What is Muscle Compartment Anatomy?

Worksheet

A muscle compartment is a group of muscles, nerves, and blood vessels enclosed by deep fascia that share a common action and nerve supply; the limbs are divided into anterior, posterior, and (in the leg) lateral compartments.

Questions

1. Which structure defines the boundary of a muscle compartment?

A) Deep fascia
B) Skin
C) Periosteum
D) Tendon sheath

2. What is the earliest reliable sign of acute compartment syndrome?

A) Absent pulse
B) Pain on passive stretch
C) Pallor
D) Paralysis

3. The anterior leg compartment is supplied by which nerve?

A) Tibial nerve
B) Superficial fibular nerve
C) Deep fibular nerve
D) Sural nerve

4. Why is compartment syndrome an emergency?

A) It causes only mild bruising
B) Sustained high pressure causes irreversible muscle/nerve necrosis within hours
C) It only affects skin
D) It resolves without treatment

5. A patient has severe leg pain after a tibial fracture, worse on passive toe stretch, and a tense swollen anterior leg. Which compartment is likely affected and why?

6. Which nerve is most likely injured if a patient loses sensation in the first dorsal webspace of the foot after anterior compartment syndrome?

7. In the forearm, a laceration damages the muscles that flex the wrist and fingers. Which compartment and nerve are involved?

8. Define: What is a fascial compartment?

9. Define: Name the three compartments of the leg.

10. Define: What causes compartment syndrome?

Answer Key

1. A) Deep fascia - Deep (investing) fascia forms tough, low-compliance walls around each compartment.

2. B) Pain on passive stretch - Pulse loss, pallor, and paralysis are late signs; disproportionate pain on passive stretch appears first.

3. C) Deep fibular nerve - The deep fibular (peroneal) nerve runs with the anterior tibial vessels in the anterior compartment.

4. B) Sustained high pressure causes irreversible muscle/nerve necrosis within hours - Untreated pressure above capillary perfusion pressure causes ischemic necrosis, often within 4-8 hours.

5. Pain with passive stretch of toe extensors points to the anterior compartment Anterior compartment houses tibialis anterior, EDL, EHL and the deep fibular nerve Tense swelling + disproportionate pain = classic acute compartment syndrome This is a surgical emergency requiring fasciotomy

6. The anterior compartment carries the deep fibular (peroneal) nerve The deep fibular nerve supplies sensation to the first dorsal webspace Compartment pressure compresses the nerve before muscle necrosis Expect numbness there as an early warning sign

7. Wrist/finger flexors lie in the anterior (flexor) compartment of the forearm Most are supplied by the median nerve, with the ulnar nerve to 1.5 muscles Compartment fascia separates them from the posterior extensor group Damage here impairs grip and finger flexion

8. A group of muscles, nerves, and vessels enclosed by deep fascia, sharing a common function and nerve supply.

9. Anterior, lateral, and posterior (often split into superficial and deep posterior).

10. Swelling or bleeding inside a fascia-bound compartment raises pressure until it cuts off blood flow to muscles and nerves.