Familial Amyotrophic Lateral Sclerosis

944-6

Familial Amyotrophic Lateral Sclerosis
Pseudobulbar Palsy

Dysarthria and dysphagia
Diminished palatal movement with positive gag bilaterally
Diminished rapid movements of the tongue
Jaw jerk and facial jerks
As her disease progressed, she became aware of difficulty walking and in April 1996 she returned for evaluation having fallen on two occasions. By this time she had lost the ability to speak and was mute. She had difficulty chewing and swallowing, particularly liquids, and noted some difficulty as well with closing her eyes.
Neurovisual Exam

Eighteen months after the onset:
  - Supranuclear paresis of upgaze
  - Delay in initiating horizontal saccadic eye movements compensated by head turning
  - Saccadic breakdown of smooth pursuit
  - No nystagmus
  - Diplopia reading – convergence insufficiency
Constellation of Eye Signs

A supranuclear paralysis of saccadic upgaze greater than downgaze with intact vertical pursuit

Slow horizontal gaze to right and left with the patient needing to move her head and eyes to look to either side

Saccadic horizontal pursuit
Constellation of Eye Signs

Convergence insufficiency with an exophoria on alternate cover test fixating on a near target

Slow volitional eye closure with preserved spontaneous eyelid opening and reflex blinking to threat and a loud noise.

No square wave jerks or nystagmus.
Figure 1: Axial T2WI in a patient with ALS shows hyperintensity in both cerebral peduncles.
Neuroimaging

Figure 2: Coronal T2WI shows the hyperintensity extending along both corticospinal tracts.
Neuroimaging – Case 2

Figure 3: Images 3-5 in another case with ALS show restricted diffusion extending along both corticospinal tracts from the subcortical white matter inferiorly through the cerebral peduncles and medulla.
Etiology

The patient’s DNA was tested for a mutation of the superoxide dismutase (SOD1) gene and was negative.

The Vinculum Associated Binding Protein (VABP) gene had not been discovered at this time.
Pathology

RIMLF-normal
Figure 4. Representative photomicrograph of rostral interstitial nucleus of the medial longitudinal fasciculus (riMLF) of the normal control (A).

Courtesy JA Buttner-Ennever
Figure 5. Two ALS patients (B,C) show in addition to marked loss of medium-sized neurons in both patients. In Patient 1 (B) the neurons appear shrunken (open arrows). Neuronal debris are seen (solid arrows). An riMLF neuron of Patient 2 shows features of central chromatolysis (C, arrow). (Nissl stain; magnification, x20 before 30% reduction).
Pathology

RIMLF-patient 2
Figure 6. A histogram comparing neuronal content of the rostral interstitial nucleus of the medial longitudinal fasciculus (riMLF) in the 2 patients and a normal control. Columns indicate mean and SD values of medium-sized neuron counts in 32 to 35 measure-windows of 0.128 mm² area, under x20 magnification.

Courtesy JA Buttner-Ennever
Figure 7. A histogram comparing neuronal content of the rostral interstitial nucleus of the medial longitudinal fasciculus (riMLF) in the 2 patients and a normal control. Columns indicate mean and SD values of medium-sized neuron counts in 32 to 35 measure-window of 0.128 mm² area, under x 20 magnification.
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