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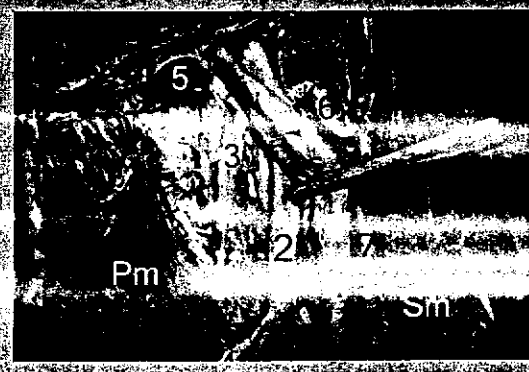

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TYPOLOGICAL AND MORPHOMETRIC STUDIES OF THE CAROTID ARTERIES IN HUMAN FOETUSES

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Variations in the branching of the aortic arch are a guide to vascular surgery in ischaemic cerebrovascular disease.
The variability and morphometric features (length, external diameter and volume) of the carotid arteries in 131 human foetuses (65 male, 66 female) from 15 to 34 weeks of gestation were studied by means of anatomical, digital and statistical methods.
In 74.05% of cases the usual pattern of the aortic arch with its three main branches was observed. A common origin of the brachiocephalic trunk and left common carotid artery occurred in 20.61% of individuals. In 5.34% of cases the left vertebral artery was an additional vessel and originated from the aortic arch between the left common carotid and subclavian arteries. In all the parameters examined no significant gender differences were found ($p \geq 0.05$). The developmental increase in length ($r_1 = 0.87$) and diameter ($r_2 = 0.84$) correlated with a linear function, but the increase in volume in relation to age corresponded to a quadratic function ($r_3 = 0.89$). All the examined parameters of the left-sided common carotid artery were consistently greater. Our results present significant differences concerning the following parameters of the left-sided vessels: the length of the common carotid artery in all cases, the diameter and volume of the common carotid artery in foetuses between the 7th and 9th prenatal months only, the original diameter of the internal carotid artery between the 7th and 9th months and the original diameter of the external carotid artery in foetuses aged 8–9 months ($p \leq 0.01$). The present data construct a normal range for the morphometric features of the foetal carotid arteries.

A CASE OF HYDROCEPHALUS IN THE PRZEWALSKI WILD HORSE WITH RESPECT TO CEPHALIC ARTERIAL VASCULARISATION

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The case concerns a mare of Przewalski's wild horse (ZATOKA 1488) born at Warsaw Zoo. The mare was horsed with a stallion (SPRUNG 1457) born in Germany. The foal was delivered by caesarean section.
The arteries of the foal head were filled with coloured vinyl superchloride and a solution of acetone. Casts of blood vessels and bones were obtained after the period of maceration. An inbreed index of Fx = 13.48% was estimated on the basis of the General Studbook for the Przewalski Horse.
The foal head was disproportionately large, while the facial part of the skull was narrow and disproportionately small. The skull was soft and prone to pressure. The cranial bones were thin with defects filled with fibrous membrane. The zygomatic arch was atrophied and the orbits narrowed. The mandible, nasal bones and frontal bones were deformed. In the temporal bone the pyramid was separated from the squama. On the basis of the morphological features and comparison with cases reported in the literature the case analysed was classified as the internal type of hydrocephalus.
Two common carotid arteries were found in the preparation. Each ramified into the internal carotid artery and the external carotid artery. In the cranial cavity both internal carotid arteries were joined to each other and to the basilar artery. The arterial circle of the brain had not been created.
Hydrocephalus has already been described in warm-blooded races of thoroughbreds in Trotter and Konik horses, which represent ancient Polish breeds of horse. According to different authors, the malformations described here have a genetic or environmental background [Jubb et al.]. In the foal investigated Fx = 13.48% was compared to the hypothetical inbreed index of Fx = 15.1% in a Konik horse with hydrocephalus. In the sparse national population of Konik horses the inbreed index sometimes exceeds 30%, although inbreed depression was not found by Jezierski. The case described here of hydrocephalus in Przewalski's wild horse has appeared in wild horse species which have survived in zoos and other closed raisings.

THE FRACTAL MODEL OF THE VESSELS OF THE CORTEX — A COMPARISON BETWEEN SYMMETRY AND ASYMMETRY

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The objective of the work was to determine the fractal vasculature of the cortex.
The methods used were that of Pickworth, computer image analysis and fractal analysis. Computer techniques were used for image processing (Scion for 98, Imtronic). The angle of bifurcation was evaluated. This angle is dependent on the diameters of its branches and for brain vessels specimens the bifurcation angle ranges from 55° to 70°. Vessels were classified according to the Stahler hypothesis which constructs a symmetrical and the asymmetric fractal model. The fractal model represents the vascular tree with a vessel diameter range of 20 μm to 400 μm. The geometry of the vascular tree was obtained from brain vessel specimens and its formation complies with Murray's law.
It was confirmed that the symmetry of the vasculature was the most important parameter influencing filling of the space and the area occupied by the given tree vessels. Symmetrical tree structures ensure steady filling of the space. Lack of uniformity is already apparent with quite a small degree of asymmetry at 1:1.2, and increases with the degree of asymmetry. Asymmetry causes the vascular tree to grow both in the prevailing and non-prevailing directions and increases the tendency of vessels to arrange themselves into smaller groups. Finally, symmetry of the capillaries ensures the equal filling of smaller spaces.
Examinations were carried out for a single vessel tree. In reality the vessel system of the brain includes many trees which are globally asymmetrical in form.

THE ANATOMY OF THE POSTERIOR BRANCH OF THE RECURRENT LARYNGEAL NERVE AND GALEN'S ANASTOMOSIS

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The recurrent laryngeal nerve divides into anterior and posterior branches. The nerve is situated in a surgically important area. The posterior branch lies beneath the mucosa of the larynx where it connects with the internal branch of the superior laryngeal nerve forming Galen's anastomosis. Recent studies suggest that different anastomoses of the laryngeal nerves may be important in larynx renervation after trauma caused by thyroid surgery.
The objective of the work was to explore the anatomy of the posterior branch of the laryngeal nerve and Galen's anastomosis.
The study was based on microdissection of nine formalin-fixed tissue blocks of neck viscera. Measurements were made using a vertical calliper.
Out of nine tissue blocks, two were unsuitable for dissection on one side. The posterior branch of the recurrent nerve entered the larynx through a separate muscular canal in 13 out of 16 cases (81%). The average extralaryngeal length of this branch was 14.1 mm and varied from 4 to 35 mm. Galen's anastomosis appeared in 16 hemilarynges. The most frequent type of this anastomosis was a single branch connection (in 13 out of 16 cases). A double branch connection appeared in two cases. Plexiform connection appeared in only one case. The number of mucosal branches of the posterior branch of the recurrent nerve varied widely and in all cases differed on two sides of one tissue block.
It was concluded that the posterior branch of the recurrent nerve frequently enters the larynx separately. The division is often situated near the lobes of the thyroid gland and thus the posterior branch can be easily confused with the anterior branch or the recurrent nerve. The confusion may lead to recurrent nerve trauma in the course of thyroid surgery. The place of division varies and cannot be predicted by comparison with the anatomy of the opposite side.