Title: Trigeminal neuropathy from root entry zone infarction

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Author disclosures:

Funding:

The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests:

None declared.

Patient consent for publication:

Consent obtained directly from patient(s).

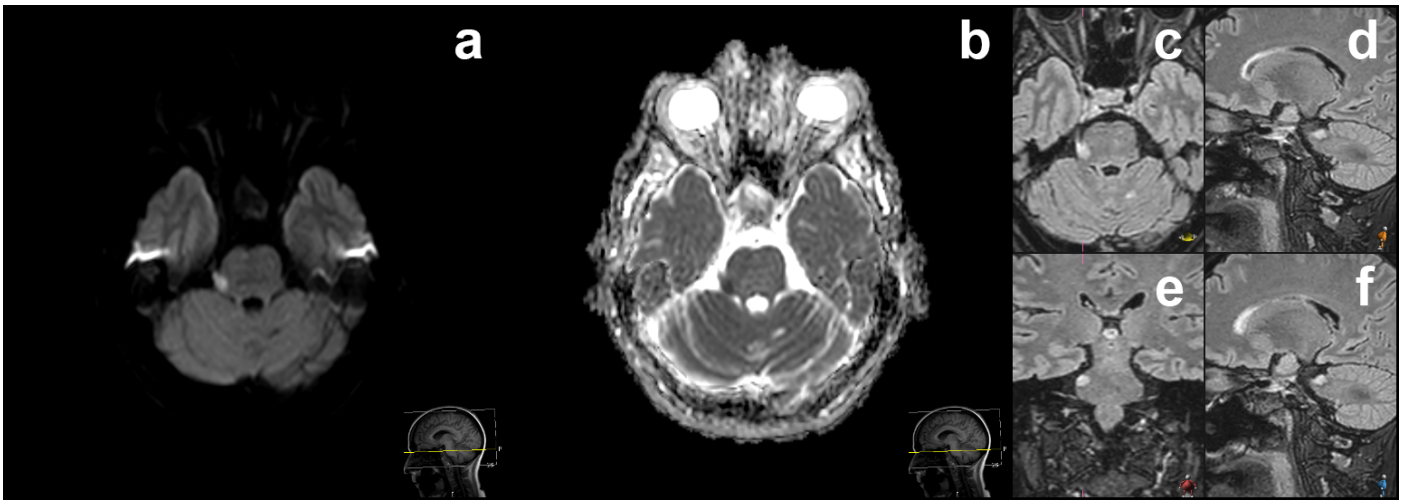
Case:

A woman in her 50s woke with facial numbness, initially involving the right nasal and perioral regions, but progressing gradually over 3 days to involve the whole of the right side of her face to the vertex. She had no associated pain or headache. She described a 'freezing' sensation to the right side of her face and constant ipsilateral numbness of her gums and palate but not her tongue. Her ear was unaffected. There were no ocular, bulbar, bladder or bowel symptoms and no peripheral motor or sensory disturbance. She was systemically well. Three days before, she had undergone a non-surgical cosmetic procedure to her abdomen with fat dissolving injections. She had chronic obstructive airway disease and was an ex-smoker. There was no history of venous or arterial thrombosis. She was normotensive and the only neurological finding was complete sensory loss to light touch and pin prick along the distribution of all three sensory divisions of the right trigeminal nerve. There were no cerebellar signs.

She had a mild lymphocytosis but blood tests were otherwise normal or negative, including lipid profile, glycated haemoglobin, bloodborne virus antibody titres and antiphospholipid antibodies. CT scan of head showed two small hypodensities within the left cerebellar vermis and hemi- spheres, considered to be non-specific but potentially representing small ischaemic insults. MR scan of brain showed a right pontine focus of diffusion restriction in the region of the right trigeminal nerve root entry zone (figure 1), representing an acute or subacute infarct. There were also background cerebellar infarcts, and mild small vessel disease but no evidence of an underlying inflammatory cause.

We started her on antiplatelet therapy. CT angiography of the aortic arch and carotid arteries showed normal carotid arteries, circle of Willis and dural venous sinuses. Bubble contrast echocardiography identified an aneurysmal interatrial septum and was mildly positive for patent foramen ovale.

Figure 1:



MR scan of brain. Focus of restricted diffusion within the right pons in the region of the right trigeminal nerve root entry zone showing on (A) axial DWI, and (B) axial ADC map. T2- FLAIR hyperintense foci within the right pons in the region of the right trigeminal nerve root entry zone showing on (C) axial, (D) sagittal, (E) coronal and (F) sagittal planes. ADC, apparent diffusion coefficient; DWI, diffusion-weighted imaging; FLAIR; fluid attenuated inversion recovery.

Discussion:

The region of the root entry zone of the trigeminal nerve is susceptible to compression (commonly the superior cerebellar artery), demyelination, inflammation, neoplasm and trauma. Isolated infarction of the trigeminal nerve root entry is rare, and previously reported patients have presented with trigeminal neuralgia (unlike here).[1][2][3][4]

Numbness is the hallmark of trigeminal neuropathy, usually from a first-order or peripheral lesion.[5] Involvement of central trigeminal pathways in this patient is supported by the radiological findings correlating with her clinical symptoms. Her symptoms evolved over 3 days, atypical for an infarct, and possibly explained by progressive ischaemia of the affected nerve branches. Given the 'onion-skin' rostral-caudal somatotopic organisation of the trigeminal complex, initial involvement of her right nasal and perioral regions may reflect early ischaemia within pars oralis—the most rostral subdivision.[6]

Although this patient had a non-surgical cosmetic procedure to her abdomen with fat dissolving injections 3 days before symptom onset, there were no signs attributable to fat embolism, specifically no petechial rash, respiratory symptoms or alteration in mental status. Radiological appearances of fat embolism can be non-specific, presenting as multiple small punctate foci of signal abnormality, with the distribution typically involving the cerebral subcortical and deep white matter, internal capsule and the corpus callosum. Although in the acute phase these can show diffusion restriction, resembling acute ischaemia from any cause, the appearances can also be associated with foci of susceptibility related loss of signal related to micro- haemorrhages. This patient did not have the typical distribution of white matter changes or the microhaemorrhages seen in cerebral fat embolism.

Considering her vascular risk factors—as well as a mildly positive bubble study for patent foramen ovale and the finding of asymptomatic previous cerebellar infarcts—the area of restriction diffusion within the right pons strongly suggests a small embolic stroke affecting a perforating vessel of the pons.

Key point:

- Trigeminal neuropathy can result from infarction of the root entry zone of the trigeminal nerve.

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