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Veterinarni Medicina

Analysis of morphological variation of the internal ophthalmic artery
in the chinchilla (*Chinchilla laniger*, Molina)

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Veterinarni Medicina, 60 (2015): 161-169

doi: 10.17221/8063-VETMED

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The aim of this investigation was the analysis of the variability within the internal and external ophthalmic artery in the chinchilla (*Chinchilla laniger*, Molina). The head vasculature of 65 individuals was analysed, with particular emphasis on the internal ophthalmic artery originating from the central and rostral part of the cerebral arterial circle. Head blood vessels were filled with acrylic latex for vascular corrosion casting. The results showed ten variants of blood supply for the orbit, with a predominance of the first variant (66.1%) = bilateral presence of the external ophthalmic artery originating from the maxillary artery. Other variants

differed in symmetry and asymmetry, sites of origination and the coexistence of both internal and external arteries.

Vascularisation of the brain in chinchillas originates mainly from the vertebra-basilar system. The observed variability seems to confirm the role of the basilar artery in the arterial blood supply of the brain in this species.

Keywords:

variability; head arterial system; rodents

References:

Araujo ACP, Campos R (2005): A systematic study of the brain base arteries and their blood supply sources in the chinchilla (*Chinchilla laniger* Molina, 1782). *Brazilian Journal of Morphology Science* 22, 221–232.

Aydin A (2008): The morphology of circulus arteriosus cerebri in the red squirrel (*Sciurus vulgaris*). *Veterinarni Medicina* 53, 272–276.

Aydin A, Ylmaz, S, Ozkan ZE, Ilgun R (2008): Morphological investigations on the circulus arteriosus cerebri in mole-rats. *Anatomia Histologia Embryologia* 3,

Aydin A, Ozekan ZE, Yilmaz S, Ilgun R (2009): The morphology of the circulus arteriosus cerebri in the ground squirrel (*Spermophilus citellus*). Veterinarski Medicina 54, 537–542.

Bervini D., Assaad N. (2014): Ophthalmic Artery Arising from the Anterior Cerebral Artery and Concomitant Internal Carotid Artery Aneurysm: Report of a Case. Journal of Neurological Surgery Part A: Central European Neurosurgery, 75, -
[<doi:10.1055/s-0034-1383776>](https://doi.org/10.1055/s-0034-1383776)

Brudnicki W (2000): Basilar arteries of the brain in domestic goat (*Capra hircus* L). Electronic Journal of Polish Agricultural University Veterinary Medicine 3, 1–6.

Brudnicki Witold, Nowicki Włodzimierz, Skoczylas Benedykt, Brudnicki Adam, Kirkilło-Stacewicz Krzysztof, Wach Jan (2012): Arteries of the Brain in Wild European Rabbit <I>Oryctolagus cuniculus</I> (Linnaeus, 1758). Folia Biologica, 60, 189-194

Bugge J (1971a): The cephalic arterial system in mole-rats (Spalacidae), bamboo rats (Rhizomyidae), jumping mice and jerboas (Dipodoidea) and dormice (Gliroidea) with special reference to the systematic classification of rodents. *Acta Anatomica* 79, 165–180.

Bugge J (1971b): The cephalic arterial system in sciuromorphs with special reference to the systematic classification of rodents. *Acta Anatomica* 80, 336–361.

Bugge Jrgen (1972): The cephalic arterial system in the insectivores and the primates with special reference to the macroscelidoidea and tupaioidea and the insectivore-primate boundary. *Zeitschrift fr Anatomie und Entwicklungsgeschichte*, 135, 279-300
[doi:10.1007/BF00519039](https://doi.org/10.1007/BF00519039)

Bugge J. (1978): The cephalic arterial system in carnivores, with special reference to the systematic classification. *Cells Tissues Organs*, 101, 45-61
[doi:10.1159/000144948](https://doi.org/10.1159/000144948)

Bugge J (1985): Systematic value of the carotid arterial pattern in rodents. Evolutionary Relationships among Rodents NATO Advanced Science Institutes 92, 355–379.

Davis FA (1929): The anatomy and histology of the eye and orbit of the rabbit. Transactions of the American Ophthalmological Society 27, 400–441.

Davis DD, Story HE (1943): The carotid circulation in the domestic cat. Publication Field Museum of Natural History (Zool. Series) 28, 1–47.

De La Torre E, Mitchell OC, Netsky MG (1962): Anatomic and angiographic study of the vertebral-basilar arterial system in the dog. American Journal of Anatomy 110, 187–197.

Souza Fernanda de, Campos Rui (2013): A systematic study of the brain base arteries in the rabbit (*Oryctolagus cuniculus*). Pesquisa Veterinária Brasileira, 33, 796-806
[<doi:10.1590/S0100-736X2013000600018>](https://doi.org/10.1590/S0100-736X2013000600018)

De Vriese B (1905): On the morphological significance of cerebral arteries (in French). Archives de Biologie 21, 357–457.

Depedrini JS, Campos, R (2003): A systematic study of the brain base arteries in the pampas fox *Dusicyon gymnocercus*. Brazilian Journal of Morphological Sciences 20, 181–188.

Ellenberger W, Baum H (1912): Handbuch der vergleichenden Anatomie der Haustiere. August Hirschwald. Berlin.

Evans HE, Lahunta A (1993): Miller's anatomy of the dog. 3rd ed. Elsevier Science Health Science Division.

Frackowiak H (2003): Arterial head vascularisation in some mammalian orders. (in Polish). Roczniki Akademii Rolniczej Poznan 336, 1–81.

Frackowiak H, Godynicki S (2003): Brain basal arteries in various species of Felidae. Polish Journal of Veterinary Science 61, 195–200.

Frąckowiak Hieronim, Jakubowski Hubert (2008): Arterial Vascularization in the Giraffe Brain. *Annales Zoologici Fennici*, 45, 353-359
[<doi:10.5735/086.045.0418>](https://doi.org/10.5735/086.045.0418)

Frąckowiak Hieronim, Śmiełowski Jan (): Cephalic arteries in the European beaver *Castor fiber*. *Acta Theriologica*, 43, 219-224 [<doi:10.4098/AT.arch.98-18>](https://doi.org/10.4098/AT.arch.98-18)

Gielecki J. S., Brudnicki W., Nowaki M. R. (1996): Digital-image Analysis of the Brain-base Arteries in Chinchilla, *Chinchilla laniger* (Molina). *Anatomia, Histologia, Embryologia: Journal of Veterinary Medicine Series C*, 25, 117-119 [<doi:10.1111/j.1439-0264.1996.tb00068.x>](https://doi.org/10.1111/j.1439-0264.1996.tb00068.x)

Gillilan Lois A. (1976): Extra- and intra-cranial blood supply to brains of dog and cat. *American Journal of Anatomy*, 146, 237-253 [<doi:10.1002/aja.1001460303>](https://doi.org/10.1002/aja.1001460303)

Godzynicki S (1972): Arteries of the head in fallow deer (*Dama dama L.*) *Polskie Archiwum Weterynaryjne* 15, 851–864.

Cedyniak S, Wiliński S (1978). Cerebral base arteries in the deer. (in Polish). Roczniki Akademii Rolniczej Poznań 49, 45–52.

Grossman RI, Davis KR, Taveras JM (1982): Circulatory variations of the ophthalmic artery. AJNR American Journal of Neuroradiology 3, 327–329.

Hafferl A (1938): Das Arteriensystem. In: Bolk K, Goppert E, Kallius E, Lubosch W (eds.): Handbuch der vergleichenden Anatomie der Wirbeltiere. Berlin-Wien 6, 563–684.

Hyrtl J (1854): Beiträge zur vergleichenden Angiologie. V. Das arterielle Gefäß-System der Edentaten. Akademie der Wissenschaften Wien. Denkschriften der Mathematisch-Naturwissenschaftlichen Klasse 6, 21–64.

Jablonski R, Brudnicki W (1984): The effect of blood distribution to the brain on the structure and variability of the cerebral arterial circle in musk-rat and in chinchilla. Folia Morphologica 43, 109–114.

Kapoor K., Kak V. K., Singh B. (2003): Morphology and Comparative Anatomy of Circulus Arteriosus Cerebri in Mammals. Anatomia, Histologia, Embryologia: Journal of Veterinary Medicine Series C, 32, 347-355 <[doi:10.1111/j.1439-0264.2003.00492.x](https://doi.org/10.1111/j.1439-0264.2003.00492.x)>

Kuchinka J, Nowak E, Szczurkowski A, Kuder T (2008): The arteries supplying the base of the brain in the Mongolian gerbil (*Meriones unguiculatus*). Polish Journal of Veterinary Science 11, 295–299.

KÜNZEL Von W. (1985): Die Arteriae cerebri bei *Meriones unguiculatus*. Anatomia, Histologia, Embryologia: Journal of Veterinary Medicine Series C, 14, 316-323 <[doi:10.1111/j.1439-0264.1985.tb00827.x](https://doi.org/10.1111/j.1439-0264.1985.tb00827.x)>

Kurtul I, Dursun N, Ozgel O (2002): Cerebral arterial circle in German shepherd dogs raised in Turkey. Journal of the Faculty of Veterinary Medicine Kafkas University 8, 127–130.

Majewski Michałka E (1984).
Vascularization of the brain in the guinea pig. I. Gross anatomy of arteries and veins. *Folia Morphologica* 53, 249–268.

Nilges Richard G. (1944): The arteries of the mammalian cornu ammonis. *The Journal of Comparative Neurology*, 80, 177-190 <[doi:10.1002/cne.900800203](https://doi.org/10.1002/cne.900800203)>

Ninomiya , Masui (1999): Vasculature of the orbital rete in the Japanese deer (*Cervus nippon*). *Veterinary Ophthalmology*, 2, 107-112
<[doi:10.1046/j.1463-5224.1999.00065.x](https://doi.org/10.1046/j.1463-5224.1999.00065.x)>

Nomina Anatomica Veterinaria (2012):
5th ed. (revised version). International Committee on Veterinary Gross Anatomical Nomenclature, Hannover.

Ocal Mehmet K., Ozer Mehpare (1992):
The circulus arteriosus cerebri in the guinea pig. *Annals of Anatomy - Anatomischer Anzeiger*, 174, 259-260
<[doi:10.1016/S0940-9602\(11\)80365-1](https://doi.org/10.1016/S0940-9602(11)80365-1)>

Ozudogru Zekeriya, Can Mehmet,
Balkaya Hulya (2012): Macro-Anatomical

Investigation of the Cerebral Arterial Circle (Circle of Willis) in Red Fox (*Vulpes vulpes* Leunnoleus, 1758). Journal of Animal and Veterinary Advances, 11, 2861-2864
[<doi:10.3923/javaa.2012.2861.2864>](https://doi.org/10.3923/javaa.2012.2861.2864)

Reckziegel SH, Lindemann T, Campos R (2001): A systematic study of the brain base arteries in capybara (*Hydrochoerus hydrochaeris*). Brazilian Journal of Morphological Science 18, 103–110.

Roskosz T, Jablonski R, Wiland C (1988): The arteries of the brain base in chinchilla, *Chinchilla laniger* (Molina). Annales Warsaw Agriculture University 14, 23–28.

Ruskell GL (1962): The orbital arteries in the rabbit. American Journal of Ophthalmology 53, 96–107.

Sade B, Tampieri D, Mohr G (2004): Ophthalmic artery originating from basilar artery: A rare variant. AJNR American Journal of Neuroradiology 25, 1730–1731.

Chao BT, Ding YY, Yu SJ, Wang JZ (2007): The arterial supply of the eye of the yak (*Bos grunniens*). Research Veterinary Science 84, 174–177.

Shively MJ, Stump JE (1974): The systemic arterial pattern of the guinea pig: The head, thorax, and thoracic limb. American Journal of Anatomy 139, 269–284.

Simoens P, Ghoshal NG (1981): Arterial supply to the optic nerve and the retina of the sheep. Journal of Anatomy 133, 481–497.

Steven DH (1964): The distribution of external and internal ophthalmic arteries in the ox. Journal of Anatomy 98, 429–435.

Szczurkowski A., Kuchinka J., Nowak E., Kuder T. (2007): Topography of Arterial Circle of the Brain in Egyptian Spiny Mouse (*Acomys cahirinus*, Desmarest). Anatomia, Histologia, Embryologia: Journal of Veterinary Medicine Series C, 36, 147-150 <[doi:10.1111/j.1439-0264.2006.00747.x](https://doi.org/10.1111/j.1439-0264.2006.00747.x)>

Tandler J (1899): Zur vergleichenden Anatomie der Kopfarterien bei den Mammalia. Akademie der Wissenschaften Wien. Denkschriften der Mathematisch-Naturwissenschaftlichen Klasse 67, 677–779.

Wang JL (2002): The Arterial Supply to the Eye of the Bactrian Camel (*Camelus bactrianus*). Veterinary Research Communications 26, 505–512.

Zdun Maciej, Frąckowiak Hieronim, Kiełtyka-Kurc Agata, Kowalczyk Karolina, Nabzdyk Maria, Timm Anita (2013): The Arteries of Brain Base in Species of *Bovini* Tribe. The Anatomical Record, 296, 1677-1682 <[doi:10.1002/ar.22784](https://doi.org/10.1002/ar.22784)>

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