Foot drop

The term of “foot-drop” describes weakness of the tibialis anterior muscle, the extensor hallucis longus muscle, and the extensor digitorum longus muscle (dorsiflexor muscles of the foot and ankle).

Etiology

The occurrence of foot drop in critical care patients may result from various underlying causes, including neurological injuries, muscular dysfunction, nerve compression, or vascular compromise. Understanding the etiology and assessing the severity of foot drop in these patients is essential for implementing appropriate management strategies and ensuring better patient outcomes [1)]

The top two most common etiologies for foot drop include lumbar degenerative disease and common peroneal nerve injury at the neck of the fibula. The lower extremity muscles in humans are innervated by the distal peripheral nerves, derived from anterior horn cells in the lower spinal cord. The axons of the anterior horn cells in the lower spinal cord travel in the L4 and L5 spinal nerve roots, and these nerve fibers then enter the lateral trunk of the sciatic nerve.

Although they usually originate from peripheral problems, foot drop is caused by lesions affecting the neural pathway related to dorsiflexor muscles, whether of central or peripheral origin.

Kim et al. present a patient with a sudden isolated foot drop caused by a small infarct in the primary motor cortex mimicking a peripheral origin. This report indicates that patients presenting isolated foot drop should be managed carefully and the possibility of both central and peripheral causes should be considered. This is the first report of a sudden isolated foot drop caused by a cortical infarction mimicking lumbar radiculopathy [2)].

Differential diagnosis

If lumbar MRI is normal in a patient with evidence of motor weakness (e.g. foot drop), do an EMG to look for peripheral neuropathy (again, a good motor exam can give the same info). If the EMG is negative for peripheral neuropathy (e.g. peroneal nerve palsy) then do an MRI (or CT) of abdomen and pelvis to look for pelvic floor tumor.

Outcome

Preoperative motor strength and time to surgery are the most important predictors of improvement in foot drop due to degenerative lumbar disease [3)].

Case reports

Bilateral foot drop (BFD) due to LDH is an extremely rare condition with only a few reported cases. We describe the case of a middle-aged man presenting with a rapid onset BFD with back and leg pain. Urgent MRI revealed an L4-L5 centrally located LDH with bilateral compression of the L5 nerve roots and the cauda equina centrally. About 4 h after presentation surgery was performed adopting a bilateral L4-L5 interlaminar approach and the prolapsed disc was removed. Nine months after surgery, the patient showed a complete recovery of his deficit. We discuss the advantages of this approach in this urgent situation and we compare it with other techniques [4].

1)
Formenti P, Sabbatini G, Brenna G, Galimberti A, Mattei L, Umbrello M, Iezzi M, Uldedaj E, Pezzi A, Gotti M. Foot drop in critically ill patients: a narrative review of an elusive complication with intricate implications for recovery and rehabilitation. Minerva Anestesiol. 2024 Mar 29. doi: 10.23736/S0375-9393.24.17912-6. Epub ahead of print. PMID: 38551615.
2)
Kim JY, Kim do K, Yoon SH. Isolated Painless Foot Drop due to Cerebral Infarction Mimicking Lumbar Radiculopathy: A Case Report. Korean J Spine. 2015 Sep;12(3):210-2. doi: 10.14245/kjs.2015.12.3.210. Epub 2015 Sep 30. PubMed PMID: 26512287; PubMed Central PMCID: PMC4623187.
3)
Macki M, Lim S, Elmenini J, Fakih M, Chang V. Clinching the cause: A review of foot drop secondary to lumbar degenerative diseases. J Neurol Sci. 2018 Oct 1;395:126-130. doi: 10.1016/j.jns.2018.09.036. [Epub ahead of print] Review. PubMed PMID: 30316068.
4)
Marchesini N, Ricci UM, Soda C, Teli M. Acute bilateral foot drop due to lumbar disc herniation treated by bilateral interlaminar approach: case report and literature review. Br J Neurosurg. 2020 Jan 20:1-3. doi: 10.1080/02688697.2020.1713992. [Epub ahead of print] PubMed PMID: 31955631.