Trigeminocerebellar artery

The trigeminocerebellar artery (TCA) is a unique branch of the basilar artery supplying both the trigeminal nerve root and the cerebellar hemisphere.

The close relationship of the TCA to the trigeminal nerve root may have clinical implications including for the etiology of trigeminal neuralgia, thus the neurosurgeon must be aware of the vasculature of the trigeminal nerve root area and the anatomical variations [1].

The trigeminocerebellar artery supplied two roots (6.89%) of the trigeminal nerves [2].

The trigeminocerebellar artery was found on the left side in one of 22 brainstems, with the vasculature injected with India ink or methylmethacrylate. The trigeminocerebellar artery, which measured 910 microns in diameter, arose from the basilar artery. The artery was divided into the pontine, trigeminal, cerebellopontine, and cerebellar segments. The artery supplied the anterolateral and lateral part of the pons, the trigeminal nerve root, the middle cerebellar peduncle, and most of the petrosal surface of the cerebellar hemisphere.

Occlusion of this artery would cause a syndrome similar to the lateral midpontine syndrome. The trigeminocerebellar artery could be misinterpreted on angiograms as the anterior inferior cerebellar artery with a high origin from the basilar artery [3].

A 31-year-old woman presented with typical right trigeminal neuralgia caused by a trigeminocerebellar artery, manifesting as pain uncontrollable with medical treatment. Preoperative neuroimaging studies demonstrated that the offending artery had almost encircled the right trigeminal nerve. This finding was confirmed intraoperatively, and decompression was completed. The neuralgia resolved after the surgery; the patient had slight transient hypesthesia, which fully resolved within the 1st month after surgery. The neuroimaging and intraoperative findings showed that the offending artery directly branched from the upper part of the basilar artery and, after encircling and supplying tiny branches to the nerve root, maintained its diameter and coursed toward the rostral direction of the cerebellum, which indicated that the artery supplied both the trigeminal nerve and the cerebellum. The offending artery was identified as the trigeminocerebellar artery. This case of trigeminal neuralgia caused by a trigeminocerebellar artery indicates that this variant is important for a better understanding of the vasculature of the trigeminal nerve root [4].

1)
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