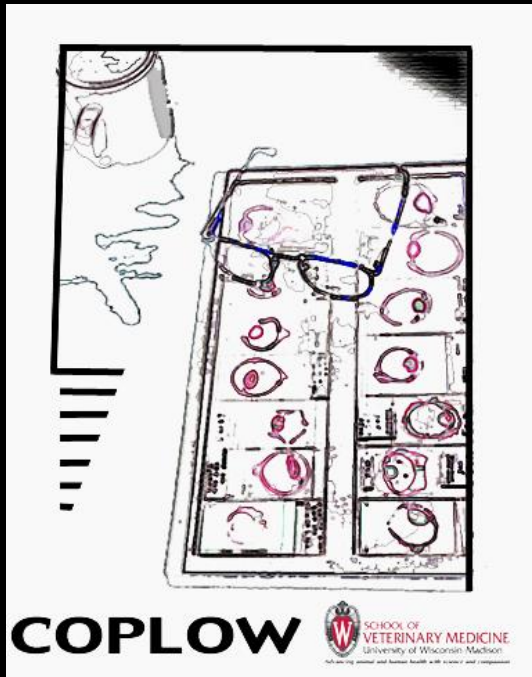
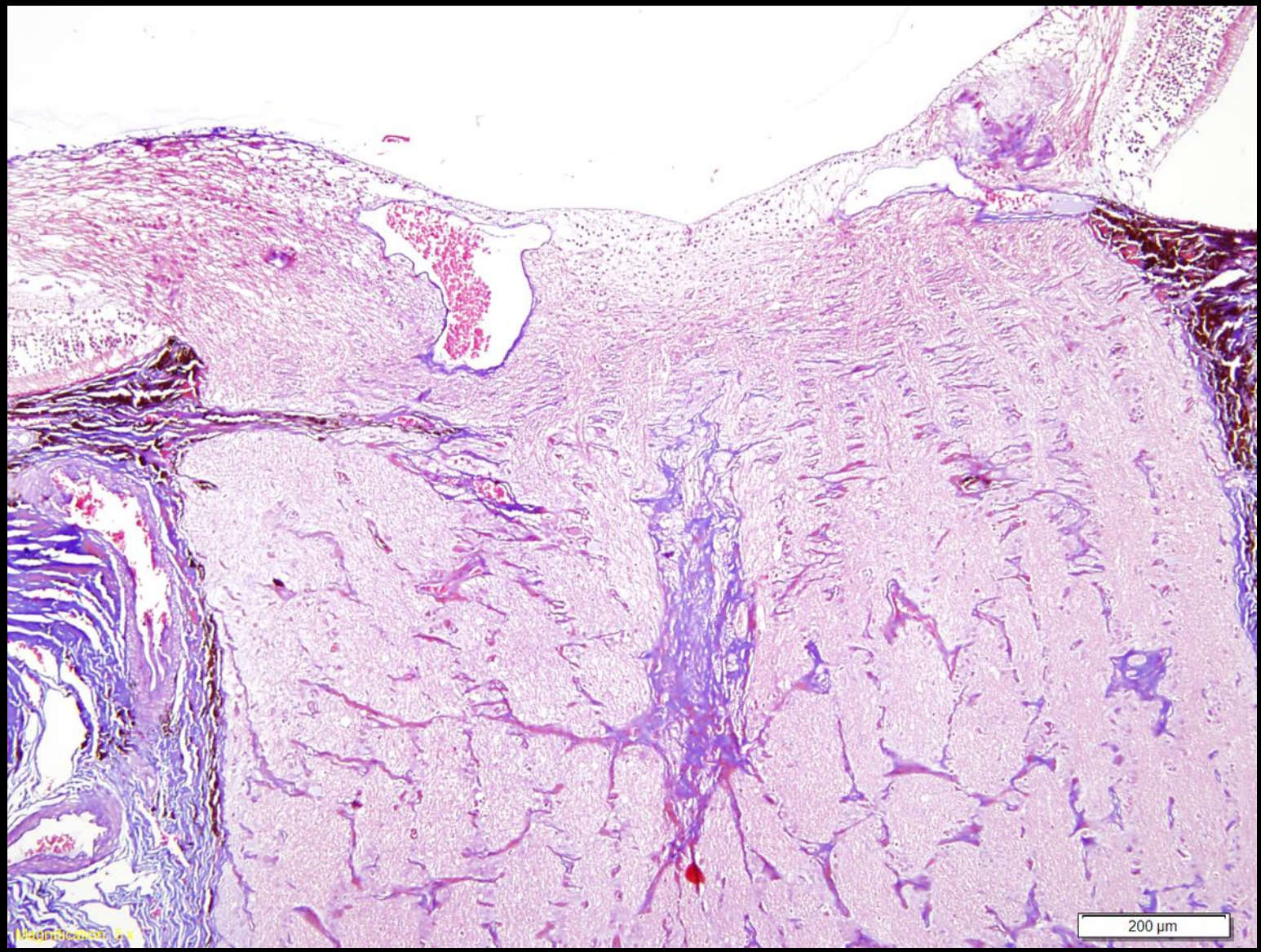
SCHOOL OF VETERINARY MEDICINE
University of Wisconsin-Madison
Advancing animal and human health with science and compassion

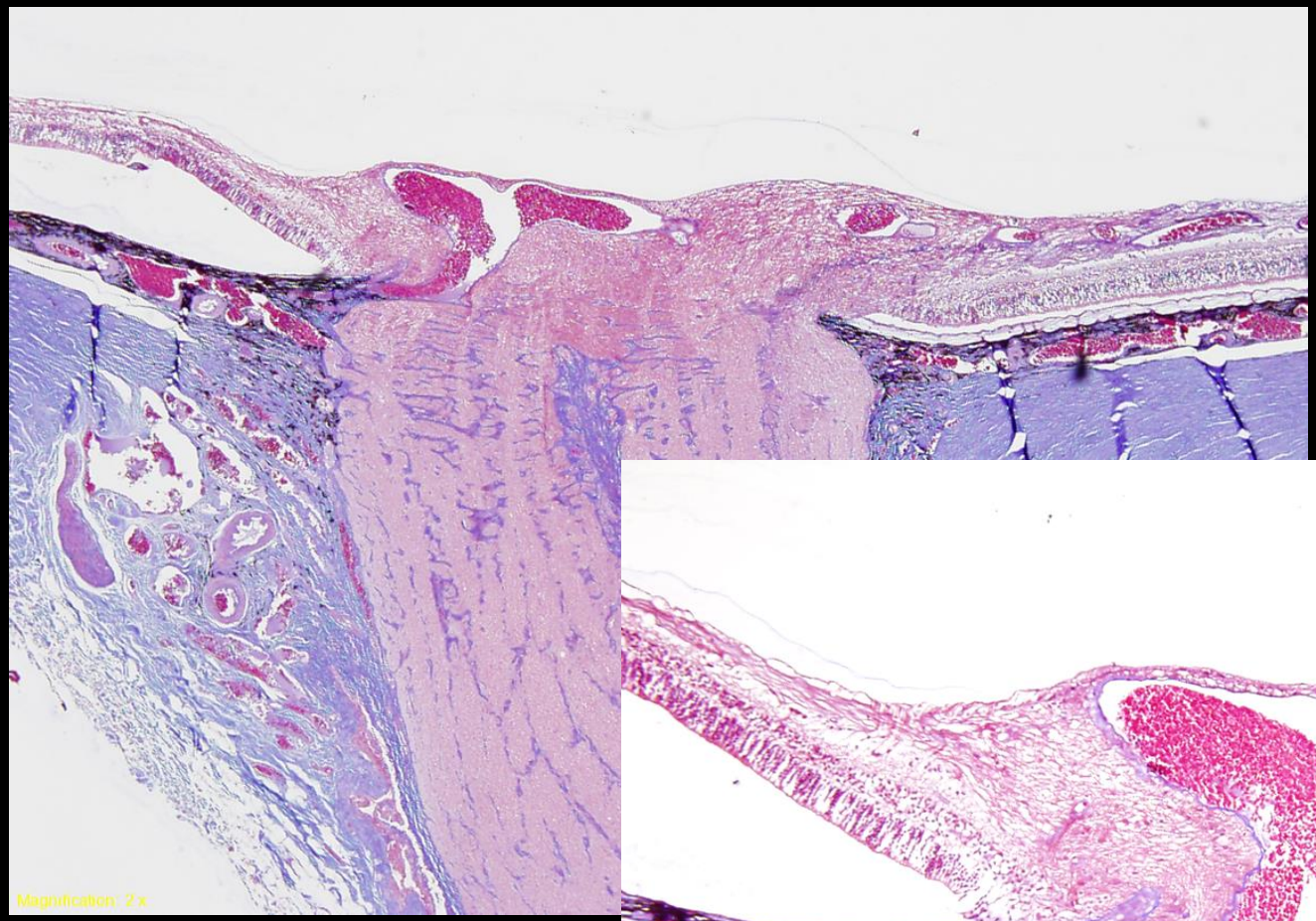
Optic Nerve Pathology

Dick Dubielzig



The Normal Canine Optic Nerve

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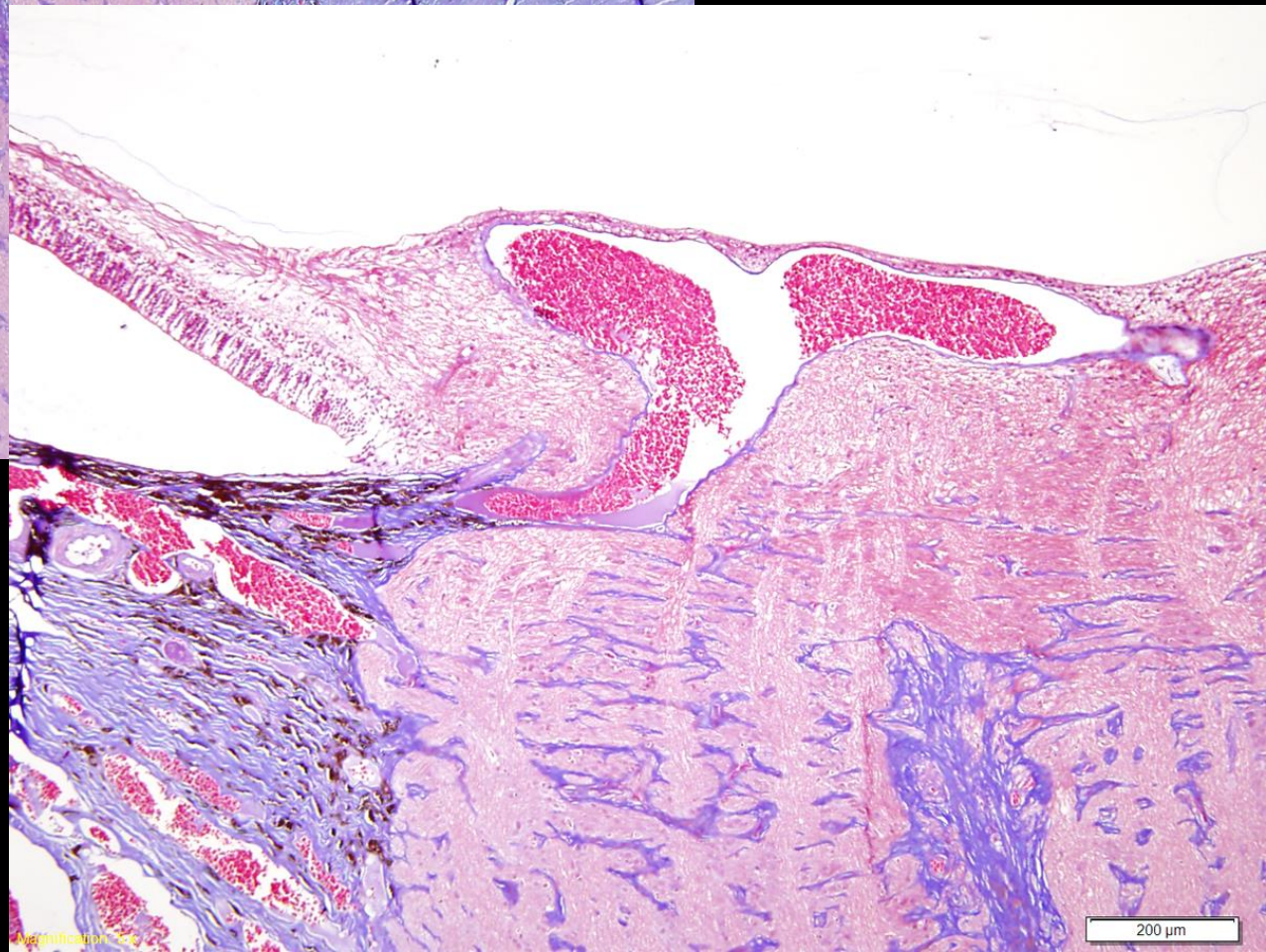
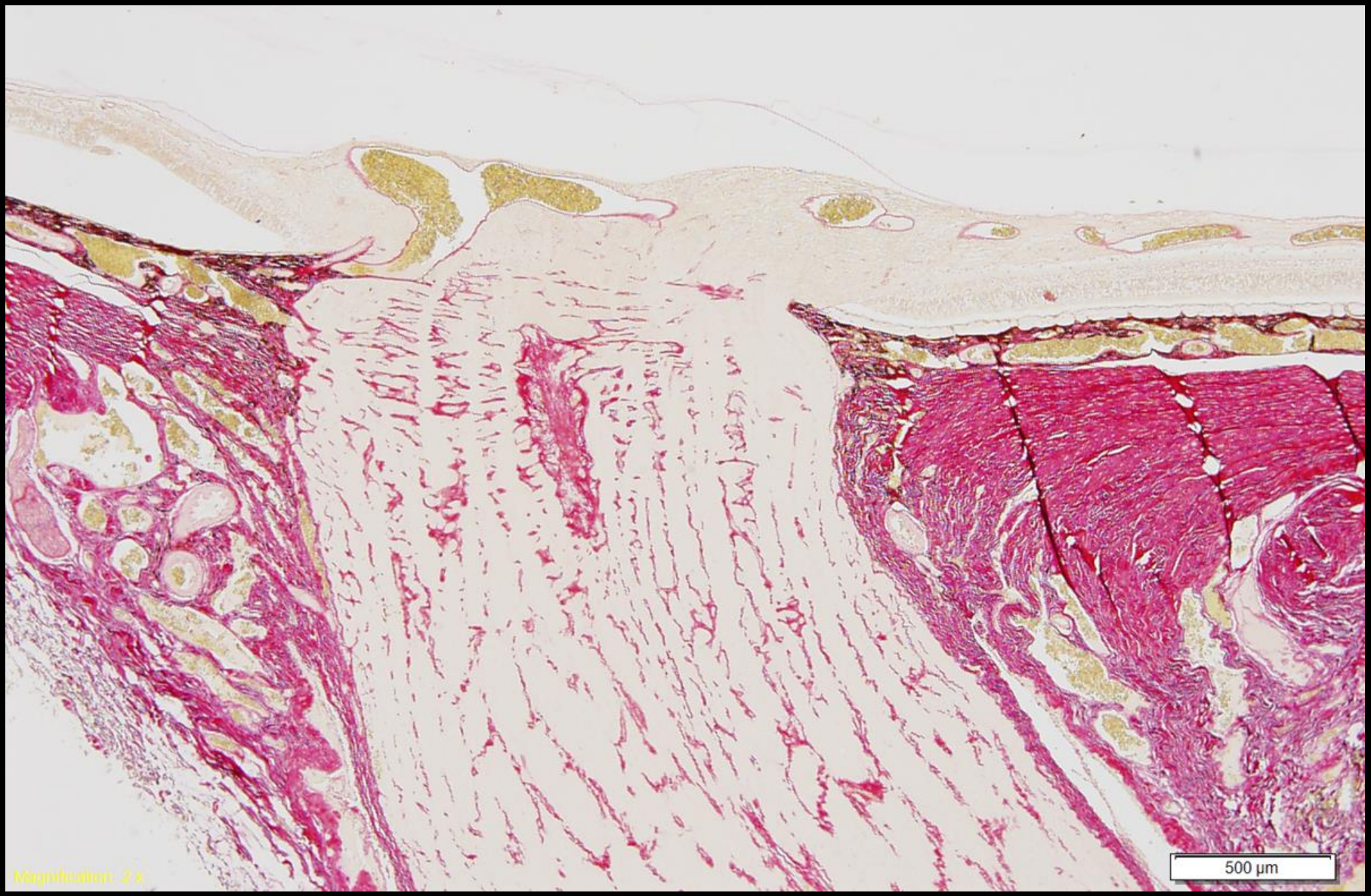

200 µm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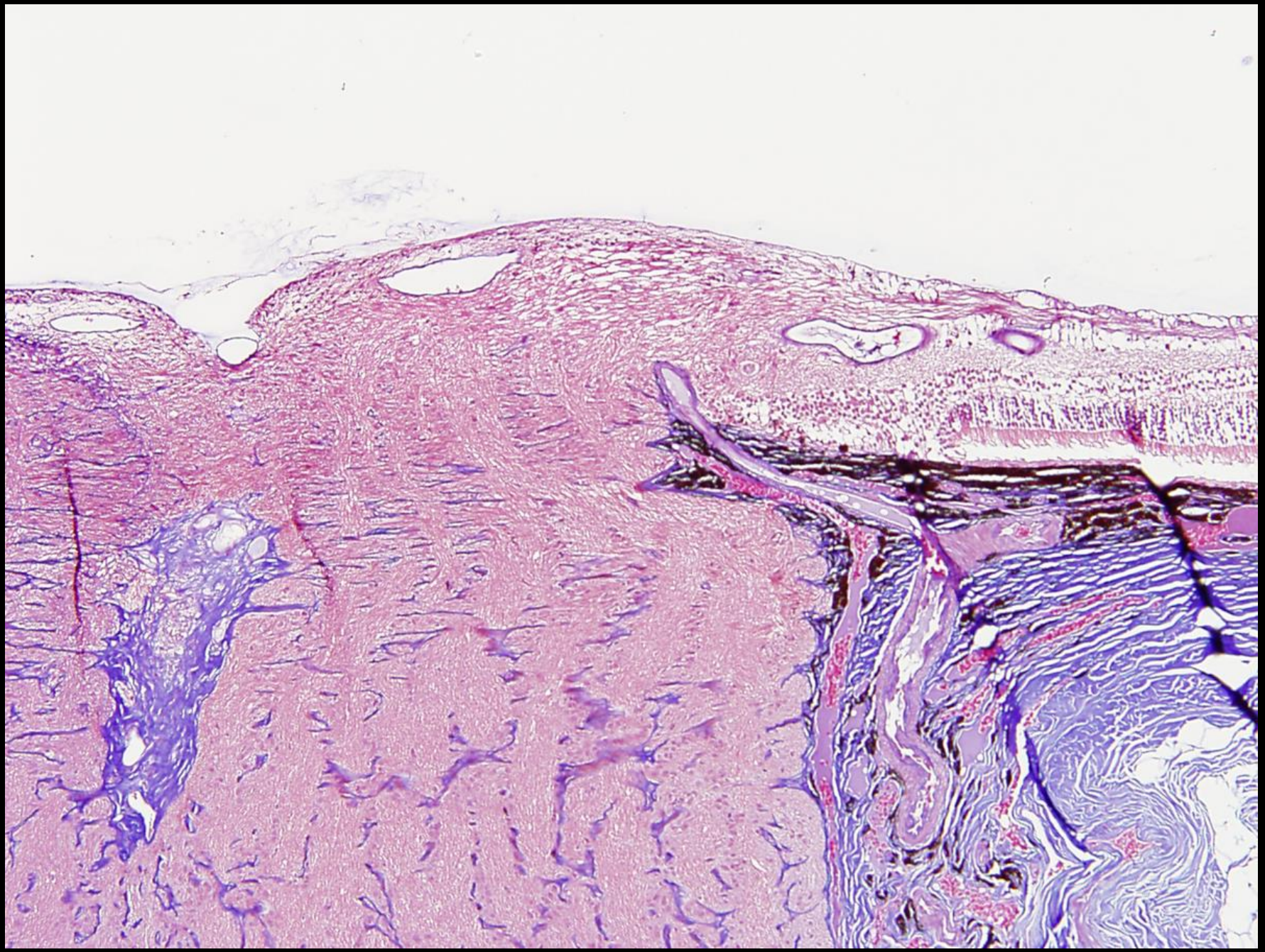
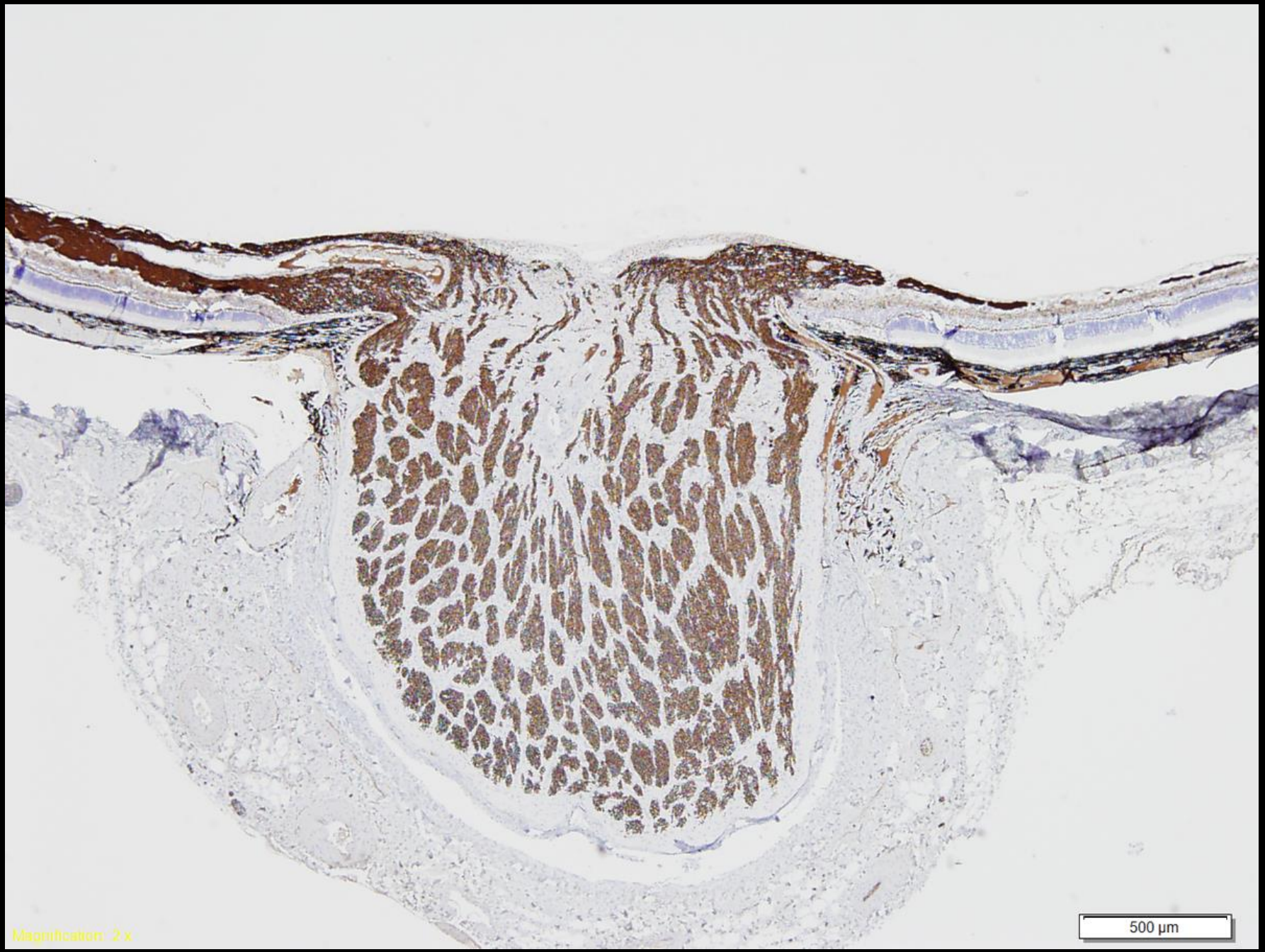
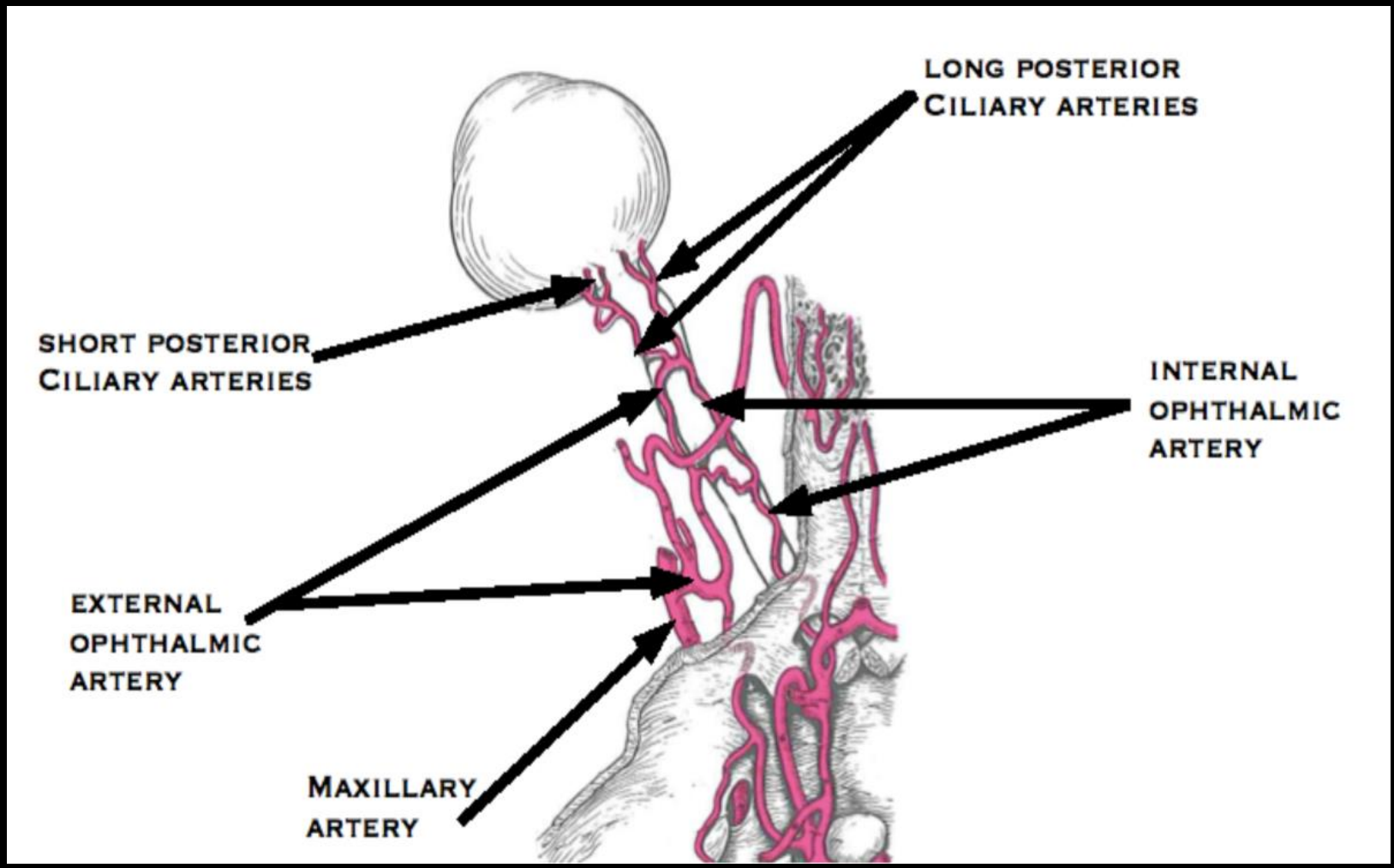
500 µm

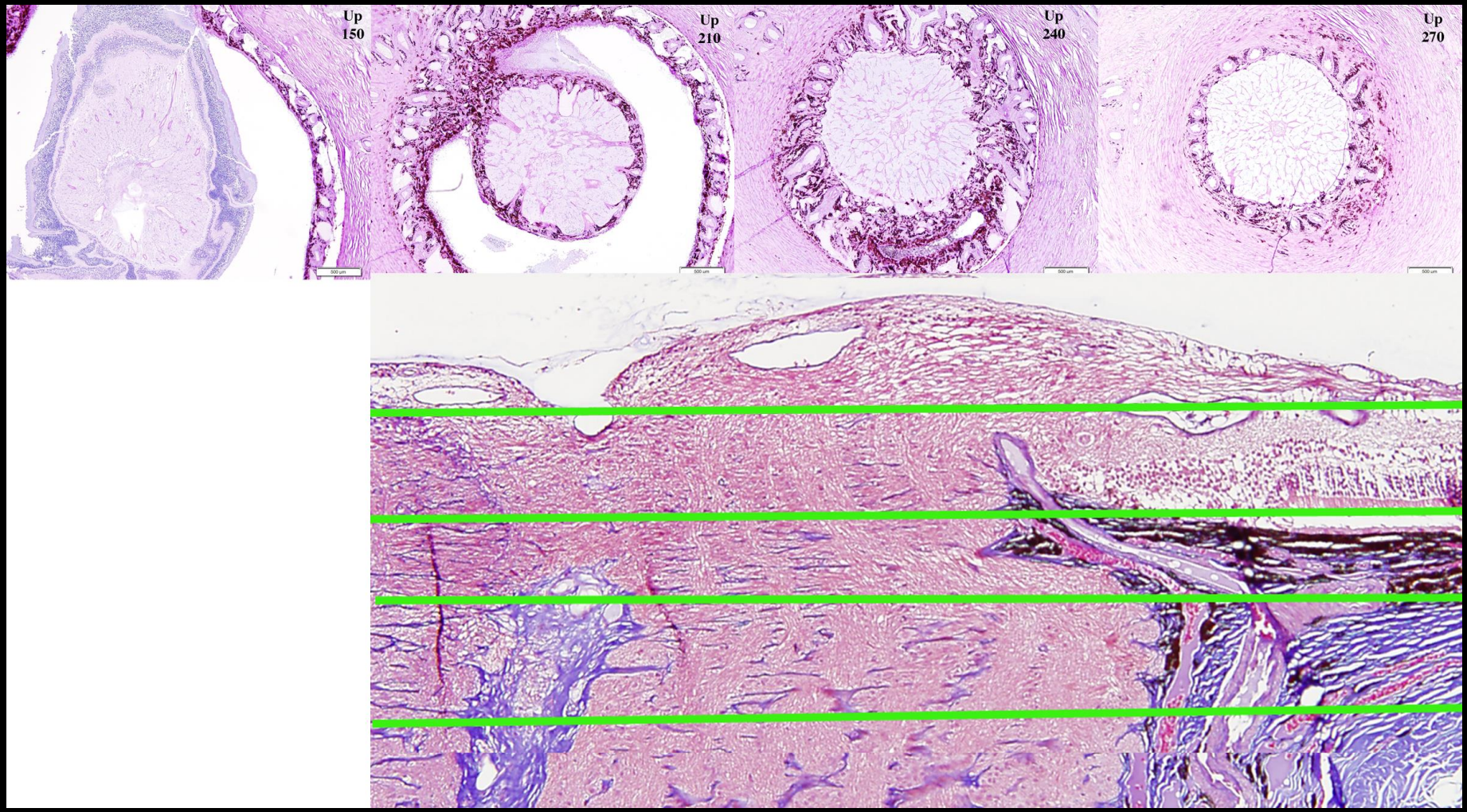



Magnification: 2 x
500 µm

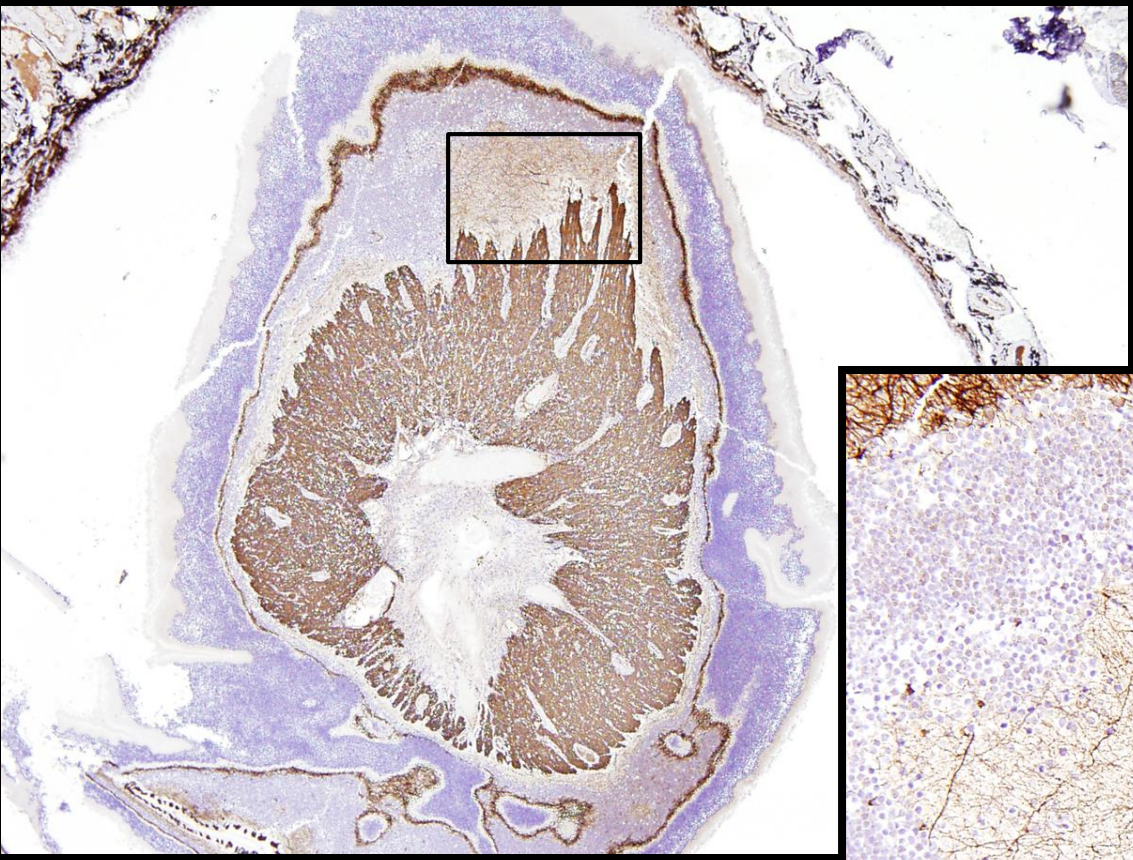
Vascular Anatomy of the Posterior Segment

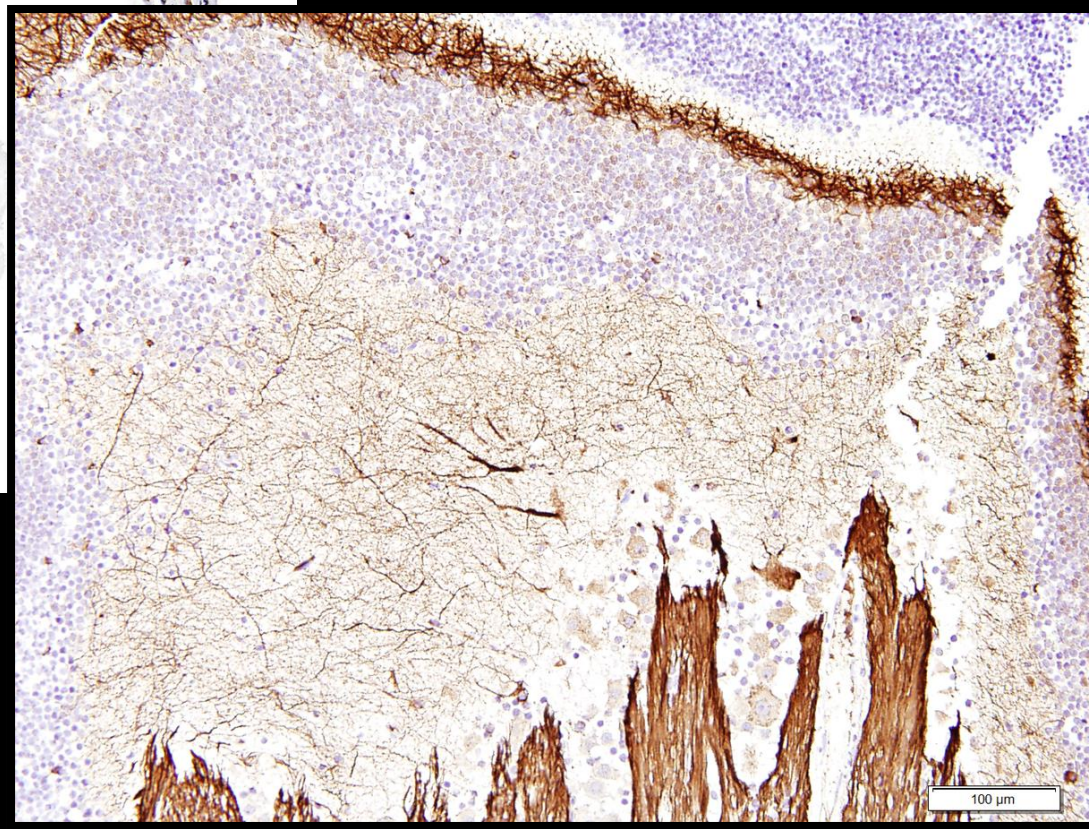


Optic Nerve Vasculature



Normal Canine Optic Disc

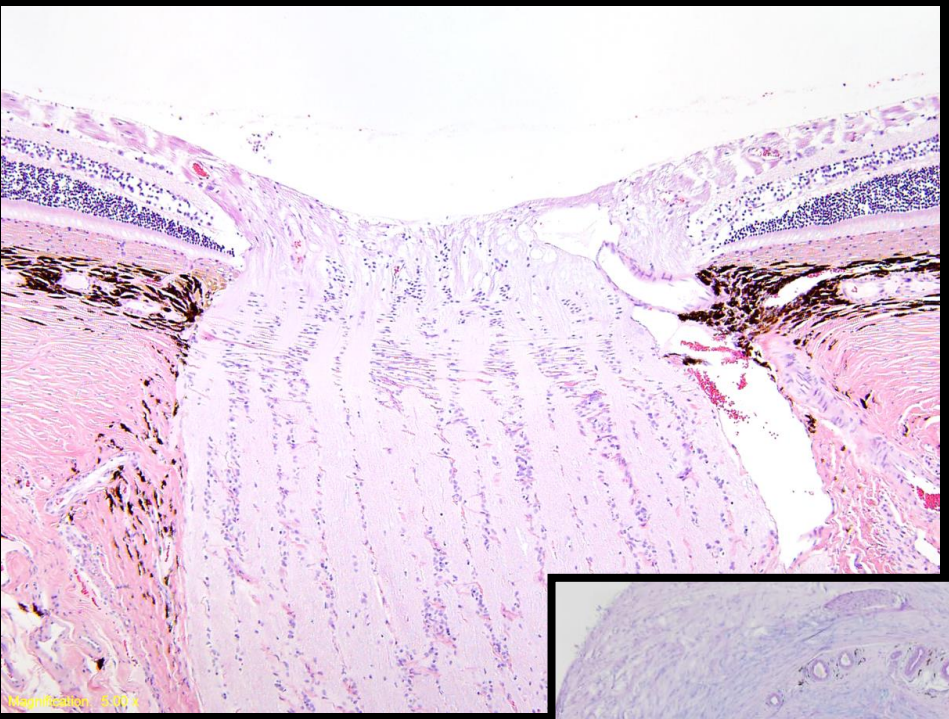


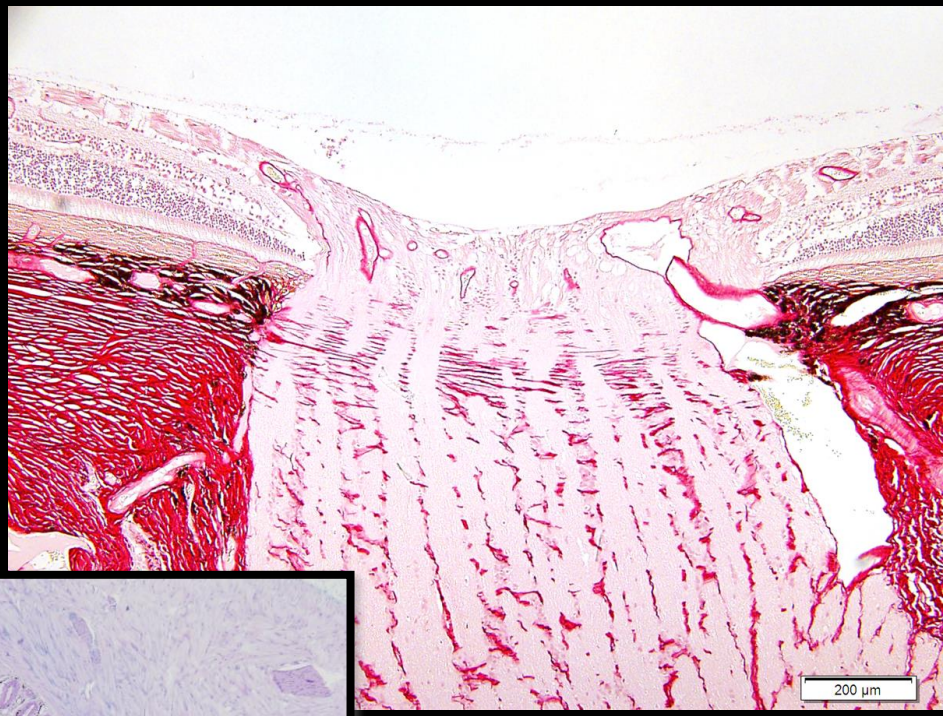


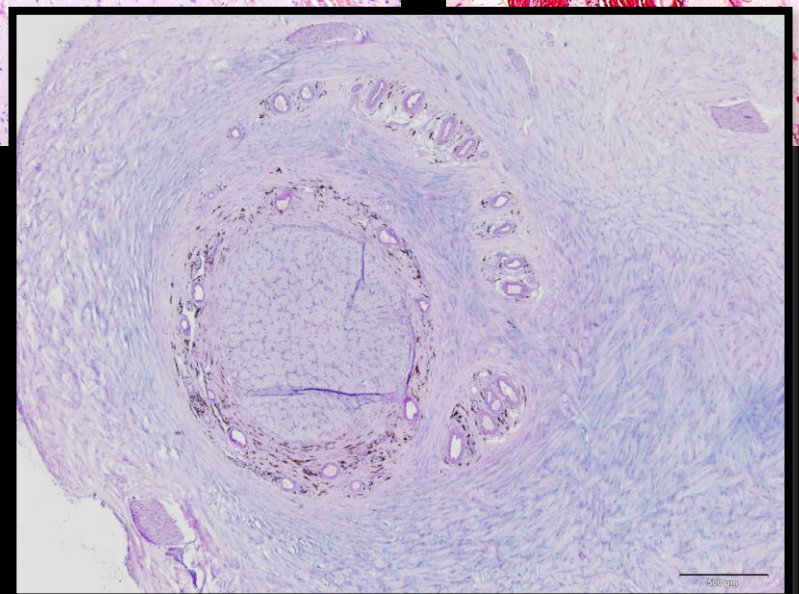
Short Posterior Ciliary Arteries

Vascular supply to the orbital portion of the optic nerve

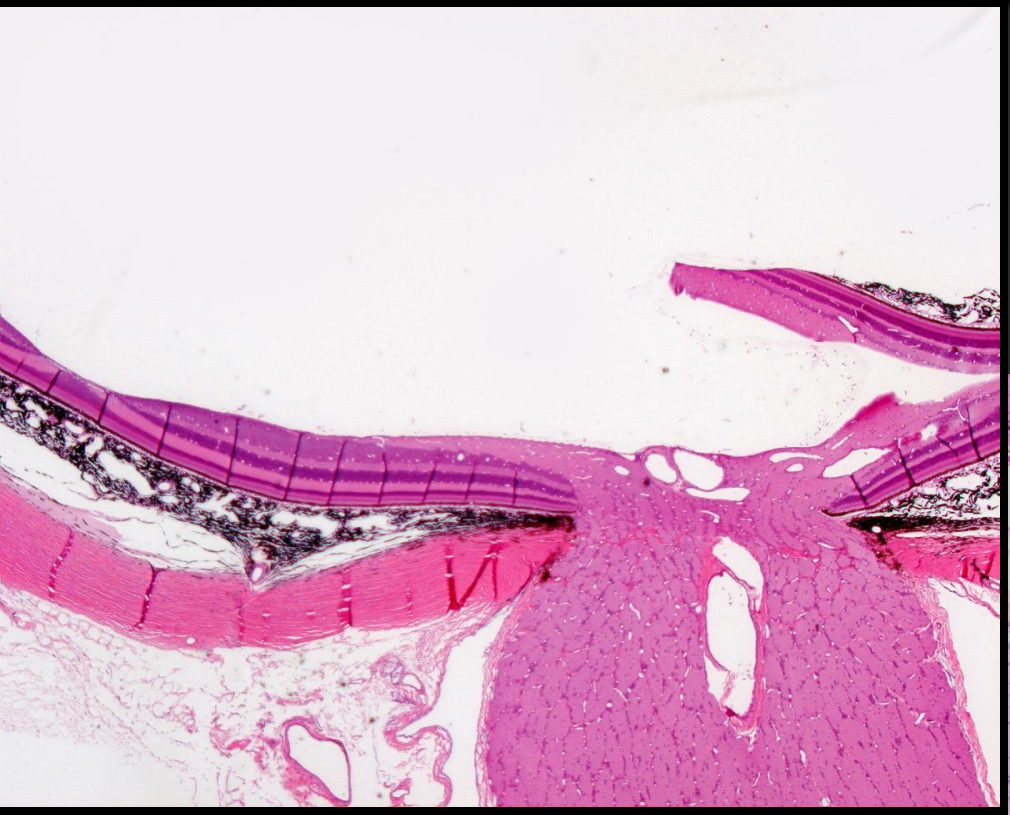
The Normal Feline Optic Nerve

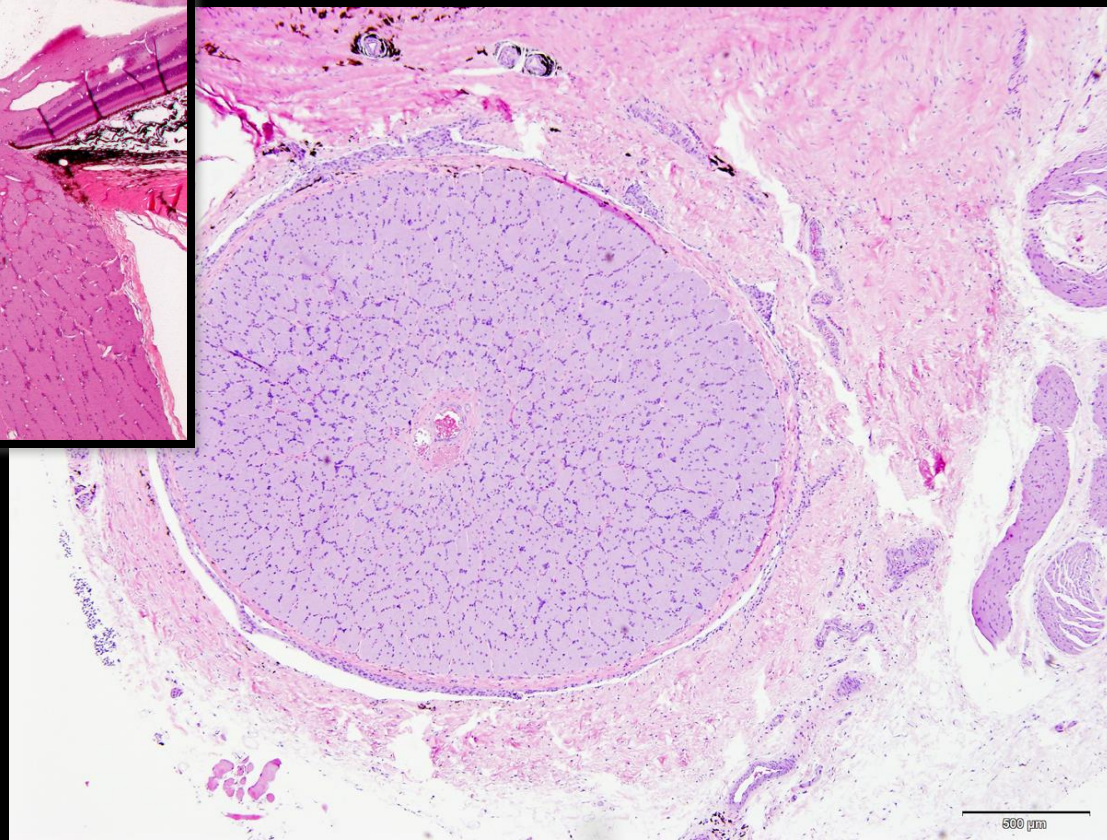




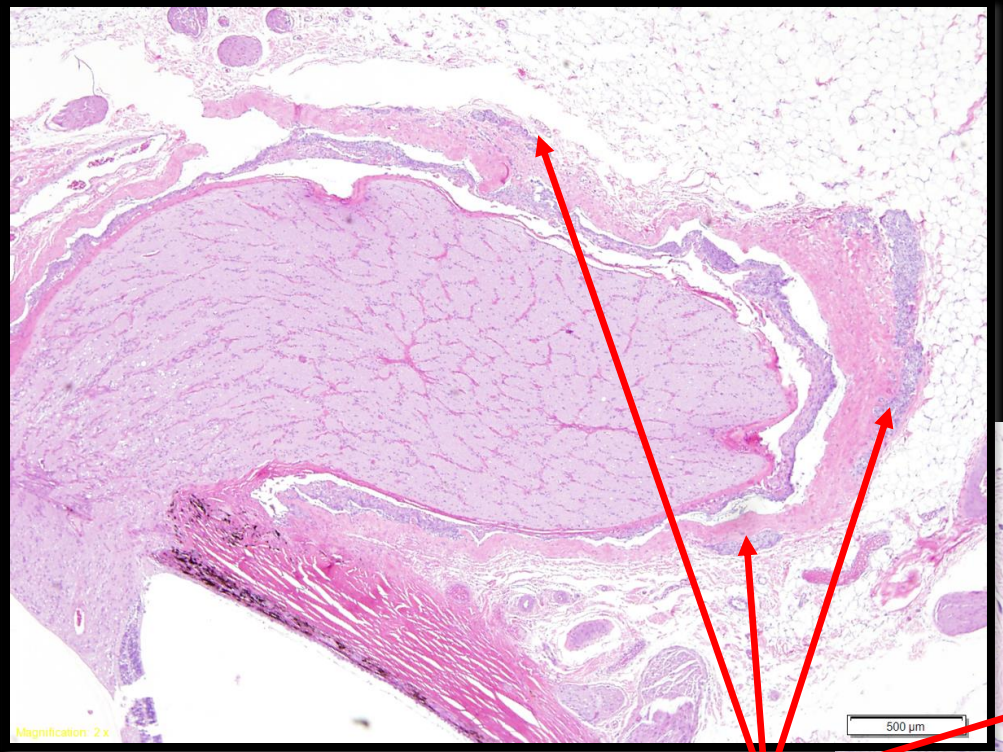


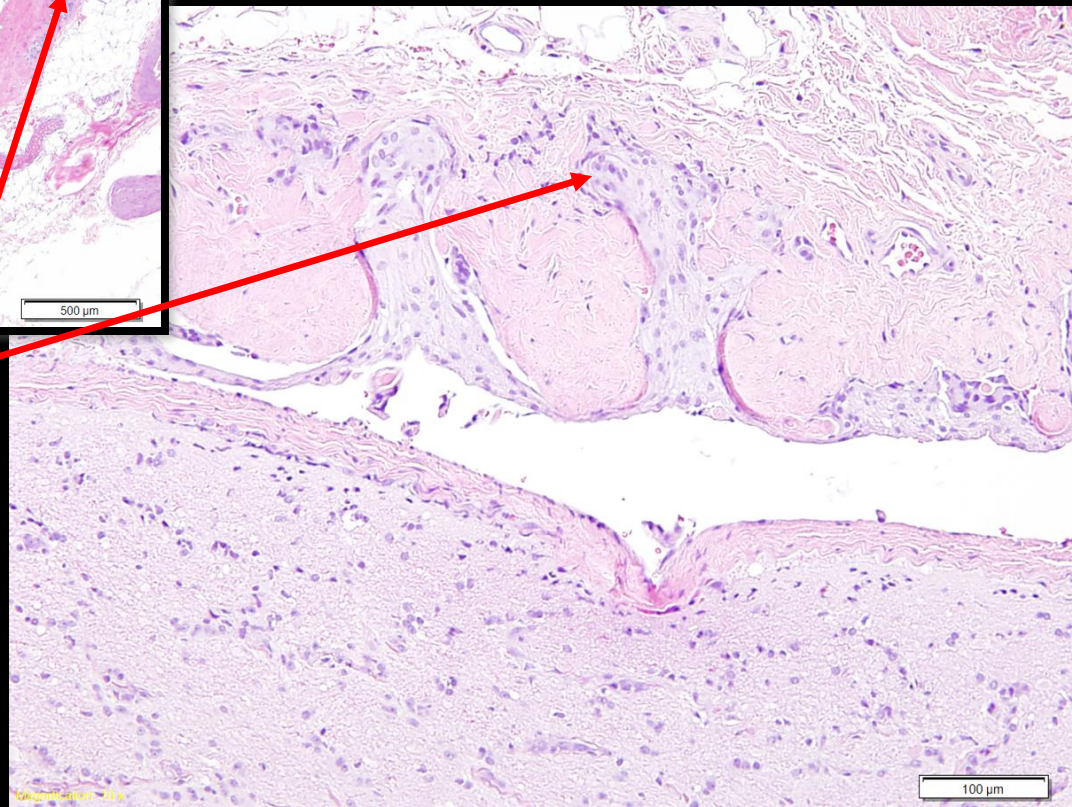
Normal Primate Optic Nerve





Canine Optic Nerve Normal





Arachnoid Cap Cells

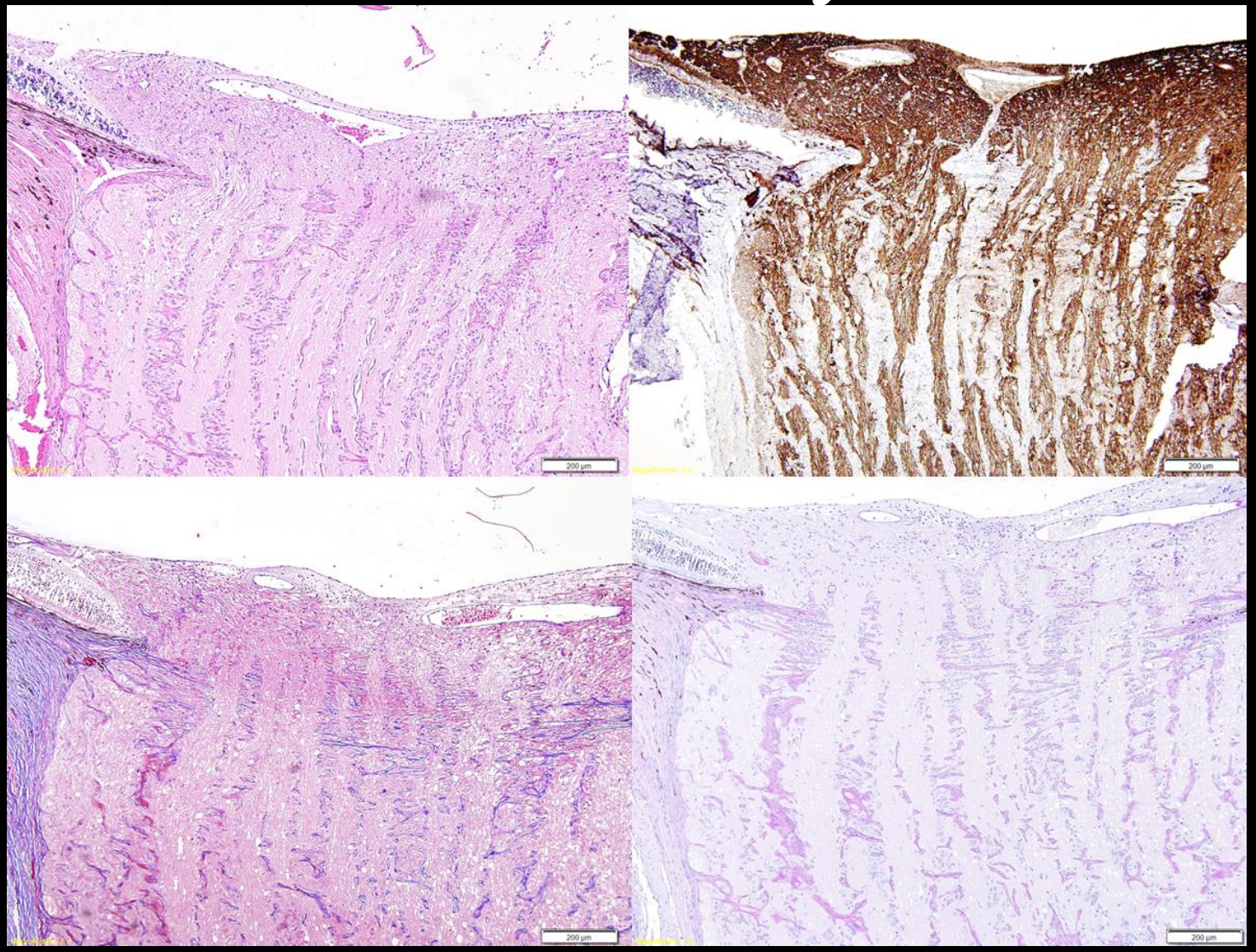
Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma

2-Day glaucoma

Disc swelling

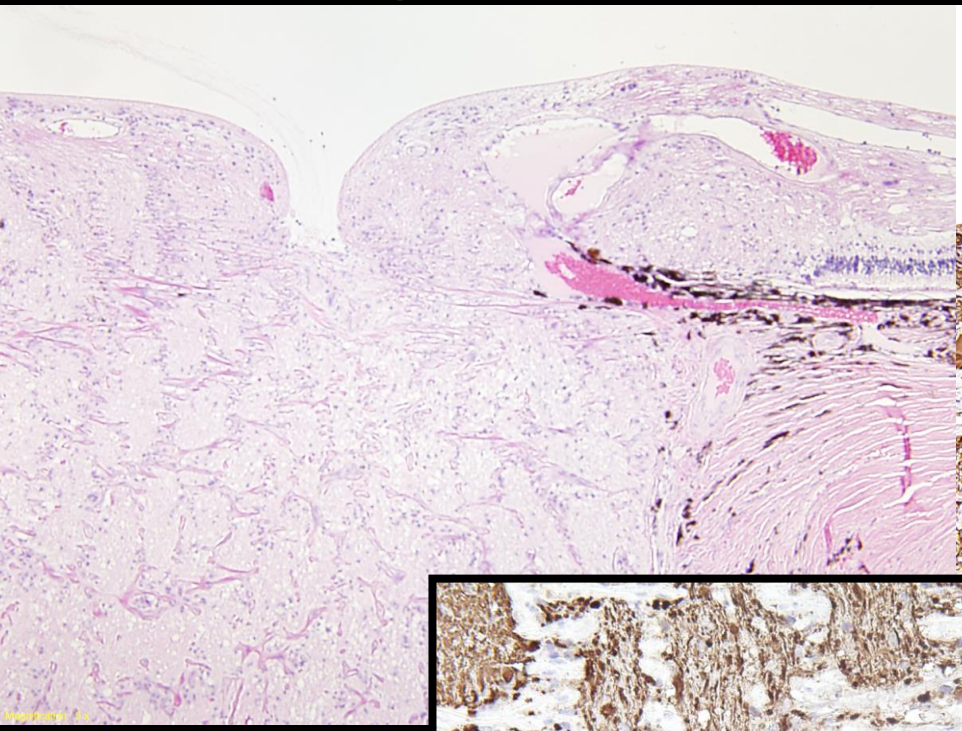
Regional retinal necrosis

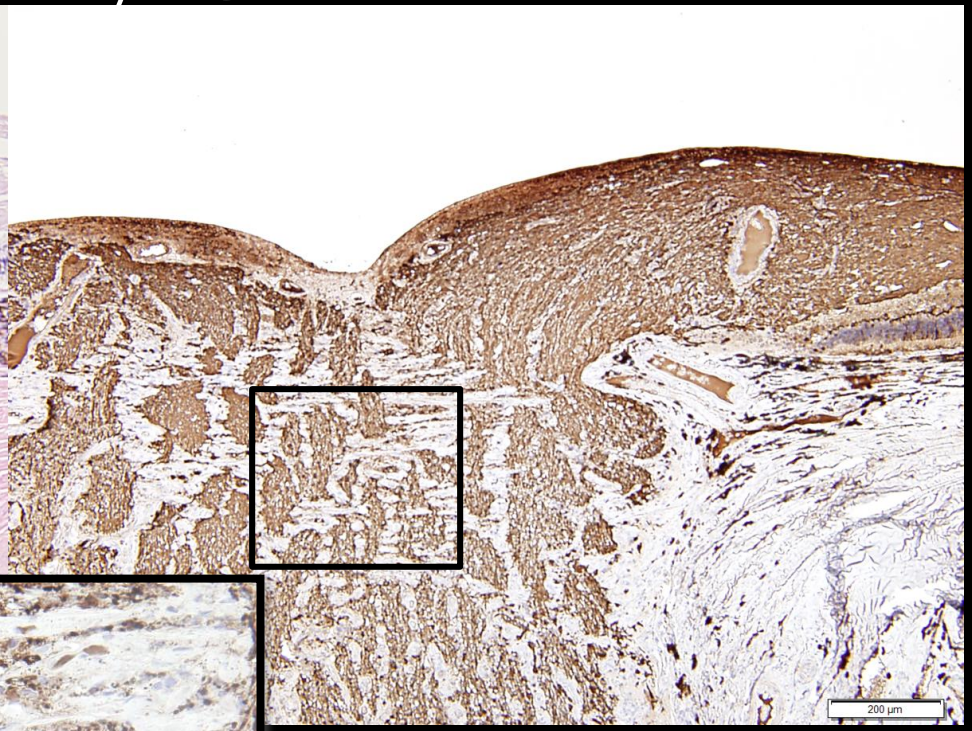
Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma

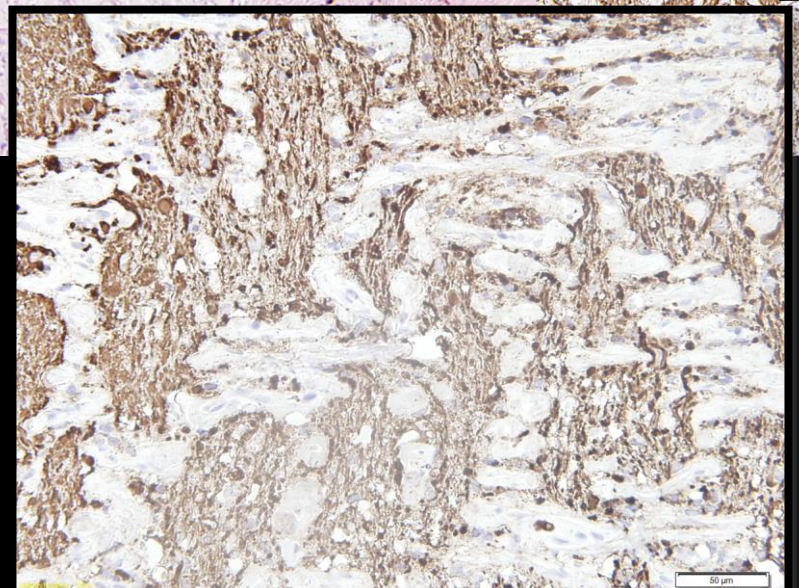


2-day glaucoma

Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma

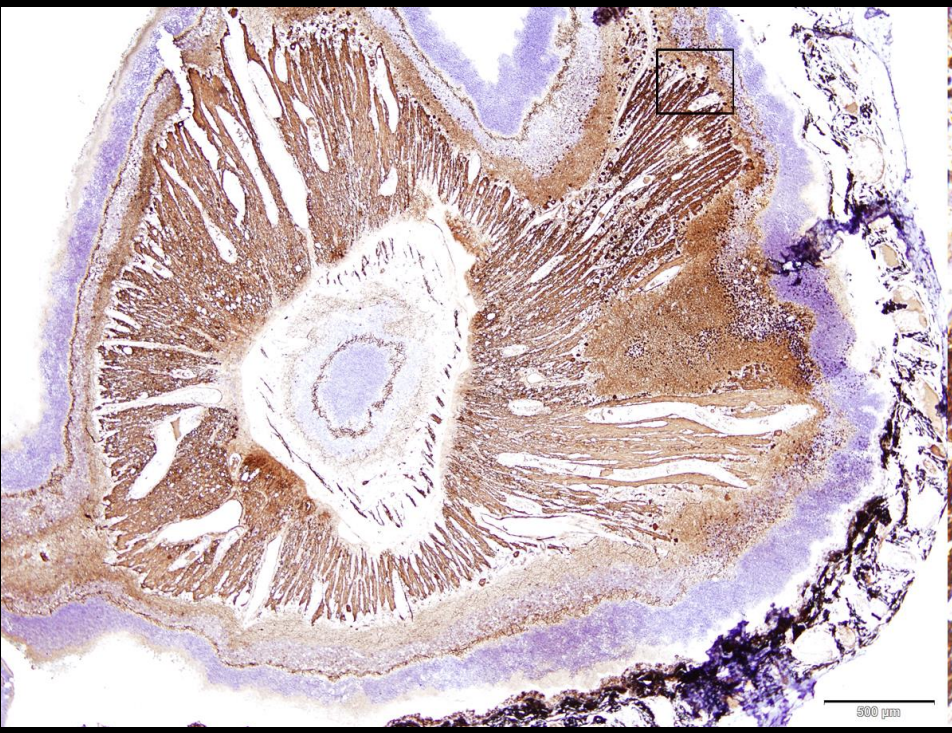


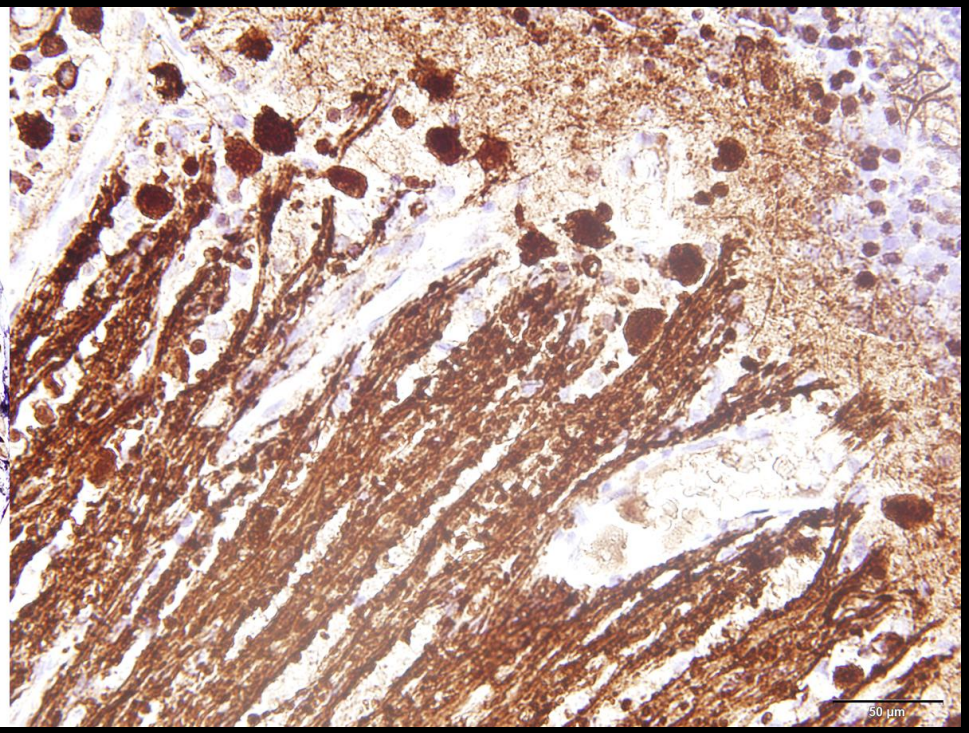




2-day glaucoma

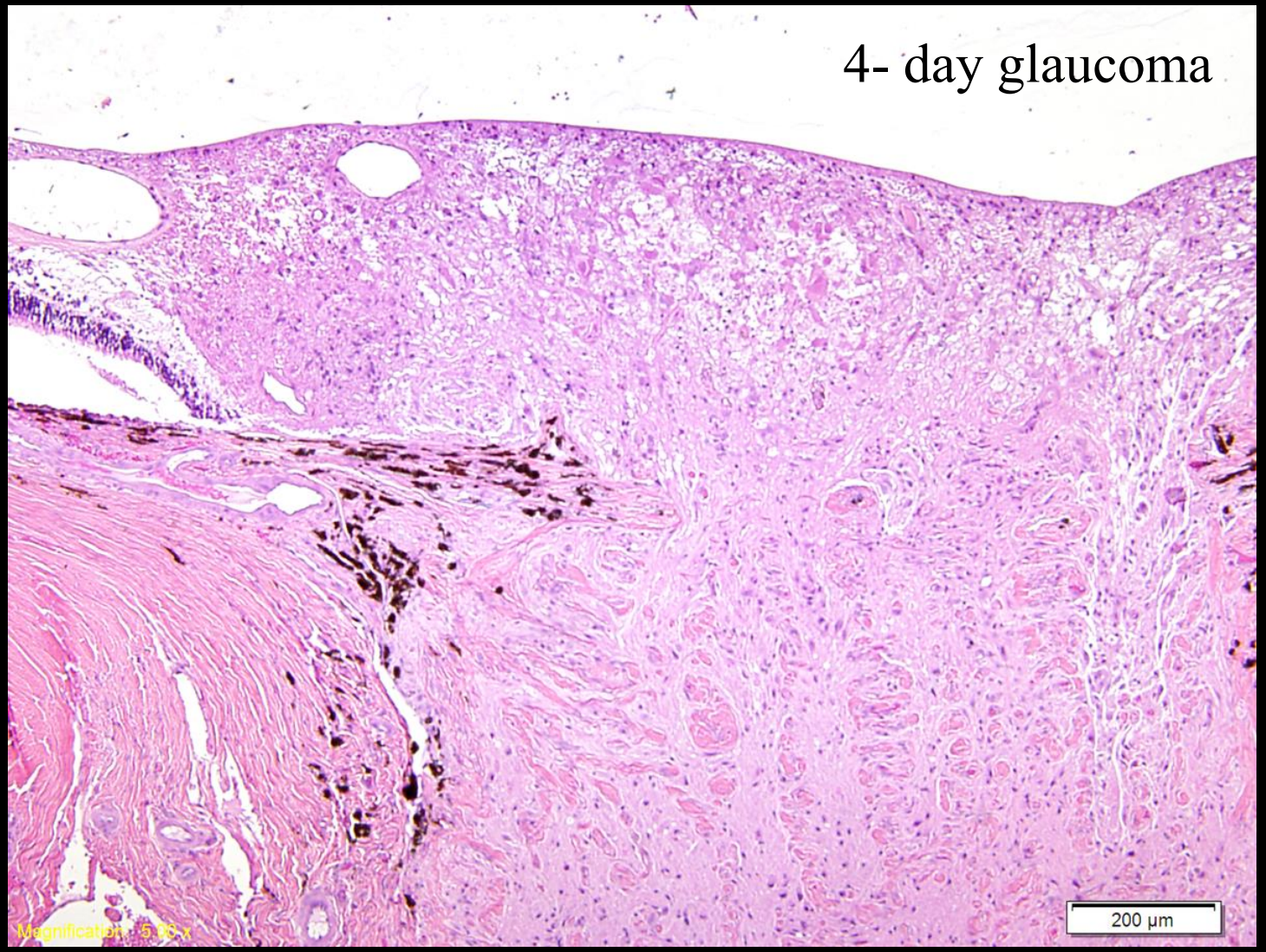
Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma





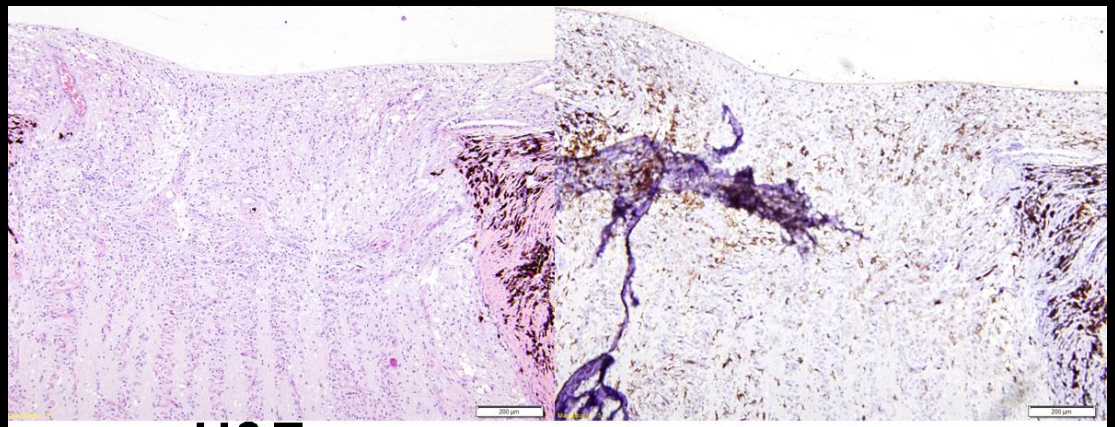
2-day glaucoma

Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma



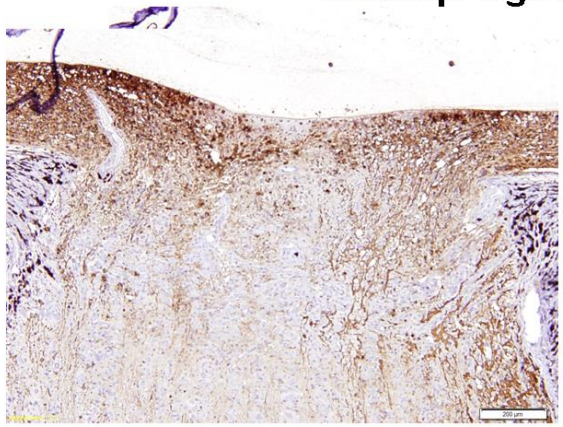
Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma

Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma



H&E

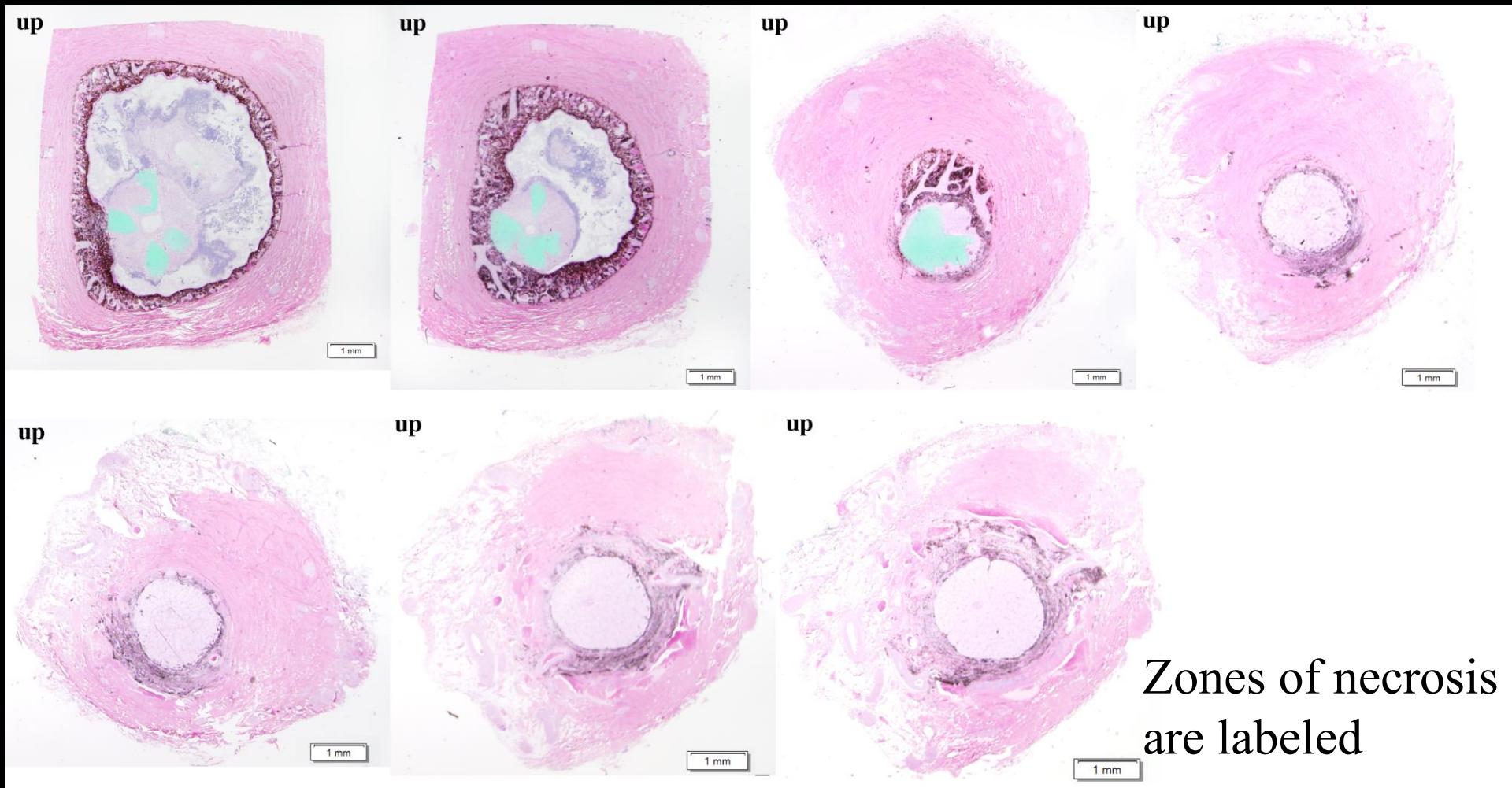
Macrophage Marker



Neurofilament Marker

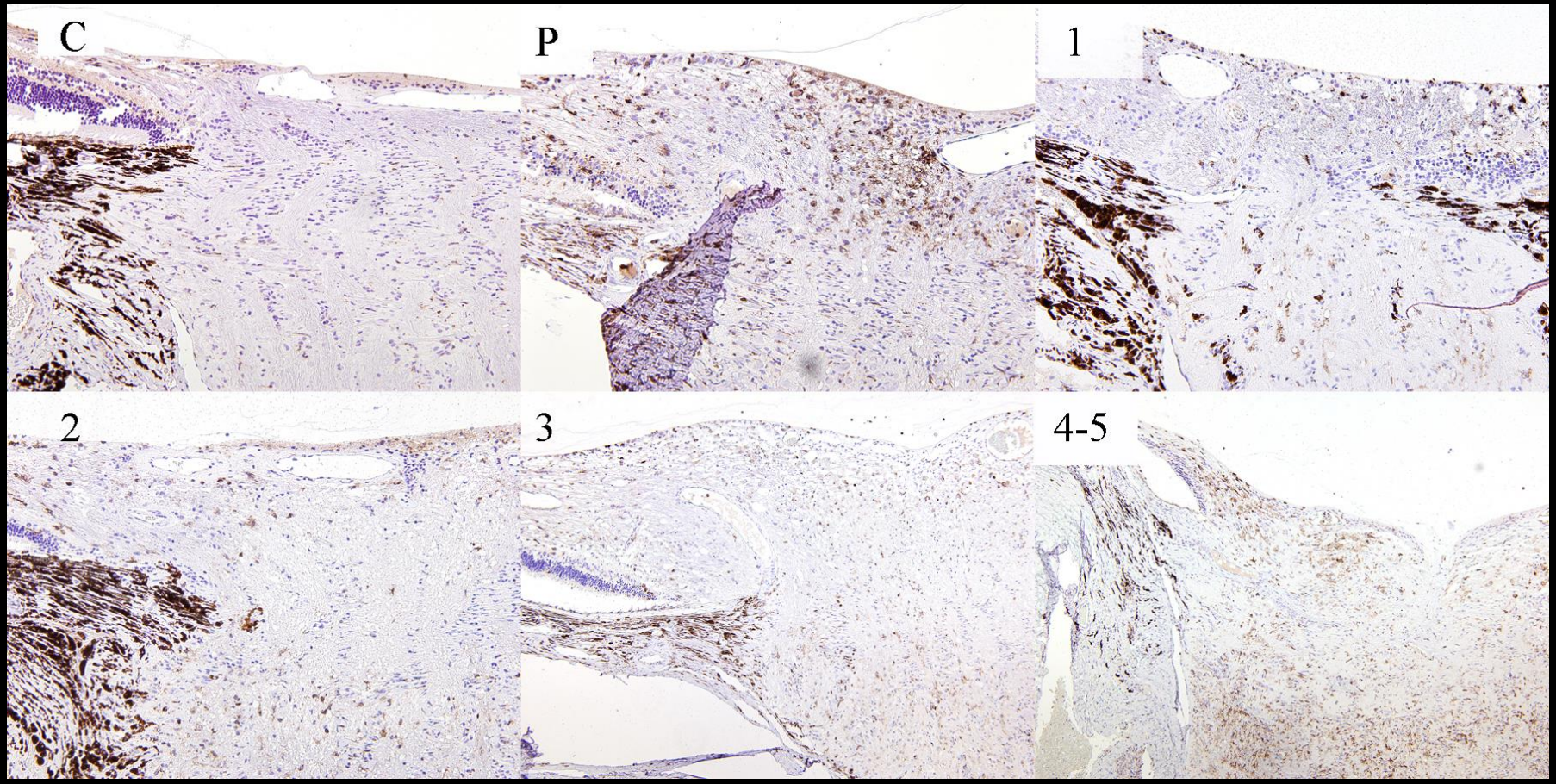
6-Day Glaucoma

Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma



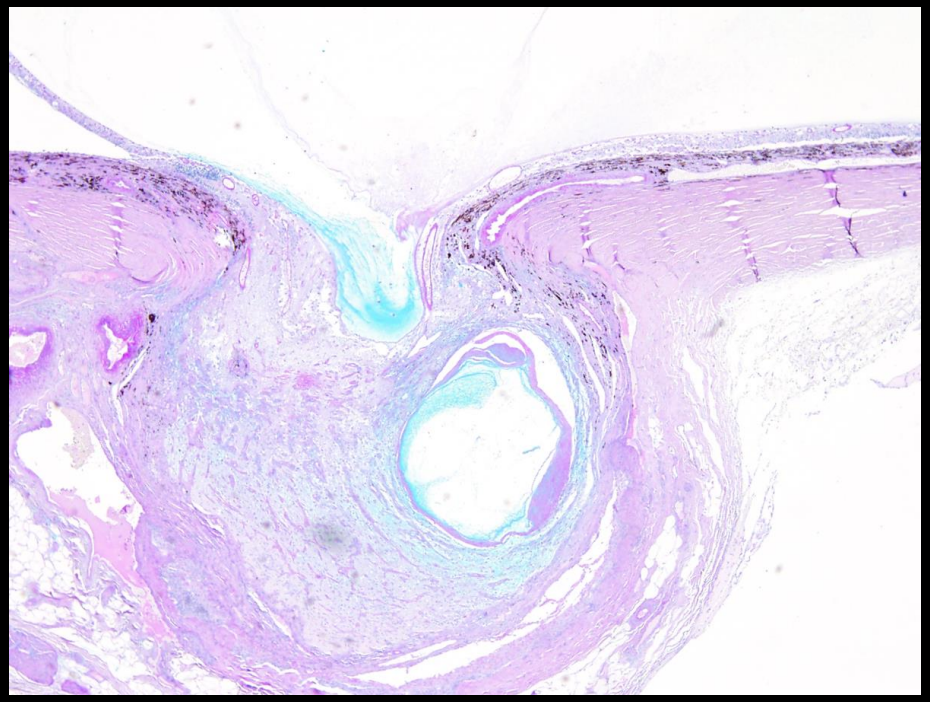
Zones of necrosis are labeled

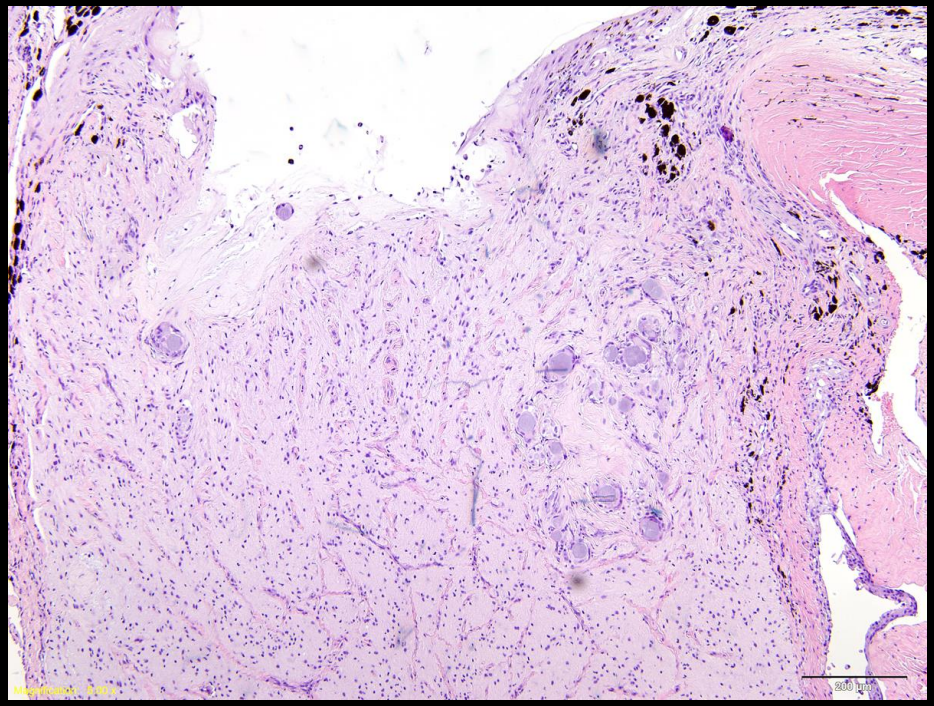
Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma



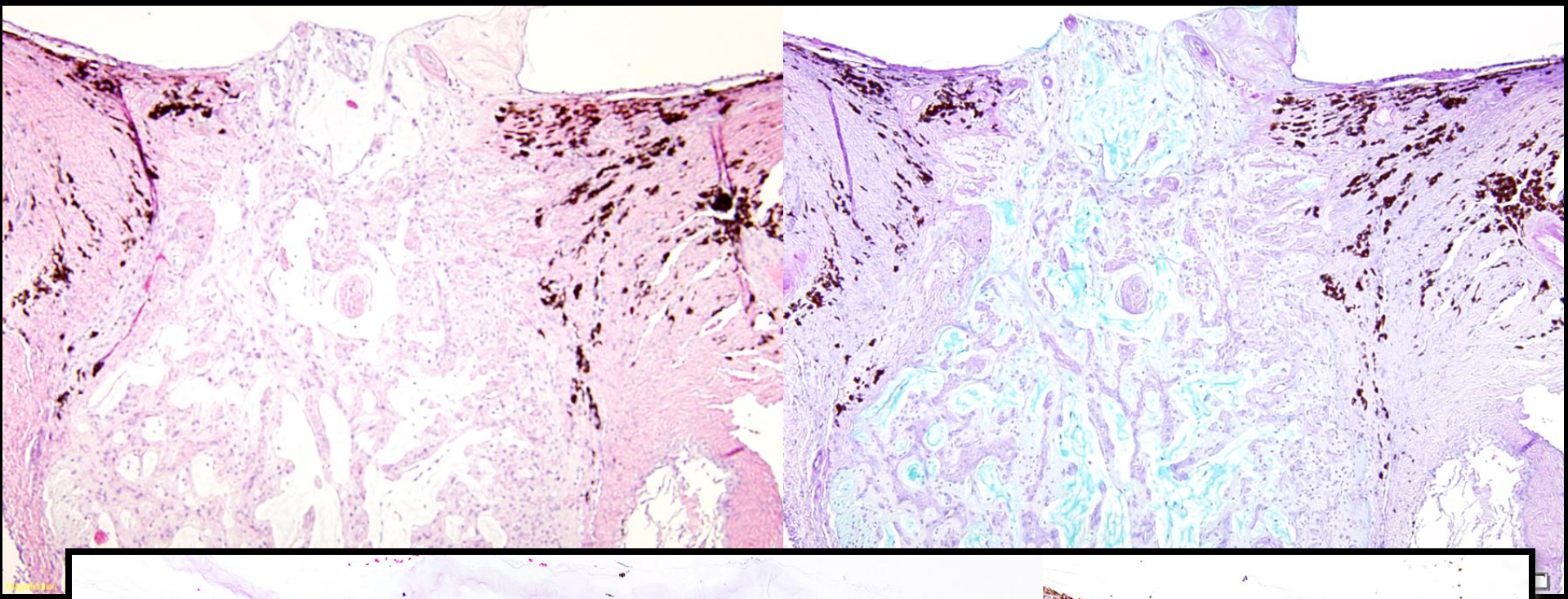
MHC 2 Label for phagocytes

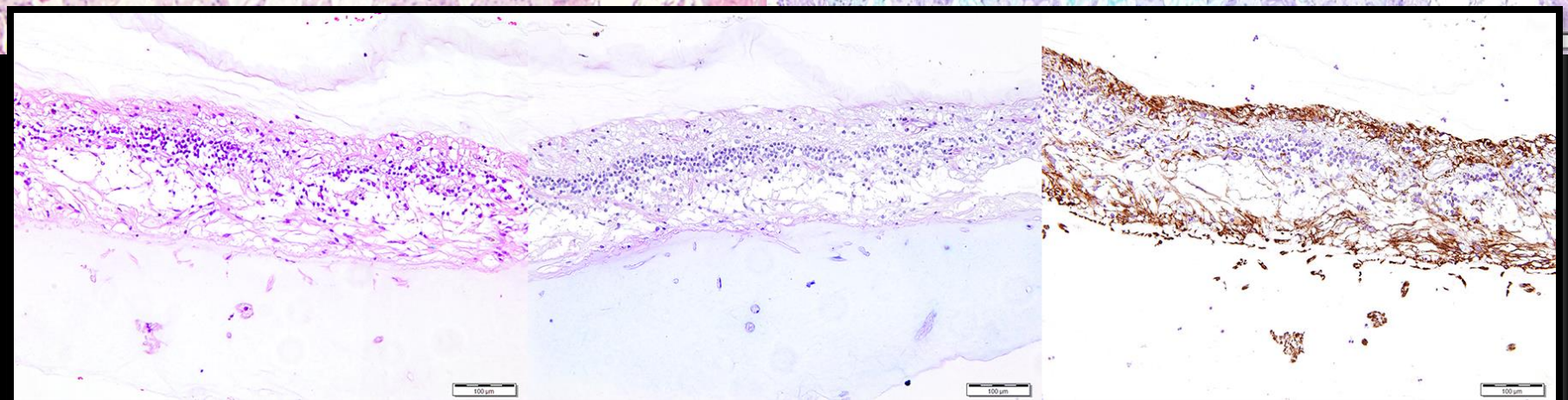
Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma



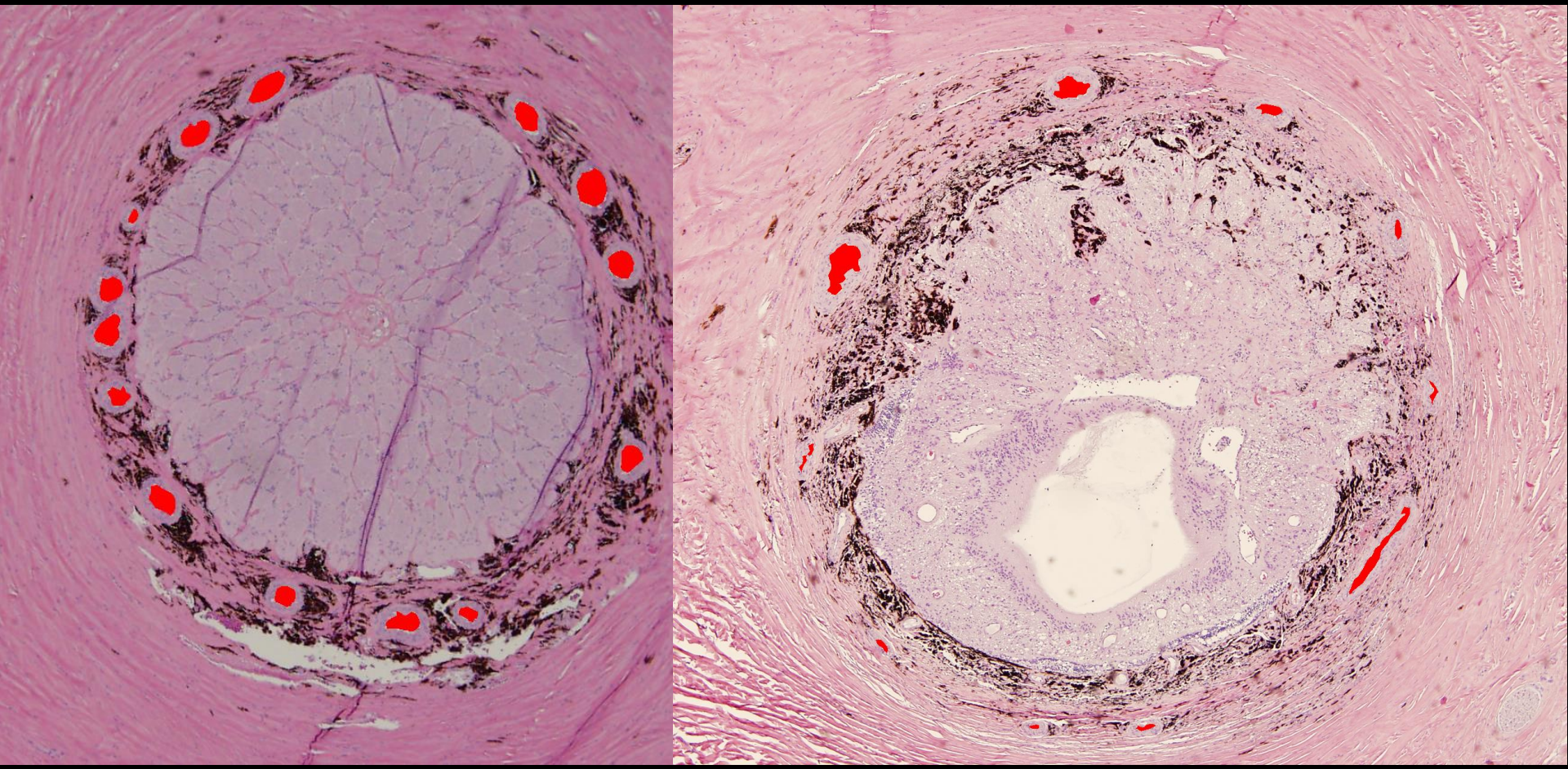


Acute Ischemic Optic Disc Changes in Canine Primary Glaucoma

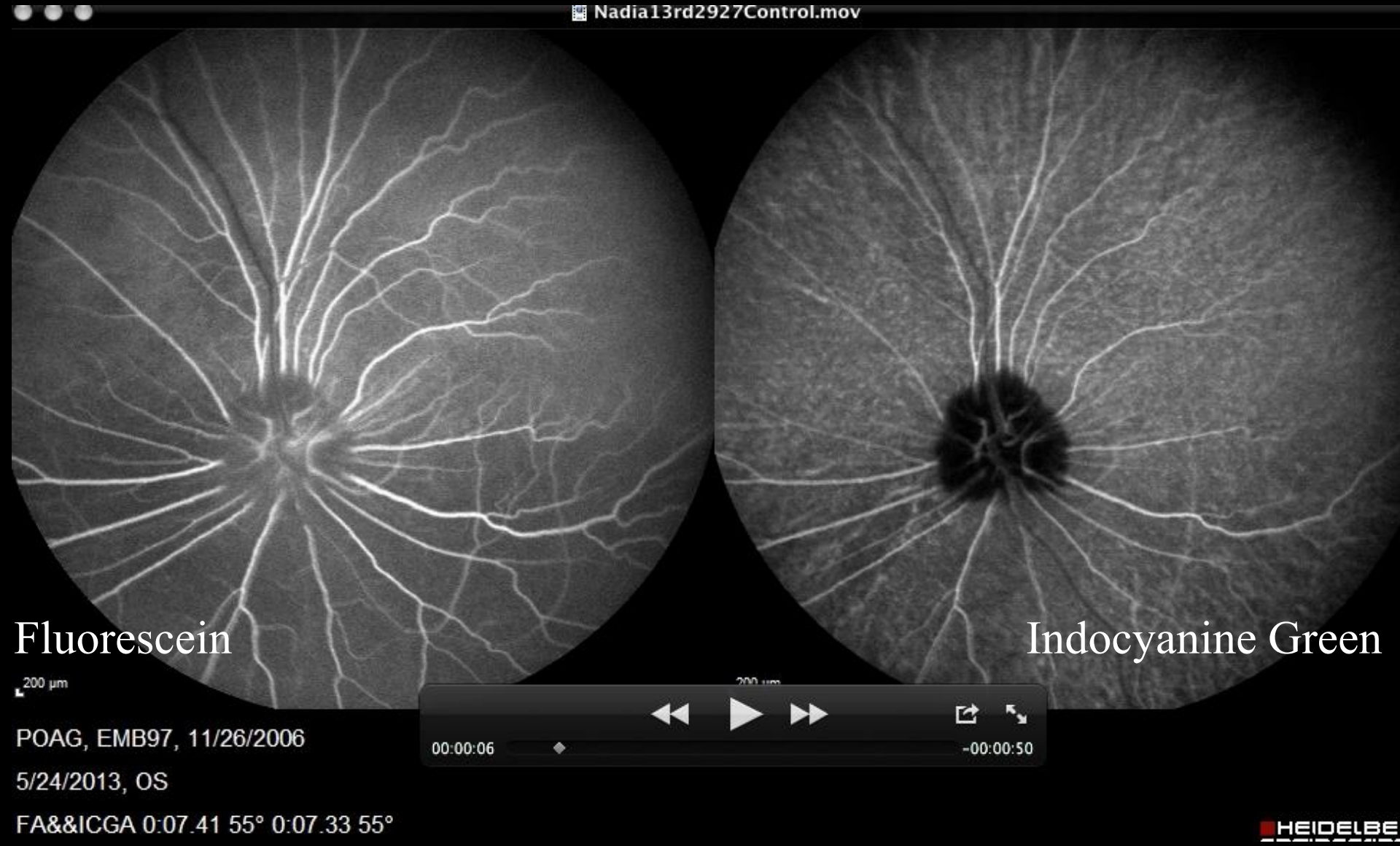




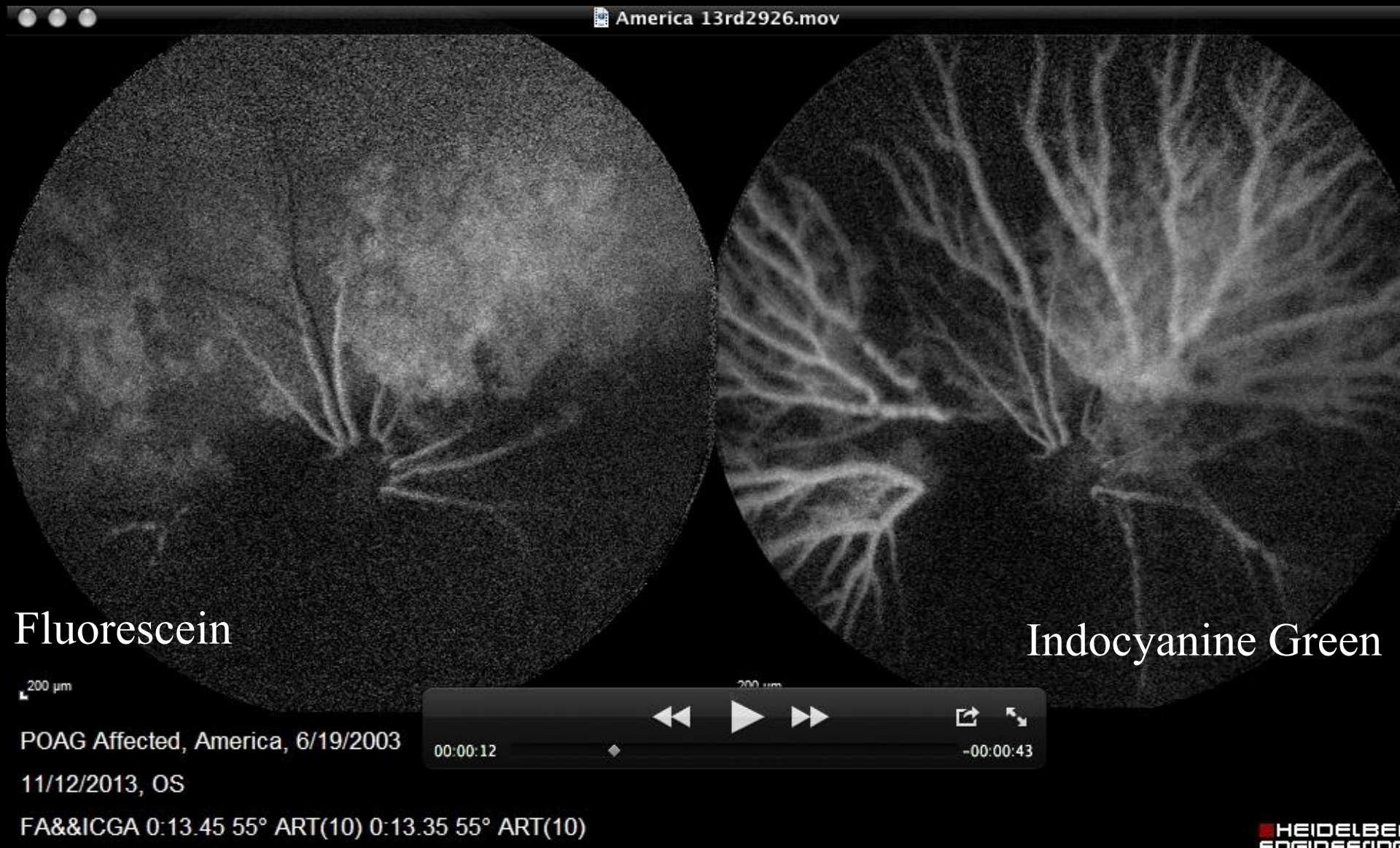
Short Posterior Ciliary Artery in Acute Glaucoma



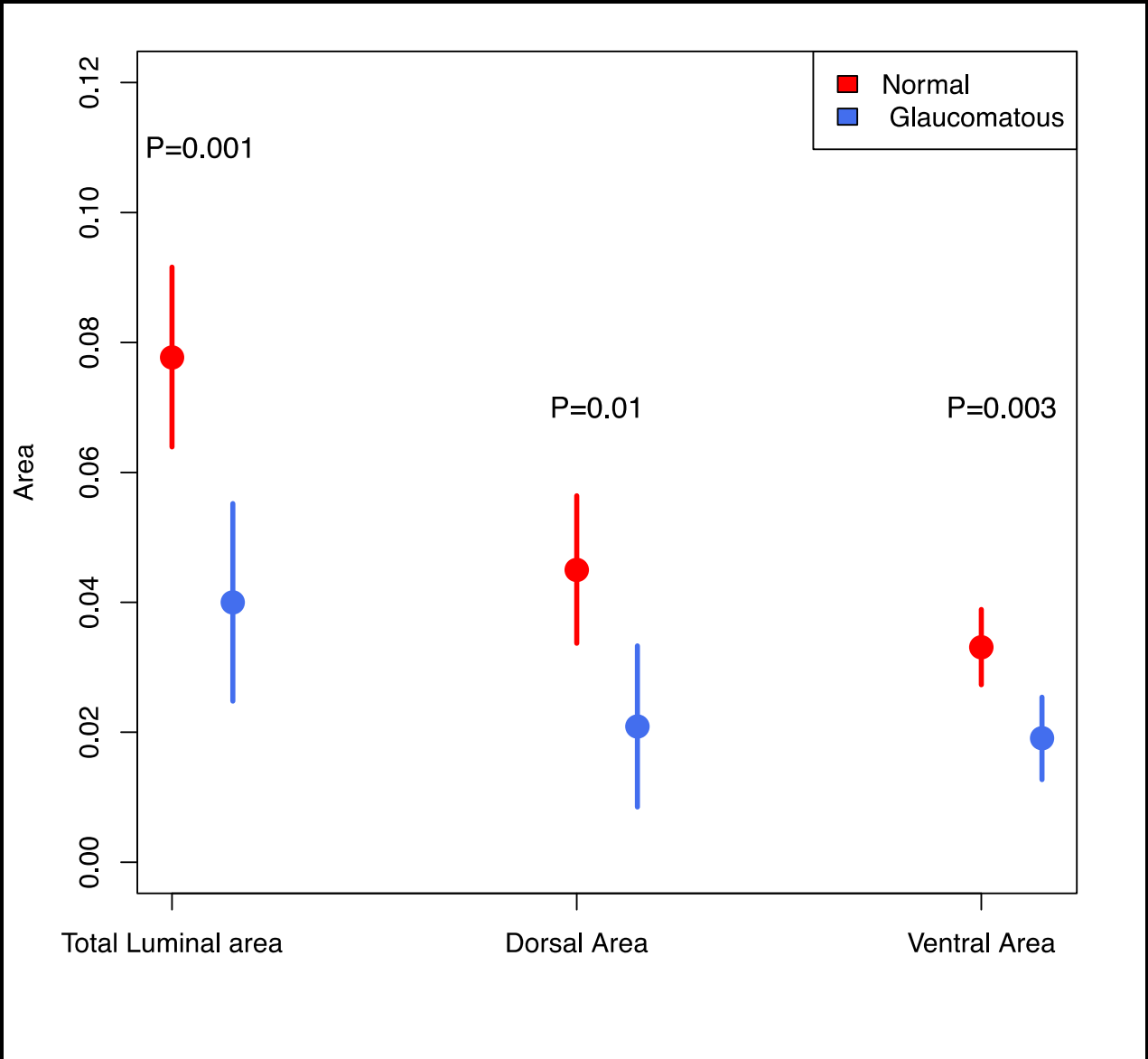
Angiogram in Normal Dog



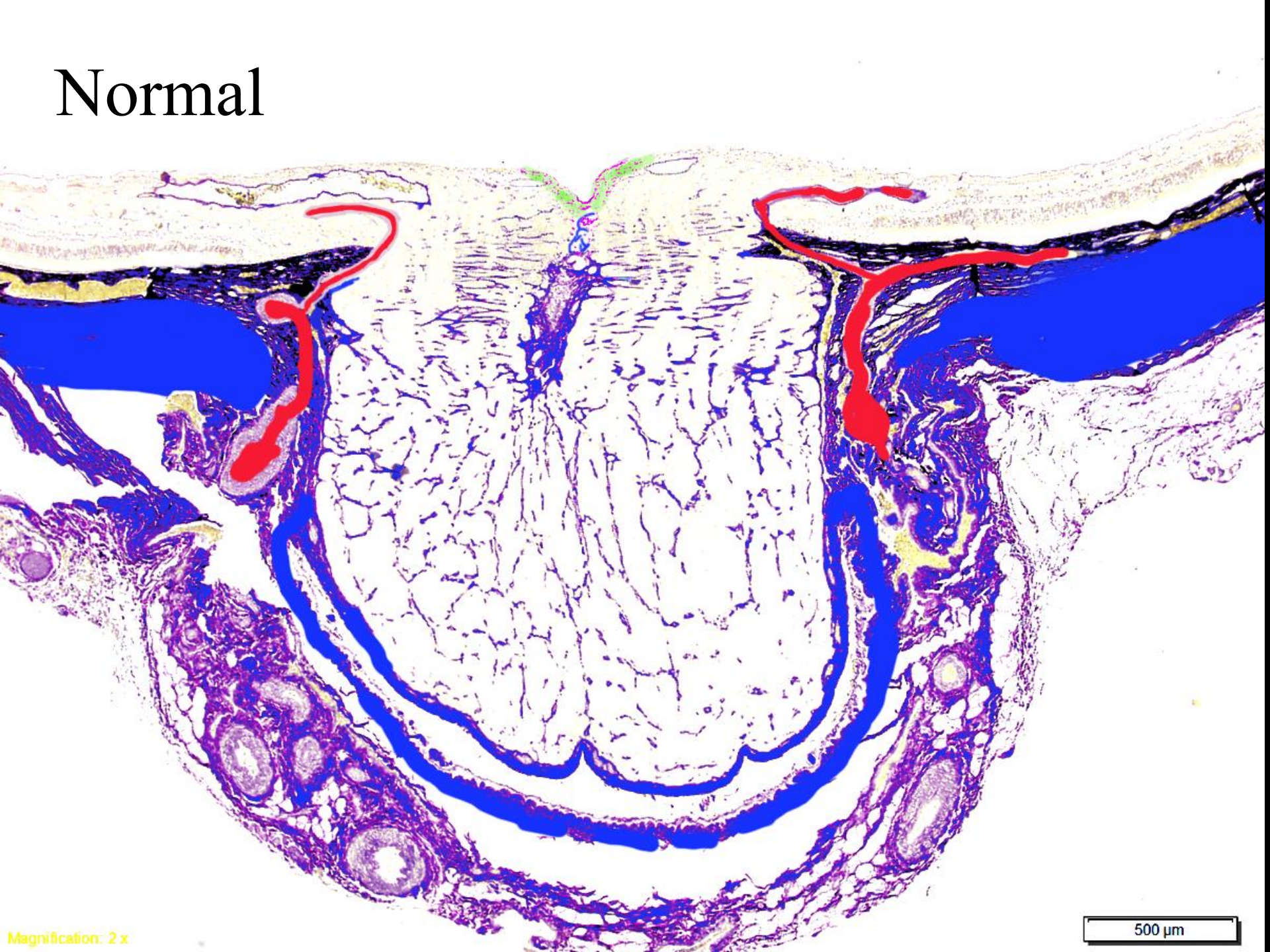
13 Second Angiogeram



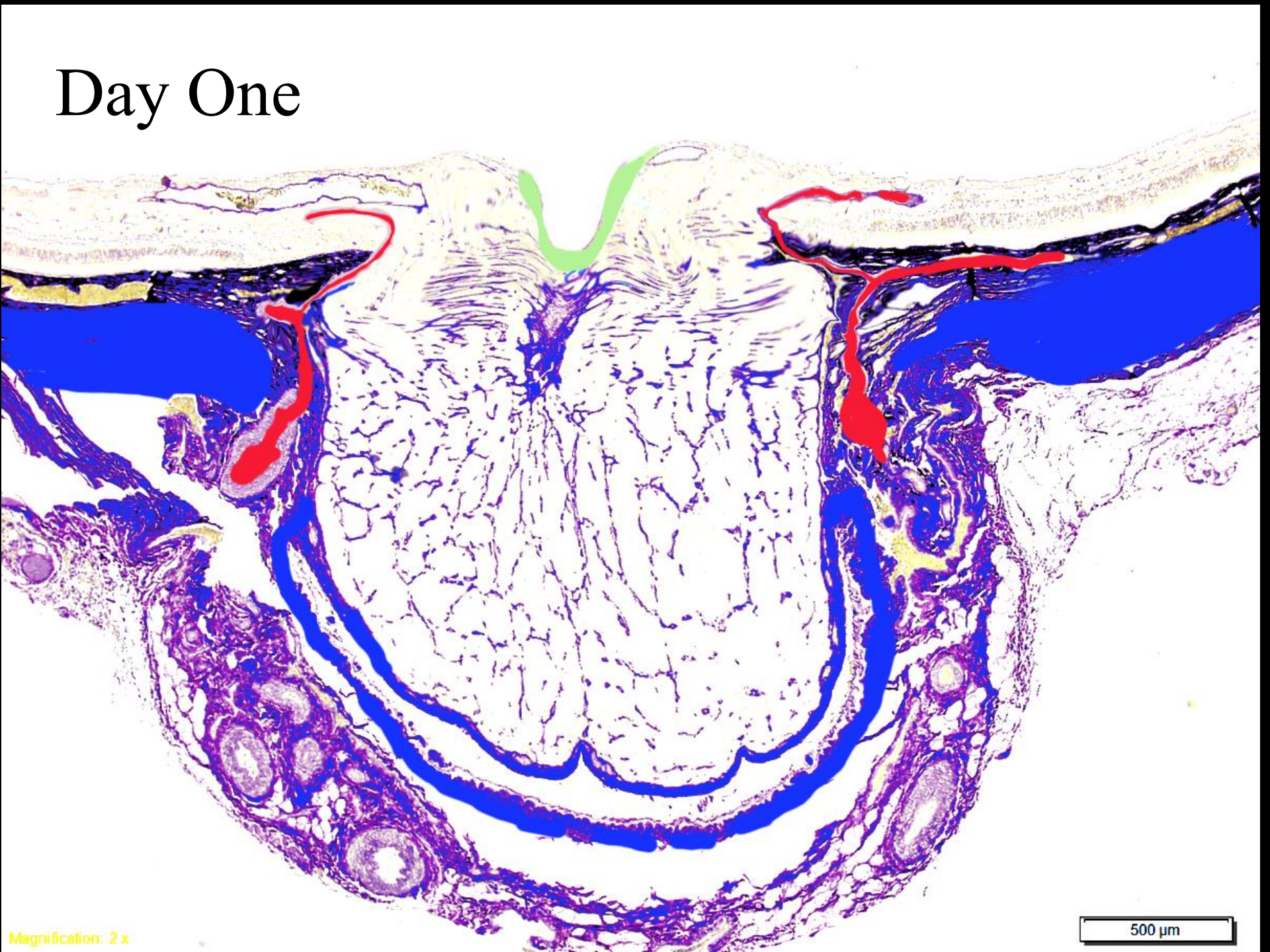
Blood Vessel Area
Normal vs Acute Glaucoma



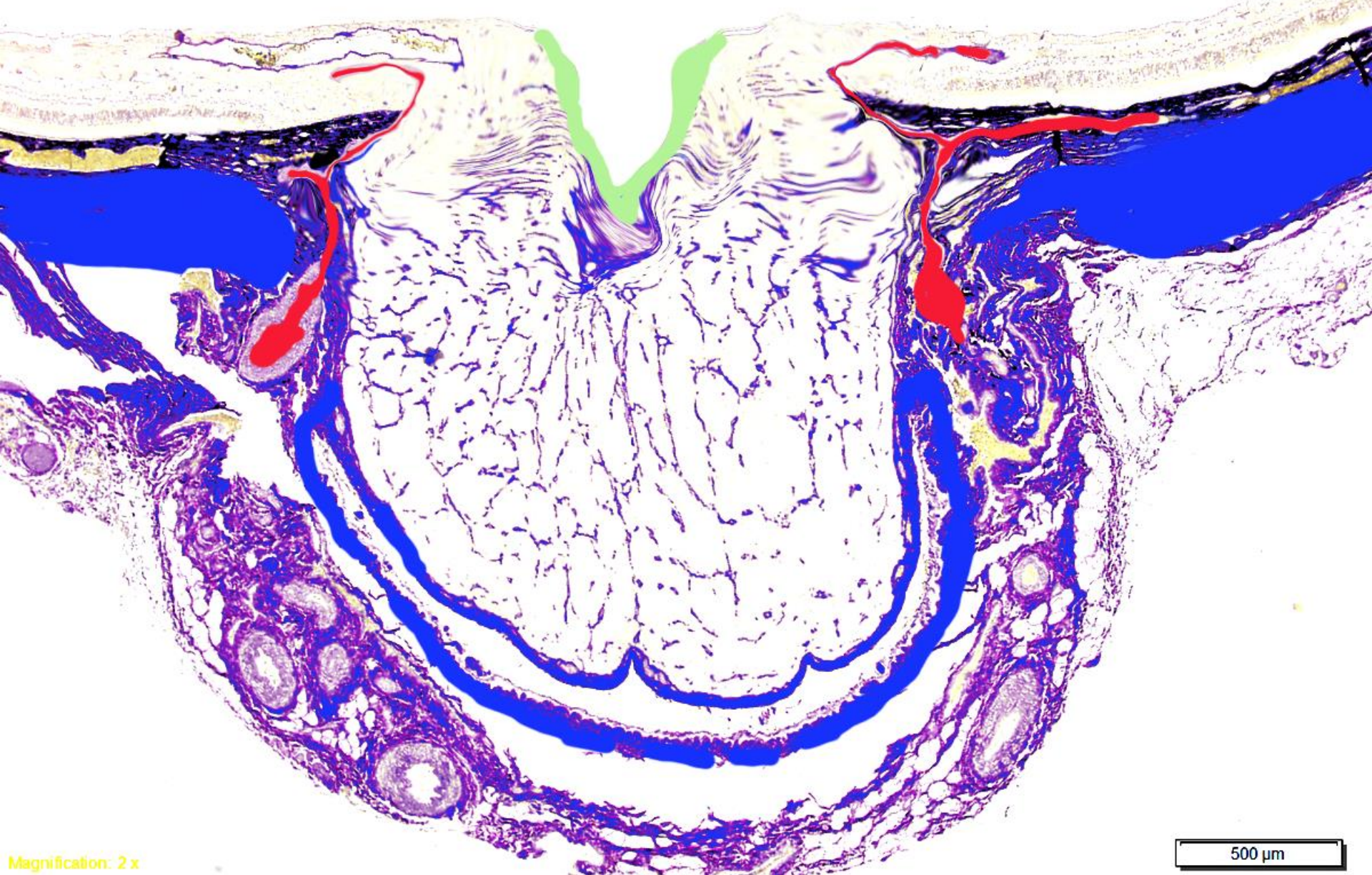
Normal



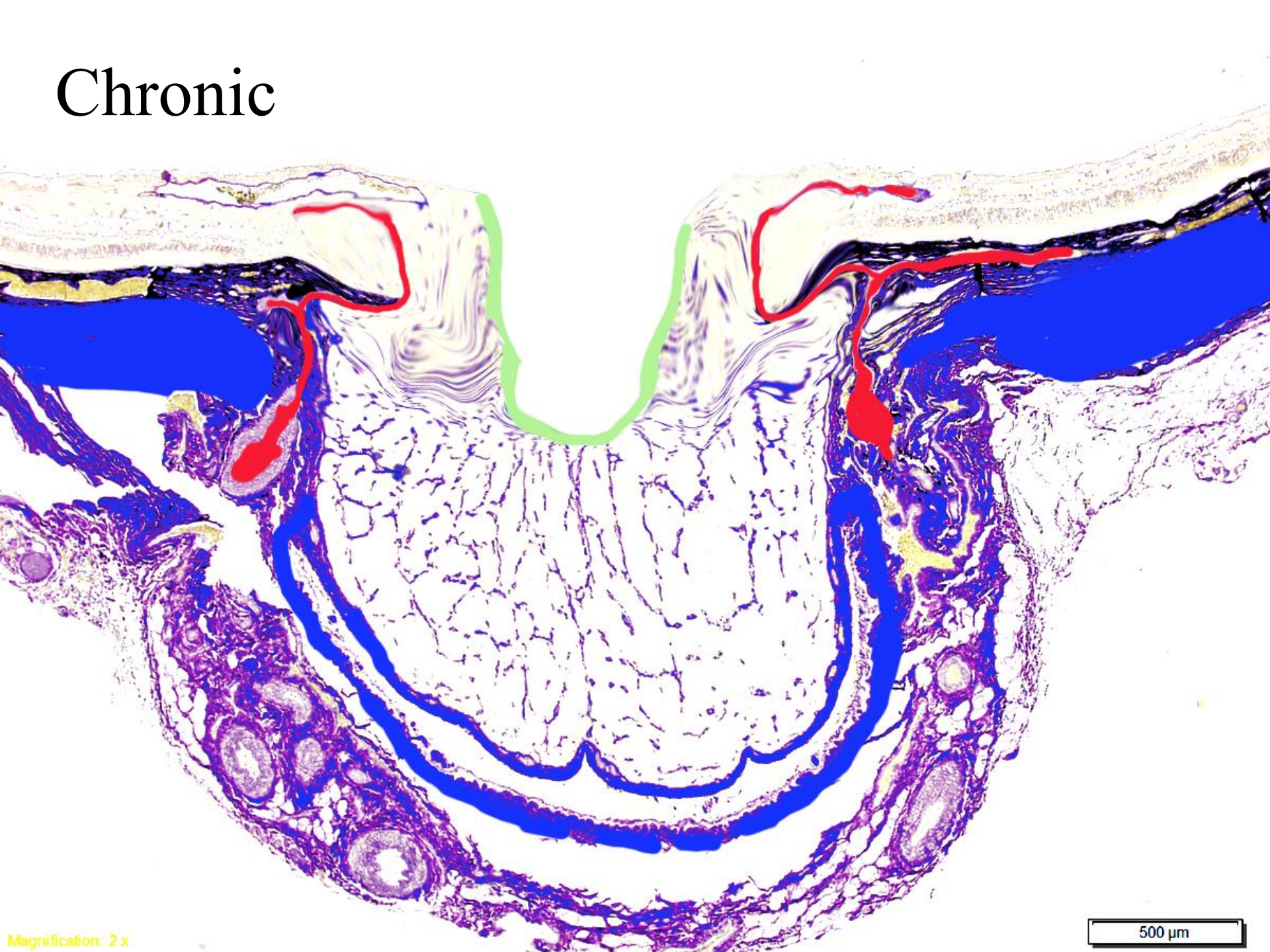
Day One



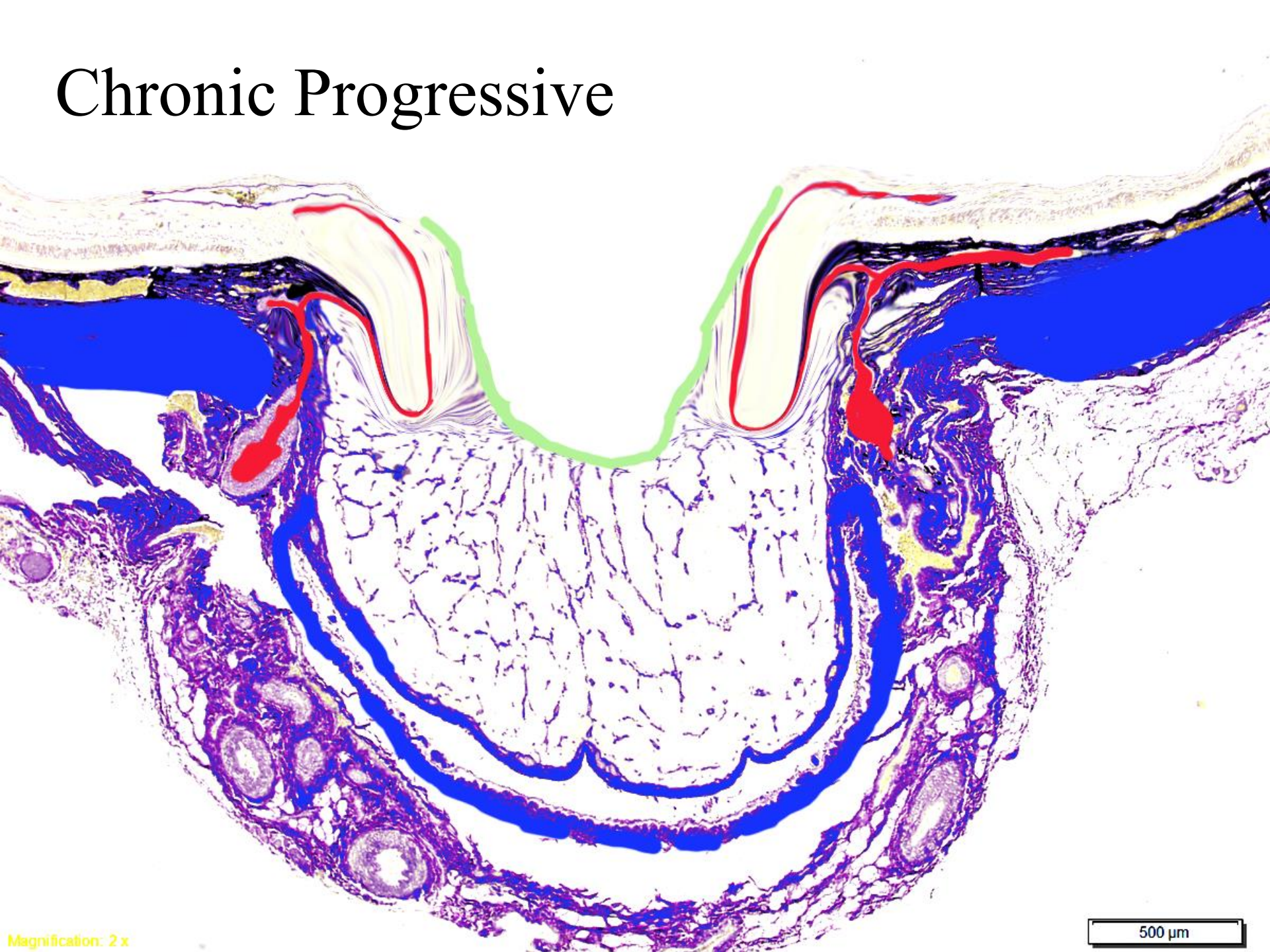
Day-5



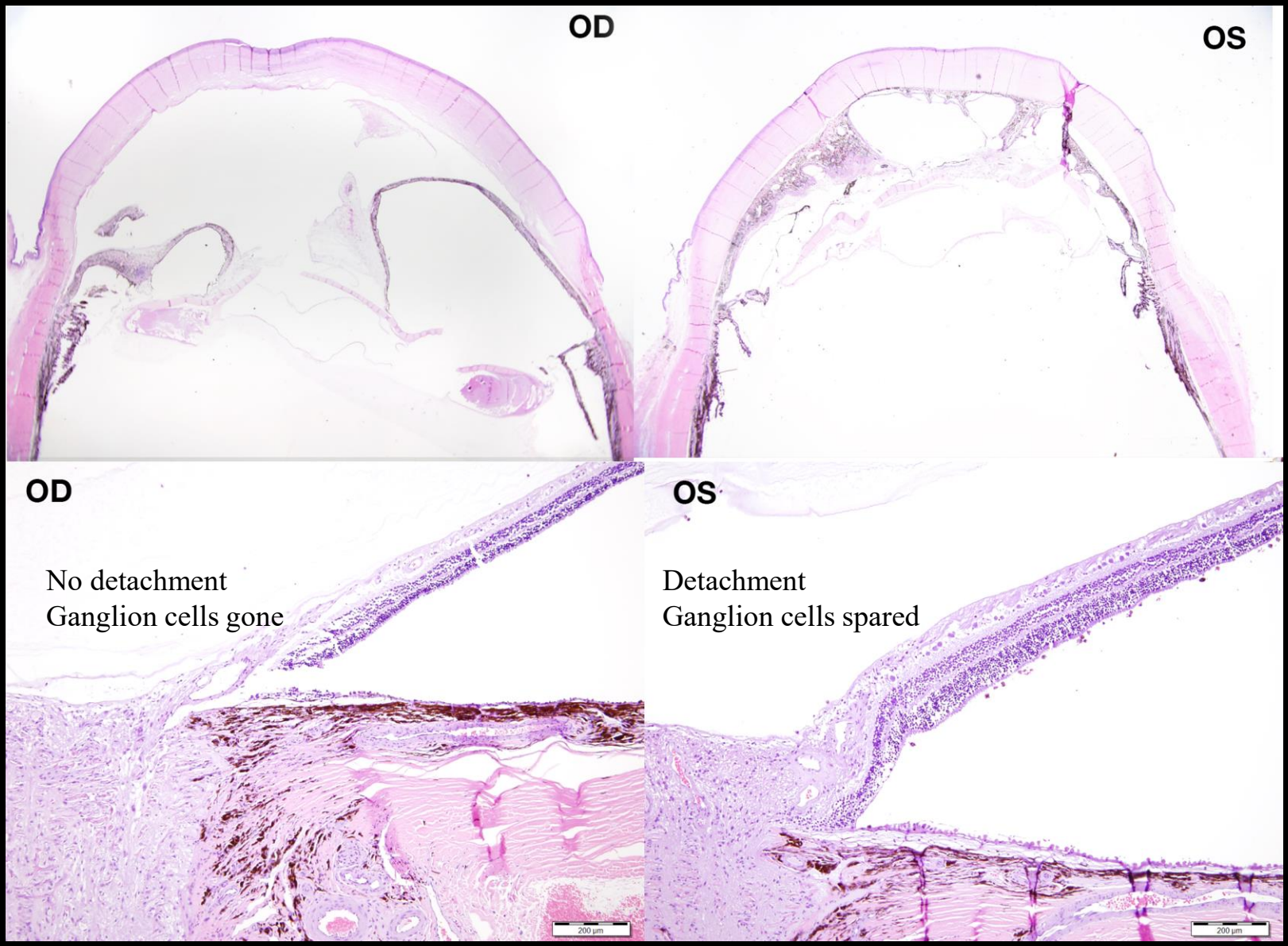
Chronic



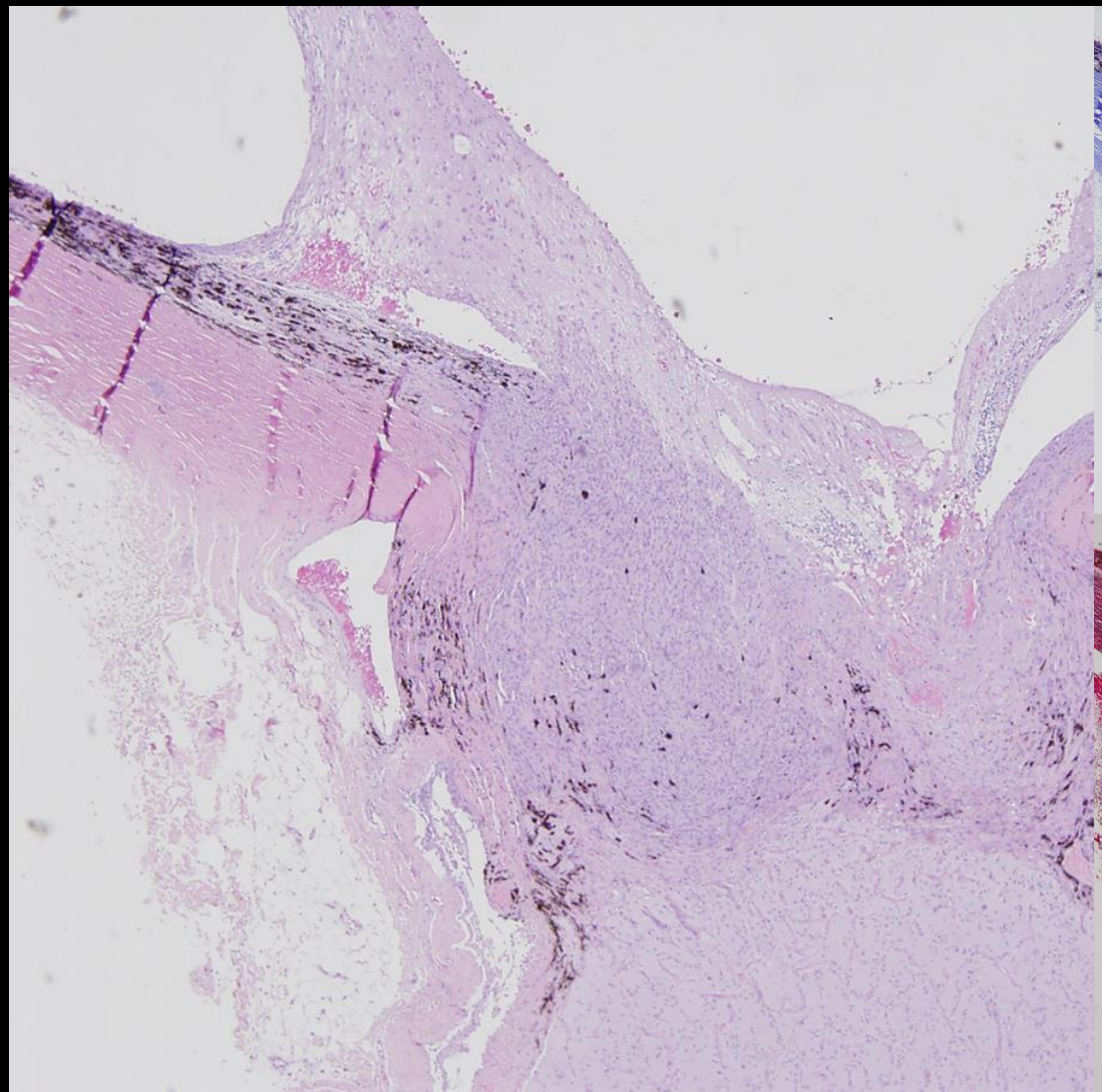
Chronic Progressive

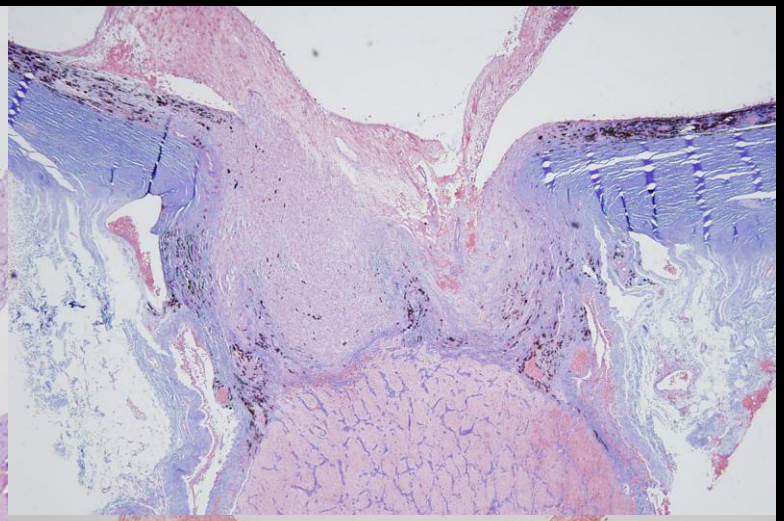


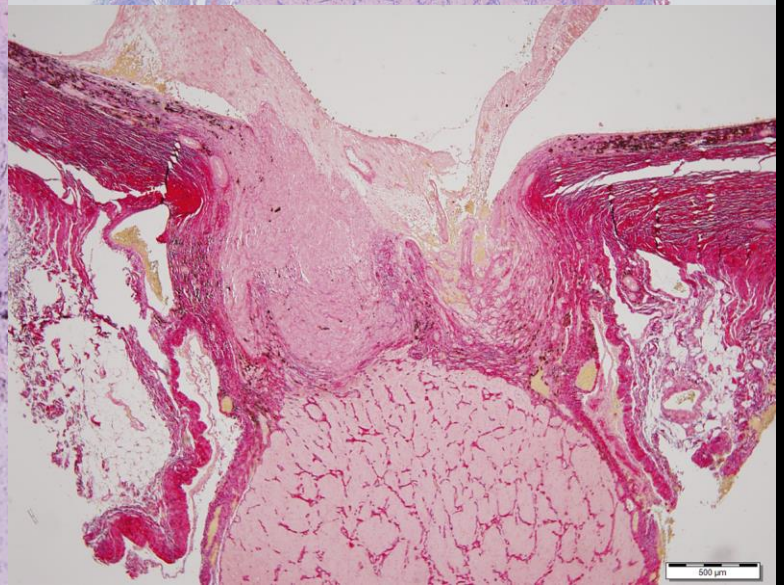
Glaucoma following retinal detachment is associated with sparing of the ganglion cell layer.



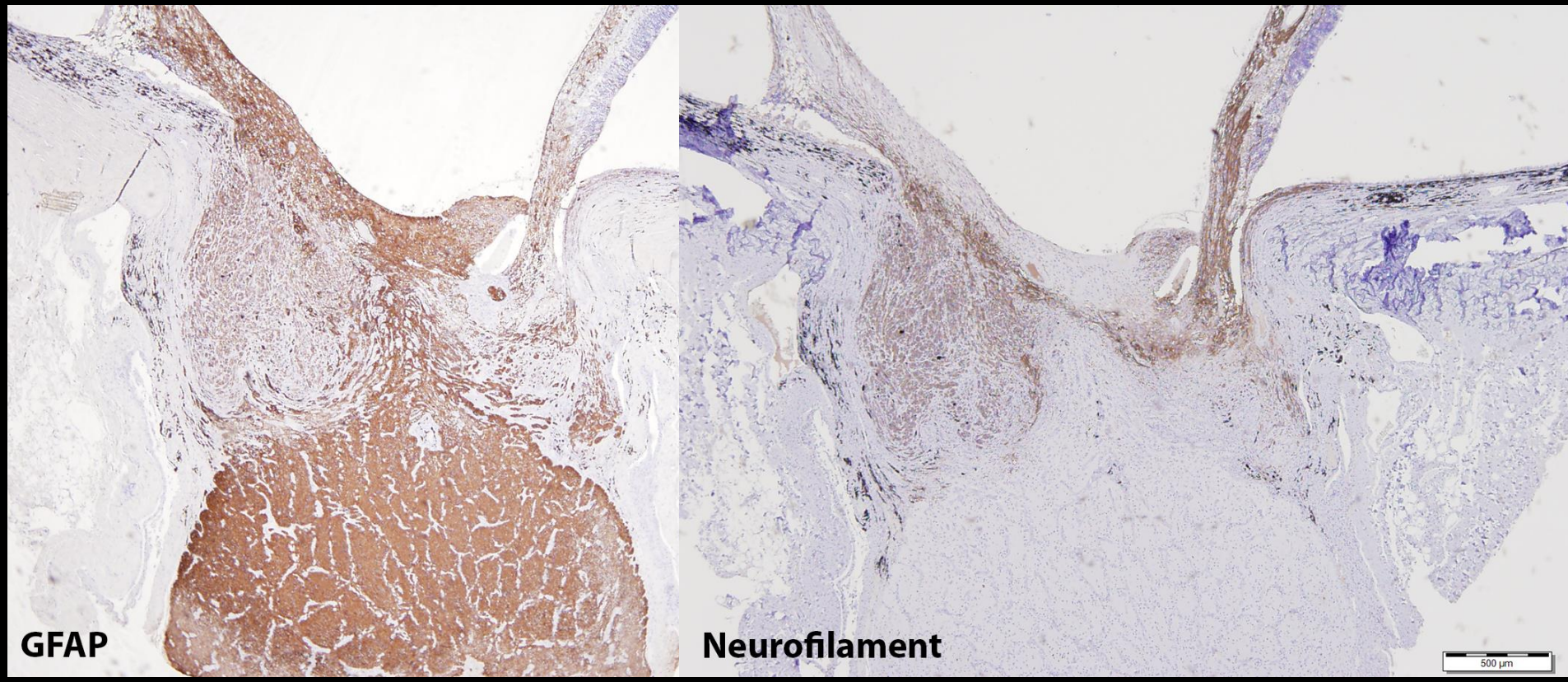
Canine Optic Nerve “Neuroma” Associated with Glaucoma



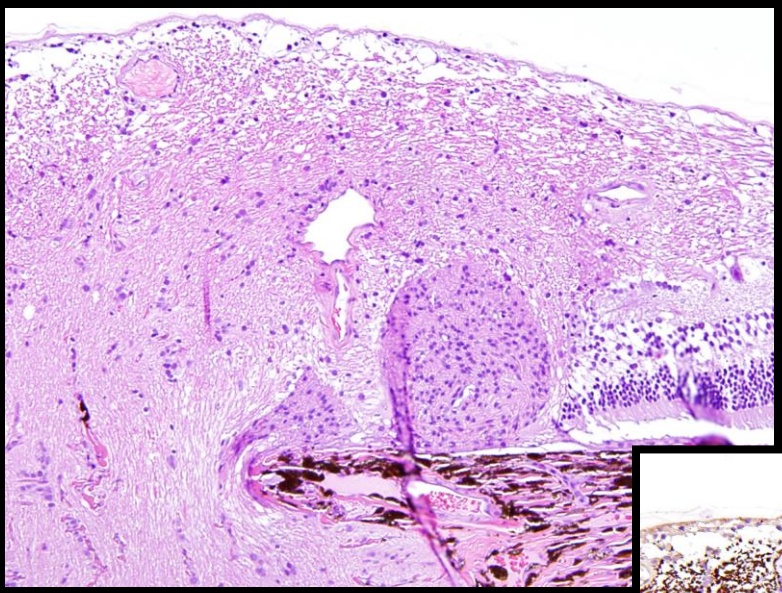


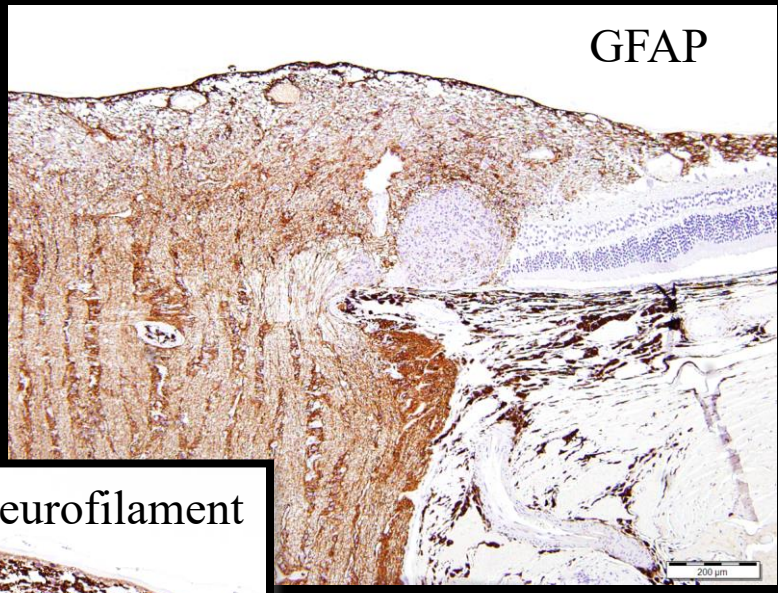


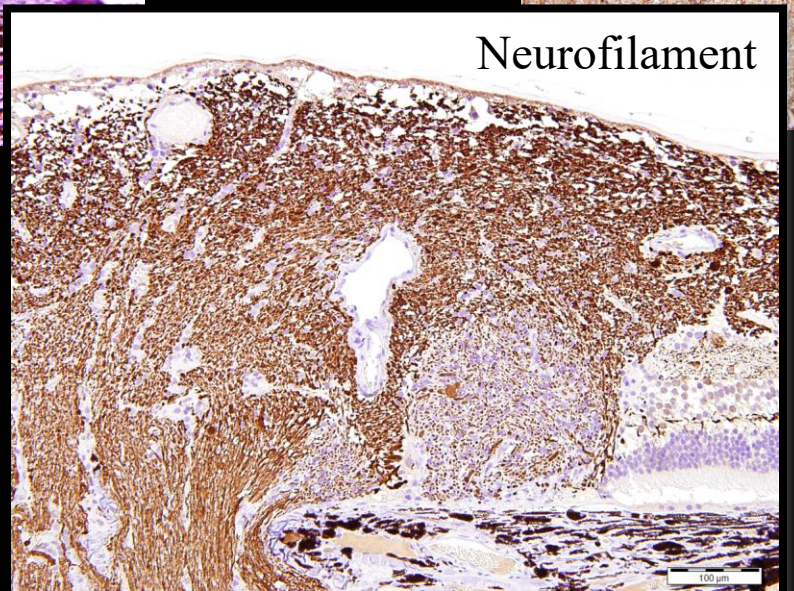
Canine Optic Nerve "Neuroma" Associated with Glaucoma



Canine + Feline Optic Nerve "Neuroma" not Associated with Glaucoma

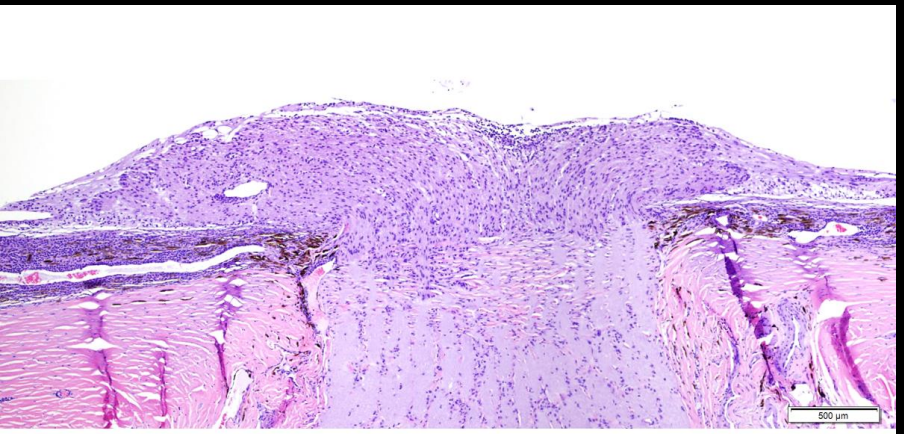




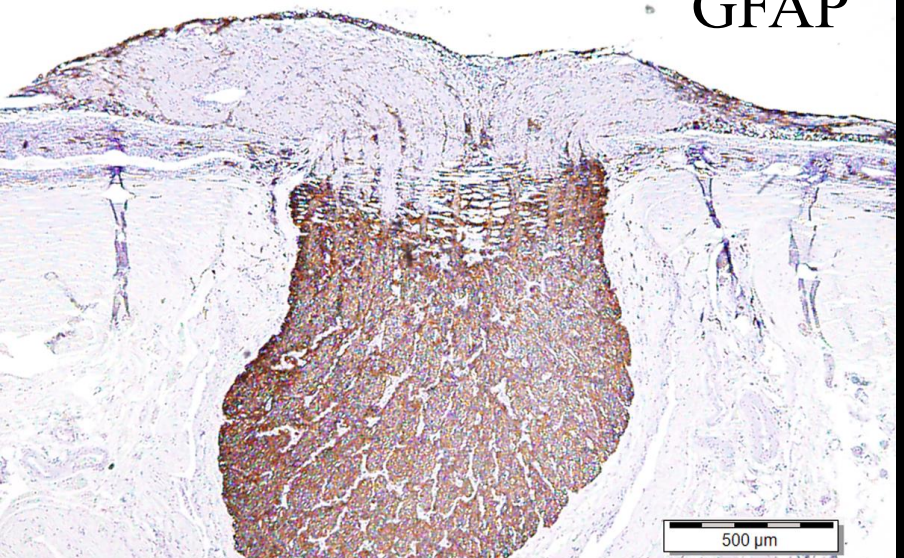


Canine

Canine + Feline Optic Nerve “Neuroma” not Associated with Glaucoma

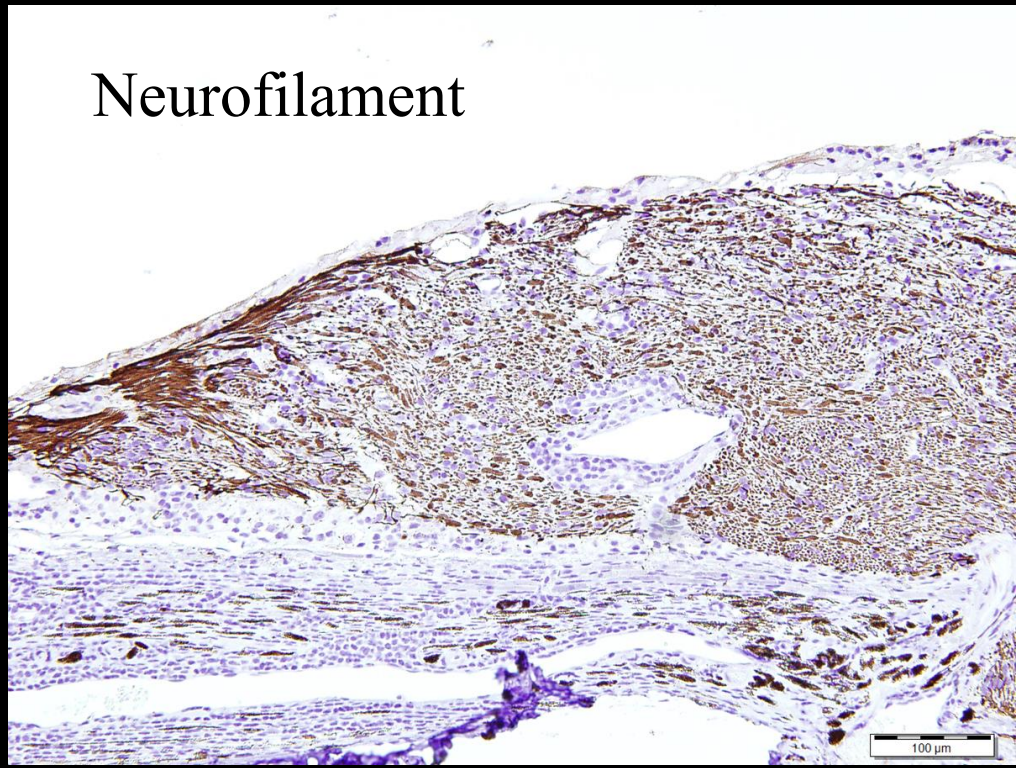


GFAP

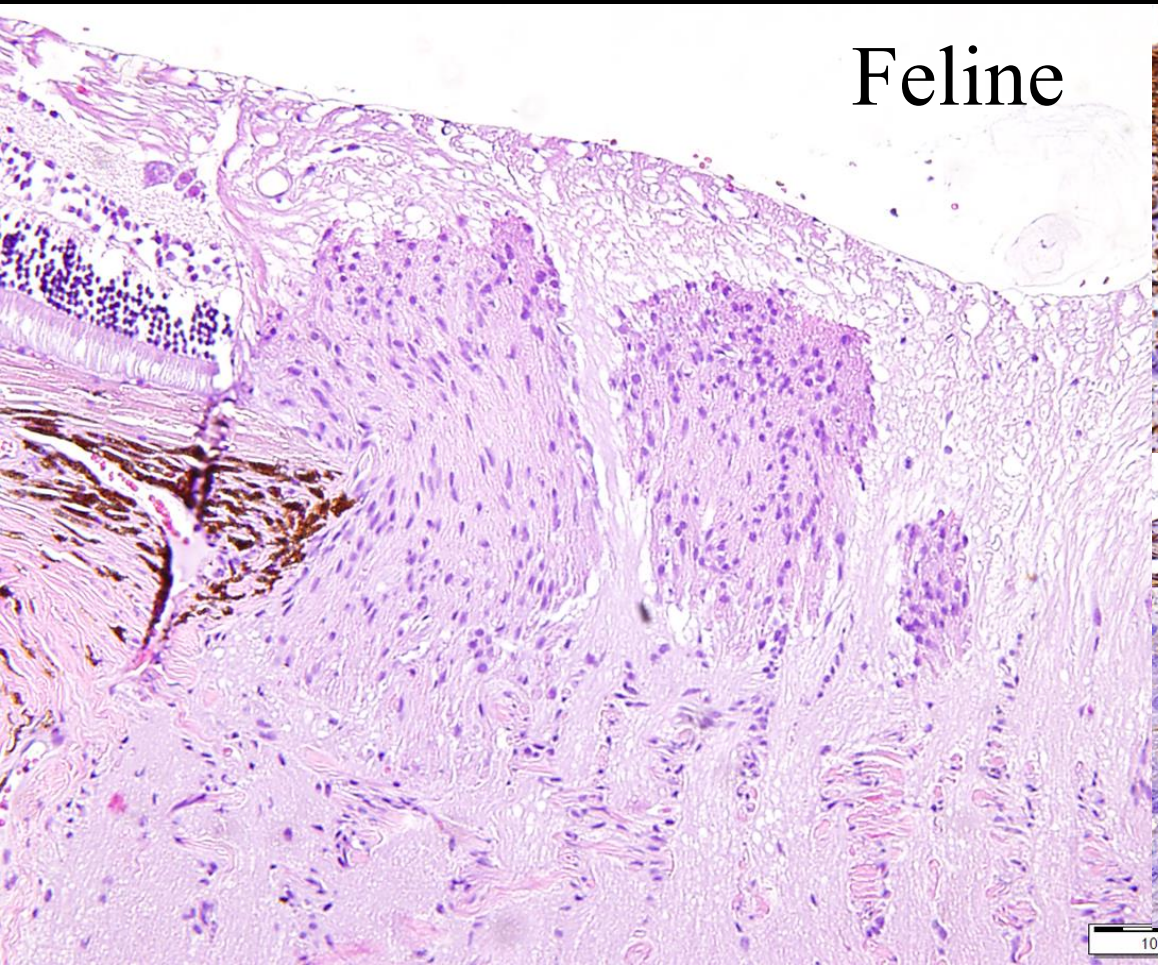


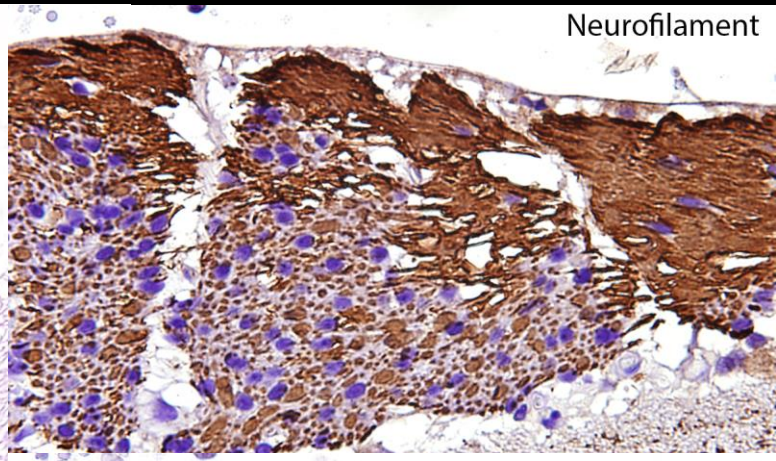
Feline

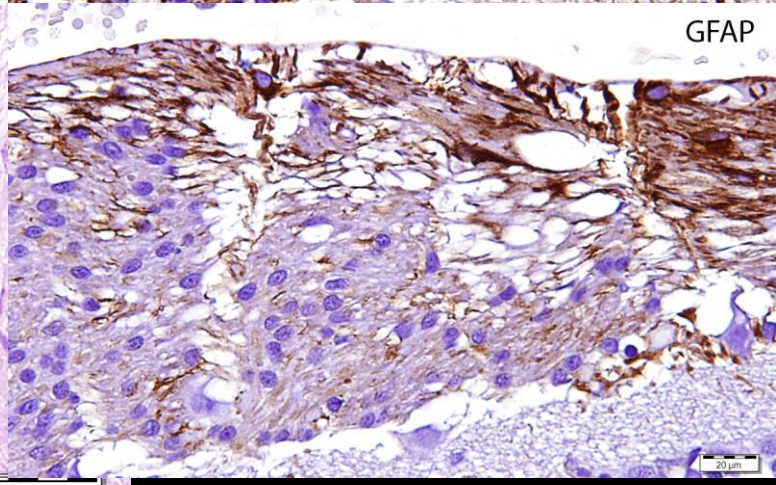
Neurofilament



Canine + Feline Optic Nerve "Neuroma" not Associated with Glaucoma





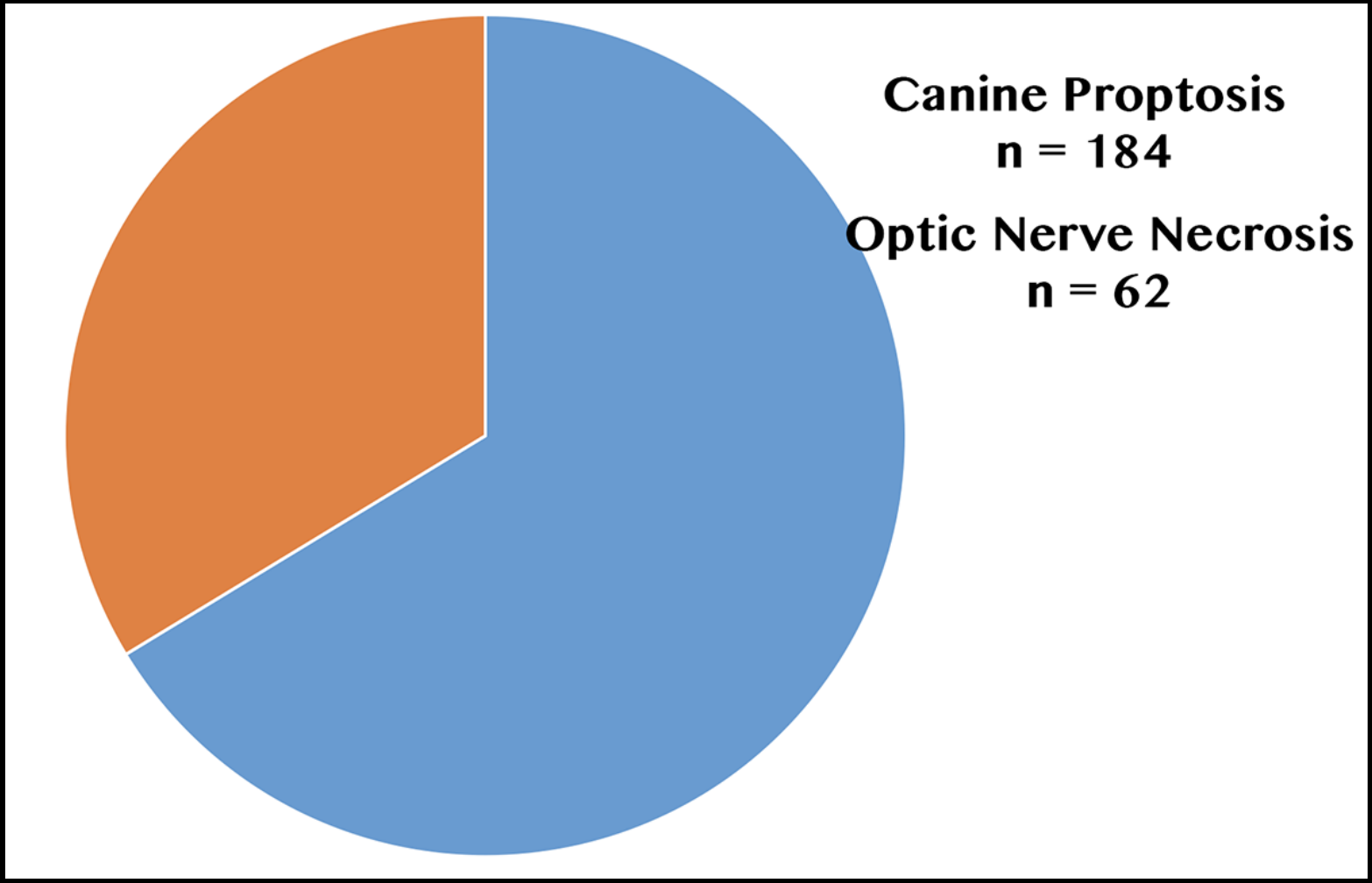


Traumatic Ocular Proptosis

Global Optic Nerve Necrosis

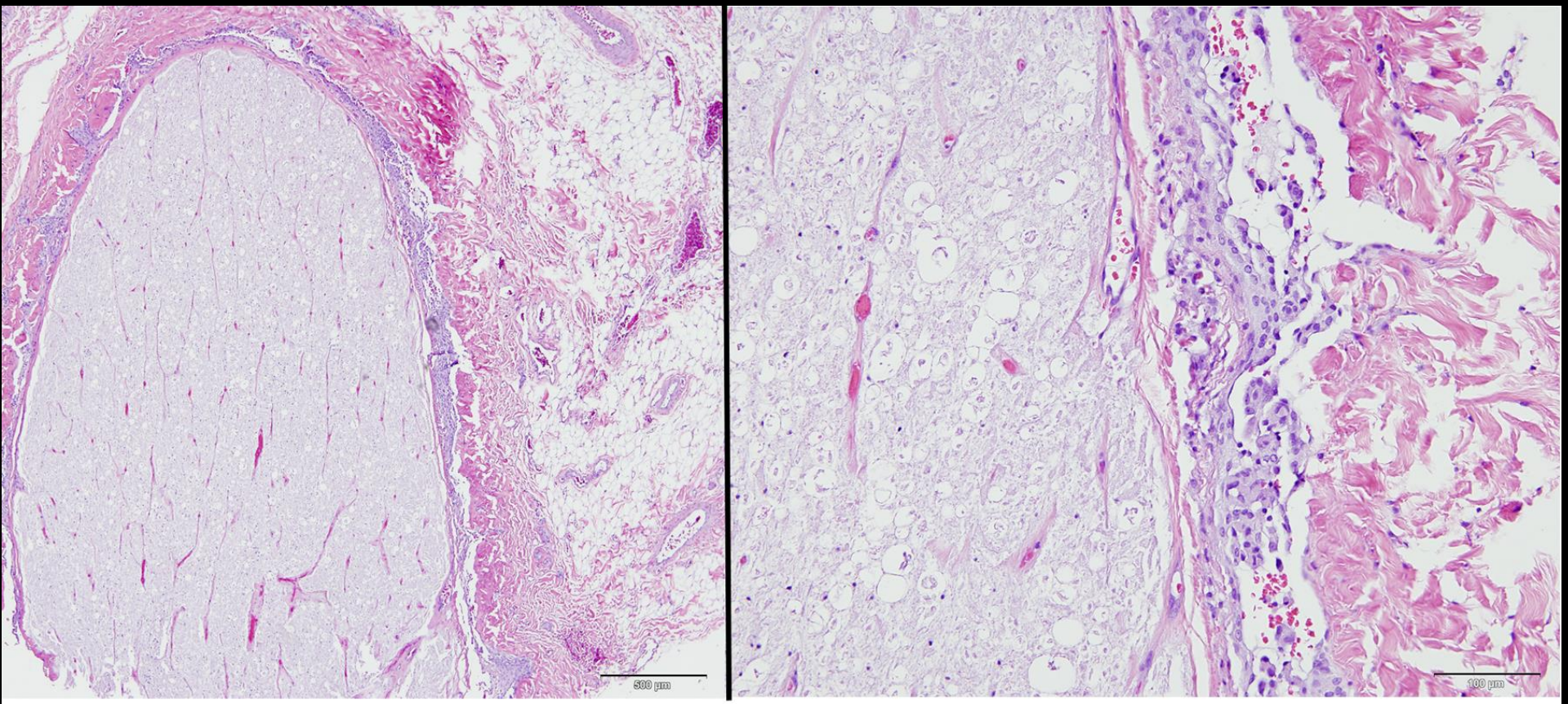
Traumatic Ocular Proptosis

Global Optic Nerve Necrosis



Traumatic Ocular Proptosis

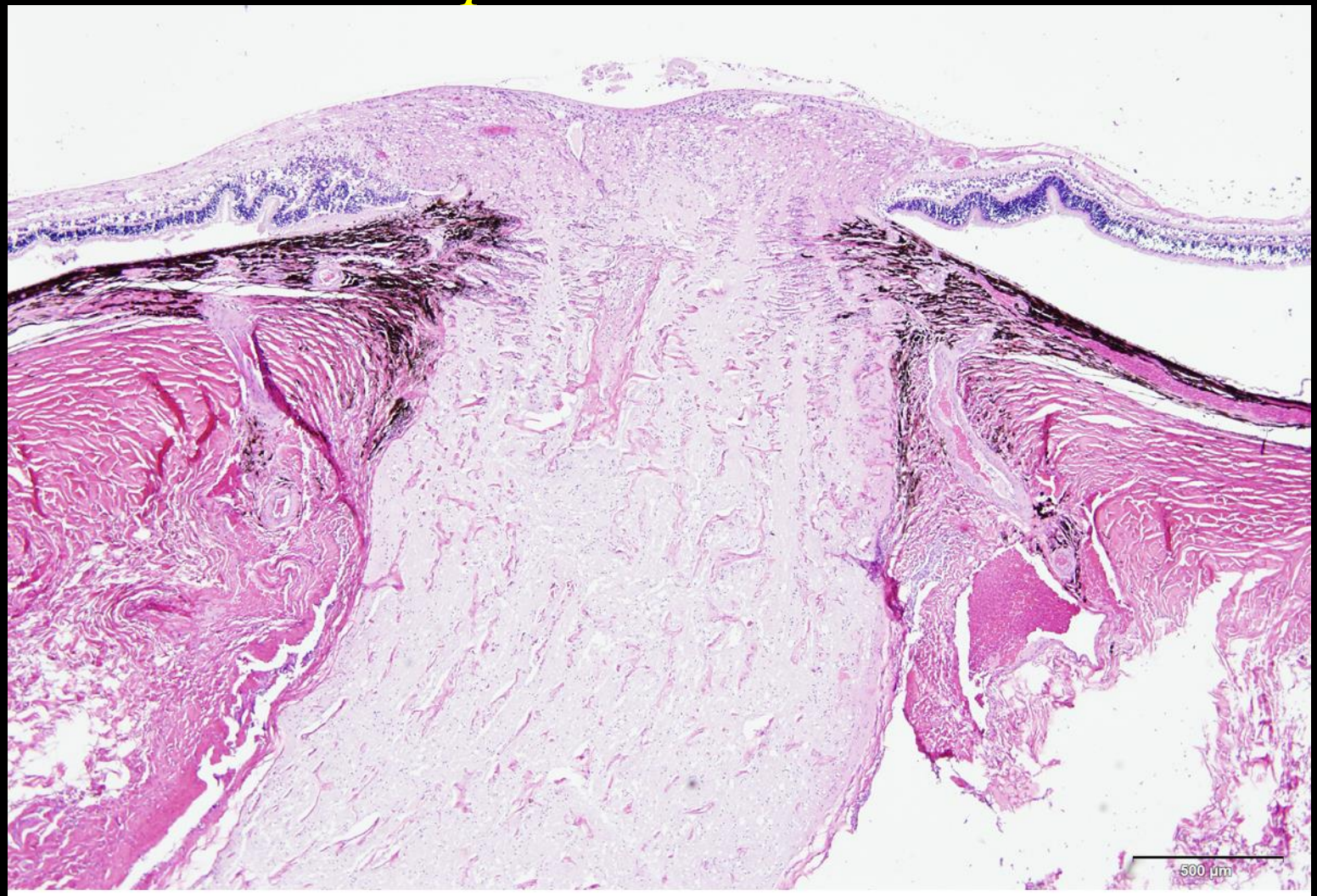
Global Optic Nerve Necrosis



Proptosis 3-days

Traumatic Ocular Proptosis

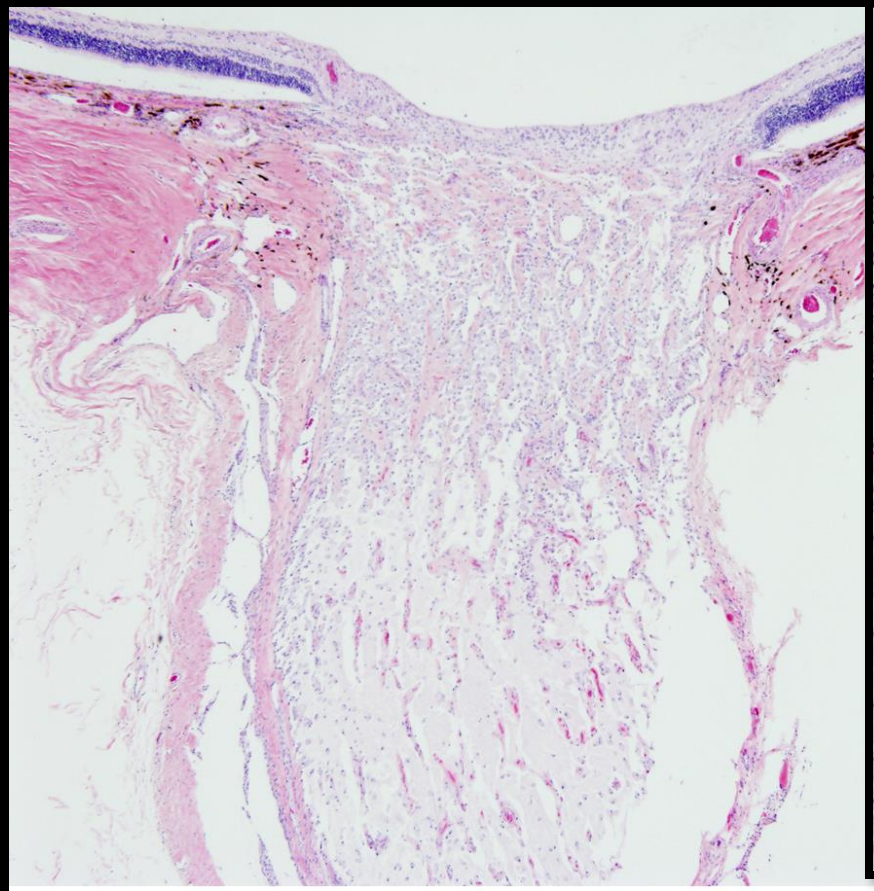
Global Optic Nerve Necrosis

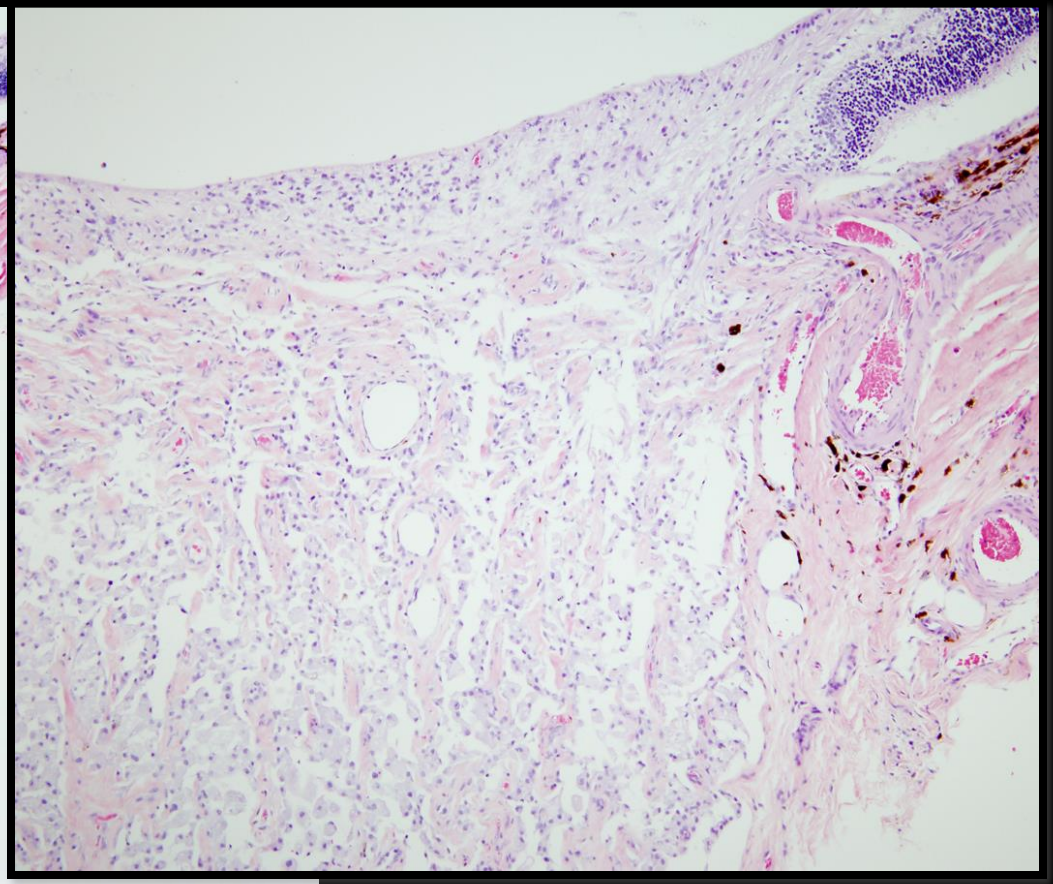


Proptosis 5-days

Traumatic Ocular Proptosis

Global Optic Nerve Necrosis

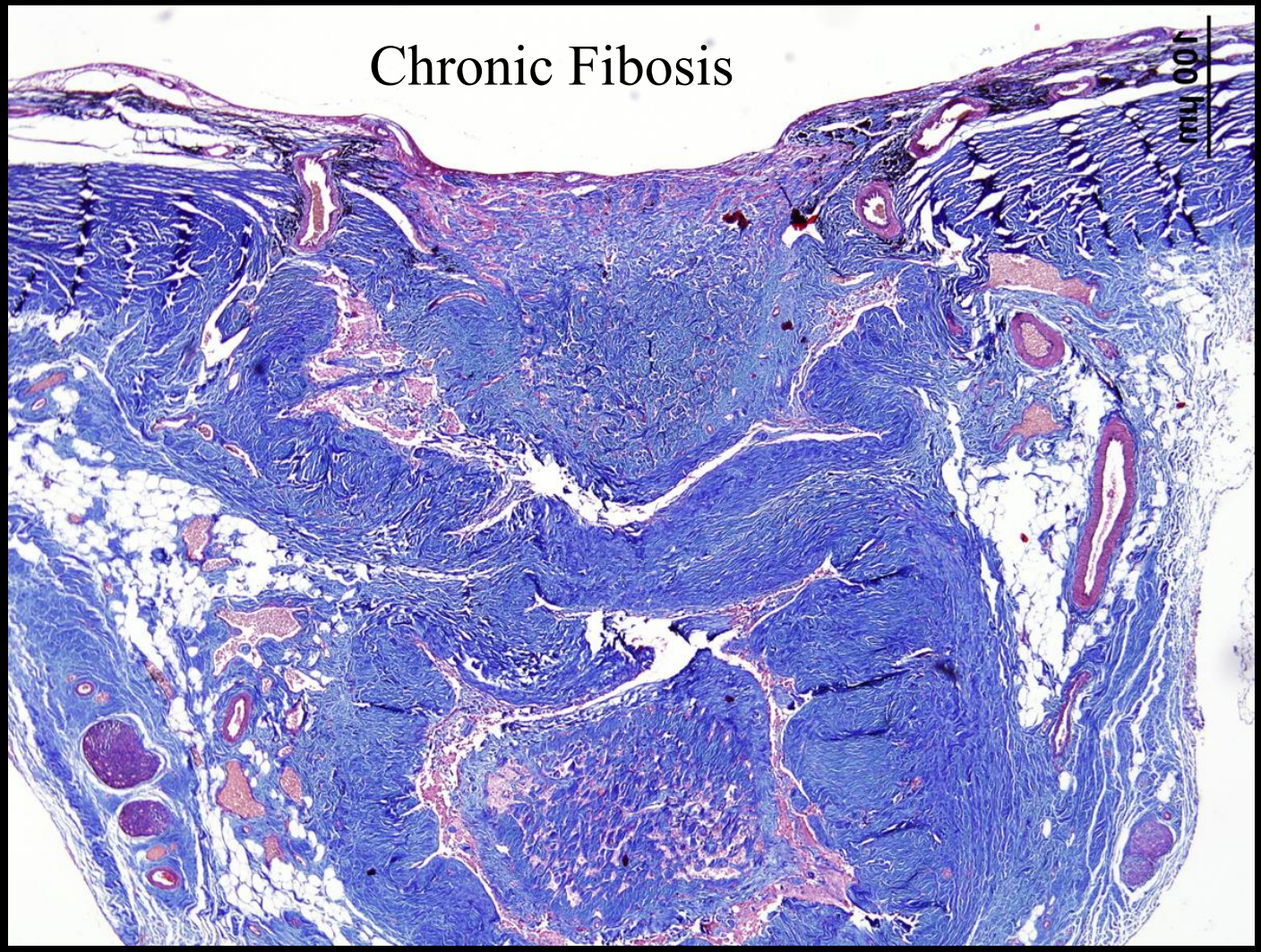




Proptosis 12-day

Traumatic Ocular Proptosis

Global Optic Nerve Necrosis

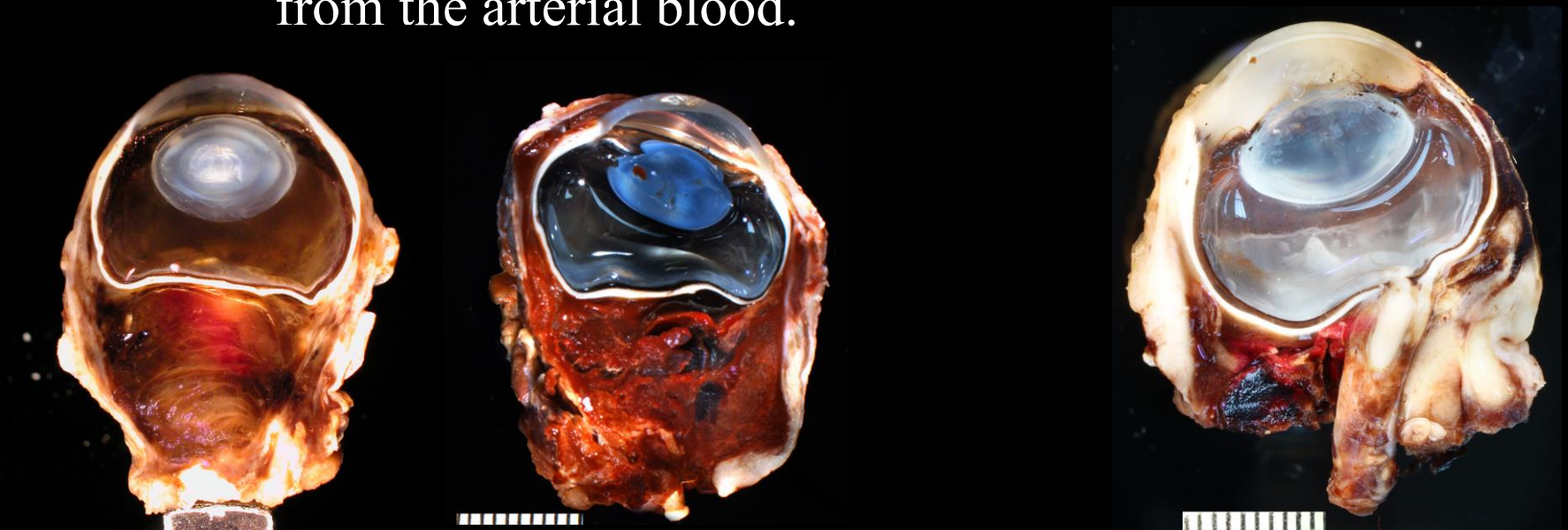


Traumatic Ocular Proptosis

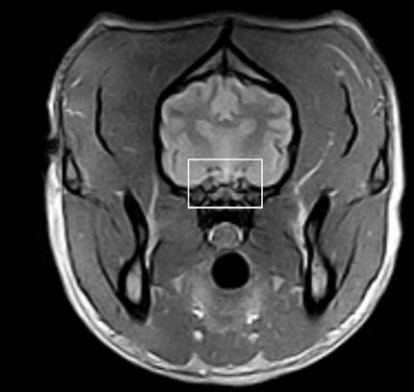
Global Optic Nerve Necrosis

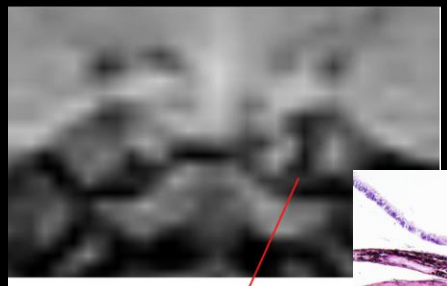
Possible Mechanisms

1. Avulsion of the meninges from the nerve tissue
2. Hemorrhage in the globe, compartment syndrome
3. Traumatic disruption of the blood supply
4. Energy wave causing disruption of the neural tissues
5. Severing of the nerve separating the ocular portion from the arterial blood.

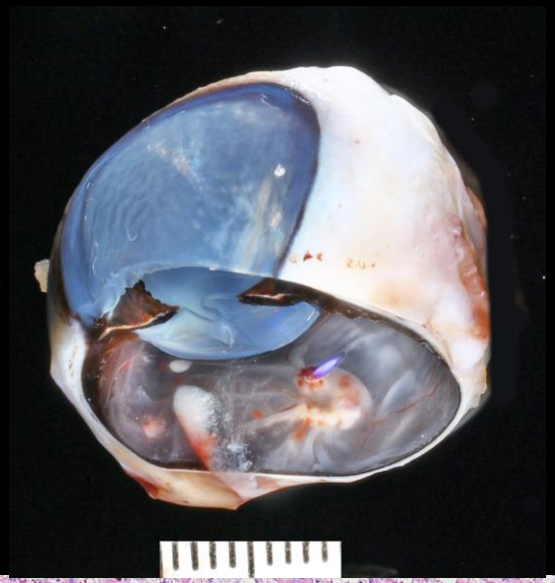


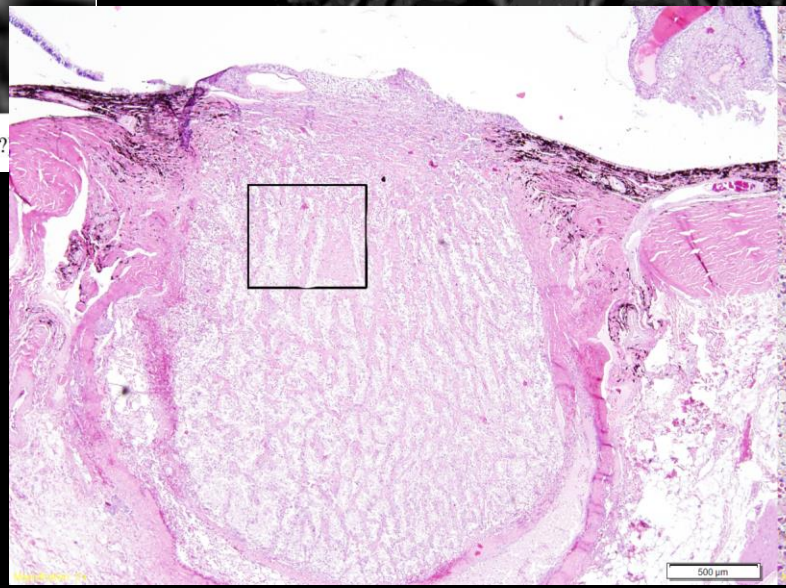
Ischemic Optic Neuropathy

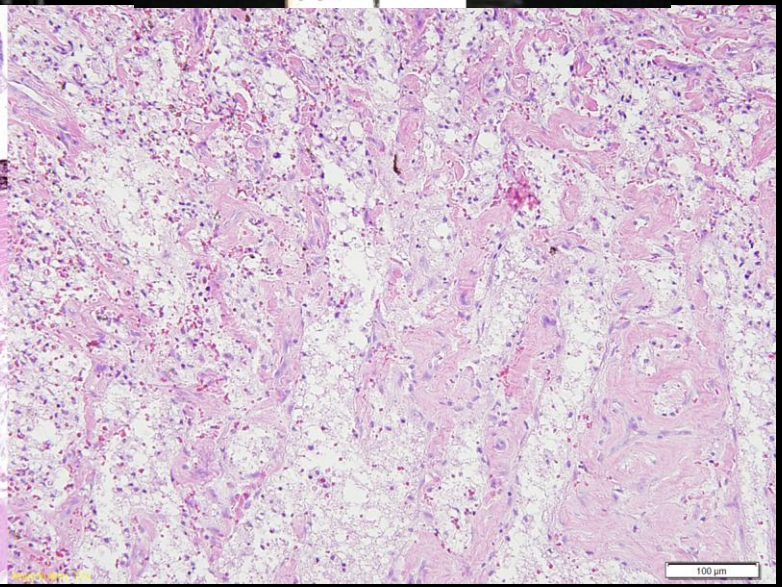




Defect adjacent to ON (Thrombus?

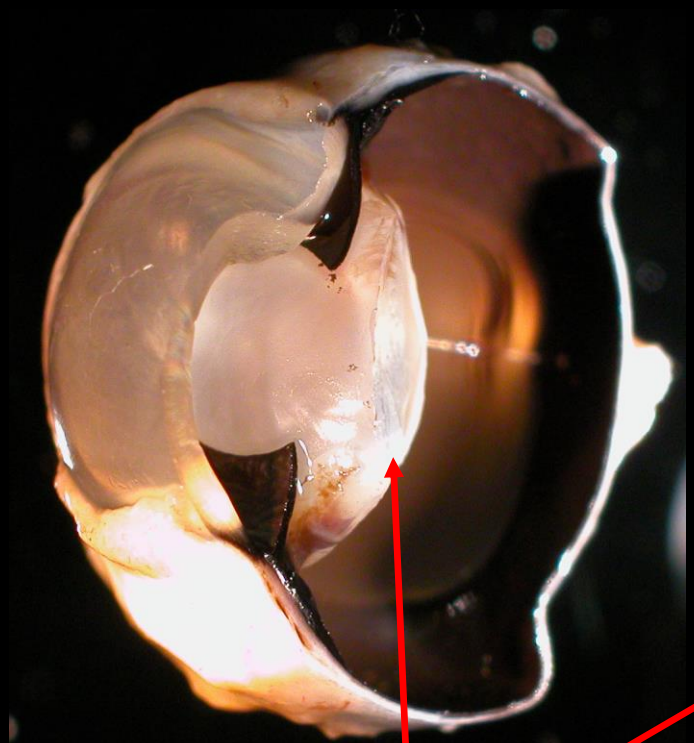


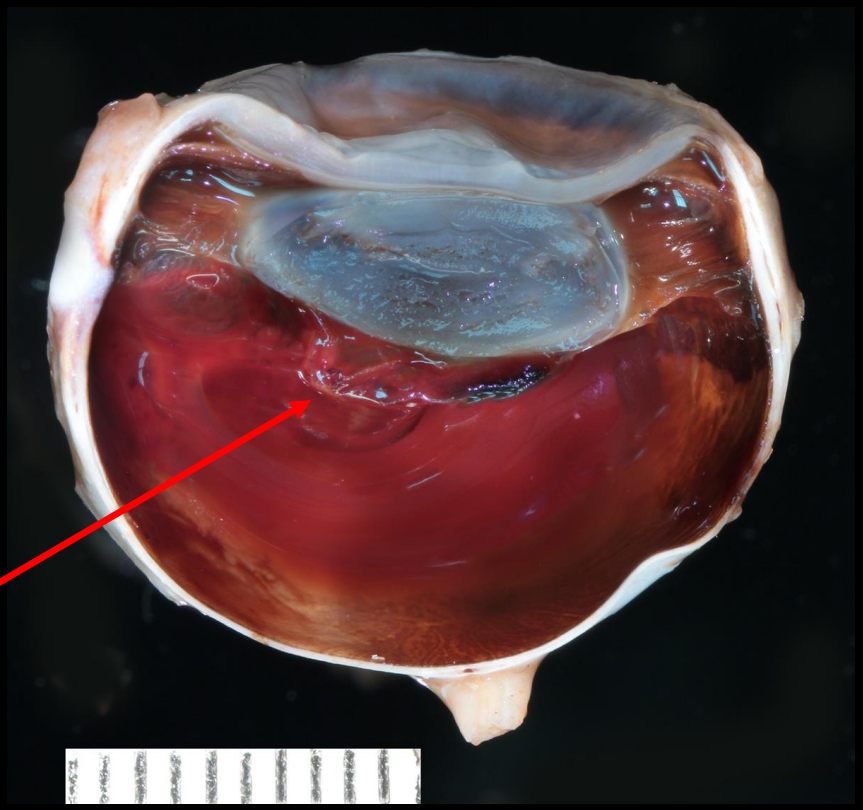




Optic Nerve Aplasia

12 cases

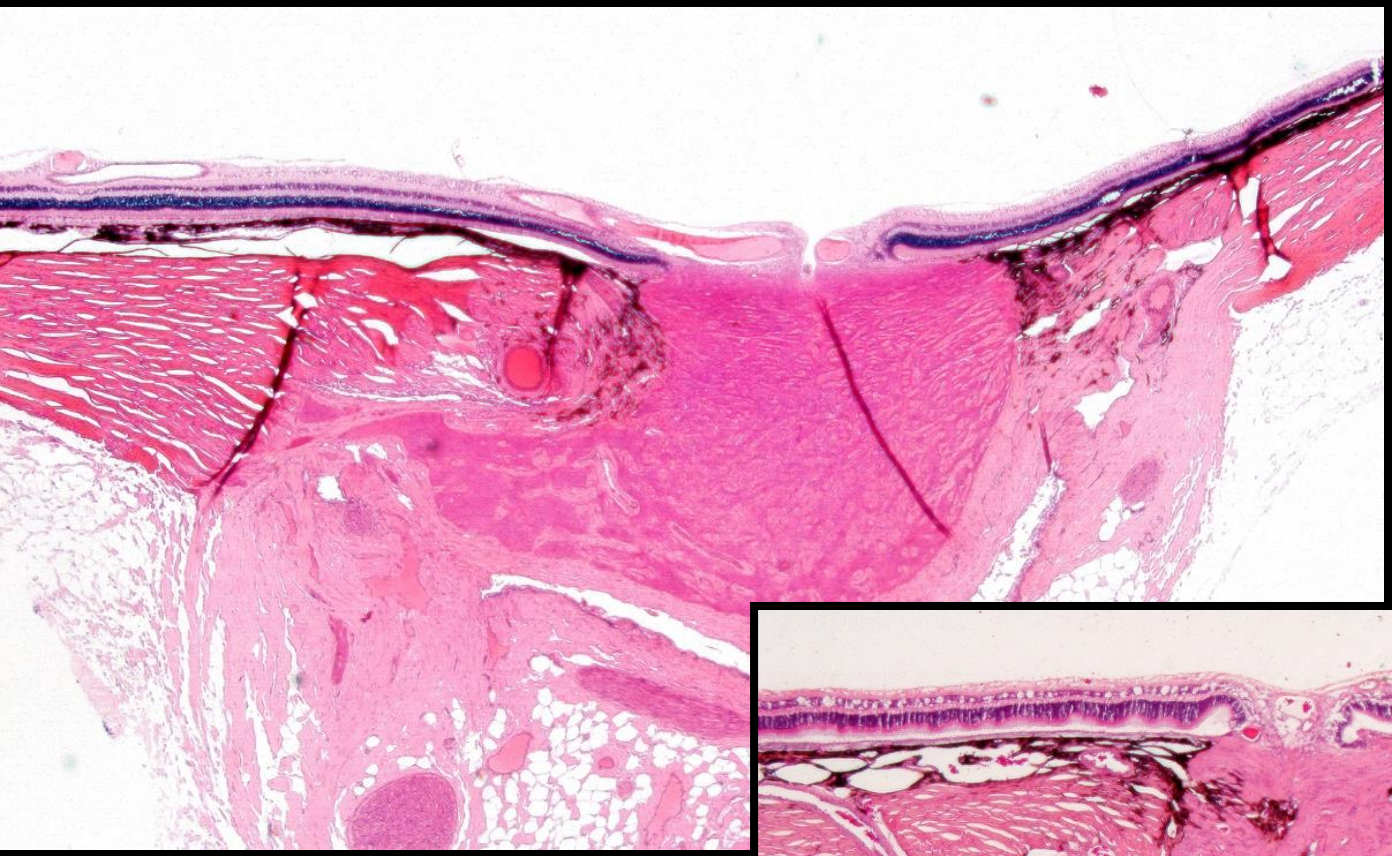


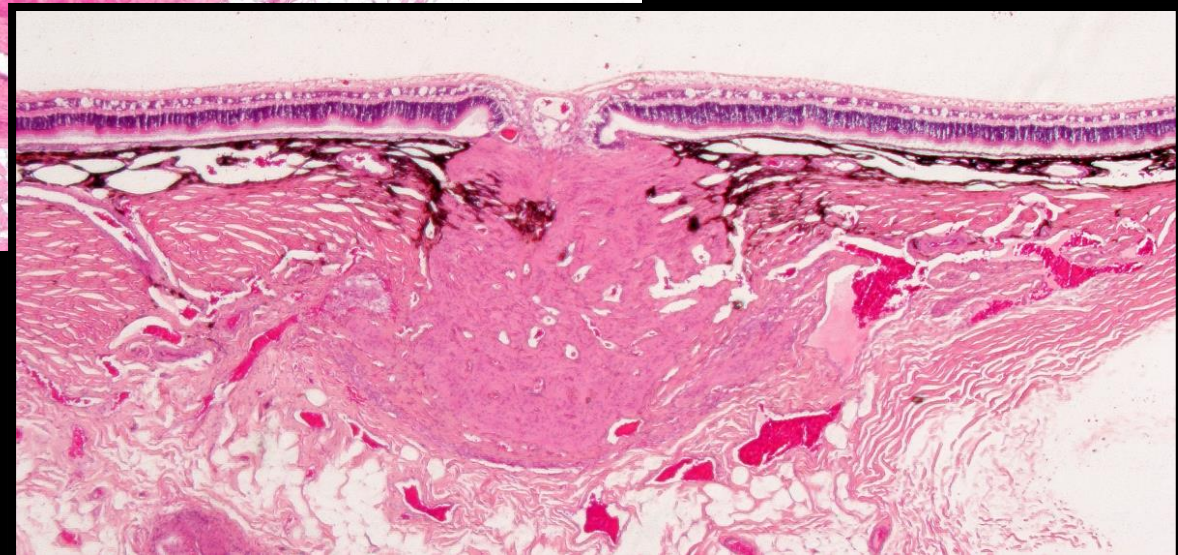


Retina

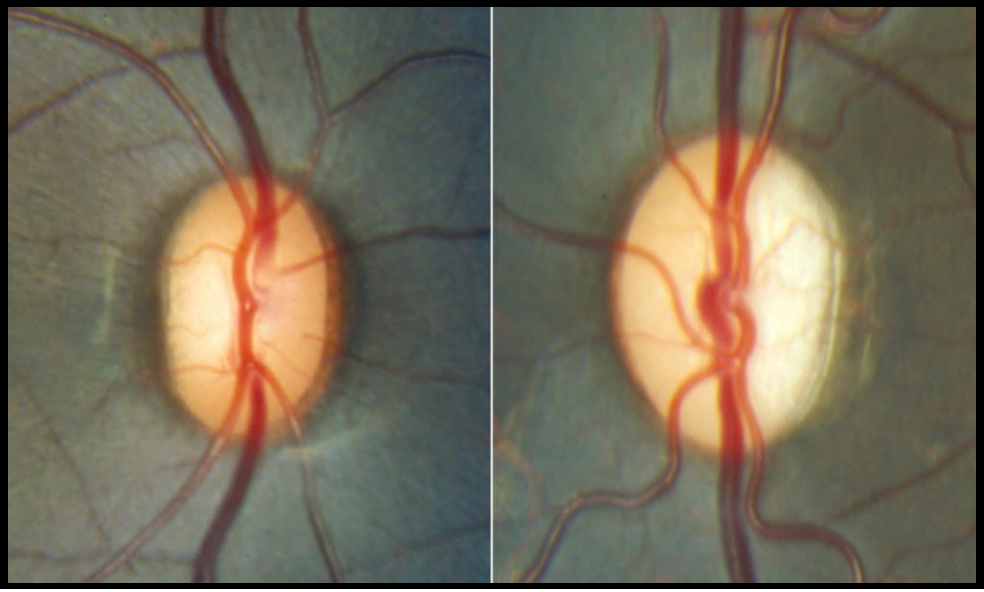
Optic Nerve hypoplasia

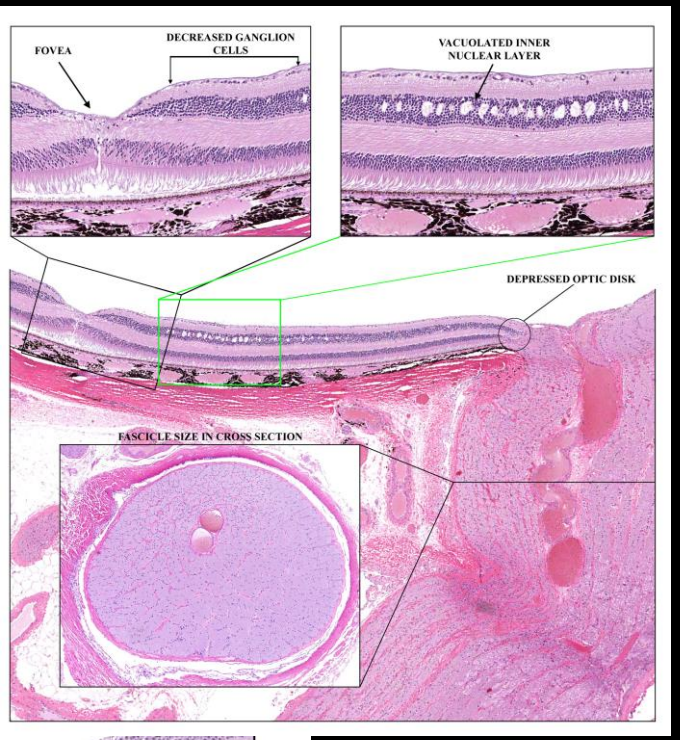
16 cases

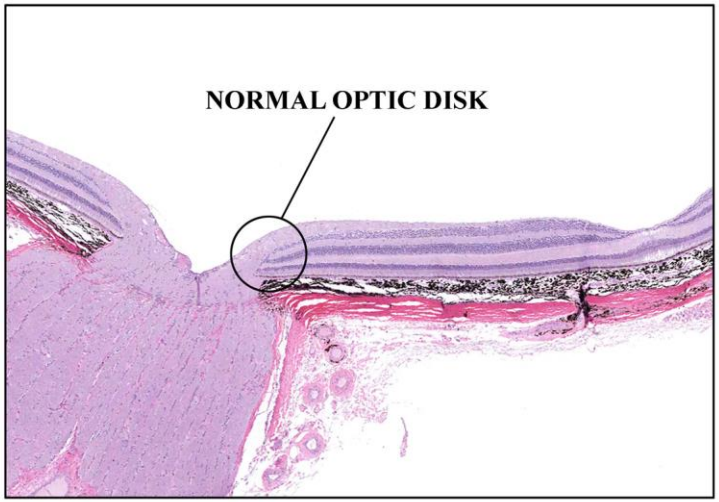


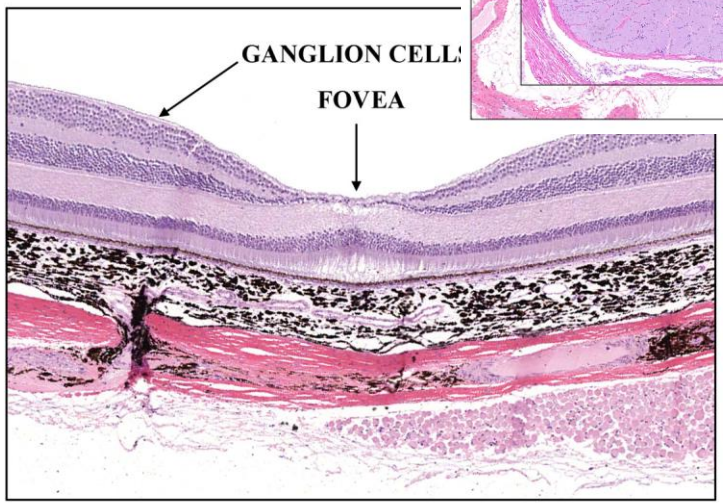


Bilateral Optic Atrophy Macaques









Canine Optic Nerve Glioma

36 cases

19 OD & 11 OS

20 Male & 14 Female

Canine Optic Nerve Glioma