If I Only Knew How My Body Heals

An overview of the normal healing process

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This month's column started by being a simple answer to one of our reader's pertinent questions. After writing for over a page, I decided that I should probably share most of this interesting information with my readers and turn it into a regular column. So Philip, you will find an answer to your question, intertwined with some more information (that is just a strategy to make all of you read my entire column!).

Question

About five months ago, I ripped the right leg's long, skinny calf muscle called the *Gastrocnemius*, and was on crutches for a few weeks and then hobbled for a while longer. Following four sessions of excellent physical therapy, I was able to return to brisk walking, then later gentle jogging, and finally regular training. However, one reminder of the injury remains, and I'm unclear whether it will likely last forever or not; my therapist indicates that he's not really an expert in sports training. At the back of my knee, when I work out hard or hike for more than maybe half an hour, I notice a feeling of stiffness and something like swelling. Yes, I still do the stretching exercises recommend during the physical therapy sessions. Everything else about the torn muscle feels normal again, but I'm wondering whether the old remnants of that shredded muscle will forever remind me of the injury and whether I should do anything further to return to full-on orienteering and rogaining. If it matters to your answer, I'm 53 and in reasonably good health.

Cheers, Philip (CROC)

Answer

Dear Philip,

There are two things that could be responsible for the pain you have been experiencing. One is of course better and easier to deal with than the other… let's begin with the brighter option.

The three healing phases

You may have some nasty scar tissue left from the damage done to your muscle. Here is how it usually happens: when a muscle rips (or any other tissue in our body), the first healing phase you go through is called *Acute Inflammation*. In this phase your white blood cells (called leukocytes) begin cleaning up the mess made by the broken cells by causing a flood in the area where many chemicals are released. That explains the swelling and heat present in the area after a fresh injury. Then the bottom feeders (called macrophages) invade the area. They will begin in the second phase to digest the broken down cell parts and secreting enzymes and hormones, necessary to normal healing. This first phase begins from the moment you injure yourself and lasts about four days.

Then you move on to the *Granulation Phase*. The clean up continues, but also the growth of new blood vessels and generation of ground substance in which the cells float (called interstitial fluid) begins. They attract additional types of white blood cells, fibroblasts, to the site of injury. These migrate to the damaged area and make massive amounts of ligamentous/fibrous blocks (called collagen fibers). That second phase will last anywhere from 10 days to about two weeks.

The last phase is called *Wound Contraction*. In this phase, the new collagen fibers are organized through a complex process into muscle fibers (or tendon, ligament, skin… depending on what type of tissue got injured). The collagen fibers winding about each other and contracting become shorter and tighten the muscle (or tendon, ligament, skin…). The fibroblasts remain on the site after all the other clean-up cells begin to disappear (they are reabsorbed by your body), continuing to secrete collagen and strengthening the new fibers for several months. When the whole healing process is successful, the new fibers are returned to their normal length and strength and the tissue (the Gastrocnemius muscle in Philip's case) to its normal function.

Should the injury be too severe or the fiber disruption perpetuated by abnormal activity (returning to normal activities too fast can be a factor) or too much swelling, the fibers could heal in an elongated way (making ligaments looser and therefore more prone to recurrent sprains – see *How to avoid a recurrent ankle sprain* ONA February 2001) or in a disorganized fashion that could create some nasty scar tissue.

Scar tissue usually creates stiffness-type pain as the new fibers do not have the mobility required to become flexible, creating a *cord* in the muscle. The pain is usually fairly localized as it comes from those fibers that are feeling like a rock in your muscle (commonly called a *knot*), right in the area that was initially damaged. Philip - if this feels like what you have been experiencing, the best way to get rid of this extra scar tissue is to go for Deep Tissue Massage, usually performed by registered massage therapists. They will most likely dig deep into the muscle and friction it (yes, it is uncomfortable at the time). Some PT's might also be able to do that kind of work for you – you might ask the PT that helped you recover.

And now for the bad news

Now Philip, if on the other hand the swelling you described is quite significant, and localized right behind the knee, there is a chance you might be dealing with what is called a *Baker's Cyst*. A Baker's Cyst is a *bubble* in the capsule of the knee joint, a pocket in the back of the knee where the swelling can escape and stay. It sometimes happens after rupturing knee ligaments like the Anterior Cruciate Ligament (ACL), but the Gastrocnemius as it crosses the knee joint might have caused some damage there as well and ripped part of the capsule. If this is the case, the liquid found in that pocket usually needs to be suctioned out and analyzed to make sure there is no blood in the collected fluid. The problem with a Baker's Cyst is that the pocket usually stays in place, so you become prone to a recurrent problem – that was the bad part of my lecture.

So for all of you out there, healing your body requires significant amounts of energy. When you rip a muscle or sprain a ligament, stay off the damaged limb and give it a chance to heal. You will need plenty of rest anyway to allow your body to conduct the reparation procedure, so that is another good reason to rest the damaged limb. If you follow this piece of advice, you increase the chances that the healing process will go normally and that you will fully recover from your injury. Think about it if you want to continue enjoying the outdoors…