

Microsurgery of the transtemporal approaches for skull base pathologies belongs to the most difficult areas of skull base surgery. Precise knowledge of its anatomy acquired in the cadaver laboratory is mandatory. The topographical anatomy of the temporal bone and the transtemporal approaches to the skull base were analyzed on cadaver dissections (234 temporal bones) and on HRCT examinations of the skull bases of living patients (100 temporal bones). The study demonstrated a significant variability of metric relationships and the possibility of failure in identifying important topographical points. Individual anatomical deviations, varieties and anomalies are not rare findings. The individual anatomy of the venous system (the size of the jugular bulb, the dominance and the position of the venous sinuses, the vein of Labbe position, and the emissary veins) is also very variable and is a part of the very important factors that are necessary to select the right approach. The most variable anatomical structures of the temporal bone in our study were the jugular bulb and the arcuate eminence. The high jugular bulb that would reach at least the floor of the internal auditory canal was identified in 16.5%. The average distance between the internal auditory canal and the jugular bulb was $7.5\pm 2.3\text{mm}$ (range 1-16mm). The arcuate eminence was not present in 8% of cases and it was difficult to identify in 34 % of cases. The average angle between the superior semicircular canal and the eminence was 16 degrees (range -23° , $+66^\circ$) in cases where we were able to identify the eminence. Both of these structures, as well as the varieties of other structures of the temporal bone, could be a potential source of perioperative complications. Preoperative analysis of the individual's anatomy, preferably with HRCT and multiplanar reconstructions in selected planes, are essential for these procedures. Accuracy of HRCT, together with accuracy of a frameless navigation system based on HRCT scans, was verified in our study on cadaver dissections with the average real error between 0.84mm - 0.92mm (range 0-2,6mm), depending on the registration method used.