Trautmann's triangle

This is a triangular space bounded by:

Bony labyrinth anteriorly

Sigmoid sinus posteriorly

Dura containing superior petrosal sinus superiorly.



Trautmann's triangle is exposed with the black lined area. This is the area of dural openning bounded by the superior petrosal sinus, the sigmoid sinus and the bone labyrinth.

SS: sigmoid sinus; TS: Transverse sinus; SPS: superior petrosal sinus; JB: jugular bulb; Black lined area: Trautmann's triangle. The size of this triangle is highly variable depending on the size of the sigmoid sinus.

This triangle is a potential weak spot through which infections of temporal bone may traverse and affect cerebellum. Extra dural abscess involving the posterior cranial fossa is also possible when thin bone in this triangle gets breached in infections / cholesteatoma involving mastoid cavity.Since bone in this area is rather thin it can be drilled out to enter into the posterior cranial fossa. This can be used as an approach to posterior cranial fossa lesions.

The size of this triangle is highly variable depending on the size of the sigmoid sinus. A large sigmoid sinus reduces the size of this triangle and also increases the angulation of the superior petrosal sinus with it. This impedes the venous drainage predisposing to the development of endolymphatic hydrops.

Trautmann's triangle (TT) faces the cerebellopontine angle and is exposed during posterior transpetrosal approaches.

TT was exposed from an external approach (transmastoid) in ten cadavers (20 sides) and from an internal approach on 20 dry adult temporal bones. Measurements included calculation of the area of TT and the distance of the endolymphatic sac from the anterior border of the sigmoid sinus. The area range of TT was 45-210 mm(2) (mean 151 mm(2); SD 37 mm(2)). Three types of triangles were identified based on area. Type I triangles had areas less than 75 mm(2), Type II areas were 75-149 mm(2), and Type III areas were 150 mm(2) and greater. These types were observed in 37.5%, 35%,

and 27.5% of sides, respectively. The distance from the jugular bulb's anterior border to the posterior border of the posterior semicircular canal ranged from 6 to 11 mm (mean 8.5 mm). The endolymphatic sac was located in the inferior portion of TT and traveled anterior to the sigmoid sinus. The horizontal distance from the anterior edge of the sigmoid sinus to the posterior edge of the endolymphatic sac ranged from 0 to 13.5 mm (mean 9 mm). Additional anatomic knowledge regarding TT may improve neurosurgical procedures in this region by avoiding intrusion into the endolymphatic sac and sigmoid sinus 1 .

1)

Tubbs RS, Griessenauer C, Loukas M, Ansari SF, Fritsch MH, Cohen-Gadol AA. Trautmann's triangle anatomy with application to posterior transpetrosal and other related skull base procedures. Clin Anat. 2014 Oct;27(7):994-8. doi: 10.1002/ca.22363. Epub 2014 Jan 16. PubMed PMID: 24431083.

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