

# Cerebellar ischemia in dog and cat

Alba Miras Xufré Final Degree Project - June 2022



# **Objectives**

2

Why are cerebellar ischemic strokes more common in dogs?

Why are dogs affected by rostral cerebellar ischemic stroke?

# Introduction

The main functions of the cerebellum are to modulate body movement and maintain balance, so in cerebellar stroke these functions may be altered. Cerebellar infarcts are usually ischemic (caused by a thrombotic or thromboembolic event).

### Arterial vascularization of the cerebellum



The cerebellum is vascularized by the rostral cerebellar arteries (branches oh the cerebral arterial circle) and the caudal cerebellar arteries (branches of the basilar artery).

Fig 1. Blood flow of the arteries that vascularize the cerebellum (Aige V 2022).

# **Clinical signs of cerebellar dysfunction**



### **Clinical interpretation of MRI**



Fig 3. The MRI images of the brain of a dog with presumed cerebellar infarct in the vascular territory of the rostral cerebellar artery. (a) Dorsal section T2-weighted image, there is a sharply demarcated wedge-shaped hyperintense lesion (arrow) in the right paravermis and rostrodorsal part of the cerebellar cortex and absence of mass effect. (b) Transverse section T2-weighted image, showing a sharply demarcated wedge-shaped hyperintense lesion extending from the left paravermis and medial cerebellar cortex to the adjacent underlying cerebellar white matter (Garosi L et al. 2006).

Fig 2. Neurological signs observed in the study by Thomsen B et al. (2016) performed on 23 dogs with presumed rostral cerebellar infarction.

#### Conclusions

- Blood flow in the basilar artery varies depending on the species, in dogs it is caudo-rostral whereas in cats it is rostro-caudal. As blood comes out of the cerebral arterial circle by a rostro-caudal flow, there is a possibility to have turbulent blow flow between the caudal portion of the circle and the basilar artery. This turbulences may be the origin of the higher prevalence of cerebellar infarction in dogs and the higher presence of vascular lesions affecting the rostral cerebellar artery. Since in cats the flow is always caudal, these turbulences would not occur, making rostral cerebellar infarcts less frequent. However, this theory has to be proven.
- The best technique for diagnosing vascular lesions is MRI.

#### References

- Aige V. Neuroanatomy of the Dog. 2022. Ronkonkoma (NY): Linus Learning.
- Thomsen B, Garosi L, Skerritt G, Rusbridge C, Sparrow T, Berendt M, Gredal H. 2016. Neurological signs in 23 dogs with suspected rostral cerebellar ischaemic stroke. Acta Vet Scand. 58:40.
- Garosi L, McConell JF, Platt SR, Barone G, Baron JC, Lahunta A, Schatzberg SJ. 2006. Clinical and Topographic Magnetic Resonance Characteristics of Suspected Brain Infarction in 40 Dogs. J Vet Intern Med. 20:311-321.