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Introduction

- Foot drop can be caused by peroneal neuropathy, lumbosacral radiculopathy, or intracranial lesions. Typically, intracranial lesions are accompanied by other neurological abnormalities other than foot drop. However, in this case, a patient with isolated foot drop presented with intracranial hemorrhage localized to the premotor cortex and a history of lumbosacral radiculopathy. We share a case in which we successfully made differential diagnosis using transcranial magnetic stimulation (TMS).

Case report

- A 62-year-old man who underwent spinal intervention at lumbar 4/5 level one week earlier for left lower extremity radicular pain with low back pain visited the emergency department with sudden left ankle weakness. Brain computed tomography (CT) showed cortical hemorrhage in the premotor cortex that was compressing motor cortex due to volume effects, corresponded to homunculus of left lower limb.[Fig 1]
- He was admitted to the neurosurgery department for conservative treatment, and on day 4, referred to the rehabilitation department for electromyography(EMG) to differentially evaluate whether his ankle weakness was caused by spinal lesion. At the time of referral, the Medical research council ratings were 0 in ankle dorsiflexion, plantarflexion, and great toe extension. Sensory examination revealed intact and hyperactive deep tendon reflexes in the left upper and lower extremities; however, he did not complain of back pain nor radiating pain. Nerve conduction study and needle EMG suggest of left chronic lumbosacral radiculopathy, L4-S1. Somatosensory evoked potential examination was normal. For the TMS of left lower extremity recording the abductor hallucis muscle, no potentials were evoked by cortical stimulation, but potentials were evoked normally by lumbar stimulation.[Fig 2]
- Combining these EMG findings with the brain CT findings and physical examination, we concluded that the acute isolated foot drop in this case was most likely caused by an intracranial hemorrhage.
- EMG was followed up on day 19. Ankle strength had recovered to 3+ and there was no definite electrophysiologic evidence of recent aggravation of the chronic lumbosacral radiculopathy. However, TMS results showed no evoked potentials when stimulated in the cortex, which was the same as the previous result.

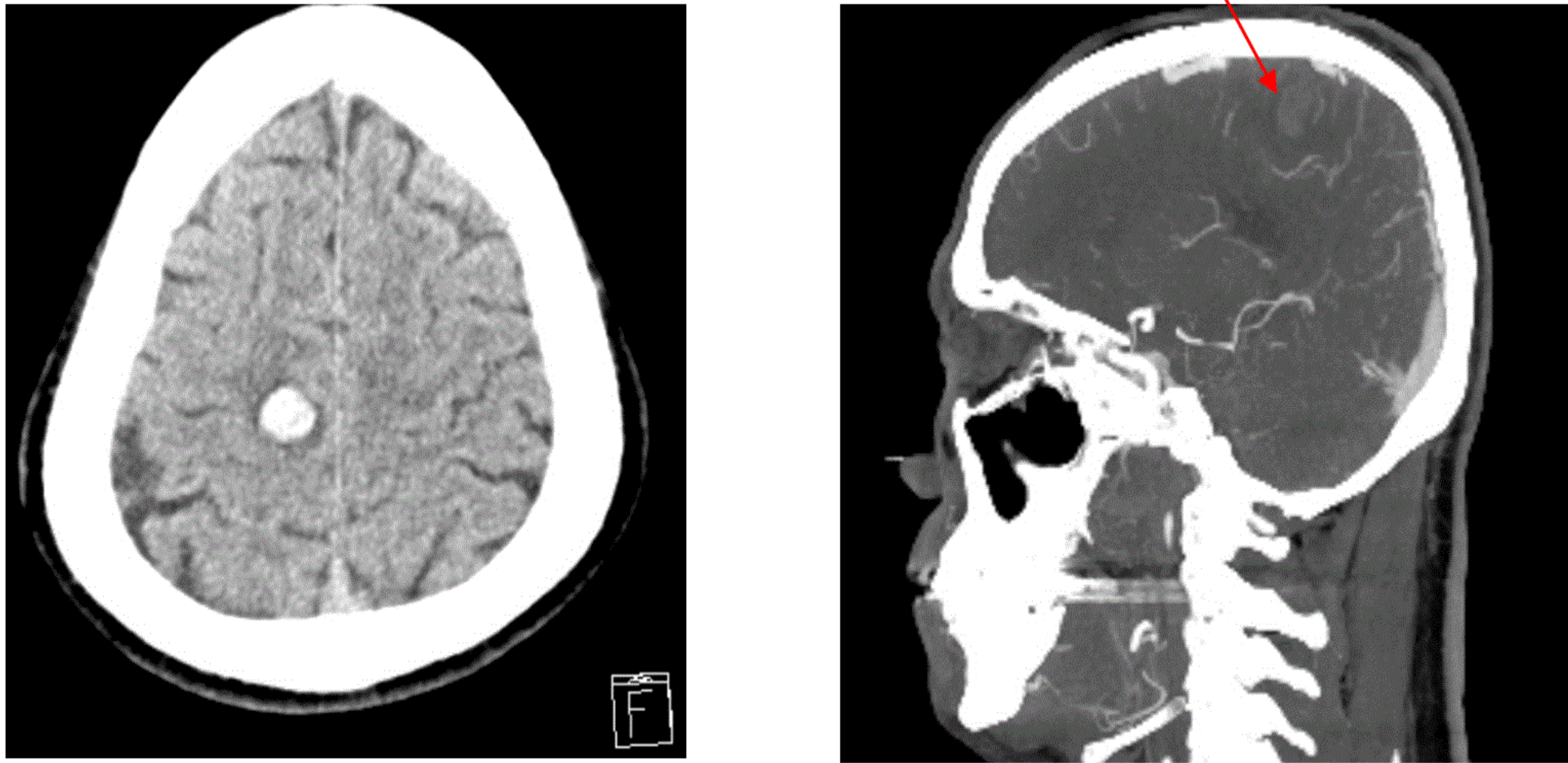


Figure 1. Brain computed tomography at onset. Right premotor cortex lesion.

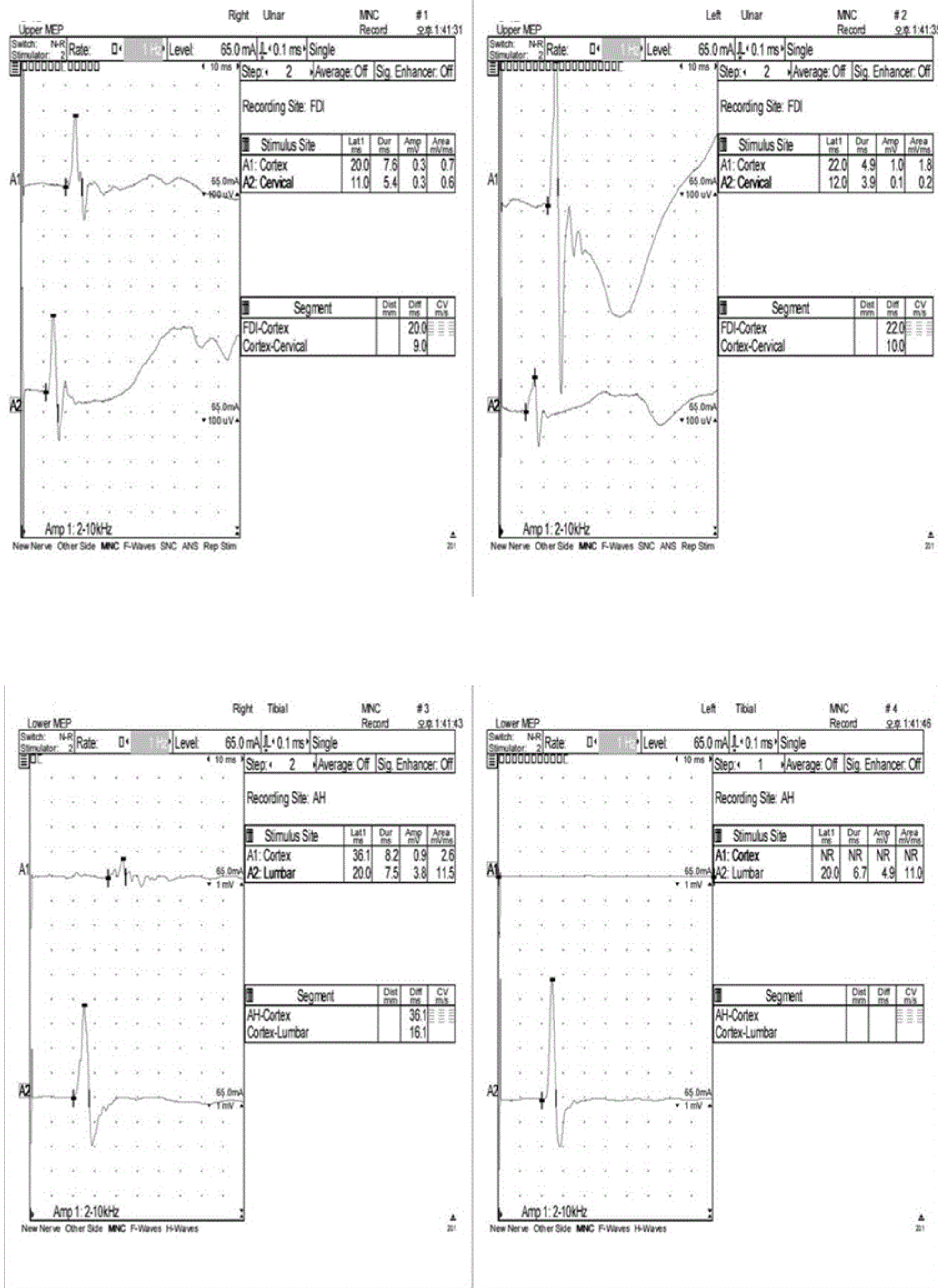


Figure 2. The result of motor evoked potential study. Only MEPs to the left lower limb stimulated from the cerebral cortex were not evoked.

Conclusion

- Foot drop can occur in patients who have recently undergone spinal intervention for lumbosacral radiculopathy, but isolated foot drop due to intracranial hemorrhage is uncommon. During acute aggravation of radiculopathy, it takes approximately 2 weeks for sufficient abnormalities to appear on EMG. Therefore, when a patient with lumbosacral radiculopathy develops an intracranial hemorrhage, it is challenging to differentiate the cause of acute foot drop by EMG in the acute phase. However, in this case, it was possible to differentiate whether it was acute aggravation of lumbosacral neuropathy or intracranial hemorrhage by properly utilizing the TMS test.