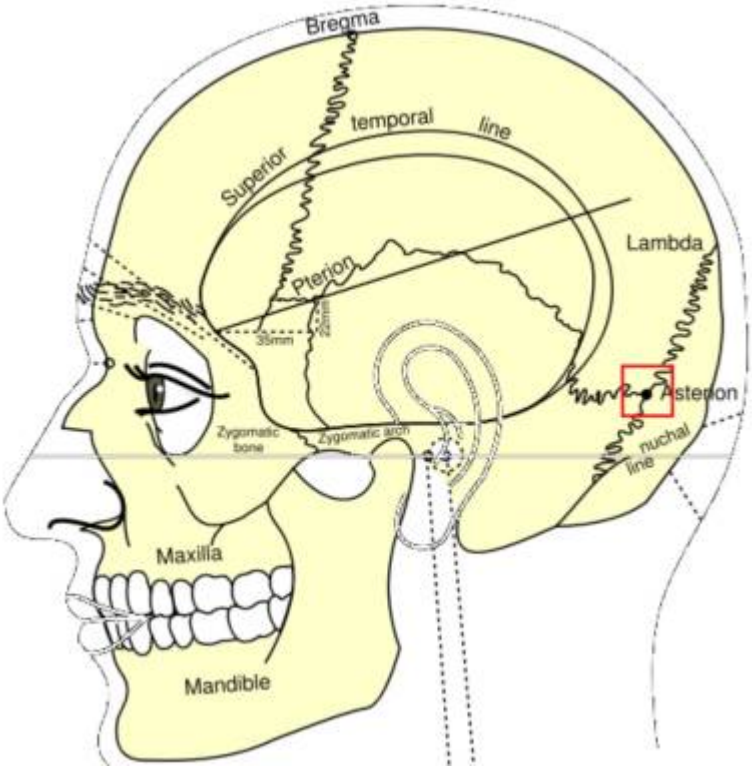
Asterion



The asterion is defined as the junction of the lambdoid suture, parietomastoid suture, and occipitomastoid sutures, corresponding to the posterior end of the parietomastoid suture.

Three cranial bones meet:

Parietal bone, Occipital bone, and Mastoid portion of the Temporal bone.

In the adult, it lies 4 cm behind and 12 mm above the center of the entrance to the ear canal.

It is a so-called craniometric point on the exposed skull, just behind the ear.

Gharehdaghi et al. examined the morphology of the asterion, its association with deep vein elements, the mastoid apex and inion in 105 adult cadavas (210 hemicraniums) including 146 males and 64 females at the anatomy lab of the Legal Medicine Organization.Results: Two types of asterion were observed. Type I was found in 14.7%, and type II in 85.3% of cases. In 70% of cases, the asterion was at or above the venous sinus. The distance between the asterion and the mastoid appendage on the right side was 47.03 mm and on the left side was 46.5 mm. The distance between the asterion and the inion at the right side was 70.55 mm and on the left side was 70.2 mm.Conclusion: The asterion in 70% of cases was at or above the level of the transverse sinus. For this reason, in posterior fossa surgical approaches, the first burr hole is preferred to start in the lower parts of the asterion [1].

Asterional approach

The asterion has been used as a landmark in lateral approaches to the posterior fossa.

The Microvascular decompression for trigeminal neuralgia by an asterional approach is an alternative with similar results to the classic retrosigmoid approach, but that adds the benefits of the principles of minimally invasive surgery. Constant efforts need to be made to optimize minimally invasive surgical techniques for TN [2].

However, its reliability as a landmark comes into question considering the apparent variability of its position.

One hundred dried skulls were obtained for a study. A 2-mm drill hole was placed at the asterion on each side. The position of the drill hole on the inner surface of the skull was next determined and recorded.

The asterion was located over the posterior fossa dura in 32% on the right and 25% on the left. Its position was over the transverse sinus or sigmoid sinus complex in 61% on the right and 66% on the left. The landmark was located above the transverse sigmoid sinus junction complex in 7% on the right and 9% on the left.

The asterion is not a strictly reliable landmark in terms of locating the underlying posterior fossa dura. Its location is very often directly over the transverse sigmoid sinus junction complex. Burr holes placed at the asterion may often open the bone directly over the sinus, leading to potential damage [3].

Lesions

Asterional dermoid cyst.

References

1)
Gharehdaghi J, Jafari-Marandi H, Faress F, Zeinali M, Safari H. Morphology of asterion and its proximity to deep vein sinuses in Iranian adult skull. Br J Neurosurg. 2020 Feb;34(1):55-58. doi: 10.1080/02688697.2019.1687846. Epub 2019 Nov 20. PMID: 31746229.
2)
López-Elizalde R, Reyes-Velasco E, Campero Á, Ajler P, Cornelio-Freer KC, Godínez-Rubí M. Minimally invasive asterional approach for microvascular decompression in trigeminal neuralgia. Gac Med Mex. 2019;155(Suppl 1):S56-S63. doi: 10.24875/GMM.M19000291. PMID: 31638613.
3)
Day JD, Tschabitscher M. Anatomic position of the asterion. Neurosurgery. 1998 Jan;42(1):198-9. PubMed PMID: 9442525.