

# Case study on compartment syndrome essay sample



**Objective:** To describe the evaluation, diagnosis, and current treatment of a men's soccer player with compartment syndrome of the forearm.

**Background:** The forearm is the most common site for compartment syndrome in the upper extremity. The compartments of the forearm include the volar (anterior or flexor), and the dorsal (posterior or exterior). Both bone forearm fractures and distal radius fractures are common initial injuries that lead to acute forearm compartment syndrome. The flexor digitorum profundus and flexor pollicis longus are among the most severely affected muscles because of their deep location, closest to the bone.

**Differential Diagnosis:** Other possible injuries and conditions which need to be ruled out include stress fractures and fractures of the radius and ulna.

**Treatment:** The treatment goal, as with most athletic injuries, is to restore the athlete's injury, pain free, with functional abilities similar to that prior to the injury. We aimed to restore circulation to the compartment through decompression. The main treatment the athlete endured was ultrasound modality, allowing the tissue to heal.

**Uniqueness:** Acute compartment syndrome is most common in the legs. The incidence of compartment syndrome is greatest where there are smaller compartments enveloped in tight sheath, which include the forearm and the lower leg.

**Conclusion:** The prognosis depends on the intensity and duration of the compartment pressure. Acute compartment syndrome results from fluid pressure in a closed compartment. If left untreated, it can lead to more

severe conditions including rhabdomyolysis and kidney failure, potentially leading to death.

#### Personal data/ Signs and Symptoms

The athlete is a 20-year-old male soccer player for Kansas Wesleyan

University. He is 5 foot 11 inches tall and weighs 175 pounds. The athlete was slide tackling for a ball when an opposing player landed on his forearm, hyper extending his elbow. He complained of immediate numbness and tingling throughout the lower arm. He has immediate decrease grip strength, but sensation was fine throughout the lower arm, elbow and upper arm. Our initial assessment was hyper extension of the elbow, stretching of the medial nerve, and compression of the ulnar nerve. We made the athlete see the doctor to rule out other possible injuries. Assessment and Diagnosis

The athlete was seen by Dr. Harbin the day after the injury occurred. There was no apparent deformity or discoloration at this time. He had moderate inflammation in his left elbow and forearm. His range of motion is decreased, along with his flexion and extension. He is most comfortable with his elbow in about 10 degrees of flexion. He can feel sensation with touch and temperature change, but is feeling some numbness and tingling of his forearm. He was experiencing pain and inflammation along volar extensor aspect of the forearm and pronator. At this point, it was evident that his hand had inflammation. He has posterior hematoma as well. The athlete had both decreased flexion, and extension of the forearm. His flexion and extension of the wrist were within the normal limits, but seemed to be quite a bit slower than normal. When going through the series of tests, they were

all negative. The only positive test was Tinel's sign. I performed both, valgus and varus stress tests at both 0 degrees, and 30 degrees. They were negative as well. The athlete was then diagnosed as having compartment syndrome for the forearm. We will work on his range of motion, three days a week. The athlete must be functionally tested before we can release him to play. Will test him in one week. Differential diagnosis

Compartment syndrome occurs when excessive pressure builds up inside an enclosed space in the body. It usually results from bleeding or swelling after an injury. The dangerously high pressure in compartment syndrome hinders the flow of blood to and from the affected tissue. Compartment syndrome can be either acute or chronic. Acute compartment syndrome is a medical emergency. It is usually caused by a severe injury. And without treatment, it can lead to permanent muscle damage. Chronic compartment syndrome, also known as exertional compartment syndrome, is usually not an emergency. This is most often caused by an athletic exertion. Because the fascia does not stretch, this can cause increased pressure on the capillaries, nerves and muscles in the compartment. The blood flow to the muscle and nerve cells is disrupted. Without a steady supply of oxygen and nutrients, the nerve and muscle cells can be damaged. Compartment syndrome most often occurs in the anterior compartment of the lower leg. But can also be present in other compartments in the leg, as well as the arms, hands, feet and buttocks.

The pain and swelling of chronic compartment syndrome is caused by exercise. Athletes who participate in activities with repetitive motions, such as running, biking, or swimming, are more likely to develop chronic

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compartment syndrome. This is usually relieved by discontinuing the exercise and is usually not dangerous. Acute compartment syndrome usually develops after a severe injury such as a broken bone. Rarely does it develop after a relatively minor injury. Conditions that may bring on acute compartment syndrome include: a fracture, badly bruised muscle, reestablished blood flow after block circulation, or constricting bandages.

The classic sign of acute compartment syndrome is pain, especially when the muscle within the compartment is stretched. The pain is more intense than what would be expected from the injury itself and using or stretching the involved muscle increases the pain. There may be tingling or burning sensations in the skin. The muscle will probably feel tight or full. The numbness is a later sign, and could indicate permanent tissue damage.

Chronic compartment syndrome causes pain or cramping during exercise and the pain will probably subside when the activity stops. Most often occurs in the lower legs. Some of the symptoms include: numbness, difficulty moving the extremity, and visible muscle bulging.

To diagnose chronic compartment syndrome, you must first rule out other conditions that could also cause pain like this. For example, to rule out tendonitis, your physician should apply pressure on the tendons in the area. You may want to get an x-ray to make sure that a stress fracture is not present. To confirm the syndrome, the pressure in the compartment must be measured before and after exercise.

Physical therapy and anti-inflammatory medicines are most often suggested. Although, they have had no definite results for relieving symptoms. The

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symptoms could subside if the activity that caused the condition is avoided.

The surgical treatment may be an option. It is designed to open the fascia so that there is more room for the muscle to swell. Clinical Case

This case was treated and rehabilitated for most of the season. As the end of the season approached, the athlete was still having some pain and discomfort, but had decreases significantly. In the beginning the left arm showed signs of hyper extension. After further evaluation by the doctor, we concurred that it was compartment syndrome, and that he must be functionally tested before he was released to play. After a week of rehabilitation, using ultrasound, ice, and ice massage, the athlete returned to the field. After the game, the athlete had decreased flexion of the elbow and extension of the fingers with wrist extension. we had him see the doctor again. The doctor allowed the athlete to play as tolerated and to continue with treatment as he had been.

We scheduled x-rays for the following day to rule out any fractures. After receiving the x-ray, which indicated a mid shaft ulna fracture. The athlete was then scheduled for surgery and had a rod placed in the shaft of the ulna, through a small puncture hole. He was placed in a splint for 10 days. After the 10 days, he returned to rehabilitation. We continued with ice, ice massage, and therapeutic ultrasound. Therapeutic ultrasound was utilized to aid in circulation of blood flow. The athlete was able to return to practice after the 10 days in the splint. We were able to wrap the athletes forearm so he could return to play with minimal pain. He wore the splint for the rest of the season and showed very little pain. Significance/ Discussion

The prognosis depends on the intensity and duration of the elevated compartment pressure. Therefore, time is of the essence in the management of compartment syndrome. If clinical findings or pressure reading are suggestive, but not conclusive, it is good to get a second opinion. With this athlete if he wouldn't have kept going to see the doctor, we might not have caught his fracture and the bone could have grown back abnormally and caused more damage. Failure to relieve the pressure of compartment syndrome can result in necrosis of tissue in that compartment, since capillary perfusion will fall leading to increasing hypoxia of those tissues. This can then cause Volkmann's contracture in the affected limbs. If you can decompress the area, it will relieve the pressure and increase the blood flow throughout the muscle.