

Bilateral Lower Extremity Exertional Compartment Syndrome: A Rare Case Report

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PURPOSE

Chronic exertional compartment syndrome is a debilitating condition, particularly affecting young, active individuals. The incidence of CECS in the lower extremity ranges from 14-27%¹. Presentation of bilateral CECS is rare with scant literature available. CECS is evenly distributed between males and females². The median age of presentation is 20 years old². Common symptoms include pain, muscle cramping, and paresthesia. Intramuscular compartment testing is one of the most reliable methods for diagnosing this condition. However, it can be misdiagnosed between 10-64% of cases with as high as a 22-month delay in diagnosis³. This case report offers valuable insight into the identification, management, and treatment of bilateral CECS.

CASE STUDY

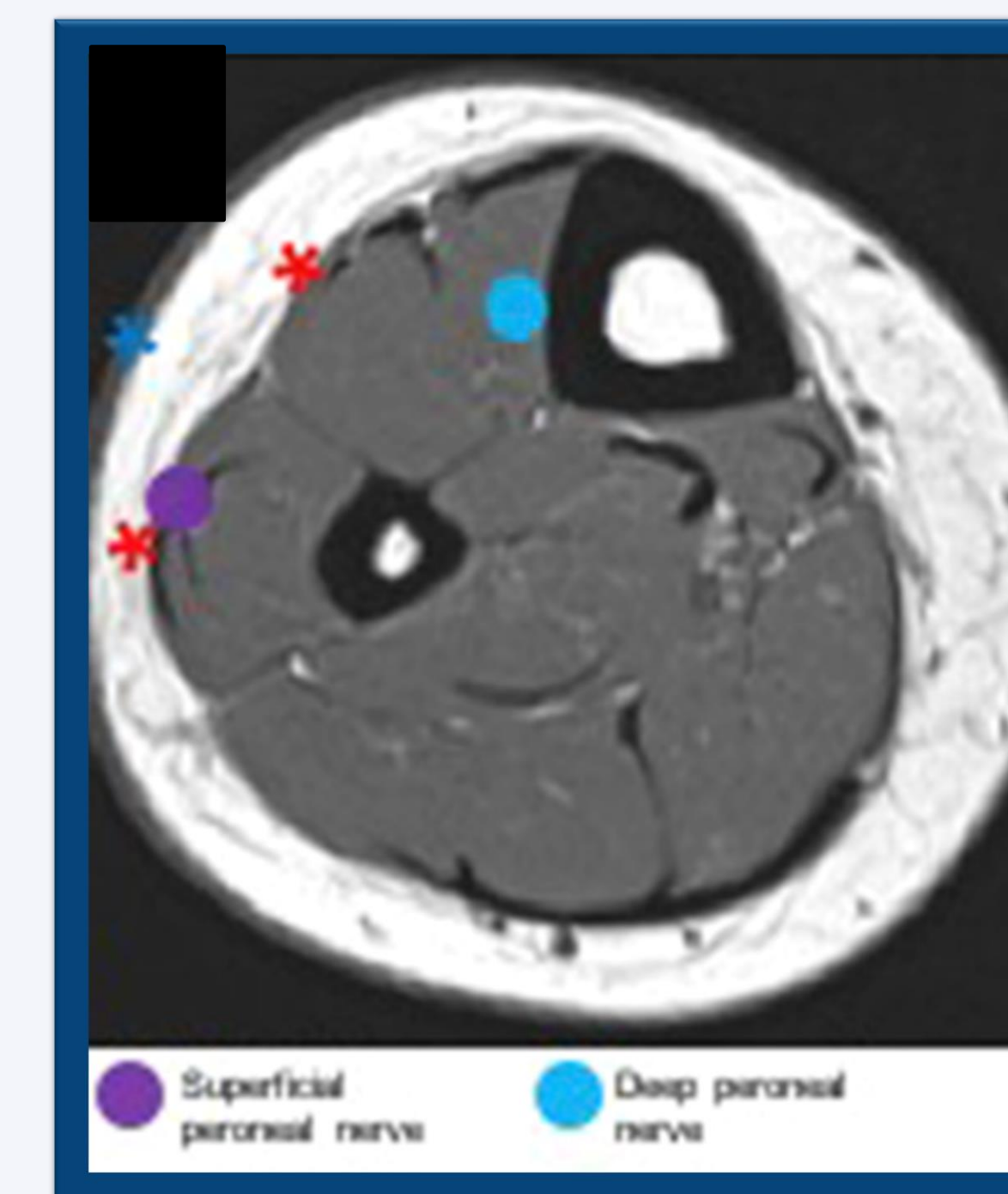
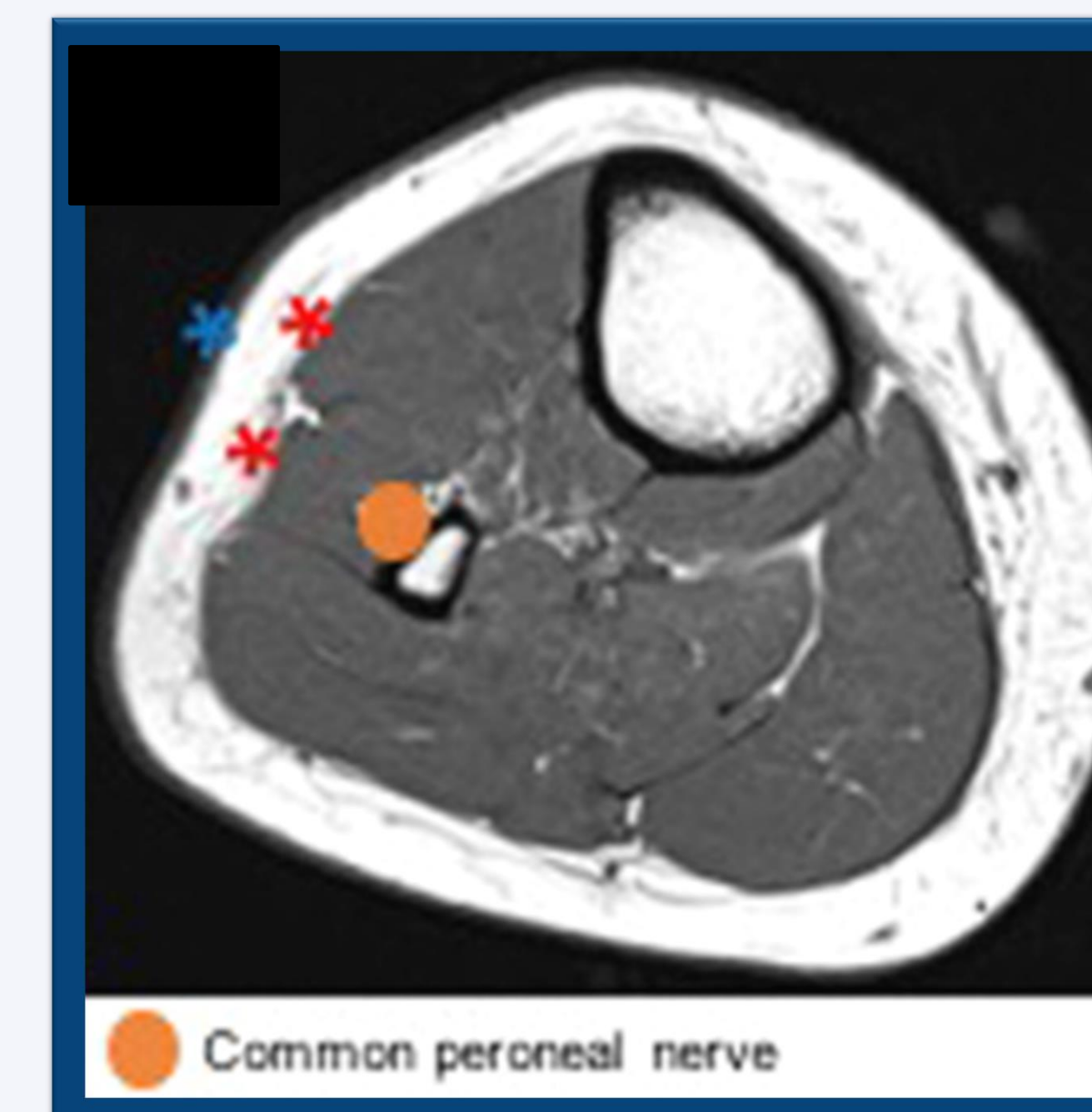
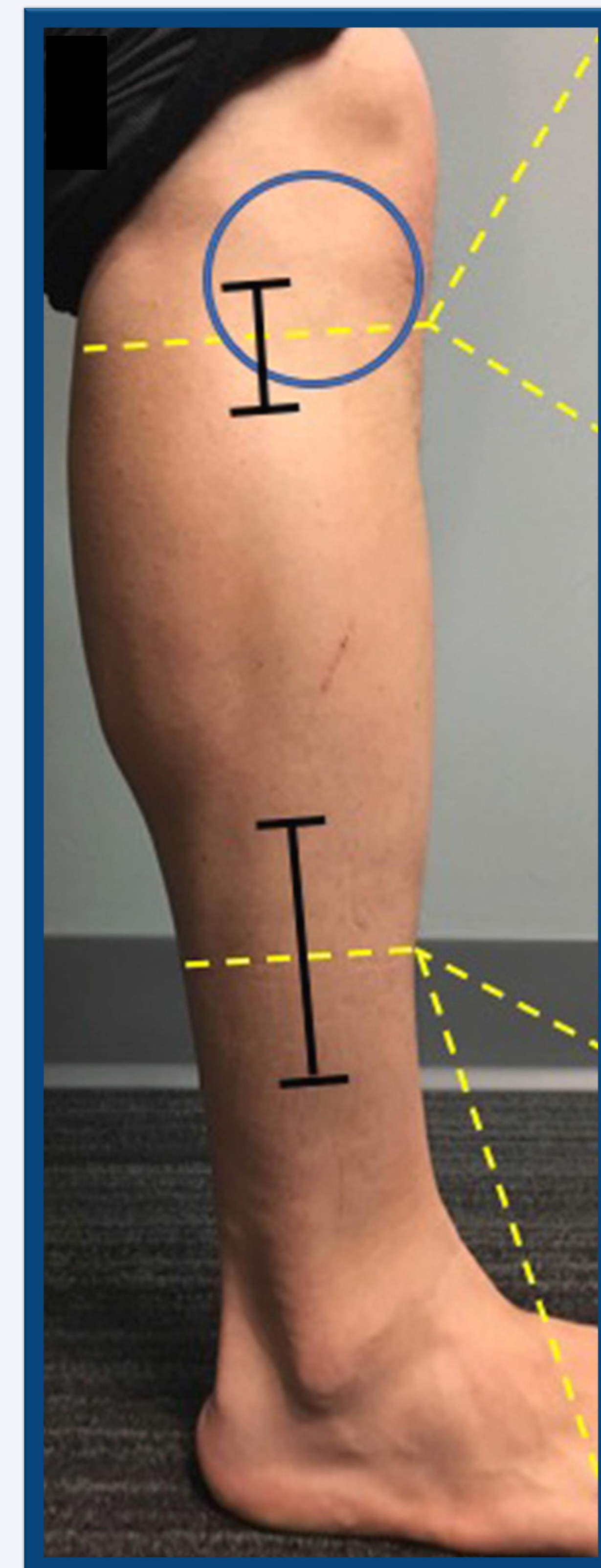
A 23-year-old male with a PMH of GERD presented with bilateral anterior and lateral leg pain that had persisted for seven years exacerbated by physical activity. His clinical exam was unremarkable aside from anterior and lateral compartments of the leg being firm with palpation. At the time of presentation, he was undergoing physical evaluations in pursuit of becoming a firefighter, he did relay having difficulty completing his evaluations secondary to pain. Given the clinical suspicion of bilateral CECS, the patient underwent exertional compartment pressure testing with a side port needle manometer, which yielded positive results according to Pedowitz's criteria for both the anterior and lateral compartments in his lower extremities, seen below.

Left Lower Extremity: Compartment	Pre-exercise (mmHg)	5-minutes post-exercise (mmHg)
Anterior	N/A	105
Lateral	N/A	95
Deep Posterior	Not Tested	Not Tested
Posterior	Not Tested	Not Tested

Right Lower Extremity: Compartment	Pre-exercise (mmHg)	5-minutes post-exercise (mmHg)
Anterior	N/A	34
Lateral	N/A	126
Deep Posterior	Not Tested	Not Tested
Posterior	Not Tested	Not Tested

CASE STUDY CONTINUED

To fulfill the physical training requirements to become a firefighter, the patient decided to proceed with bilateral fasciotomies of the anterior and lateral compartments. A proximal and distal skin incision was made centered over the proximal 1/3 and distal 1/3 of the lateral aspect of bilateral lower extremities. Sharp dissection was performed down to the level of subcutaneous tissue. Muscle herniation was noted at the level of the SPN. Therefore, a SPN neurolysis was performed due to being impinged. Next, through our two incisions the fascia of both the anterior and lateral compartment was identified and transected. The patient was non-weightbearing for the first 5 days after surgical intervention then transitioned to weightbearing as tolerated in a tennis shoe. The patient successfully healed their incisions, completed physical therapy, and resumed running activities.



Figures: Fasciotomy incisional placement for anterior and lateral leg compartments (blue asterisk). The level of fascia releases (red asterisk). Important nerves to be aware of include common peroneal, superficial peroneal, and deep peroneal⁴.

DISCUSSION

CECS presents with various signs and symptoms, including muscle weakness and paresthesia. There is a range of diagnostic modalities available for evaluation, including the more common intramuscular compartment pressure (IMCP) assessment, as utilized in our case, MRI, near-infrared spectrometry (NIR), and shear wave elastography⁵. It is crucial to differentiate CECS from other potential diagnoses, such as stress fractures, medial tibial stress syndrome, and popliteal artery entrapment syndrome⁵.

Treatment strategies encompass both nonsurgical and surgical options. Nonsurgical approaches include physical therapy, gait retraining, and botulinum toxin injections⁵. Surgical approaches include primarily fasciotomies which was utilized for our patient in this case. Salzler et al. reported fasciotomies for CECS in the running population can improve both pain and provide patient satisfaction in over 75% of patients, with 84% of patients able to return to sports. However, only 56% of their cohort returned to running competitively and 19% developed recurrent symptoms⁶.

CONCLUSION

Our rare case of bilateral chronic exertional compartment syndrome was properly diagnosed with intramuscular compartment pressure testing and effectively treated with bilateral anterior and lateral compartment fasciotomies. More importantly, our workup and management allowed the patient to return to his baseline physical activity to pursue his dream of becoming a firefighter.

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