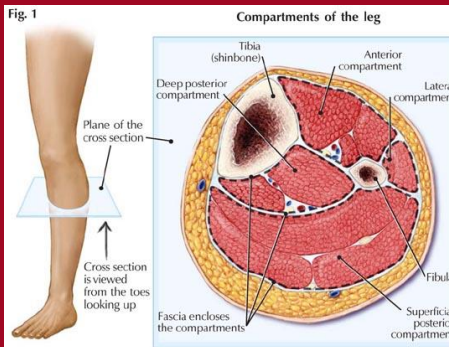


EM CASE OF THE MONTH

BROWARD HEALTH MEDICAL CENTER DEPARTMENT OF EMERGENCY MEDICINE



Compartment Syndrome is the buildup of pressure in a compartment that is surrounded by inflexible fascia. The increase in pressure prevents adequate blood flow to the muscle and nerves. It is important to recognize early because delayed diagnosis can result in permanent damage or loss of limb.

EM CASE OF THE MONTH

EM Case of the Month is a monthly “pop quiz” for ED staff. The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.



Acute Compartment Syndrome

A 32 year old male is transferred to Trauma from Plantation General Hospital following a gunshot wound to his right calf. He says he has been walking on it for an hour prior to going to the hospital but the pain and tightness has gotten worse and he can no longer walk.

His vital signs are T 98.8, HR 80, RR 20, BP 140/85, O2 sat 98%. There is an entry wound on the medial calf and an exit wound laterally. There was a significant amount of swelling and pain. He has motor function, sensation and palpable pedal pulses bilaterally. X-ray showed no fractures. The patient was given antibiotics, IV fluids, and the wound was dressed.

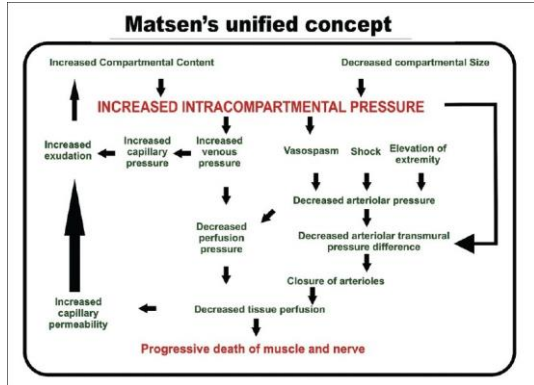
An hour later, the patient was re-assessed. He says the pain has been getting worse. He had significant pain to passive movement of the ankle and toe, and decreased sensation to the first web space. It was determined that he had compartment syndrome and he was taken for immediate surgery.

What is the most important early clinical sign for compartment syndrome?

- A) Paresthesia in the distribution of a nerve root
- B) Incompressible compartments upon palpation
- C) Disproportionate pain with passive flexion of the big toe
- D) Decreased pedal pulses
- E) Paralysis of the distal limb



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Acute Compartment Syndrome

The correct answer is C. While all of the answer choices are possible symptoms of compartment syndrome, most don't appear until after irreversible damage has been done. Therefore, the most important early symptoms are pain with passive flexion/extension and progressive pain.

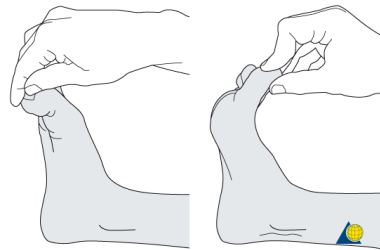
Compartment Syndrome occurs when pressure in a muscle compartment builds due to the swelling against the closed ridged, inflexible fascia membrane. As the pressure builds the arteriolar pressure cannot overcome the compartment pressure and local blood supply is decreased, and cannot meet the metabolic demands of the tissue and anoxic tissue necrosis occurs.

The build of pressure is most often due to trauma, but any condition increases the fluid in a compartment can result in a compartment syndrome including vascular injury, ischemia-reperfusion, and nephrotic syndrome.

Fractures are present in 75% of patients with compartment syndrome, however the lack of fracture does not exclude compartment syndrome. The most common site is the lower leg followed by the forearm.

Take Home Points

- Compartment Syndrome can cause permanent damage if diagnosis is delayed. A high suspicion is necessary especially with major trauma.
- Early signs include significant pain with passive motion and progressive pain.
- If unsure, you can use manometer to measure the compartment pressure
- Diastolic BP – CP = less than 30 = Sx
- It is not necessary to measure the compartment pressure to diagnosis
- The only treatment is surgical fasciotomy



For a list of educational lectures, grand rounds, workshops, and didactics please visit

<http://www.BrowardER.com>

and click on the "Conference" link. All are welcome to attend !

Signs and Symptoms

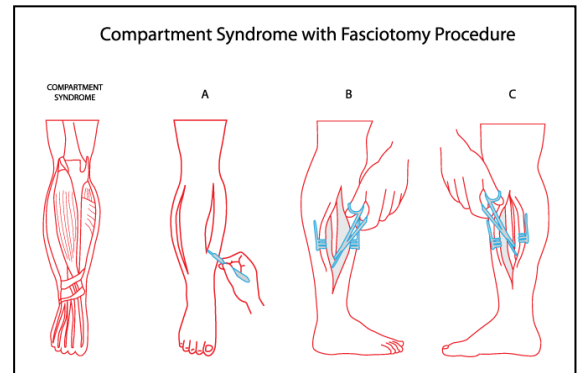
- Pain out of proportion with passive flexion/extension
- Progression of the pain
- Paresthesia in a nerve distribution pattern or “pins and needles”
- Paralysis or muscle weakness
- Pulselessness or diminished pulses
- Poikilothermia (cold)
- Pallor
- Pressure upon palpation

If unsure of the diagnosis, you can measure the pressures of the compartment using a manometer. The most accepted criteria is

- Diastolic BP – Compartment Pressure = less than 30mmHg

Treatment

There is no non-surgical treatment for compartment syndrome, and elevation the legs will actually increase the pressure. If compartment syndrome is suspected, immediate surgical fasciotomy is necessary to prevent irreversible damage. Compartments should be left open with sterile dressing for 48 – 72 hours.



THIS WEEKS CASE PRESENTATION WAS WRITTEN BY JONATHAN CHAPEKIS. JON IS A FOURTH YEAR MEDICAL WHO ROTATED IN FEBRUARY. HE PLANS TO GO INTO ORTHOPEDIC SURGERY.