Retrosigmoid keyhole approach

To provide anatomic basis for the retrosigmoid supra-tentorium to infra-tentorium keyhole approach and to explore the feasibility, 60 skulls were observed and measured to demonstrate the position relations among related bony landmarks, 12 cadaveric heads were dissected and measured for localization of the keyhole and the incision through tentorium. For giving the angle and depth for endoscopic approach, 40 adult volunteers were performed head MRI scan and the pictures were measured and analyzed. The surface projection of sigmoid and transverse sinus can be positioned by mastoidale, external occipital protuberance, and anterior end of parietomastoid suture (AEPMS) on body. There is a safe trigone of cerebellar tentorium (STCT) among inner edge of upper curve of sigmoid sinus, entrance of tentorial sinus/vein and midpoint of posterior edge of temporal arcuate eminence. 15 mm superior to the midpoint between asterion and AEPMS can be recognized as the central point of the keyhole. Magnetic resonance imaging pictures show there is potential subarachnoid space for endoscopic approach from the indicated keyhole to pontocerebellar trigone. This study demonstrated endoscopy can arrive at pontocerebellar trigone through the STCT and the keyhole supra-tentorium to infra-tentorium endoscope approach is feasible in anatomy and will contribute to excise lesions involving both supra- and infra-tentorial structures [1)].

A 20 mm hole made backwards from the midpoint of the asterion to the mastoid process is suitable for a retrosigmoid keyhole approach with the aid of an endoscope. The endoscope-assisted retrosigmoid keyhole approach can be considered an effective and safe method for removal of vestibular schwannoma.

With the aid of an endoscope, we simulated surgical procedures in 30 sides of 15 formalin-fixed cadaver heads.

(1) For 24 (80%) sides, the midpoint of the top notch to the mastoid process was in the anterior edge of the sigmoid sinus; for 27 sides (90%) the midpoint of the asterion to the mastoid process was in the posterior edge of the sigmoid sinus. (2) The IAC and CPA were exposed by the retrosigmoid keyhole approach with the aid of the endoscope [2)].

The combining trans-subtemporal and suboccipital retrosigmoid keyhole approach is simple, safe, and minimally invasive, and an ideal operation approach for petroclival meningioma [3)].

1)
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2)
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3)
Chen LH, Yang Y, Wei Q, Li YJ, Li WD, Gao JB, Yu B, Zhao H, Xu RX. [Microsurgical management of petroclival meningiomas combined trans-subtemporal and suboccipital retrosigmoid keyhole approach]. Beijing Da Xue Xue Bao. 2016 Feb 18;48(1):738-42. Chinese. PubMed PMID: 27538163.