Case report

An atypical pontine infarction presenting with segmental sensory disturbance and uncrossed sensory symptomatology: case report

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ABSTRACT

We reported a patient who presented with analgesia and thermesthesia from the face to T4 dermatome on the contralateral side to the lesion due to infarction of the dorsal tegmentum of the caudal pons, which was inconsistent with classical dorsolateral pontine infarction. We speculated that the lesion affected the trigeminothalamic tract deriving from the second-order neurons on the contralateral side and partial lateral spinothalamic tracts carrying pain and temperature sensation above T4 dermatome, while the spinal trigeminal tract and its nucleus on the ipsilateral side and other parts of lateral spinothalamic tracts were spared. This case showed the atypical presentations of dorsolateral pontine infarction and may provide clinicians with new diagnostic ideas.

1. Introduction

Dorsolateral pontine infarction always shows distinctive clinical symptom characterized by lateral abducens nerve and facial nerve palsy and crossed sensory symptomatology. The crossed sensory symptomatology is the typical symptom of dorsolateral pontine infarction which appears as pain and temperature impairment in the ipsilateral face and the contralateral body. However, lesions on dorsolateral pons may present various clinical manifestations under different conditions for its special neuroanatomical structure. Sensory impairment from the face to T4 dermatome on the contralateral side to the lesion has rarely been reported compared to crossed sensory impairment. Here we reported a patient who presented unilateral pain and temperature deficits from the face to T4 dermatome on the contralateral side to the lesion accompanied by other brainstem symptoms.

2. Case report

A 54-year-old man was admitted to our hospital complaining of dysesthesia of right upper extremity and face, facial palsy on left side, dizziness, left drooping eyelid and diplopia on waking in the morning. He had been diagnosed with hypertension and diabetes for the past 2 years. However, he did not take his medication regularly or monitor his blood pressure and blood sugar periodically. On admission, he had a blood pressure of 180/106 mmHg with normal blood glucose. The neurological examination revealed that the abduction of his left eye was severely impaired, left forehead line and nasolabial fold disappeared, pinprick and temperature sensation of right trunk above T4 level, right upper limb and right face diminished, and sweat on the left forehead and face also decreased. No positive result was found in the emergency head CT scan after the onset. Magnetic Resonance Imaging (MRI, 1.5T, Philips) and time-of-flight Magnetic Resonance Angiography (MRA) of the brain after 48 h showed new infarct in the left dorsal tegmentum of the caudal pons and local stenosis of vertebrobasilar artery and its branches (Figure 1).

3. Discussion

The lesion of dorsolateral pons can be found in the patients of stroke, multiple sclerosis, tumor and vasculitis [1]. There are many nuclei and nerve fiber pathways located densely in this area. Various lesions with different etiology in the area might damage different neuroanatomic structures thus leading to unequal symptoms.

Our patient was diagnosed as acute stroke of caudal pons by MR imaging. He presented with dizziness, lateral abducens nerve and facial...
nerve palsy on left side and diplopia which were partially consistent with dorsolateral pontine infarction. However, his sensory impairment was uncrossed which was different from typical crossed sensory symptomatology of dorsolateral pontine infarction. As we know, the spinal trigeminal tract and its nucleus are responsible for carrying sensation from the ipsilateral side of the face. We speculated that the ventral trigeminothalamic tract which is made up of crossed fibers deriving from second-order neurons on the contralateral side was impaired instead of the ipsilateral spinal trigeminal tract and its nucleus [2] (Figure 2).

Another clinical feature distinguishing our patient from other patients with dorsolateral pontine infarction was that this patient presented segmental sensory disturbance on the contralateral side which was similar to spinal cord injury. The spinothalamic tract pathway in

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**Figure 1.** T2 TSE sequence (A) and DWI sequence (B) of MRI showed high signals, while ADC sequence of MRI (C) showed a low signal in the left dorsal tegmentum of the caudal pons. MRA image (D) showed multiple local stenosis of vertebral basilar artery.

**Figure 2.** The exact location of the lesion (shaded area) affected trigeminothalamic tract which is responsible for contralateral sensation of face, partial lateral spinothalamic tracts which are responsible for contralateral sensation above T4 level, abducens nucleus and facial nucleus. While the spinal trigeminal tract and its nucleus which are responsible for ipsilateral sensation of face and other parts of lateral spinothalamic tracts were spared.
the spinal cord has a certain somatotopic organization. The medial part of the track receives cervical input while the lateral part receives sacral input [3]. We speculated that the spinothalamic tract pathway has a similar pattern in pons as in the spinal cord [4]. For this patient, fibers of lateral spinothalamic tract which were responsible for contralateral sensation of upper limb and trunk above T4 segment were impaired when the infarct occurred, while the rest was spared (Figure 2). In conclusion, this case was another example for physicians to be cautious when managing complicated and atypical clinical manifestations.

This article was approved by the ethical committee of Taikang Xianlin Drum Tower Hospital, Nanjing University School of Medicine. The informed consent was obtained from all patients for our experiments.

Declarations

Author contribution statement

Liumin Wang: Conceived and designed the experiments; Wrote the paper.
Tongchao Geng, Shucheng Gang: Conceived and designed the experiments.

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The authors declare no conflict of interest.

Additional information

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