we will see how Prolotherapy, and other more effective treatments can be employed.

Connective Tissue Injury

Ligaments are like cables between two bones, allowing the bones to move, but limiting that motion. Tendons are like cables between a bone and a muscle, allowing the muscle to move the bone. Under a microscope, tendons and ligaments are hard to distinguish. Both are largely made of **collagen**, which give these structures their vast strength, and both have a huge nerve supply. Now, imagine a steel cable, made of many small steel wires, rated at 10,000 pounds of strength. Break half of the wires. Now try to support a 10,000 pound weight with the cable. What will happen? The cable will definitely start to stretch (and possibly break). Similarly, in a ligament or tendon, if you break a certain number of collagen molecules and do not replace them, your ligament or tendon will start to stretch as you put weight on it.

What problem might this stretching create? Remember, these structures have a huge nerve supply. One kind of nerve fiber is of particular interest—called a C-fiber. These are very small, so small that they do not have the typical myelin sheath around the fiber, which offers strength and protection to most nerve fibers, so they are particularly fragile. And they principally carry pain sensation. What do you think will happen when you put these fibers, which do not stretch, in a structure that suddenly begins to stretch? These fibers will begin to sustain damage every time you use the structure. And they will start to let you know this (by pain, and a variety of other symptoms). I call this condition of a ligament or tendon 'non-loadbearing'.

What symptoms do ‘non-loadbearing’ ligaments and tendons cause? There are six principle manifestations of such unhealed damage, and these are often misdiagnosed by the medical community.

- 1) The structure will hurt when you use it.
- 2) The structure may hurt randomly, or all the time
- 3) The structure, whether it is hurting or not at the time, will ALWAYS be tender when you press on it with moderate pressure. (These first three items are commonly noted in, say, tennis elbow or plantar fasciitis)
- 4) The damaged structure can send many referred symptoms to other places—pain, tingling numbness, aching, burning, etc. These symptoms are ALMOST ALWAYS misdiagnosed as due to some kind of pressure on a nerve.
- 5) The damaged structure can cause reflex muscle weakness or tensioning. This can look like not being able to fully straighten your back, or not being able to stop limping, or not being able to raise your shoulder above horizontal. It may look like back, or neck, or other muscle spasm. Basically, any muscle malfunction that lasts more than a few weeks is ALMOST ALWAYS associated with unhealed connective tissue damage, either in a tendon insertion point or in a nearby ligament.
- 6) Ligament instability. If you have a structure that stretches when you put weight on it, and you keep using this structure, what will happen? It will stretch, ultimately becoming like a stretched-out rubber band. If this happens in your ACL, your knee will become unstable and you will be much more vulnerable to meniscus and cartilage damage. If this happens in ligaments between your vertebrae, your vertebrae will over-rotate and move in other abnormal ways. What do you think will happen to your disks? They will be damaged by these abnormal forces, and may rupture. This seems an odd question, but stay with me for a moment. What would happen if you took a hammer and hit your forearm quite hard in the same place for 30 minutes, then repeated this every day for six weeks, then took an x-ray of your forearm? What would you see? Actually, what you would see is a lump of new bone forming. Abnormal contact is a stimulus for new bone formation. Now, let’s take a joint and make the ligaments 20% or 30% longer than they are supposed to be. Are you likely to do damage to the cartilage in the joint, and to other supporting structures like the meniscus and labrum? And, as the bones ‘bang together’ in the loose joint, instead of sliding smoothly against one another, what is likely to happen? New bone formation? Now, if you get an x-ray of a joint and you see loss of cartilage, and new bone formation, what will the Radiologist call it? ‘Arthritis’. What is ‘arthritis’? Although there are different kinds, I firmly believe that MOST arthritic joints are actually the inevitable mechanical outcome of loose, damaged ligaments. I also think that most back pain associated with disk damage is actually coming from the ligaments. I have a lot of clinical experience that backs up that assertion.

Very commonly, when people have symptoms of connective tissue damage, particularly with referred symptoms or muscle malfunction, imaging studies are done. Since connective tissue damage that can cause even severe symptoms often DOES NOT show

up on any imaging study, either the doctor will ‘see something’, or they will ‘see nothing’. If they see a bulging disk, or a frayed meniscus, or a bone spur, they will tell you that you have pain due to..., and they will treat..., but you will still have pain. Or, you will hear that ‘the tests are negative’—basically implying that you must not be hurting as badly as you think you are hurting, because there is really nothing wrong with you. But, if you take note of item #3 on the above list, you will find the key to proper diagnosis of these problems: a good physical examination by someone who knows what they are looking for. These structures are ALWAYS tender when you press on them.

Your Connective Tissue Healing System

Most joint pain goes away with time, or with ‘conservative’ treatment. That is because your body has a healing system. It has two healing systems, in fact, which we will now examine in some detail. One system is your everyday, wear and tear, ‘deal with the daily micro-damage and small injury’ system. Your body is in a daily tug of war between damage and healing. Every day you should repair virtually all of the damage you sustain. If you do more damage, like running or working out with weights, you should build yourself back stronger. This is the premise of all athletic training. This system is strong enough to heal most injuries, given time and support. But, what if your healing system isn’t working quite right or what if you sustain an acute, or repetitive motion, injury more severe than this system can fix? You get pain that doesn’t go away. Or, you get significant, recurring pain. These are the folks that start looking for medical treatment.

Fortunately, your body has a second, stronger healing system. Unfortunately, it is difficult to access. Most people are familiar with this system operating after a major operation. There is a huge outpouring of healing after, say, a major abdominal operation that lasts for a few weeks, then stops. Actually, this system has to be triggered by some very definite factors, it makes collagen (the principal way your body repairs damage) for right at 42 days, then collagen production stops. This ‘acute injury system’ is capable of huge feats of healing, then it goes away and does not come back. Unfortunately, the fact that you need healing will not trigger this system. It IS triggered by a group of chemicals that reside in your white blood cells (immune cells) and your platelets, collectively called ‘growth factors’. We have identified about 15 such individual chemicals. If your WBC’s or your platelets can be persuaded to release these chemicals in adequate quantity, the acute injury system is activated and the six-week healing cycle is initiated. Three things will trigger this system. A major injury, a major operation, and Prolotherapy.

Several other facts about your healing system bear mentioning. First, your ‘everyday, wear-and-tear’ healing system is also driven by a much more modulated release of these same chemicals. Therefore, both of your healing systems are totally dependant on your immune system and your platelets. Therefore, anything that impacts your immune system may effect your connective tissue healing. Secondly, your healing system, whether you are male or female, is dependant on an adequate quantity of testosterone (the male hormone), and DHEA being available. In females, progesterone also plays a small

role in connective tissue healing. Females do not have MUCH testosterone, but they do have some. If their level of testosterone or DHEA is abnormally low, it WILL compromise the connective tissue healing system. There is a group of women who tell me, "I was fine until a couple of years ago, and now my whole body is falling apart". The vast majority of these women have abnormal levels of the hormones mentioned above. Thirdly, your connective tissue healing depends on an adequate supply of Human Growth Hormone (HGH). This chemical is released primarily during stage III and IV sleep (the deepest sleep). If you have a sleep disorder, or do not get adequate sleep, you will compromise your connective tissue healing.

Treating Athletic Injuries

So, what does damaged, unhealed connective tissue look like in an athlete? Different sports have different common injury patterns. Things that I commonly see are with running sports are: Plantar fasciitis, 'Morton's Neuroma (pain in the ball of the foot that is usually attributed to a 'neuroma', but which is almost always actually ligament damage of the metatarsal/phalangeal joint of the toes), ankle sprains or ankle instability, 'shin splints', knee pain, damaged knee ligaments, torn meniscus, 'chronic' hamstring pain or tightness, hip pain due to damage to the capsular ligament and capitis femoris ligament (often associated with 'arthritic findings'), damage to the multiple ligaments in the pelvis and sacroiliac joint, damage to tendinous insertions in the gluteals and piriformis muscles, and damage at various points along the iliotibial band. Golf, tennis, and other sports that rely on rotation of the lower spine and pelvis often produce damage in the sacroiliac and iliolumbar ligaments. Throwing sports (including golf and tennis) commonly produce painful connective tissue damage in the elbow and/or shoulder. Weightlifting and wrestling obviously put your whole body at risk for connective tissue damage. Neck, low back, and knees seem especially vulnerable in these sports. Gymnastics often produces injuries of the shoulder, elbow, and ankle.

How can Prolotherapy help these various sites of damage? If you trigger the 'acute injury healing system', you can successfully heal damage (even long term, chronic damage), in any ligament, tendon, cartilage surface, meniscus, labrum, or fascia. This requires injecting a 'proliferant solution' into the damaged structure, which in turn triggers the white blood cells and/or platelets to release the 'growth factors' mentioned earlier. The proliferant selections that I use can trigger 80% to 90% of people to heal. If the healing process can be triggered, it is simply a matter of time, and an adequate number of inductions of this healing process, before structures are rendered 'load bearing' and pain, and other symptoms, stop. The average number of inductions of the healing system that are necessary in my patient population is about 4 for any area, with the range being one treatment to about six treatments, usually given at monthly intervals. It is very rare to need more than six treatments in a give area. Again, the ultimate success rate for treating any of the above connective tissue problems is 80% to 90%.

I sometimes need to rectify problems in people's connective tissue healing system. This may include treating hormone deficiencies with bio-identical hormone replacement, evaluating food allergies or other immune system stressors, and altering diet, supplements, medications, or habits.

If, on the other hand, you want to significantly increase the chances that you will turn short term connective tissue pain into chronic, severe connective tissue pain, there are three things you can do. Coincidentally, these treatments are commonly offered for connective tissue pain. First, put ice on your injuries. You will feel better faster, but you WILL NOT HEAL your connective tissue damage. Secondly, take non-steroidal, anti-inflammatory drugs (NSAID's), like Advil, Aleve, Motrin, Celebrex, Mobic, etc. Remember, healing is mediated by your white blood cells (sometimes called 'inflammatory cells'). If you take an 'anti-inflammatory', what are you doing? Impairing the function of your white blood cells, and among those functions is putting out the growth factors that produce healing. And, thirdly, when steps one and two lead to more severe pain, go get a Cortisone shot. This will REALLY impair your connective tissue healing body-wide for a few weeks, although it may make you feel better in the short run. Not that everybody who uses ice, or takes NSAID's, or gets a steroid shot WILL develop a chronic problem. Some do not. But, many do. What is the alternative path to chronic connective tissue pain?

Heat any injury. Do not use ice EXCEPT FOR AN ACTUAL MUSCLE INJURY. The RICE strategy was developed to avoid 'compartment syndrome' following MUSCLE injuries in the 1970's. DO NOT USE THIS STRATEGY FOR CONNECTIVE TISSUE INJURIES. I know this is countercultural, and even sounds radical, but try it and see if it does not work better for you. I can cite many examples of athletes in my practice who have proven this point for themselves. Use pain-killers other than NSAID's if you need pain relief. There are various over-the-counter and prescription options. Then, if you get an injury that does not heal and continues to produce pain or other symptoms, try the usual 'conservative' therapies—massage therapy, chiropractic, physical therapy. If your injury is more severe than these 'conservative' therapies will heal (or if it is a situation where surgery may be an option, like a rotator cuff tear, ACL tear, or a torn meniscus), then consider Prolotherapy.

I have an extensive website that explains this treatment (ProlotherapyNashville.com), and there are other extensive resources on the net. Dr. Ross Hauser has authored several books, notably one on Prolotherapy and sports injuries. The GetProlo.com website has many resources, including his books. Or, you can call me, or talk to one of my patients. I am always happy to discuss this treatment option (office number 615-506-0536).

Athletes are often very dedicated to their sport. It is a tragedy when a curable connective tissue problem steals your enjoyment, or steals your sport altogether. It has been very gratifying to me personally to participate in many, many people 'getting their life back', as their connective tissue pain is cured. If you have connective tissue pain or joint instability, I suggest that you fully investigate Prolotherapy as an option.

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