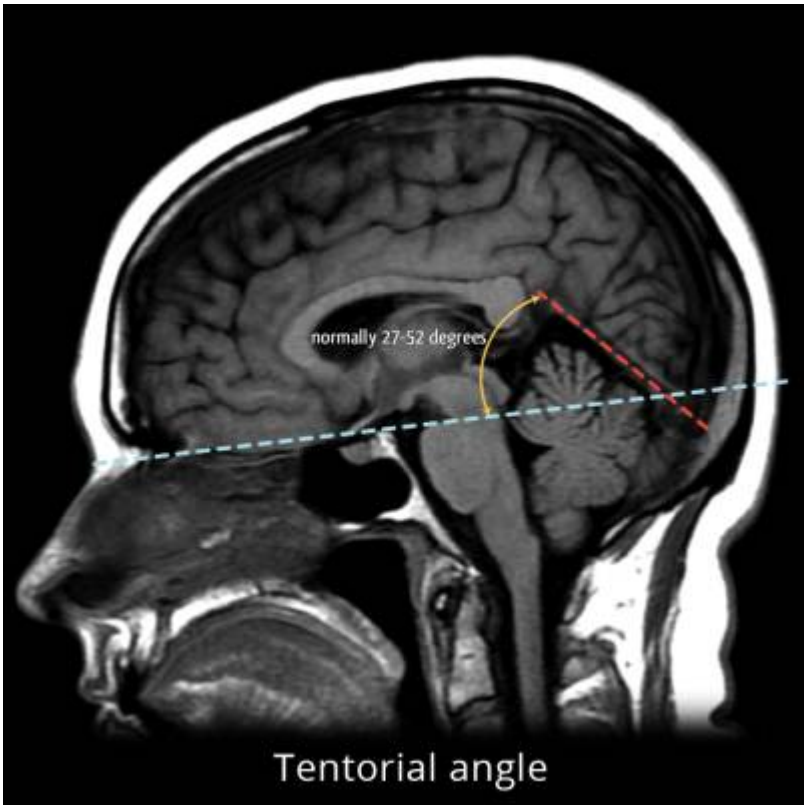
Tentorial Angle



Various techniques of measuring tentorial alignment and their surgical implications have been described; however, all of the methods are burdened with limitations and there is still a lack of consensus regarding the anatomical reference lines and cutoff values for tentorial angles to discriminate between “shallow” and “steep” angles [1) 2) 3)].

Nemir et al., from the University Hospital Center Zagreb, Croatia, present data on craniocaudal dimensions of posterior fossa cisterns, their relationship with tentorial alignment, and discuss their relevance in Supracerebellar Infratentorial approach and Occipital transtentorial approach

The clivus-tentorium (C-T) angle was measured to assess tentorial alignment. The following distances were used as craniocaudal cisternal measurements: quadrigeminal cistern = superior colliculus - inferior part of the splenium of corpus callosum (SC-ISCC), and superior cerebellar cistern = vermis - inferior part of the splenium of corpus callosum (VER-ISCC).

Median C-T angle value was 19 ± 7°, the quadrigeminal cistern height 6.7 ± 1.6 cm, and the superior cerebellar cistern height 10.4 ± 2.6 cm. The C-T angle was negatively correlated with the SC-ISCC distance ($r = -0.271$; $p < 0.001$) and the VER-ISCC distance ($r = -0.052$, $p > 0.001$). The SC-ISCC distance was positively correlated with the VER-ISCC distance ($r = 0.282$; $p < 0.001$) [4)].

Studies have used the Twining line (from the tuberculum sellae to the torcula), or the floor of the fourth ventricle as reference lines and defined different cutoff values of “steepness”. The other important factors to be considered in approaching the pineal region are anatomic features of the quadrigeminal cistern and superior cerebellar cistern, as both host important neurovascular structures and serve as anatomic corridors [5) 6) 7) 8) 9)].

The current trend to use the Twining line to define this angle has significant pitfalls.

The goal of a study of Syed et al., was to provide a new and accurate way to measure the tentorial angle and demonstrate its impact on surgeries of the pineal region.

n-angle to measure the tentorial angle was introduced using the floor of the fourth ventricle and the torcula. Comparisons with older techniques were made to illustrate reliability. Midline sagittal MR images were used to measure the tentorial angle in 240 individuals to obtain population-based data. A cohort of 8 patients who underwent either the infratentorial or the transtentorial approach to the pineal or upper vermian region were examined in search of correlations between tentorial angle and surgical approach.

The data in this study showed that the Twining line technique understates the tentorial angle in people with low-lying torcula. The n-angle is more reliable in reflecting the true steepness of the tentorium regardless of torcula position. On average, men have slightly steeper tentoriums. In the clinical cohort, all patients who underwent infratentorial surgery had tentorial angles <55°, whereas the majority of patients who underwent transtentorial surgeries had angles >67°.

The n-angle provides a reliable and accurate way to describe the slope of the tentorium. The population-based average of 60° may be a useful measurement to influence the choice of surgical approach, either under or through the tentorium, to the pineal region [10].

A steep tentorial angle is an unfavorable preoperative radiographic factor for achieving maximal resection with the supracerebellar infratentorial approach. Collectively, a study of Zhao et al. showed that versatility is required to treat patients with falcotentorial meningiomas and that treatment goals and surgical approach must be individualized to obtain optimal surgical results [11].

References

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