Compartment Syndrome

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What is a compartment syndrome?

A compartment syndrome is a painful condition where the pressure within a muscle builds up to a point where it produces severe pain. This can occur in any muscle but is very common in the muscles of the leg but may also be seen in small muscles of the feet and hands and forearm.

What are the symptoms?

The major symptom of a compartment syndrome is the development of pain. When a person runs, the muscles tend to fill up with blood and swell. In a compartment syndrome, the sheath or casing around the muscle is very tight and unable to stretch. As the muscle swells with running, it gets to a point where it cannot swell anymore and the pressure inside that muscle produces pain.

The typical history is that people are able to walk or jog without pain but as they run harder they start to develop pain in the involved muscle. If they continue to run the muscle gets more and more painful and almost always necessitates the person stopping their run. When they stop running the pain gradually resolves and they are able to run again but the pain will again build up until they have to stop. There are some associations with this pain. The first is that the muscle will go quite hard to the touch and also since nerves run through some muscles there will often be some associated numbness in the top of the foot.

What causes compartment syndromes?

There needs to be some abnormality with the sheath around the muscle such that it cannot allow for the normal swelling of the muscle. It is believed that this probably relates to previous injury or a rapid exercising program that builds up muscle size too quickly for the sheath to grow to accommodate it.

What are the risks?

Unfortunately, the pressure inside the muscle can build up to pressures as high as the blood pressure of the arteries pumping blood into the muscle. If the person continues to exercise with severe pain then the muscle will not get enough oxygen and almost certainly will start to break down. This is certainly a complication that we see following fractures and unfortunately people who continue to exercise with a compartment syndrome they may permanently damage their muscle.

Are any tests needed?

Certainly this diagnosis needs to be confirmed because of its importance. The only method of definitely assessing the pressure in the muscle is to perform compartment pressure testing. This test involves passing a small needle into the muscle and measuring the pressure within the muscle before the person starts exercising. The person is then sent off for a run and they come back when they have the pain. The needle is past into the muscle a second time and the pressure recorded again. It is through this that compartment syndromes can be diagnosed.

Often xrays and/or bone scans will be performed because of the confusion between this condition and stress fractures and shin splints.

What can I do to treat this?

There is a lot of belief that changing running style, shoes and the use of orthotics may reduce the severity of a compartment syndrome. This is certainly well worth a trial in minor cases. Unfortunately, if the syndrome is quite severe then none of these treatments will work.

What treatments are available?

The only long term cure for this condition is surgery. The operation involves cutting the sheath around the muscle over the full length of the full muscle so that exercising muscle can expand as it should. Whilst this operation will leave a scar, the relief of pain is almost immediate.

What is the long term outcome?

People who have had surgery for a compartment syndrome will have rapid relief of their pain and a very rapid return to normal exercising program. Really, the compartment syndrome will re-occur if the scar tissue develops over the muscle sheath with healing.