

Case report

## Isolated trigeminal sensory change due to pontine hemorrhage

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### Abstract

Isolated trigeminal sensory change has been rarely described as a manifestation of pontine hemorrhage. We report a 31-year-old man who developed sudden and long-lasting trigeminal sensory disturbances. Brain magnetic resonance imaging showed a hemorrhage in the right lateral pontine tegmentum corresponding to the trigeminal sensory nucleus, and the venous phase angiogram demonstrated abnormal vascular structures. Pontine hemorrhage secondary to venous malformation can be one of the causes of isolated trigeminal sensory change.

**Key words:** Trigeminal sense; Pontine hemorrhage; Venous malformation

### 1. Introduction

Isolated trigeminal sensory neuropathy due to pontine hemorrhage has been rarely reported [1,2]. We report a patient with pontine hemorrhage secondary to probable venous malformation presenting with isolated trigeminal sensory disturbance.

### 2. Case report

A 31-year-old previously healthy man suddenly developed a tingling sensation in his right cheek that persisted without change in severity. Four years later when he was referred to our hospital, his blood pressure was 130/80 mm Hg and no neck bruits or heart murmurs were heard. He complained of numbness on the right side of his face, especially in the maxillary (V2) and mandibular (V3) nerve distribution. Results of neurologic examination were normal except for the abnormal trigeminal sensation; pinprick, temperature, touch, and vibration sense were decreased in V2 and V3 dermatomes of the right side of his face including the tongue, lip, upper and lower gums, and the hard palate. The ophthalmic nerve (V1) dermatome was less severely involved and corneal sensation was mildly attenuated on the right. Strength of mas-

seter, temporalis, and pterygoid muscles was normal and no facial muscle atrophy was noted. Brain magnetic resonance imaging (MRI) showed an old hemorrhage in the right lateral pontine tegmentum. Small, enhancing vascular structures were also seen around the hemorrhage (Fig. 1). Venous phase of the angiogram revealed tortuous vascular structures in the right cerebellar pontine angle region (Fig. 2).

### 3. Discussion

There have been occasional reports of vascular malformations in the area of trigeminal root entry zone which produced trigeminal sensory neuropathy mimicking trigeminal neuralgia [3–8]. However, intraaxial pontine hemorrhages selectively involving the trigeminal nucleus are rare [1,2]. Holtzman et al. [1] reported a 45-year-old normotensive man who showed isolated hypesthesia in the face, less marked in the V1 area. Brain computed tomography identified a hemorrhage probably involving the principal trigeminal sensory nucleus. Ruptured arteriovenous malformation was suspected, but an angiogram showed normal findings. More recently, Berlit [2] reported a 23-year-old man with pontine hemorrhage who showed trigeminal sensory deficit and weakness of the masseter muscle. MRI and angiogram did not reveal a vascular malformation.

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Fig. 1. T1-weighted MRI shows an old hematoma and linear vascular structure (arrow) in lateral pontine tegmentum.

Our patient is the third with intraaxial pontine hemorrhage causing isolated trigeminal sensory change, and the first in which MRI and angiogram demonstrated a vascular malformation. Although venous malformation bleeds rarely, a small number of cases with bleeding have been reported [9–12], some of them resulting in brain stem hemorrhages [11,12]. Since patients having both venous and cavernous malformations were reported [13], however, the possibility of concomitant existence of a cavernous angioma is not completely ruled out in our case.

In our patient, trigeminal motor function was spared as in the patient described by Holtzman et al. [1]. Sensory examination showed decreased pinprick, touch, and vibration sense in the right side of his face. In the human pons, trigeminal sensory fibers carrying pinprick and

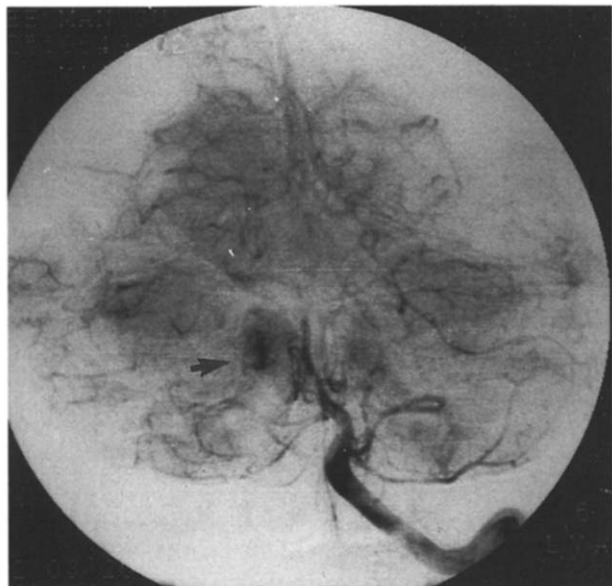


Fig. 2. Venous phase of angiogram shows abnormal vascular structures (arrow).

temperature sense descend as a spinal trigeminal tract soon after they enter the pons. Root fiber conveying impulses for tactile and pressure sense do not descend, but enter the principal sensory nucleus [14]. Therefore, in our case, entering (or descending) sensory fibers and the principal sensory nucleus seem to be simultaneously involved while motor fibers situated in the medial side of the sensory nucleus are spared. It is noteworthy that sensation in the ophthalmic nerve dermatome was only mildly impaired in our patient and the patient described by Holtzman et al. [1]. Fibers carrying sensation from the V1 area are localized in the most ventral part of the descending trigeminal tract while tracts from the V2 and V3 areas are located more dorsally [14]. Therefore, the most ventral portion of the lateral pontine tegmentum may have been less severely involved in the above two patients with intraaxial hemorrhage.

## References

- [1] Holtzman, R.N.N., Zablocki, V., Yang, W.C. and Leeds, N.E. (1987) Lateral pontine tegmental hemorrhage presenting as isolated trigeminal sensory neuropathy. *Neurology*, 35: 637–643.
- [2] Berlit, P. (1989) Trigeminal neuropathy in pontine hemorrhage. *Eur. Neurol.*, 29: 169–170.
- [3] Dandy, W.E. (1934) Concerning the cause of trigeminal neuralgia. *Am. J. Surg.*, 24: 447–455.
- [4] Eisenbrey, A.B. and Hegarty, W.M. (1956) Trigeminal neuralgia and arteriovenous aneurysm of the cerebellopontine angle. *J. Neurosurg.*, 13: 647–649.
- [5] Johnson, J.H.J. and Kline, D.G. (1968) Arteriovenous malformation presenting as trigeminal neuralgia: case report. *J. Neurosurg.*, 29: 287–289.
- [6] Kawano, H., Hayashi, M., Kobayashi, H., Tsuji, T., Kabutu, M. and Kubota, T. (1987) Gas CT cisternography of trigeminal neuralgia caused by arteriovenous malformation of the cerebellopontine angle. *Am. J. Neuroradiol.*, 8: 161–162.
- [7] Veerapen, R. (1989) Spontaneous lateral pontine hemorrhage associated with trigeminal root hematoma. *Neurosurgery*, 25: 451–454.
- [8] Zager, E.L. (1991) Isolated trigeminal sensory loss secondary to a distal anterior inferior cerebellar artery aneurysm: case report. *Neurosurgery*, 28: 288–291.
- [9] Pak, H., Patel, S.C., Malik, G.M. and Ausman, J.I. (1981) Successful evacuation of a pontine hematoma secondary to rupture of a venous angioma. *Surg. Neurol.*, 15: 164–167.
- [10] Carter, J.E., Wymore, J., Anbacher, L. and Reid, W.S. (1982) Sudden visual loss and a chiasmal syndrome due to an intrachiasmatic vascular malformation. *J. Clin. Neuroophthalmol.*, 2: 163–167.
- [11] Sadeh, M., Shacked, I., Rappaport, Z.H. and Tadmor, R. (1982) Surgical extirpation of a venous angioma of the medulla oblongata simulating multiple sclerosis. *Surg. Neurol.*, 17: 334–337.
- [12] Kilpatrick, T.J., Davis, S.M., Tress, B.M. and Rosenfeld, J.V. (1991) Lateral tegmental pontine hemorrhage due to vascular malformation. *Cerebrovasc. Dis.*, 1: 108–112.
- [13] Rigamonti, D. and Spetzler, R.F. (1988) The association of venous and cavernous malformations. Report of four cases and discussion of the pathophysiological, diagnostic, and therapeutic implications. *Acta Neurochir. (Wien)*, 92: 100–105.
- [14] Carpenter, M.B. and Sutin, J. (1983) *Human Neuroanatomy*, 8th edn., Williams and Wilkins, Baltimore, MD, pp. 393–402.