

Collateral circles in neck supplied by the thyroid arteries – a morphological study

MC Rusu^{1*}, V Nimigean¹, N Maru¹, R Cergan¹, MA Banu¹, MC Niculescu²

¹University of Medicine and Pharmacy Carol Davila, Bucharest, Romania, ²University of Medicine and Pharmacy Victor Babes, Timisoara, Romania

Collateral circles in neck own a particular importance in compensating the symptoms due to the unilateral occlusion of the common carotid artery. Also, surgical procedures at the level of the thyroid gland and larynx rise the problem of a good knowledge of the arterial morphology at that levels. The present study was designed to investigate the possible morphologies of the thyroid arteries anastomoses. For the study 20 human adult specimens were dissected, 15 in cadavers and other 5 on laryngeal specimens that were drawn at autopsies. Dissections evidenced bilateral and unilateral anastomoses of the thyroid arteries, that were classified as extralaryngeal and intralaryngeal, the former constantly being represented by the supraisthmus arcade made by the superior thyroid arteries and the retrobar anastomoses of the superior and inferior thyroid arteries. Constant intralaryngeal anastomoses were those of the superior laryngeal artery with the inferior laryngeal artery and, respectively, with the cricothyroid artery. The analogy with the cardiac collateral circulation, the thyroid arteries anastomoses may be classified as intrathyroid and interthyroid arterial anastomoses. We also present in this paper a rare variant that we didn't find described in the references we investigated, represented by the paramedian perilaryngeal anastomose of the suprahyoid branch emerged from the lingual artery and the cricothyroid artery sent by the superior thyroid artery. The collateral circles in neck are supplied by the thyroid arteries; the clinicians must be aware of their possible functional value and the surgeons must take into account these arterial morphologies while acting on the neck viscera.

*Corresponding author
E-mail: anatomon@gmail.com

Comparison of four methods for the estimation of intracranial volume: a gold standard study

B Sahin^{1*}, N Acer², OF Sonmez³, M Emirzeoglu¹, H Basaloglu⁴, A Uzun¹, S Bilgic¹

¹Department of Anatomy, Medical School, Ondokuz Mayıs University, Samsun, Turkey, ²Allied Health School, University of Mugla, Mugla, Turkey, ³Neurosurgery Clinic, Gazi Governmental Hospital, Samsun, Turkey, ⁴Department of Anatomy, Medical School, Adnan Menderes University, Aydın, Turkey

Investigators can infer how much reduction in volume has occurred since brain volume was at its peak, by combining measures of brain volume with measures of intracranial volume (ICV). Several methodologies have been proposed to assess the ICV. However, we have not seen a gold standard study evaluating the results of the methodologies for the assessment of ICV. In the present study the actual intracranial volume of 20 dry skulls was measured using the water-filling method, using this as a gold standard. Anthropometry, cephalometry, point-counting and planimetry techniques were applied to the same skulls to estimate the ICV. Anthropometric and cephalometric measurements were carried out directly on skulls and roentgenograms, respectively. Consecutive computed tomography sections at a thickness of 10 mm were used to estimate the ICV of the skulls by means of the point-counting and planimetry methods. The mean (\pm SD) of the actual ICV measured by the water-filling method was $1262.0 \pm 160.4 \text{ cm}^3$, ($1389.5 \pm 96.5 \text{ cm}^3$ for males and $1134.5 \pm 94.3 \text{ cm}^3$ for females, respectively). Our results showed that the estimated values obtained by all four methods differed from the actual volumes of the skulls ($p < 0.05$). The data obtained by anthropometry resulted in over-estimation. However, cephalometry, point-counting and planimetry methods produced under-estimation. After calibration, there were no significant differences between the actual volumes and the results of the four methods ($p > 0.05$). While the anthropometric method is easy and quick to apply, its result may deviate from the actual values. The optimized stereological techniques of point-counting and planimetry methods may provide unbiased ICV results since they take the third dimension of the structures into account.

*Corresponding author
E-mail: bsahin@omu.edu.tr