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The Effect of Low-frequency rTMS on Hemichorea after Stroke

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Introduction

We report a case of patient with profound right-sided hemichorea from a subacute left thalamic intracranial hemorrhage (ICH) resulting in substantial functional decline. To diminish the degree of hemichorea, low-frequency repetitive transcranial magnetic stimulations (rTMS) were applied.

Case report

A 74-year-old man admitted hospital for intensive rehabilitation. The patient had history of left thalamic ICH by computed tomography of brain about 3 and a half months ago (Fig. 1). On physical examinations, he had right hemiplegia with upper proximal motor power 3, distal 3 and lower proximal motor power 3 and distal 2. Sensory was decreased to 60% compared to the non-hemiplegic side. Deep tendon reflex of right knee was increased. Right Babinski reflex was positive. There was no increase in spasticity. He could walk with moderate assist of the therapist. Besides usual hemiplegic manifestations, he had involuntary movements in right upper and lower limbs. When the patient was told to move, his right upper limb showed sudden involuntary, non-rhythmic movement with severe dysmetria. Even the limb could hit his own face. The lower limb showed the same characteristic movements (Video 1). The patient's abnormal movements could be categorized into hemichorea or hemiballismus. To find out the cause of the hemichorea, laboratory test and family history were done. His glucose level was normal and had no family history of Huntington's disease. For further evaluation, the patient was referred to neurology and the reason for hemichorea was left thalamic ICH. His BUN, creatinine level were elevated due to acute kidney injury, so the use of medications were cautious. Instead of medication, low-frequency rTMS were applied. He received 1 Hz rTMS for 20 minutes a day, 10 times. Each session included 900 stimulation over the supplementary motor area of the ipsilesional hemisphere at intensity 90% of abductor pollicis brevis resting motor threshold. Before the rTMS, berg balance scale (BBS) was 4 and modified Barthel index was 38. Conventional rehabilitation was done 2 times a day. After the low-frequency rTMS, degree of hemichorea on the upper limb could be diminished, but the lower limb had less effect. (Video 2). BBS and MBI improved to 11 and 45 respectively. It seems that low-frequency rTMS had effect on suppressing hyper-activated thalamocortical circuits due to

the left thalamic lesion. In those stroke patients with hemichorea who could not use medications, low-frequency rTMS could be a helpful treatment option.

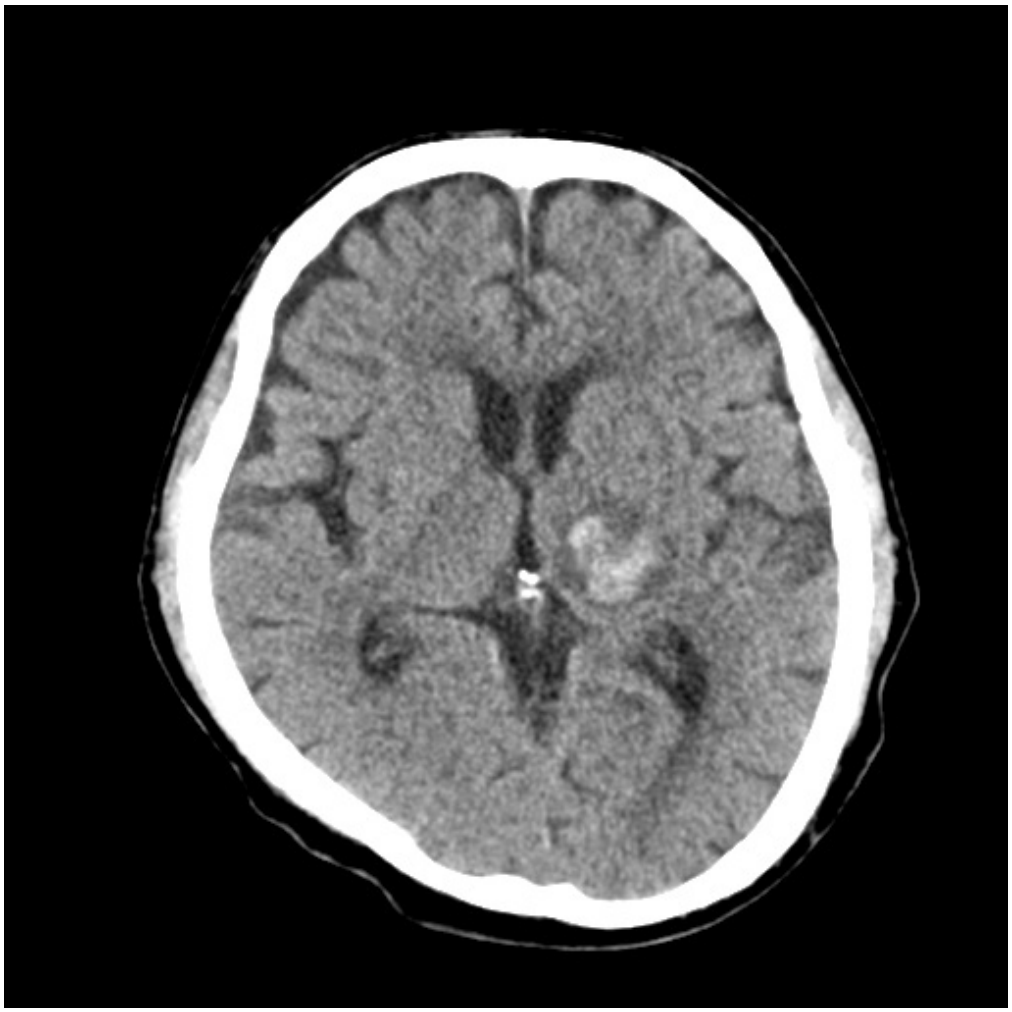

Figure. 1. The patient had intracranial hemorrhage at left thalamus.