

## MR demonstration of a unilateral olivary hypertrophy caused by pontine tegmental hematoma

N. Hirono<sup>1</sup>, M. Kameyama<sup>2</sup>, Y. Kobayashi<sup>3</sup>, F. Udaka<sup>2</sup>, T. Mezaki<sup>2</sup>, K. Abe<sup>2</sup>, and N. Nishitani<sup>2</sup>

<sup>1</sup> Department of Neurology, Baba-memorial Hospital, Osaka, Japan  
Departments of <sup>2</sup> Neurology and <sup>3</sup> Radiology, Sumitomo Hospital, Osaka, Japan

Received: 14 December 1989

**Summary.** Two patients with unilateral olivary hypertrophy (OH) following a pontine tegmental hematoma are presented. Both showed palatal myoclonus and one patient showed an extremity myorhythmia on the opposite side of OH. The magnetic resonance (MR) examination demonstrated an abnormal unilateral hyperintense lesion in the ventral part of medulla oblongata on T2-weighted images. The MR findings were highly suggestive of the pathological nature of the lesion, showing the value of MR.

**Key words:** Magnetic resonance – Olivary hypertrophy – Palatal myoclonus – Extremity myorhythmia – Pontine tegmental hematoma

Olivary hypertrophy (OH) is usually accompanied by lesions of the dentato-olivary tract, the afferent pathway to the olive [1]. This pathway may be injured in the contralateral dentate nucleus or superior cerebellar peduncle or the ipsilateral central tegmental tract [2]. It is well known that OH is usually accompanied by palatal myoclonus or other involuntary movements such as extremity myorhythmia clinically [1, 3, 4]. However the diagnosis of the cause and confirmation of the localisation of lesions leading to the syndrome OH has been able to be executed only by histopathological methods. The aim of this paper is point out that the MR examination may be the only procedure capable of furthering the diagnosis in vivo.

### Case report

#### Case 1

A 60-year-old man had suffered a pontine tegmental hemorrhage on April, 1988. He was admitted to our hospital on January, 1989. On admission, neurological examination revealed a right abducens palsy, a disturbance of

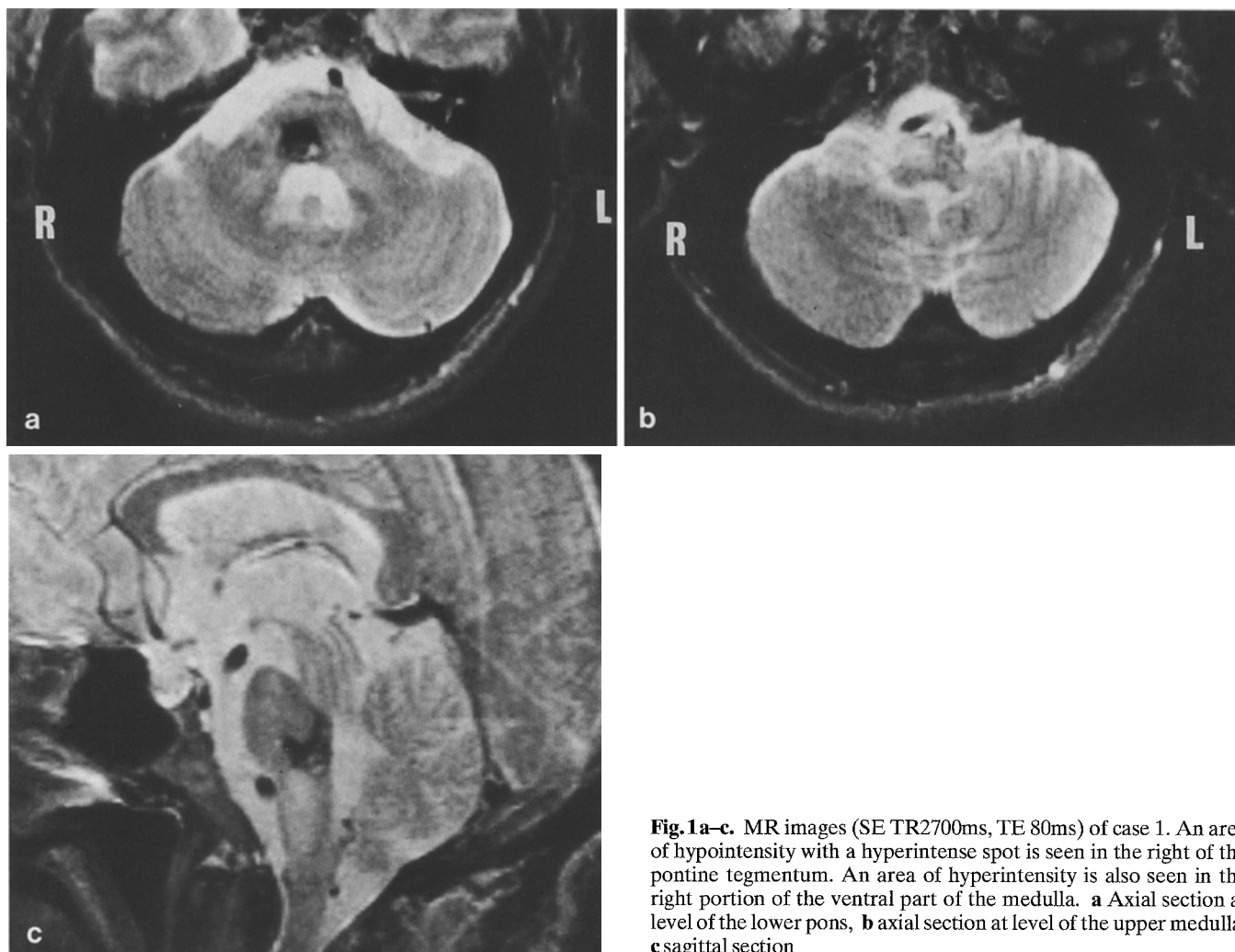
rightward saccadic eye movement, a mild right deafness, a mild left hemiparesis with brisk tendon reflexes, an extremity myorhythmia of the left hand and leg, a superficial sensory disturbance on the right side of the face and both superficial and deep sensory disturbances on the left side of the body, and a left limb ataxia. He developed palatal myoclonus in March, 1989. MR was performed with a 1.5 Tesla Shimadzu machine in February, 1989. It demonstrated a hypointense lesion with a hyperintense spot suggesting an old hematoma in the right portion of pontine tegmentum and a hyperintense lesion in the right portion of the ventral part of the medulla in T2-weighted images (SE TR2700ms, TE 80ms) (Fig. 1).

#### Case 2

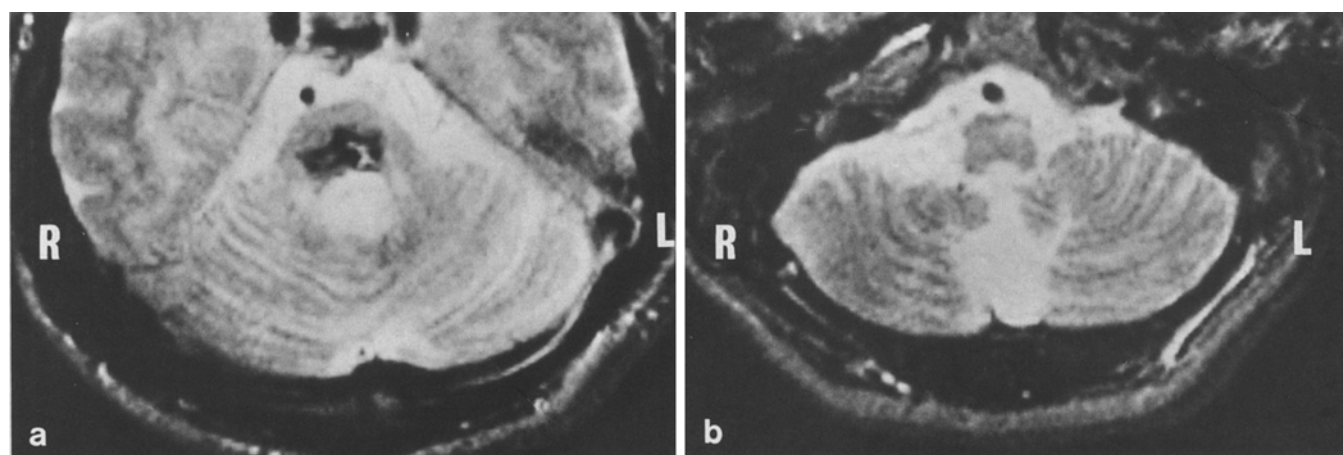
A 52-year-old man had developed a pontine tegmental hematoma in February, 1981. He was admitted to our hospital on December, 1987. On admission, neurological examination revealed palatal myoclonus, ataxic eye movements with fixation nystagmus, a mild right hemiparesis with brisk tendon reflexes, superficial and deep sensory disturbances of the right side of the body, a right sided limb ataxia, and truncal ataxia. MR, performed in February, 1989, demonstrated a hypointense lesion with a hyperintense spot suggesting an old hematoma in the tegmentum of the pons principally on the left side and a hyperintense lesion in the left side of the ventral part of medulla on T2-weighted images (Fig. 2).

### Discussion

OH is considered to be caused by lesions within a classical triangle made up of the contralateral dentate nucleus, the ipsilateral red nucleus and the ipsilateral inferior olive (Guillain-Morraret triangle) [1]. OH has been frequently reported with lesions involving the ipsilateral central teg-



**Fig. 1a–c.** MR images (SE TR2700ms, TE 80ms) of case 1. An area of hypointensity with a hyperintense spot is seen in the right of the pontine tegmentum. An area of hyperintensity is also seen in the right portion of the ventral part of the medulla. **a** Axial section at level of the lower pons, **b** axial section at level of the upper medulla, **c** sagittal section



**Fig. 2a, b.** MR images (SE TR2700ms, TE 80ms) of case 2. An area of hypointensity with a hyperintense spot is seen in the tegmentum of the pons dominantly on the left side. An area of hyperintensity is seen in the left side of the ventral medulla. **a** Axial section at level of the lower pons, **b** axial section at the level of the upper medulla

mental tract and contralateral superior cerebellar peduncle or dentate nucleus [2] and also with palatal myoclonus and other involuntary movements such as extremity myorhythmia [1, 3, 4].

In the two cases reported here, the lesions found in MR images in the ventral part of medulla were placed in the clinical category of OH because: (1) They lay in the

position of inferior olivary nuclei and were associated with pontine tegmental hematoma. (2) Both patients showed palatal myoclonus and one patient had also an extremity myorhythmia contralateral to the lesion.

To our knowledge, there were only two reports of the demonstration of the causative lesion in this syndrome with MR imaging [5, 6]. In each report, MR revealed a high intensity lesion on a T2-weighted image in the ventral part of the medulla. This finding seems to be the same as our findings in two patients. In these two reports, olivary lesions were reported to be bilateral. In only one case [6] was unilateral disease of the olive identified in a proton density-weighted image. However in this case, bilateral olivary lesions were identified in a T2-weighted sequence.

In the two cases reported here, a unilateral olivary lesion could be identified in T2-weighted images. The symptoms in our cases were considered to be caused by damage to the central tegmental tract without damage to the superior cerebellar peduncle at its junction with the tegmentum pontis because they correlated with the principle side of pontine hematoma.

MR is strongly recommended for the investigation of patients with this symptomatology.

## References

1. Guillan G, Mollaret P (1931) Deux cas de myoclonies synchrones et rythmiques velo-pharyngo-laryngo-oculo-diaphragmatiques. Le probleme anatomique et physio-pathologique de ce syndrome. *Rev Neurol* 2: 545-566
2. Jellinger K (1973) Hypertrophy of the inferior olives. *Z Neurol* 205: 153-174
3. Matsuo F, Ajax ET (1979) Palatal myoclonus and denervation supersensitivity in the central nervous system. *Ann Neurol* 5: 72-78
4. Masucci EF, Kurtzke JF, Saini N (1984) Myorhythmia: a widespread movement disorder. Clinicopathological correlation. *Brain* 107: 53-79
5. Sperling MR, Herrmann C Jr (1985) Syndrome of palatal myoclonus and progressive ataxia: two cases with magnetic resonance imaging. *Neurology* 35: 1212-1214
6. Yokota T, Hirashima F, Furukawa T, Tsukagoshi H, Yoshikawa H (1989) MRI findings of inferior olives in palatal myoclonus. *J Neurol* 236: 115-116

Dr. N. Hirono  
Department of Neurology  
Baba-memorial Hospital 4-244  
Hunao-tyo Higashi, Sakai-shi  
Osaka 592, Japan