Acute compartment syndrome: A case report & associated small group worksheet to supplement musculoskeletal curriculum for pre-clinical students' learning

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Introduction

- Acute compartment syndrome = limb-threatening orthopedic emergency
- 5 P's (pain (w/ passive stretch), pallor, paresthesia, paralysis, pulselessness)
- During pre-clinical education, exposure to MSK pathology is limited and often inadequate, shown by Peeler et al (1)
- Thus, vital to highlight even routine cases of traumatic MSK problems to the learning mind
- Robert et al has shown supplemental content, such as online modules, has been beneficial to aid in learning MSK content (2), so we have decided to include a supplemental worksheet to aid in understanding this case

Objective

To provide a case report and supplemental worksheet to aid in the education of MSK disease for pre-clinical students, due to inadequacies of MSK curriculum in this phase.

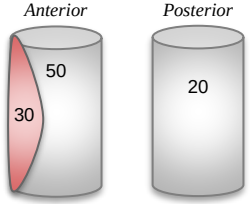
Case Description

- Day of presentation
  - Leg stuck between lawn mower and pole
  - X-ray confirmed open fx, started IV Cefazolin & topical Bacitracin
  - Intramedullary fixation & distal tibia nailing, with deep posterior release
- POD 1
  - 10am: + paresthesia of toes and plantar foot, compartments not tense
  - 1pm: increased pain with passive stretch, paresthesia up to knee, anterior compartment tense
  - Decision was made to do fasciotomy, and at this time patient's diastolic pressure (P) was 79 mmHg

Case Description (cont'd.)

Δ P = diastolic pressure – compartmental pressure
If Δ P < 30, it is strongly suggestive of compartment syndrome

R Lower Leg Compartment Pressures



Compartment	Δ P
Anterior	29
Lateral	49
Posterior	59
Deep posterior	previously released

Outcome
- Kept on Abx for two weeks post-op
- Therapy and WB began one-month post-op
- At 2-month mark, patient came in with incision site infection, was given week course of Bactrim
- Currently healing well with no gross motor or sensory deficits

Discussion

- Acute compartment syndrome is a rapidly progressing injury, must keep high on differential, even if only pain with passive stretch and paresthesia are present
- Serial physical exams are required to ensure timely intervention
- This case and supplemental worksheet provided can be used in an incomplete MSK curriculum
- Next steps: design a study to find if there is a measurable improvement on a standardized MSK exam when utilizing this case and worksheet versus not

1. Peeler J, Mann S, Orchard T, Yu J. Inadequacies in Undergraduate Musculoskeletal Education-A Survey of Nationally Accredited Allopathic Medical Programs in Canada. Am J Phys Med Rehabil. 2024 Jul 1;103(7):624–31.
2. Robertson K, McNulty MA, Natoli RM, Stout J, Ulrich G. Musculoskeletal Clinical Online Cases With a Focus on Anatomy for Preclinical Learners. MedEdPORTAL. 2024;20:11457.