

Dysphagia Following Putaminal Hemorrhage at a Rehabilitation Hospital

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Background: Dysphagia occurs frequently during the acute phase of cerebral hemorrhage; however, there are few reports of dysphagia associated with cerebral hemorrhage in the subacute and chronic phase. We focused on putaminal hemorrhage at a rehabilitation hospital and evaluated the relationships between the frequencies of dysphagia, focus, and hematoma volume and type. *Methods:* A hundred patients with putaminal hemorrhage referred to our rehabilitation hospital were evaluated. Bedside swallowing assessments (BSAs) were conducted and results were evaluated relative to the information obtained on computed tomography imaging, including hematoma type and volume, and oral intake at the time of admission/discharge from the hospital. *Results:* A regular diet was provided to 48 patients, dysphagia diet to 44 patients, and enteral feeding to 8 patients. There were significant feeding group differences in age, hematoma volume and type, existence of ventricle rupture, neurological manifestation, cognitive function, existence of unilateral neglect and aphasia, initial BSA, activities of daily living (ADL) score using the Functional Independence Measure at the time of admission/discharge from the hospital, and length of stay. At discharge, we provided a regular diet to 81 patients and dysphagia diet to 19 patients. Age and ADL score had the greatest influence on oral intake at the time of discharge from the hospital. *Conclusion:* The prognosis of dysphagia caused by putaminal hemorrhage is good, with no patient requiring enteral feeding, although putaminal hemorrhage often causes dysphagia. Patient age and ADL score on admission are used to predict the residual factors of dysphagia. **Key Words:** Putaminal hemorrhage—dysphagia—rehabilitation—bedside swallowing assessment.

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Introduction

Eating and swallowing dysfunction is observed in 40%–70% of patients with acute stroke.^{1,2} Although majority of these patients recover within a few weeks of onset,^{3–5} dysphagia may continue in some patients. When patients with ongoing disabilities leave an acute care hospital, they are typically transferred to a rehabilitation hospital to receive several months of rehabilitation treatment. Cerebral hemorrhage comprises approximately 20% of total stroke incidence, and putaminal hemorrhage is the most common type of cerebral hemorrhage.⁶ Putaminal hemorrhage is known to cause eating and swallowing dysfunctions as well as motor paralysis and sensory

impairment, influencing the activities of daily living (ADL). There have been few studies on dysphagia in patients with putaminal hemorrhage because the incidence of cerebral hemorrhage is much lower than that of cerebral infarction. However, little is known about the detailed relationships between the type of hematoma and/or hematoma volume and clinical features such as eating and swallowing dysfunctions. In the present study, we evaluated the occurrence of putaminal hemorrhage in a rehabilitation hospital and studied possible relationships between the frequency of dysphagia, focus, and hematoma volume, as well as other factors that can influence swallowing function at the time of discharge from the hospital.

Subjects and Methods

Subjects

A total of 134 patients with putaminal hemorrhage were discharged from our Kaifukuki rehabilitation hospital⁷ from April 2013 to March 2015. From this group, 34 patients, including those with a history of dementia or stroke, who were unconscious, and who died, were excluded (Fig 1). The study cohort consisted of 100 patients, 64 males and 36 females, aged 61.4 ± 12.4 years (mean \pm standard deviation (SD); range, 29-87 years). The period from symptom onset to hospitalization was 30.2 ± 16.7 days (mean \pm SD; range, 7-124 days) and the mean length of stay was 67.4 ± 31.2 days (mean \pm SD; range, 4-168 days). The assessed parameters included the period from symptom onset to hospitalization, hematoma type⁸⁻¹⁰ via computed tomography performed at stroke onset, focus side, hematoma volume, bedside swallowing assessments (BSA), and clinical condition. This research was conducted with the approval of our university ethics committee and a thorough explanation of the study was provided to the patient before consent was requested and received.

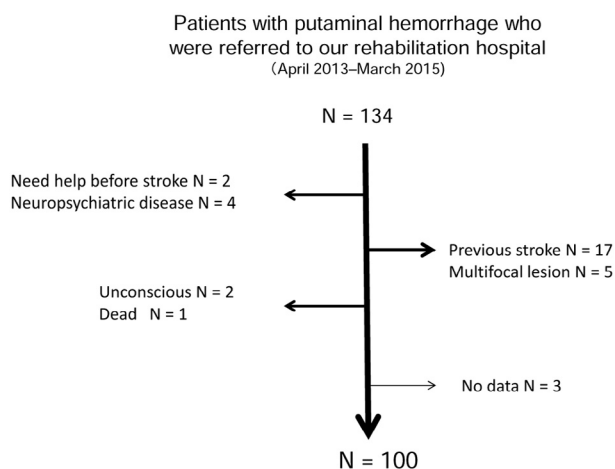


Figure 1. Flowchart of patient recruitment.

Hematoma type was classified as type I, hematoma that is localized in the putamen; type II, hematoma that extends to the anterior limb of the internal capsule; type III, hematoma that extends to the posterior limb of the internal capsule; type IV, hematoma that extends to the anterior and posterior limbs of the internal capsule; and type V, hematoma that extends to the thalamus or subthalamus. Hematomas were further classified (a, yes, and b, no) pertaining to the existence of ventricle rupture. The amount of bleeding was calculated using the major axis of hematoma \times minor axis \times height \times 1/2 (mL).¹¹

For the initial evaluation of bedside swallowing, the repetitive saliva swallowing test (RSST)¹² and the modified water swallowing test (MWST)¹³ were conducted by the attending physician. These assessments can be excellent tools to screen for swallowing function and do not require videofluoroscopy; however, the test results are highly correlated with videofluoroscopy assessments.^{12,13} Furthermore, these BSAs have been strongly recommended by the Japanese Guidelines for the Management of Stroke.¹⁴

In this study, patients were categorized as having a normal BSA score if the attending physician observed 3 or more swallows within 30 seconds during RSST and allocated 4 points or more during MWST. Conversely, the patients were diagnosed with impaired BSA if the attending physician observed 2 swallows or less within 30 seconds during RSST and/or allocated 3 points or less during MWST.^{13,15-17}

The severity of neurological impairment was evaluated using the National Institutes of Health Stroke Scale (NIHSS)¹⁸ and cognitive function was evaluated using the Mini-Mental State Examination (MMSE).¹⁹ We also evaluated the presence of aphasia and unilateral neglect. At the time of admission and discharge from the hospital, we assessed the ADL score based on the Functional Independence Measure (FIM),²⁰ whether they went home or not, and their oral intake (regular diet).

Selection of Food Form and Training for Eating and Swallowing

Patients without abnormal BSA and those on a regular diet prescribed by the previous physician were provided with the diet and observed for symptoms of aspiration, such as choking. If the previous physician had prescribed a dysphagia diet or enteral feeding to the patient, with the consent of the patient and family, videofluorography was performed and an appropriate diet was selected. For patients with abnormal BSA scores, based on the information from the previous physician, we began to carefully administer the dysphagia diet and allowed the patients to eat more aggressively after videofluorography.^{16,17}

If it was difficult to initiate oral intake or the intake amount was not sufficient, nutrition via a nasogastric tube

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