Trochlear nerve

Anatomy

Knowledge of the microanatomy of the trochlear nerve is useful to skull base surgeons, because is important to preserve during approaches to the skull base.

The trochlear nerves run through the cerebellomesencephalic fissure, as do the superior cerebellar artery (SCA).

Segments

Traditionally, this nerve has been divided into cisternal, cavernous, and orbital segments. However, Tubbs et al. anecdotally observed an additional segment during routine cadaveric dissections. Therefore, they performed this study to better elucidate this anatomy.

In Twenty latex-injected cadaveric sides (10 adult cadavers) with the aid of an operating microscope. Standard microdissection techniques were used to examine the course of the distal cisternal and precavernous segments of the trochlear nerve. They identified a previously undescribed segment of the trochlear nerve in all specimens. This part of the nerve coursed between the entrance of the trochlear nerve into the posterior corner of the oculomotor trigone to the posterior wall of the cavernous sinus.

This segment of trochlear nerve was, on average, 4 mm in length.

They propose that this be referred to as the trigonal segment [1)].

The assessed distances measured from the tentorial entry point of the trochlear nerve to the anterior clinoid process was 14 to 28 mm, to the posterior clinoid process was 9 to 19 mm, to the posterior lip of the inner auditory canal was 25 to 29 mm, to the posterior border of the Meckel cave was 9 to 14 mm, and to the oculomotor triangle was 5 to 16 mm.

The cisternal length of the trochlear nerve shows a marked variability and may be further distorted by tumors, whereas the entry point into the tentorium is a stable landmark. Therefore, it might be an important reference point for identifying the nerve before cutting the tentorium [2)].

After drilling the suprameatal tubercle toward the petrous apex, the Meckel's cave was exposed. The trochlear nerve was the landmark for opening the cavernous sinus by this approach. The dura located medially to the entry point of the trochlear nerve into the tentorium was resected, allowing exposure of the intracavernous carotid artery with its meningohypophyseal trunk.

The extended retrosigmoid intradural suprameatal approach allows exposure of the posterior cavernous sinus and may be used to remove lesions of the posterior fossa extending into the Meckel's cave and into the cavernous sinus [3)].

Mapping

Trochlear nerve mapping.

Palsy

see Trochlear nerve palsy

References

1)
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