Tortuous Vertebrobasilar System: A Cause of Cranial Nerve Signs*

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Summary. Elongation of the vertebrobasilar system into the cerebellopontine angle may cause abnormalities of the cranial nerves. The diagnosis may be suspected at pneumoencephalography or with posterior fossa pantopaque studies and be confirmed by vertebral angiography.

Systeme vertebro-basilaire tortueux : une cause d'atteinte des nerfs crâniens
Résumé. L'elongation du système vertébro-basilaire dans l'angle pontocérébelleux peut être l'origine d'anomalies des nerfs crâniens. Le diagnostic peut être évoqué à la pneumo-encéphalographie ou lors d'examens de la fosse postérieure au Panthopaque et confirmé par l'angiographie vertébrale.


Numerous reports of megadolichobasilar arteries causing cranial nerve signs and symptoms appear in the literature. In each case, either a fusiform aneurysm or arteriosclerotic dilatation and elongation of the basilar artery was described [1, 2, 4–6, 14, 15, 17].

Recently we have seen 3 patients with similar complaints in whom simple elongation of the otherwise normal sized vertebral and basilar artery was demonstrated, which extended out into the cerebellopontine angle. These anomalies are here reported and the arteriograms are compared with 50 reportedly normal vertebral arteriograms obtained on patients without any cranial nerve signs.

Case Reports

Case I. This 59-year-old Chinese woman was well until 10 years previously when spontaneous twitches of the right facial muscles developed. Two years later she noted weakness of these muscles upon voluntary movement, gross muscular twitches while at rest, and an aggravation of these symptoms with nervous tension. Six years before admission, neurologic examination revealed misdirected, regenerated nerve fibers. (Rapid blinking of the eyes resulted in twitches of muscle groups about the right side of the mouth. Repeated lip movements were also accompanied with small muscular twitches in the region of the right eye.)

Clumsiness and stiffness of the left arm and leg developed 3 years before admission. These difficulties progressed in severity and eventually involved her entire body. Also noted at that time was a typical Parkinson's tremor.

On admission the face was inexpressive and infrequent blinking was observed. The facial muscles were weak and spastic on the right. The other cranial nerves were normal. Mild upper motor neuron weakness of the left arm and both legs, increased tone of the left arm and both legs, and some cogwheel rigidity were noted. No ataxia or sensory changes were present. The deep tendon reflexes were abnormally hyperactive bilaterally, but plantar stimulation resulted in flexion.

Laboratory data, including results of serologic tests for syphilis and spinal fluid examination, were normal. Vertebral angiography disclosed pronounced elongation of the vertebral and basilar arteries, which extended into the right cerebellopontine angle. A myelogram of the posterior fossa confirmed these findings.

Case II. This 50-year-old Caucasian woman noticed spontaneous rapid twitching of the muscles around the left eye for 4 months. The movements increased in frequency and on admission involved the entire left face. For several weeks before admission she noted also some drooping of the left eyelid.

The patient was well developed and blood pressure was 150/88. Except for a decreased left corneal reflex and hypesthesia over all divisions of the left fifth cranial nerve, the results of physical examination were normal. A lower motor neuron weakness of the left seventh nerve was evident. Rapid small fascicular movements of the muscles of the face and left upper and lower lids were noted. The rest of the cranial nerves were normal.

Laboratory data, including audiograms, were normal. Pneumoencephalography showed a 5 × 10 mm ovoid mass adjacent to the fifth cranial nerve. An angiogram revealed this mass to be a vertebral artery that extended into the cerebellopontine angle (Fig. 1).

Case III. This 52-year-old Chinese woman was seen on her fourth admission because of a progressive and relentless tic of the entire left face. The patient noted some associated dull frontal and occipital headache and some dullness to touch of the left side of the face. Otherwise she was asymptomatic and in good health.

A previous pneumoencephalogram and myelogram of the posterior fossa had been interpreted as normal. The only abnormality on physical examination was the almost continuous twitching of the entire left face, relatively sparing the brow, and involving some of the muscles of the neck. The facial muscles on the left were noticeably weak. Blood pressure was 105/75.

Pneumoencephalogram and vertebral arteriogram showed the vertebrobasilar junction to be in the left cerebellopontine angle cistern (Fig. 2).

* Supported in part by a Special Fellowship in Neuroradiology (1 F11 NS 02413-01A1) from the National Institute of Neurological Diseases and Stroke.
Fig. 1. Case II. a) Vertebral arteriogram, anteroposterior projection. b) Towne projection. These views show lateral extension of the vertebral artery which was elongated but of normal diameter. The loop is well into the cerebellopontine angle and lies adjacent to the internal auditory canal. c) Anteroposterior tomogram at pneumoencephalography showing this loop of the vertebral artery in the cerebellopontine angle adjacent to the internal auditory canal (arrow).

Fig. 2. Case III. a) Towne view. b) Anteroposterior view. Pronounced tortuosity and elongation of both vertebral arteries which extend into the left cerebellopontine angle cistern.