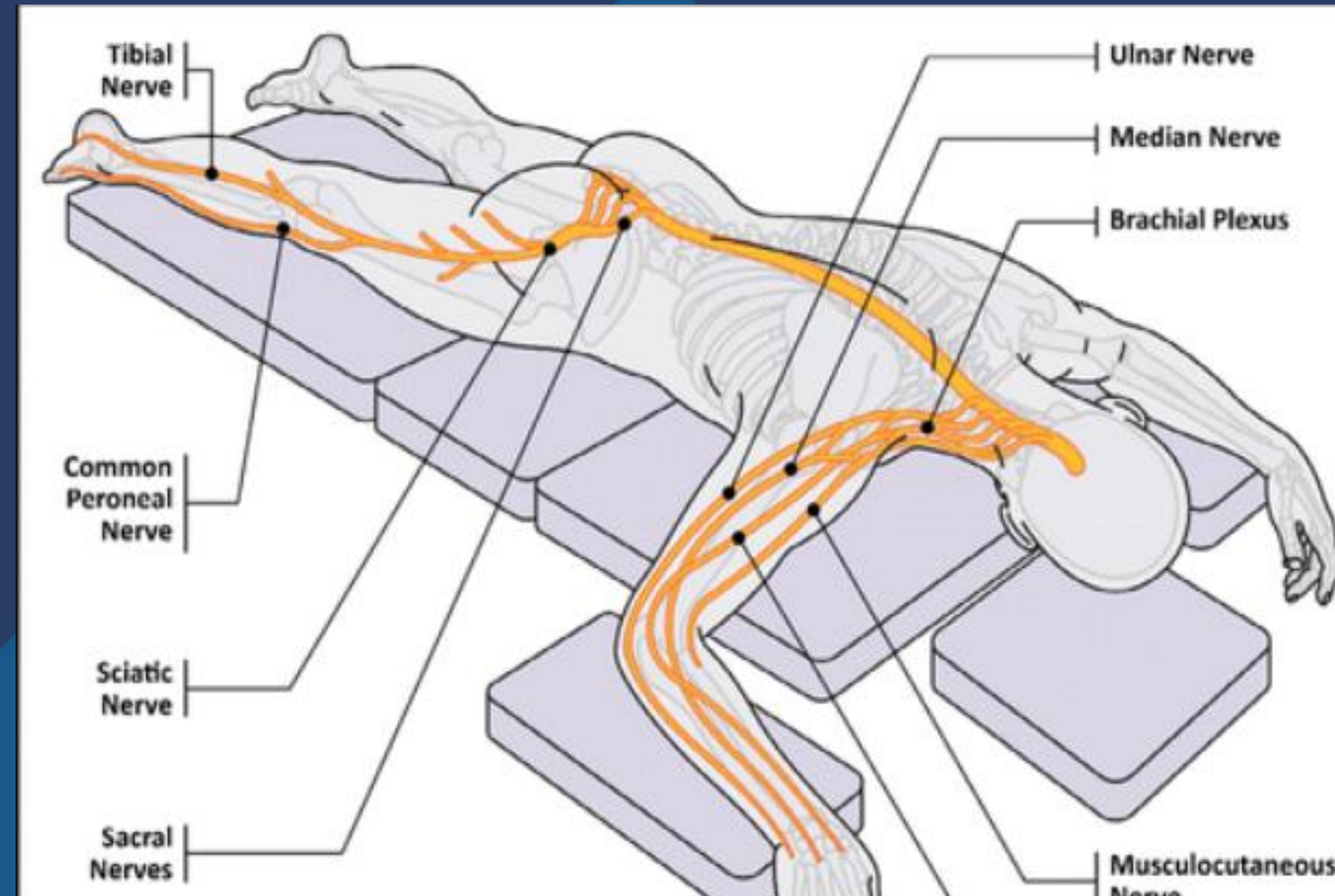


Abstract

COVID-19, the global pandemic that first appeared in 2019 has resulted in a growing number of cases of peripheral neuropathies that are now becoming apparent as part of the aftermath. Although pinpointing a single culprit is difficult, it is believed that a combination of post-infectious inflammatory neuropathy, prone positioning-related stretch/compression injury, systemic neuropathy and nerve entrapment from hematoma are significant contributors ¹. As several of these survivors begin to enter the rehabilitative phase of their recovery a better understanding of the pathophysiology is needed to prevent and curtail further incidences as the pandemic continues.

Case Description

A previously healthy 42-year-old man presented to an acute hospital in early April with acute respiratory distress secondary to COVID-19. He was initially given hydroxychloroquine, antibiotics and convalescent plasma. Due to deterioration from COVID-19 sepsis he would require intubation with “lung protective strategies” and eventually undergo hemodialysis, tracheostomy secondary to VDRF and anticoagulation for bilateral upper and lower extremity clots. Once stabilized he was discharged to acute inpatient rehabilitation for an aggressive physical, occupational and speech therapy program. As medical complications from COVID-19 began to resolve and functional mobility and strength improved some deficits persisted. A bilateral foot drop that was present on admission during acute rehabilitation persisted. As such, he was fitted with bilateral ankle-foot orthosis and eventually discharged after an almost a 3-month long hospital and rehab course. He would eventually return for outpatient electrodiagnostic testing in September 2020 to determine the cause of his continue bilateral foot drop.



Picture taken from Reference 1 showing prone position of patient that may lead to compression/traction nerve injuries.

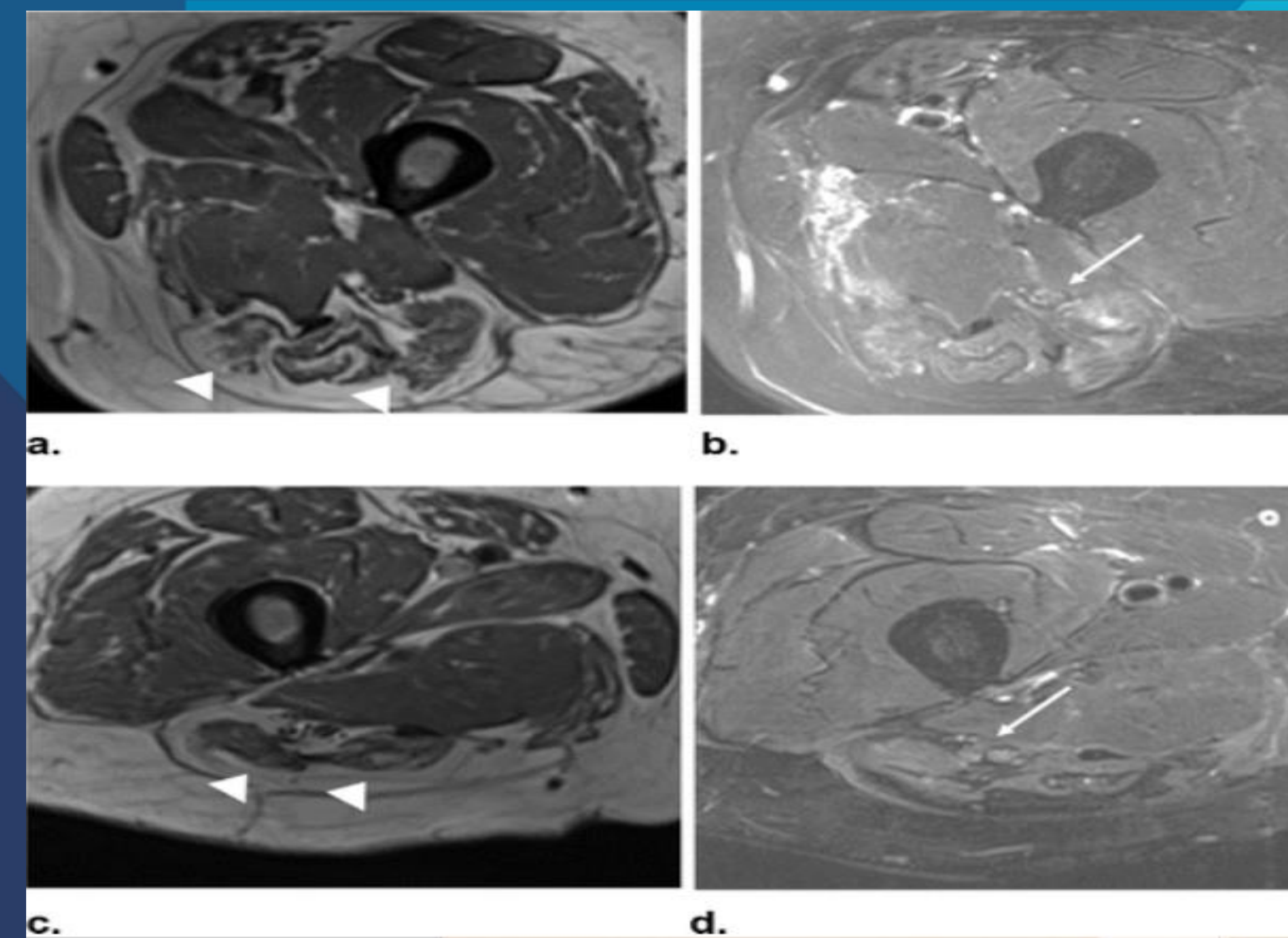


Image taken from Ref article 1. COVID-19 patient with bilateral foot drop and EMG localized peripheral nerve injury to sciatic nerves. Image A/B, right leg, shows mild signal hyperintensity of sciatic nerve (arrow) and atrophy of posterior compartment musculature (arrowheads). Image C/D, left leg, mild signal intensity of sciatic nerve (arrow) with atrophy of posterior musculature. Findings compatible with distal symmetric polyneuropathy.

Image taken from reference 1. CT image of COVID-19 patient on anticoagulation with asymmetrically enlarged and hyperdense iliacus muscle concerning for femoral nerve compression secondary to iliopsoas hematoma.



Results

At the conclusion of electrodiagnostic testing, it revealed that the patient had "Absent left sural and bilateral superficial peroneal sensory responses.... Absent bilateral peroneal/fibular motor responses with pickup over the EDB and tibialis anterior muscles. Absent left tibial motor response. Reduced amplitude of the right tibial motor response. EMG of selected bilateral tibial and peroneal innervated muscles showed fibrillations and positive waves with reduced recruitment. Normal EMG of the bilateral gluteal muscles and LS paraspinals." These findings suggest that a more distal nerve injury vs radiculopathy was likely.

Discussion

There appears to be several documented complications of COVID-19 infection that primarily affect the nervous system. These sequelae include both central and peripheral deficits, which occur at various points along the viral course, and can lead to debilitating consequences. This case demonstrates a unique neurological pathology following COVID-19 infection. The presentation of bilateral sciatic neuropathy following severe sepsis retains some clinical and electromyographic similarities to both critical illness polyneuropathy as well as the axonal variant of Guillain Barre Syndrome (GBS), both of which have been cited in the literature as rare but documented complications of COVID-19. Additionally, peripheral nerve injury can result as a sequela of hospitalization, such as positioning related neuropathy or because of a complication of treatment for COVID-19 such as anticoagulation treatment resulting in nerve entrapment secondary to hematoma.¹ This patient's clinical course and retained deficits following acute rehabilitation reinforce the need for continued investigation into the long-term health interactions of COVID-19 and the nervous system to better tailor treatment plans and avoid long term disability.

Conclusion

The novel coronavirus is a global threat to public health and has several known and unknown long-term complications. As new information emerges from the sequela of COVID-19 a comprehensive multidisciplinary approach will be needed to mitigate long term deficits.

References

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- 2.) William K Diprose, Laura Bainbridge, Richard W Frith, Neil E Anderson. Bilateral upper limb neuropathies following prone ventilation for COVID-19 pneumonia. Neurol Clin Pract Aug 2020, 10.1212/CPJ.0000000000000944; DOI: 10.1212/CPJ.0000000000000944