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Case series

Callosal dysarthria

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1. Introduction

Dysarthria has been observed in patients who have lesions of the corticobulbar tract, cerebellum, and basal ganglia. Callosal lesions can also cause dysarthria [1]. Nathan et al. have reported apraxic dysarthria in callosal lesions [2]. However, the apraxic dysarthria was a misnomer according to apraxia of speech suggested by Wertz et al. [3]. In addition, the dysarthria caused by callosal lesions has not yet been characterized. Four patients with selective callosal infarctions visited our hospital. Their main complaint was dysarthria. Here we describe the characteristics of dysarthria as a result of callosal lesions, which we have termed "callosal dysarthria".

2. Case report

2.1. Representative case (patient 1)

A 66-year-old right-handed woman was admitted because of dysarthria. One week prior to admission, she showed sudden dysarthria, hypophonia, and gait disturbance. She did not have any problem in swallowing. She could walk 3 days after onset. On admission, mild right-central-type facial palsy was noted. Limb weakness and asymmetry of deep tendon reflex were not observed. Her speech was very slow, and she had a harsh voice. She showed asymmetry during labial movement (Fig. 1A) and could not protrude her tongue promptly. Instead, it remained deviated in her left oral cavity for 2.9 s (Fig. 1B). After such deviation and hesitation, she could protrude tongue out of oral cavity without deviation. She had signs of callosal disconnection including cross localization of fingertips, cross replication of hand postures, left ideomotor apraxia, left tactile anomia, and left agraphia (apraxia of writing with left hand) [4]. She also showed an alien hand sign. Difficulty in lingual movement began to improve 9 days after onset.

2.2. Other cases

We summarized the patients and associated symptoms in Table 1. The main complaints in all patients were dysarthria and gait disturbances. Patients 2, 3, and 4 had mild left-central type facial palsies (Fig. 1C). None of the patients could walk at symptom onset, although weakness in the lower limbs was not severe. The dysarthria exhibited by patients 1 and 3 was more severe than in the other two patients. The symptoms of patient 2 were the mildest; we could not discern dysarthria in this patient and she could walk on the 1st day following symptom onset. The dysarthria of patient 4 began to improve on the 5th day from symptom onset and she could

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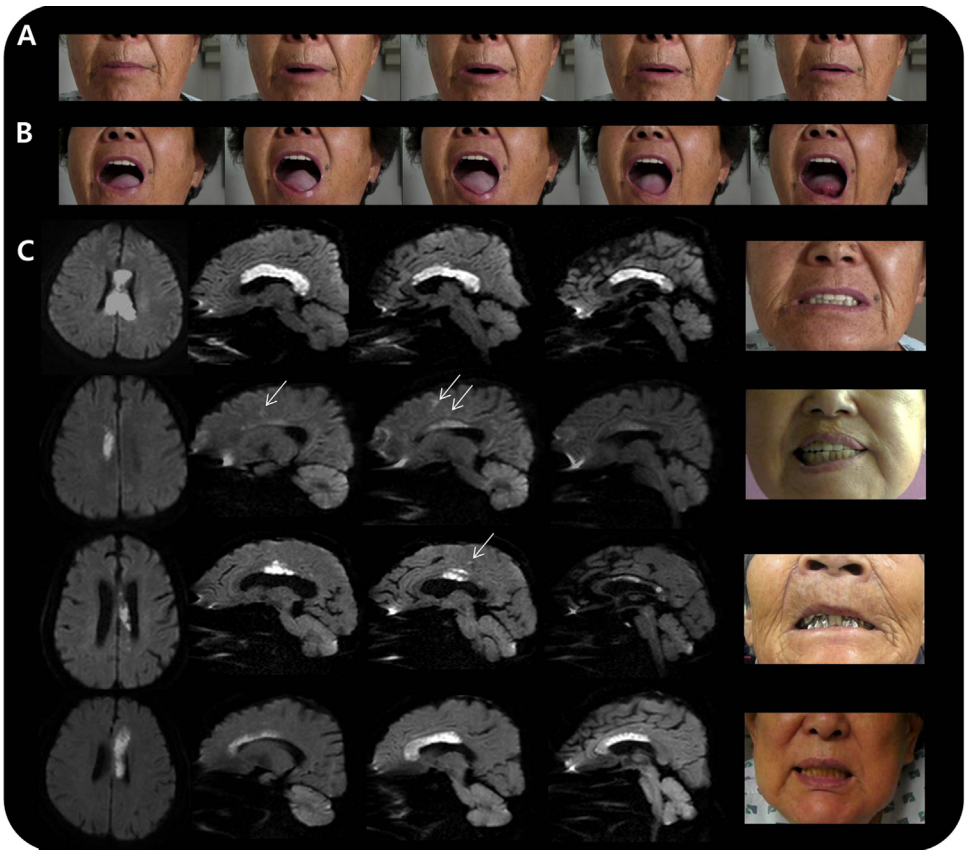

Fig. 1. Clinical photographs and MR imaging. (A) Sequential photographs showing labial movement asymmetry in patient 1 when pronouncing the/pʌ/sound. The time interval of each picture was 0.033 s. (B) The difficulty in lingual movement and asymmetry of patient 1. Upon instruction, there was a 2.9 s delay in tongue protrusion. (C) Axial and sagittal diffusion-weighted MRI central-type facial palsies. From top to bottom, we showed MRI and pictures of patient 1, 2, 3, and 4, respectively. Arrows indicate dot legions outside the corpus callosum.

Table 1
Summary of patients.

	Patient 1	Patient 2	Patient 3	Patient 4
Age	66	75	85	77
Sex	Woman	Woman	Woman	Woman
Handedness	Right	Right	Right	Right
Admission day from symptom onset	Day 8	Day 1	Day 6[a]	Day 3
Stroke risk factors	DM, hypertension	Dyslipidemia, hypertension	Dyslipidemia, hypertension	DM, hypertension
Neurological deficits				
Dysarthria	Present	Present (mildest)	Present	Present
Nasolabial fold blunting	Right	Left	Left	Left
Asymmetric labial movement	Present	None	Present	None
Dysphagia	None[b]	None	None	None
Gait disturbance	Present	Present	Present	Present
Motor power (right/left)				
Upper limbs	Grade V/V	Grade V/V	Grade V/V	Grade V/V
Lower limbs	Grade V/V	Grade V/V	Grade IV/IV	Grade IV/V
Deep tendon reflex	Symmetric	Symmetric	Symmetric	Symmetric
Limb/truncal ataxia	None	None	None	None
Urinary incontinence	None	None	None	None
Alien hand sign	Present	None	None	None
Other disconnection signs[c] (test day from symptom onset)	5/5 (day 11)	3/5 (day 13)	N/A	3/5 (day 7)
Laterality of lesion	Both	Right	Left	Left
Lesion in the corpus callosum	Body, splenium	Body	Body	Body, rostrum

[a] From detection time.
[b] There was not any abnormality even in the videoradiographic study of patient 1.
[c] We tested cross localization of fingertips, cross replication of hand postures, ideomotor apraxia, tactile object naming and writing of both hand. Patient 1 showed the disconnection signs in the five tests. Patient 2 showed abnormalities in the cross localization of fingertips, cross replication of hand postures, and left ideomotor apraxia. Patient 4 showed abnormalities in the cross localization of fingertips, cross replication of hand postures, and left agraphia. We did not perform the tests in patient 3. N/A, not available.