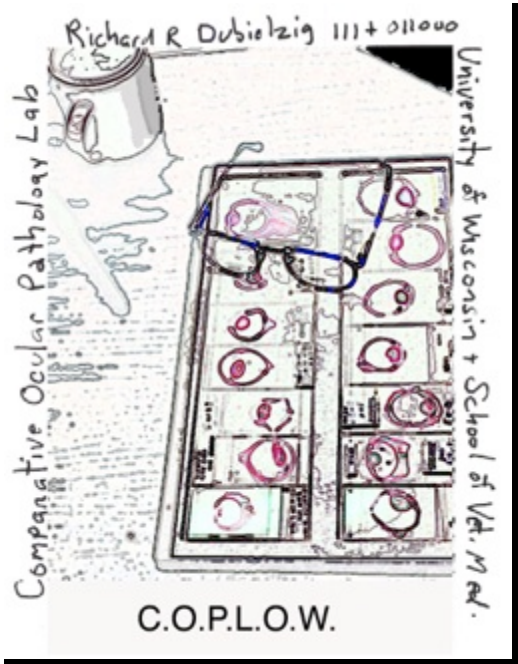
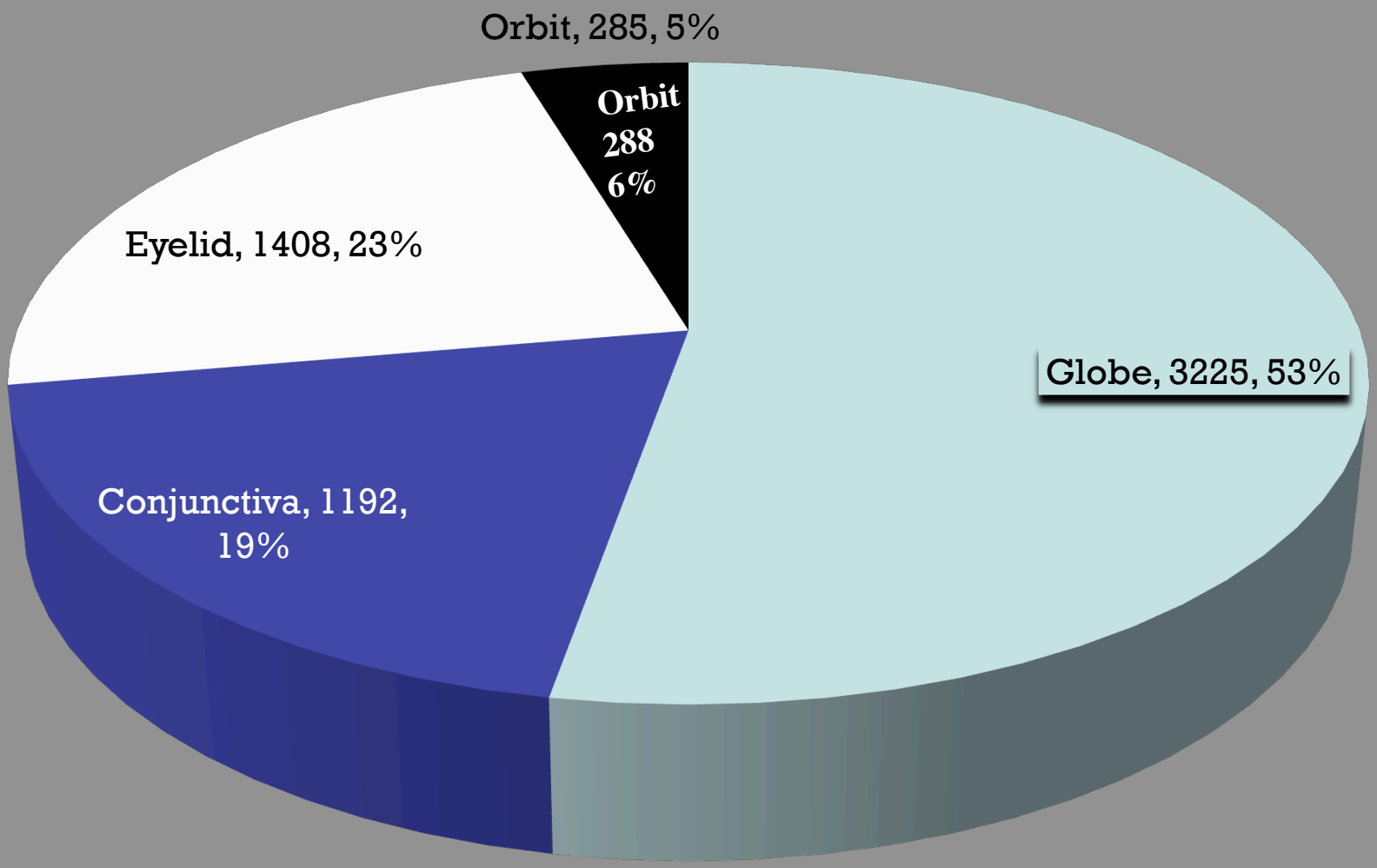


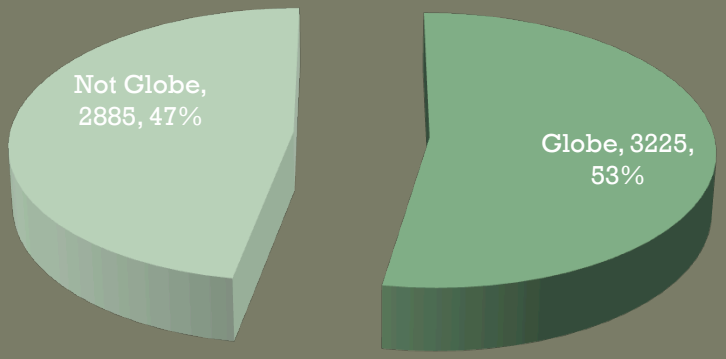
Tumors of the Canine Globe

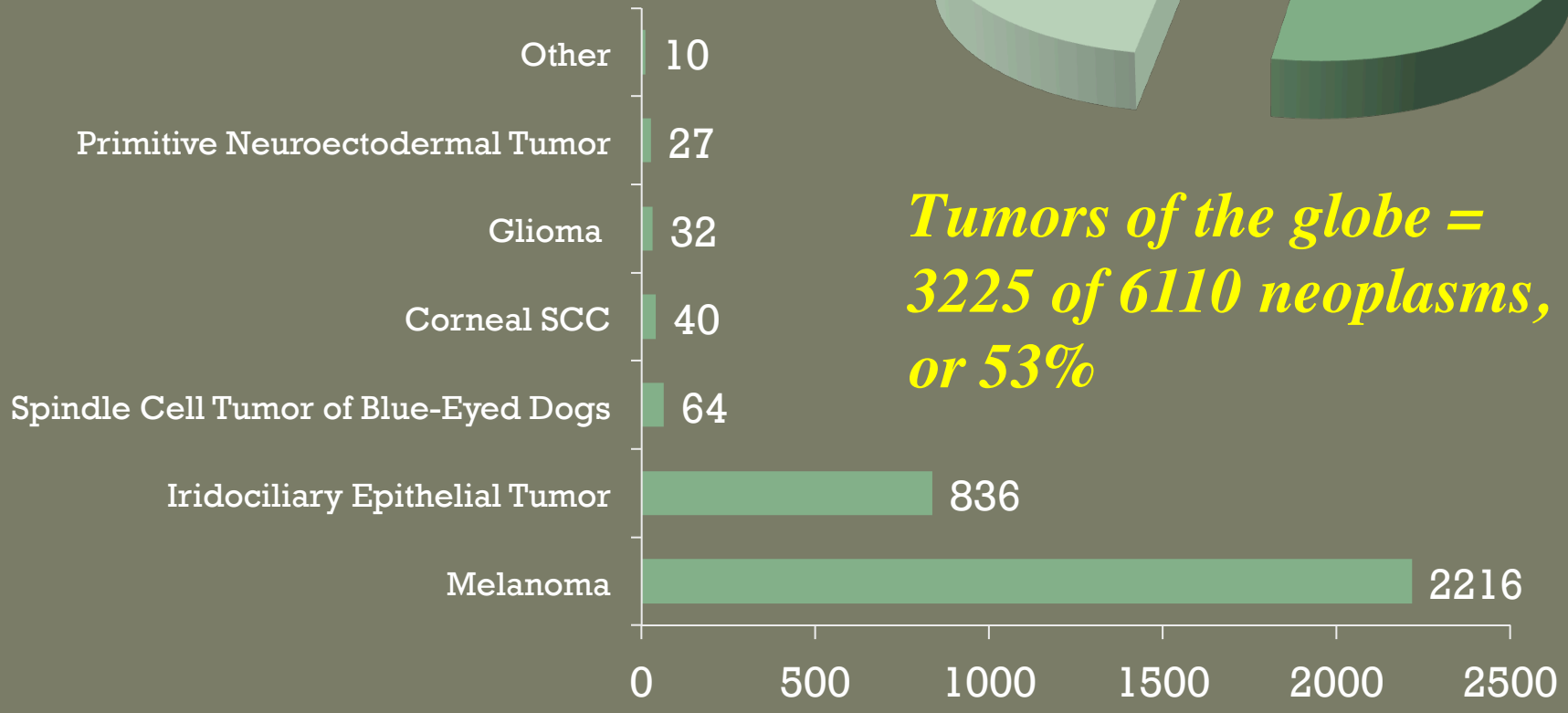
Richard R Dubielzig

Anatomic Distribution of Canine Primary Ocular Neoplasia (n = 6110)



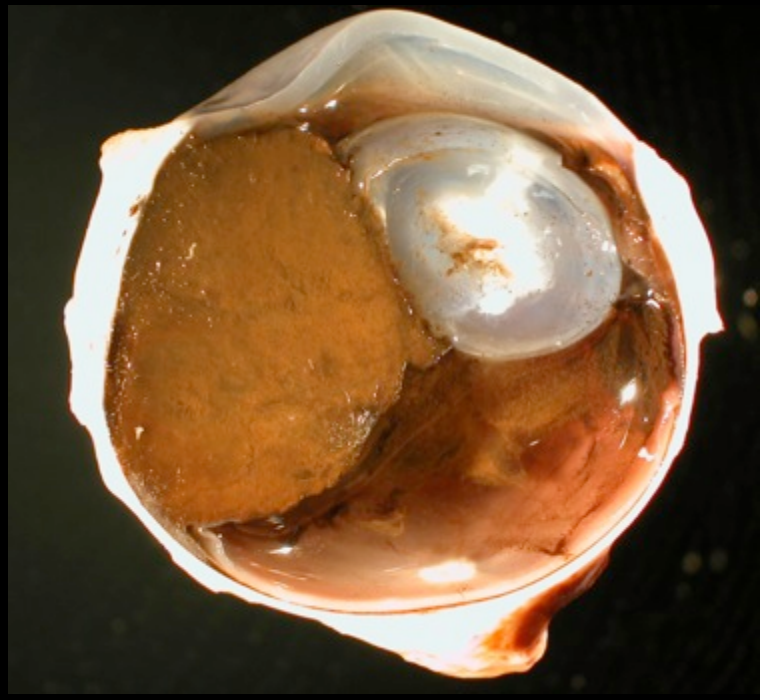
Canine Primary Tumors of the Globe (n = 3225)





Tumors of the globe = 3225 of 6110 neoplasms, or 53%

2135/5722 Canine Melanocytic Tumors *(numbers from 2012)*



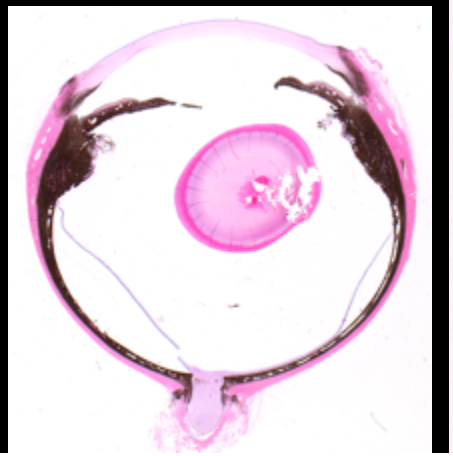
- Outside the Globe: 264
  - Conjunctival: 159
  - Eye Lid: 72
  - Skin: 33
- Affecting the Globe: 1871
  - Anterior Uveal Melanocytoma: 1245
  - Anterior Uveal Malignant Melanoma: 312
  - Limbal Melanocytoma: 213
  - Choroidal: 86 Melanocytoma and 11 malignant Melanoma
  - Metastatic Melanoma: 15

Giuliano EA, Chappel R, Fischer B, Dubielzig RR. (1999) A matched observational study of canine survival with primary intraocular melanocytic neoplasia. *Vet. Ophthal.* 2: 185-190.

Anterior Uveal Melanocytoma
1245 Cases

Many cases arise within ocular melanosis or heavily pigmented globes

Melanocytoma is distinguished from melanosis by the presence of a distinct mass lesion or by a double population of spindle and round cells

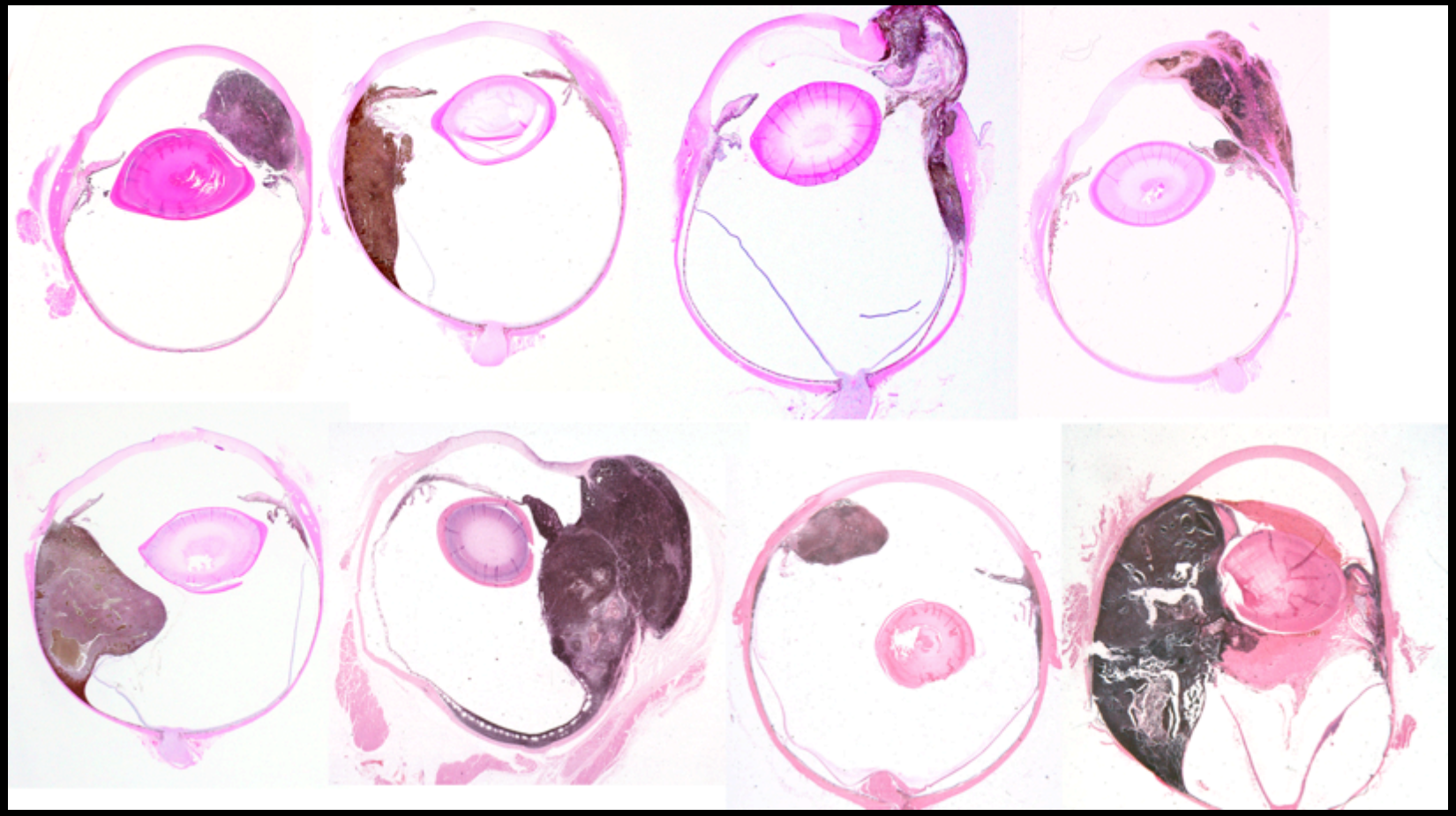


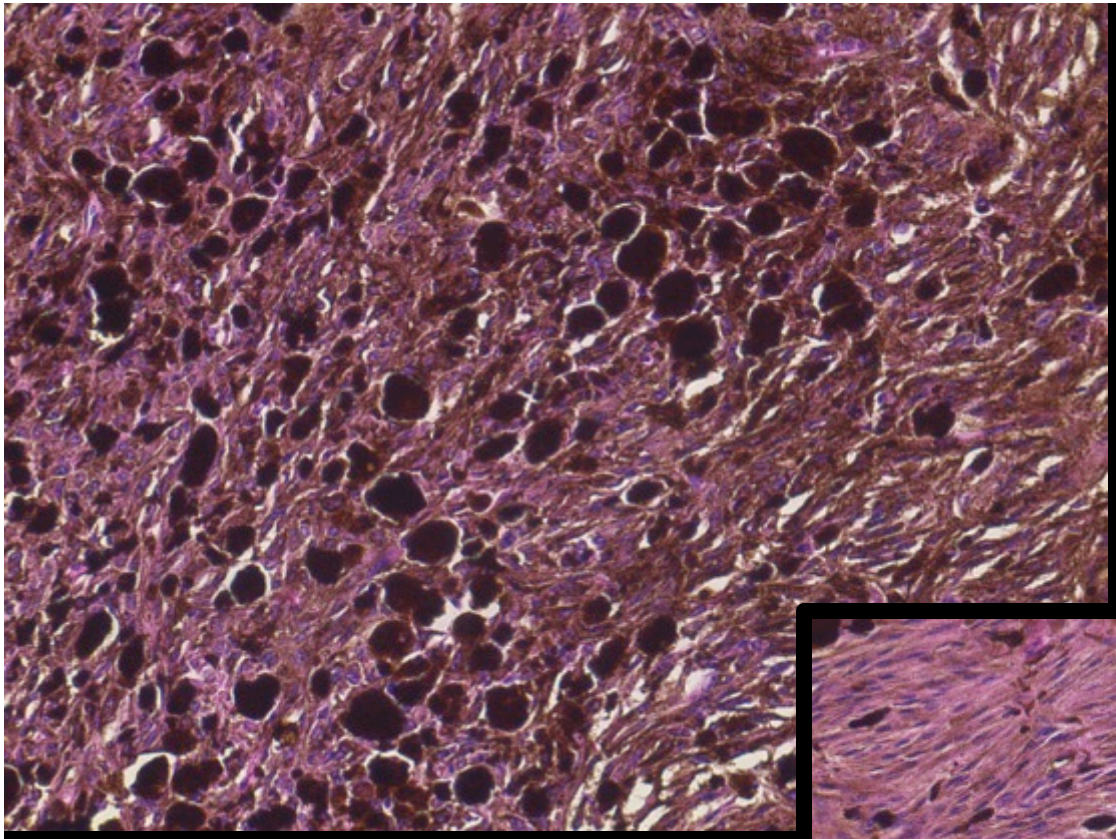
Melanosis

Melanocytoma

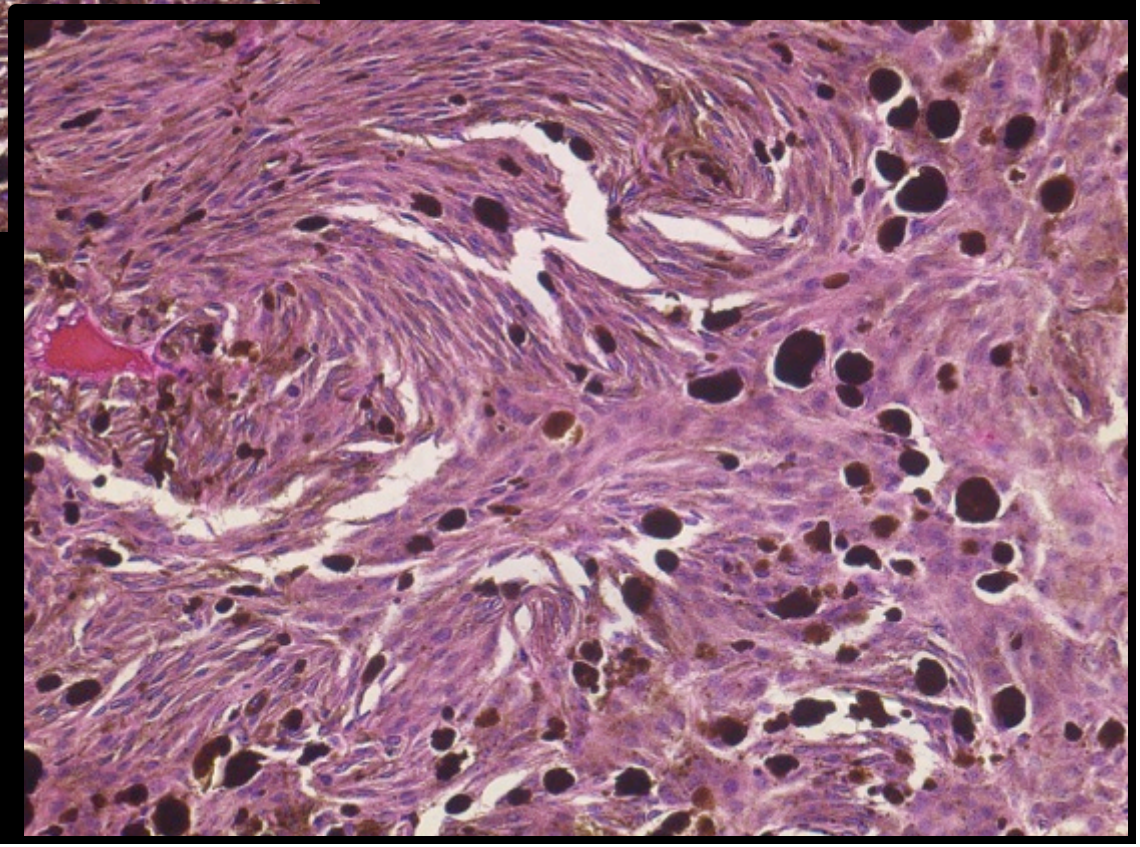
Melanocytoma

Melanocytoma



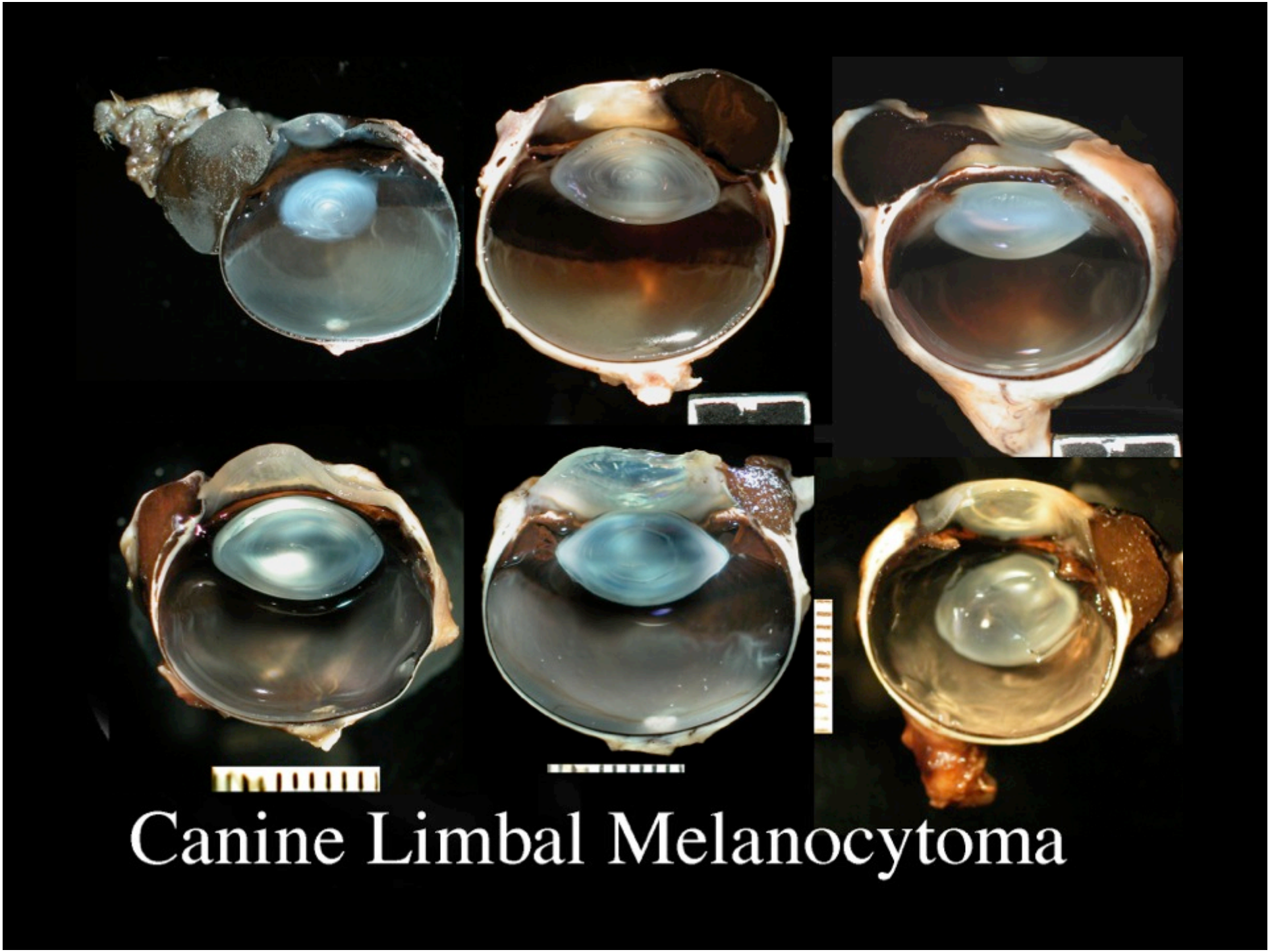


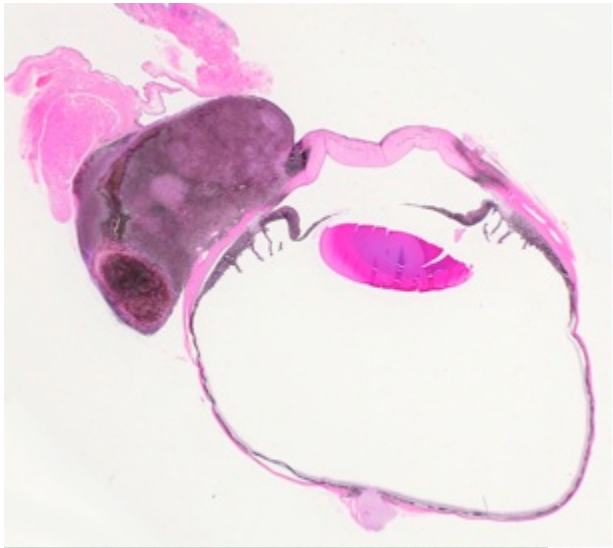
Heavily pigmented Round cells and Heavily pigmented Spindle cells

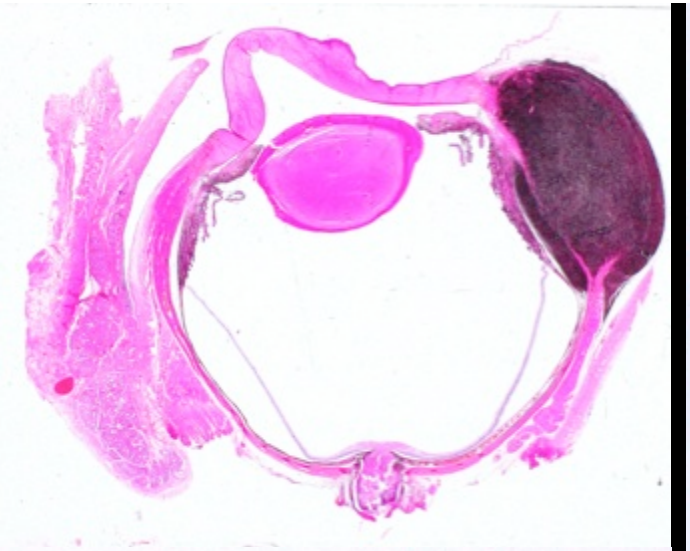


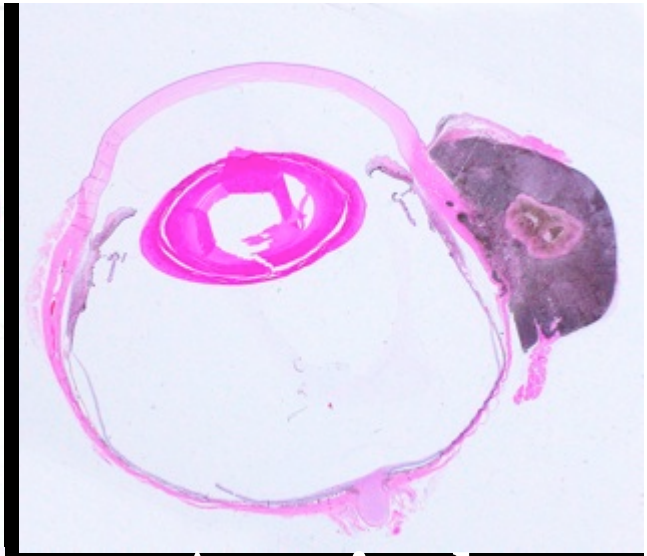
Limbal (Epibulbar) Melanocytoma 393 Cases

- 76 Labradors
- 65 Golden Retrievers
- 38 German Shepherds

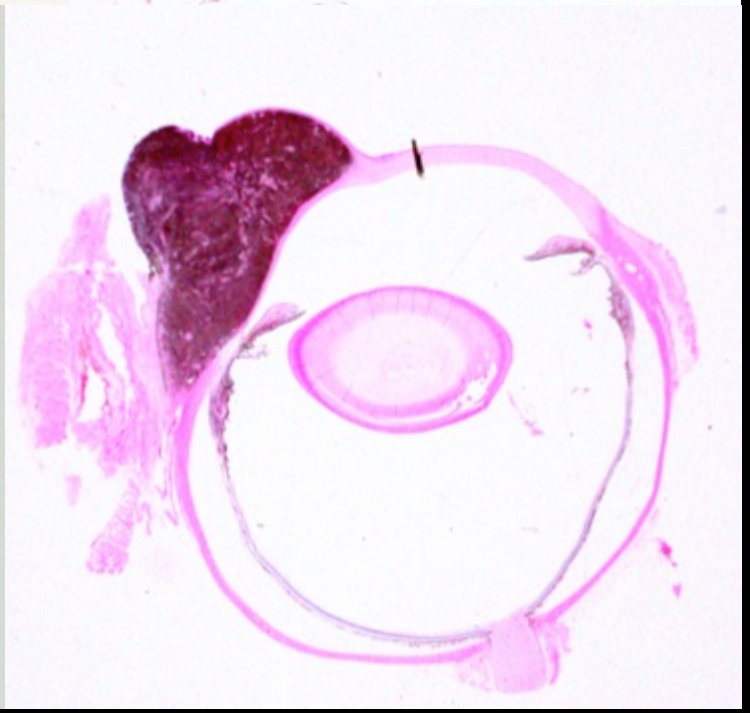

Canine Limbal Melanocytoma



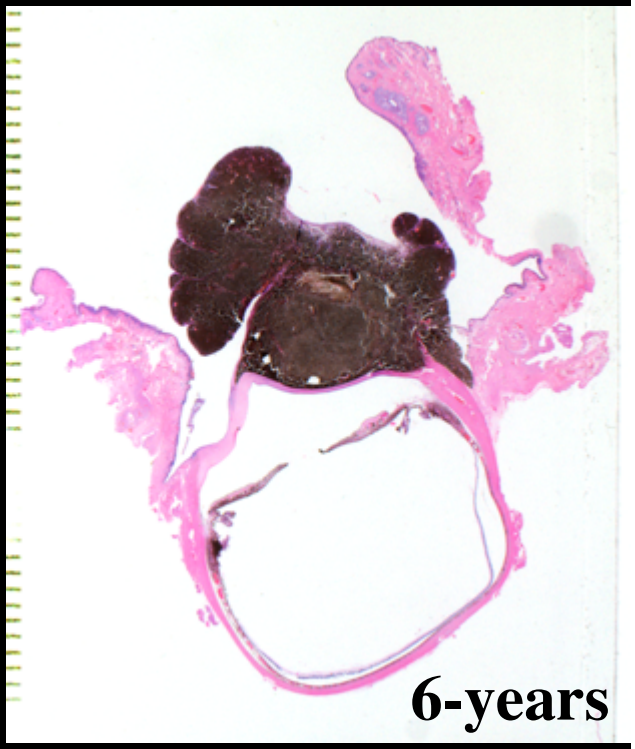




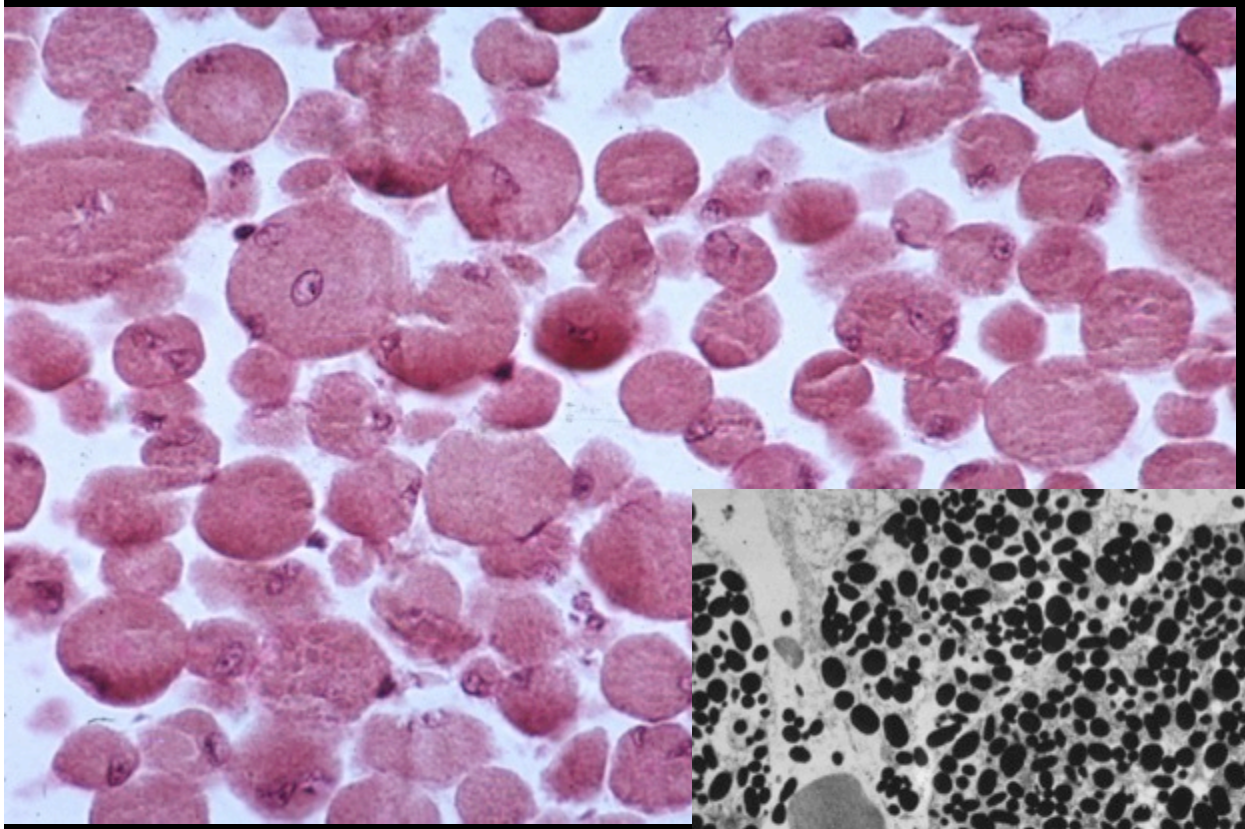
Atypical



Typical Limbal Melanocytoma

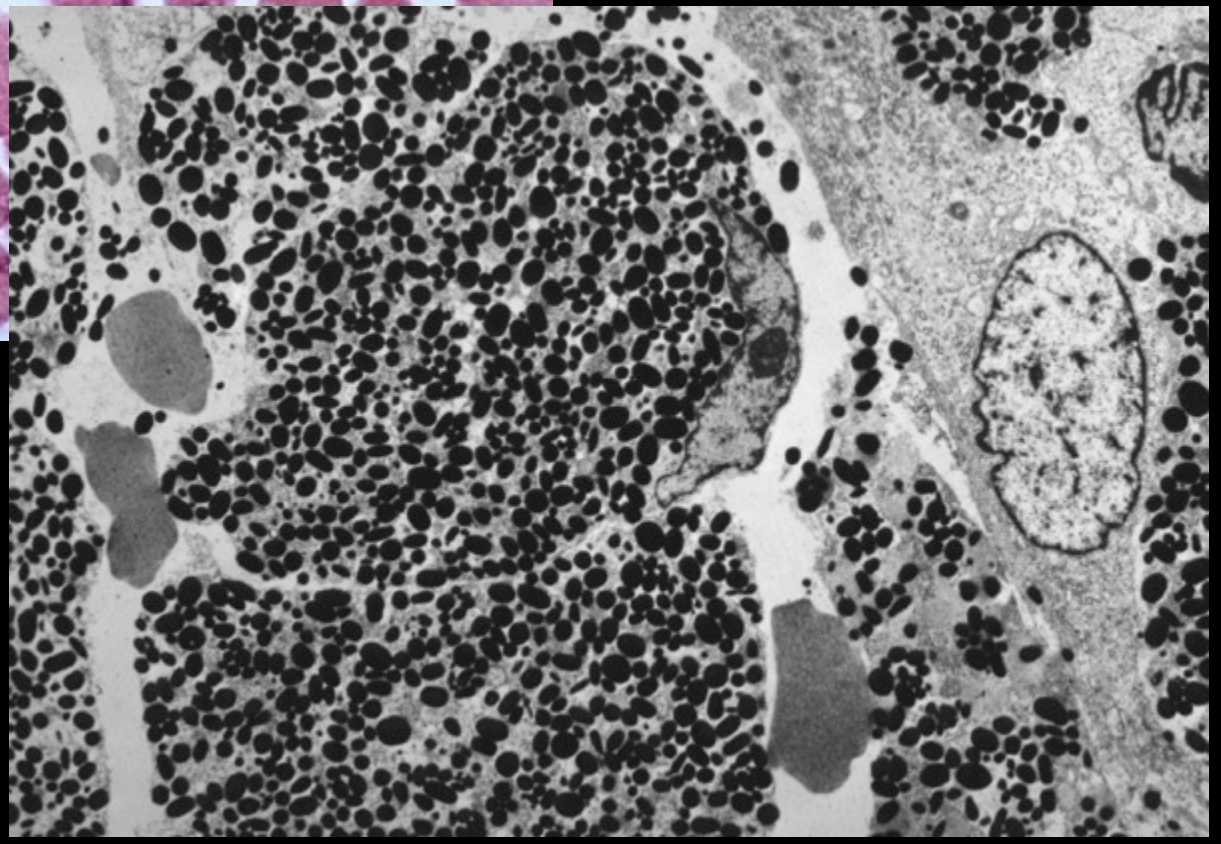


6-years



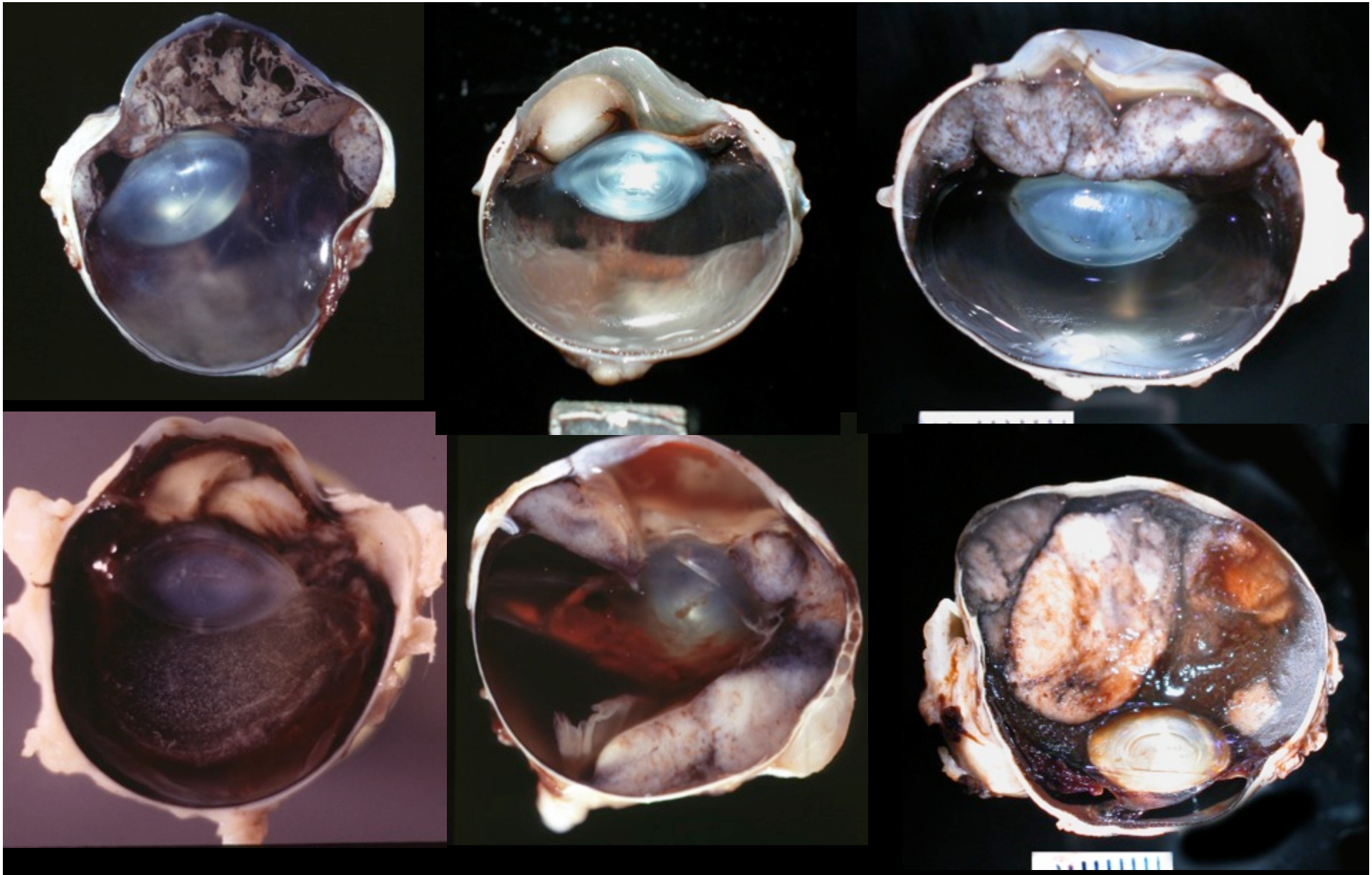
Round cells dominate

Electron Micrograph Melanocytes

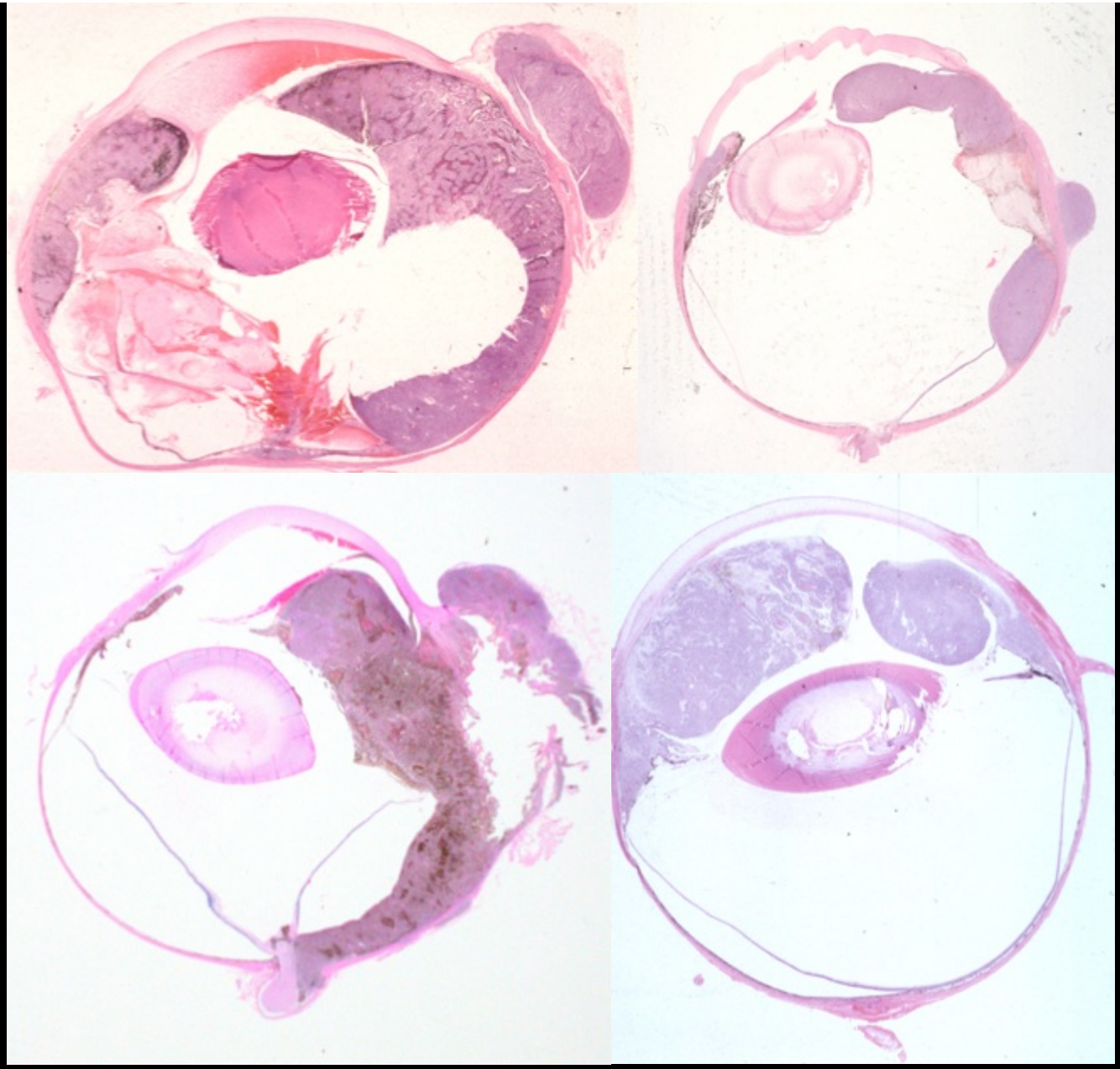


Anterior Uveal Malignant Melanoma
312 Cases

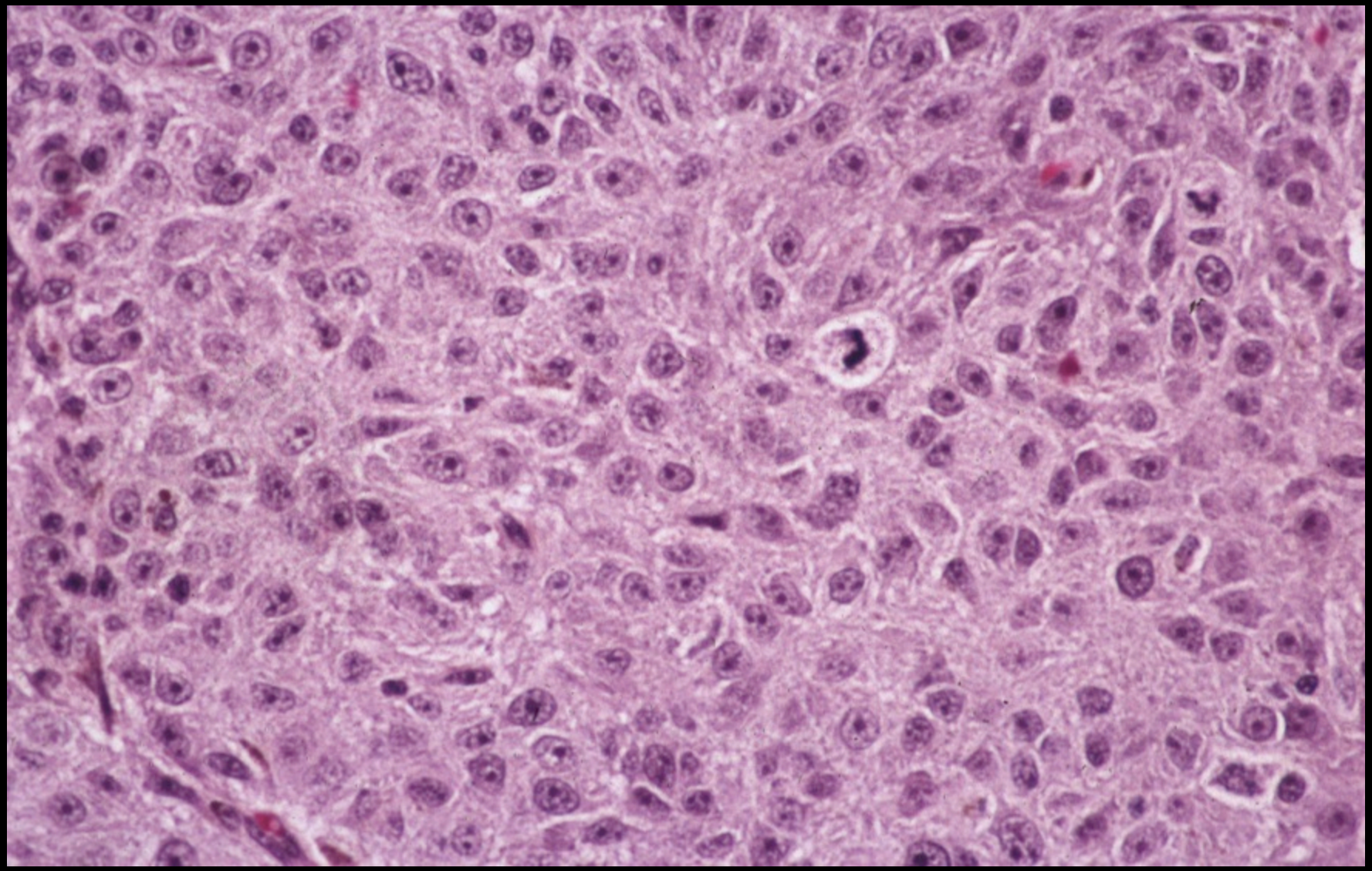
Many Cases arise from
Melanocytoma or Melanosis



Malignant Uveal Melanoma

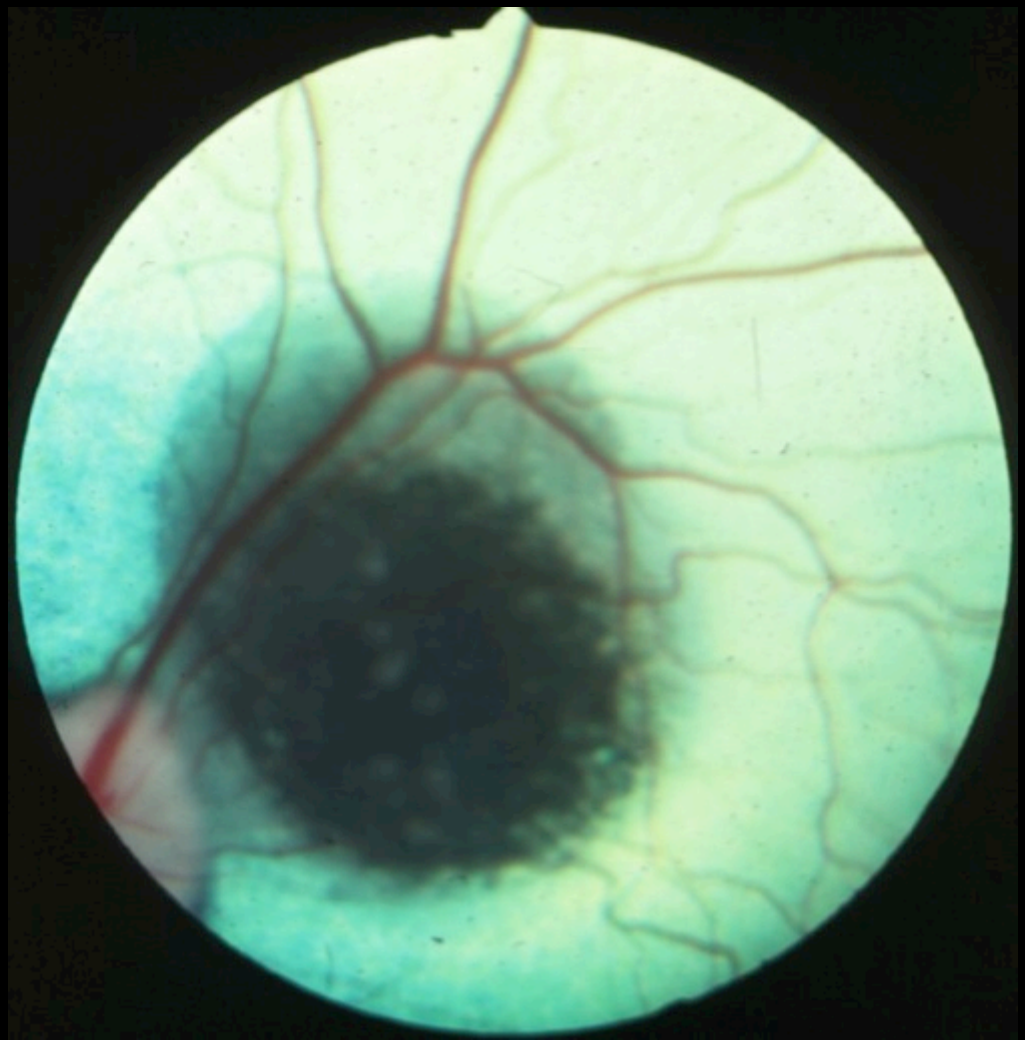


Malignant Uveal Melanoma

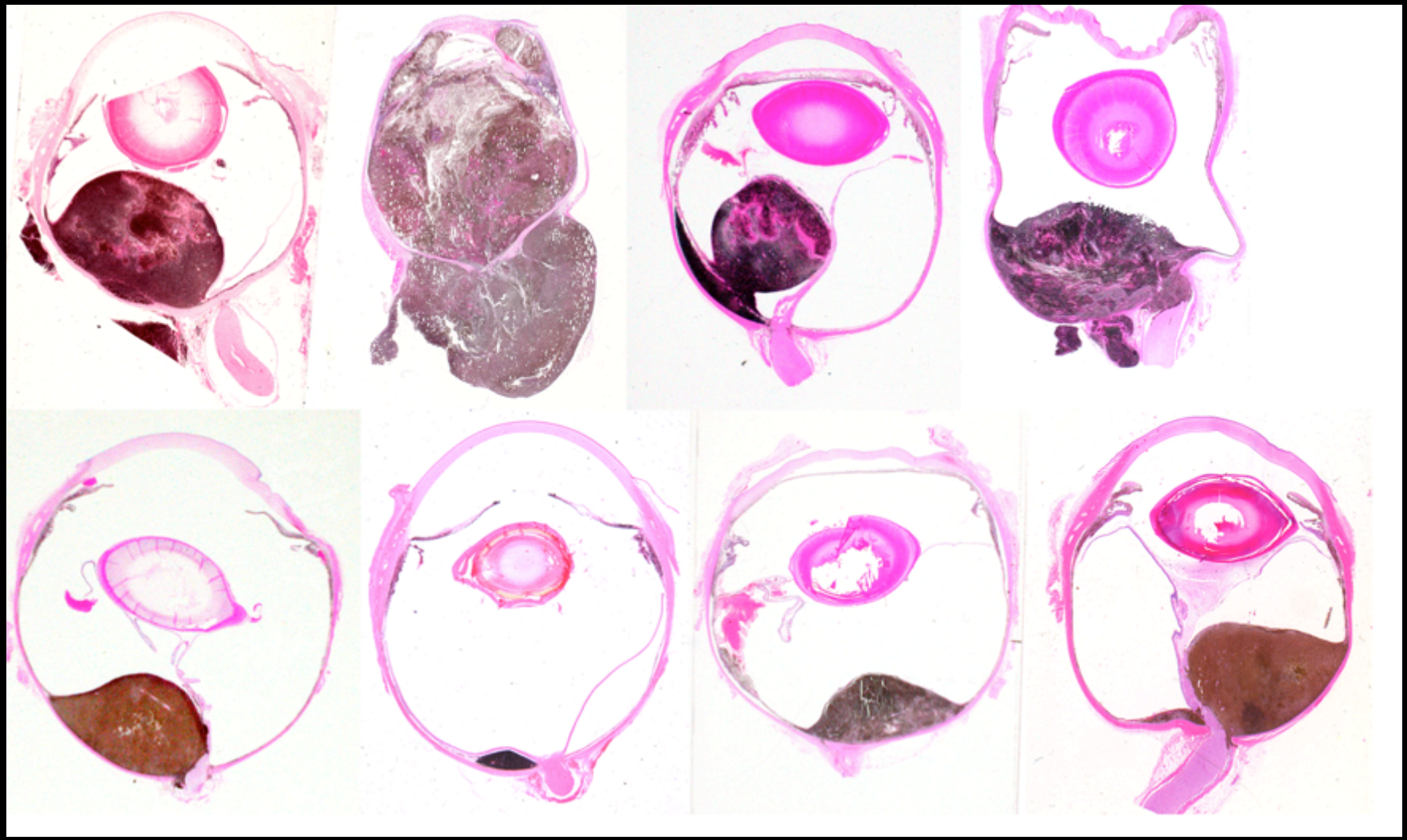


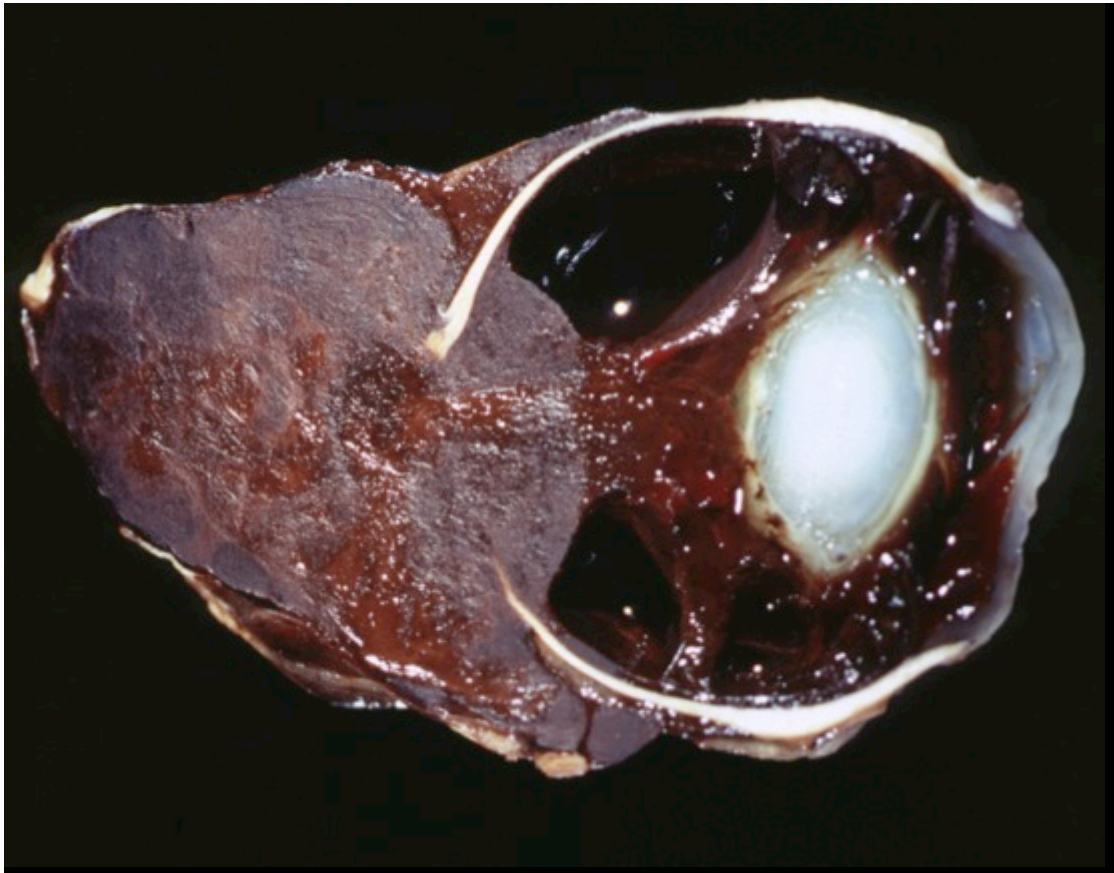
Malignant Uveal Melanoma

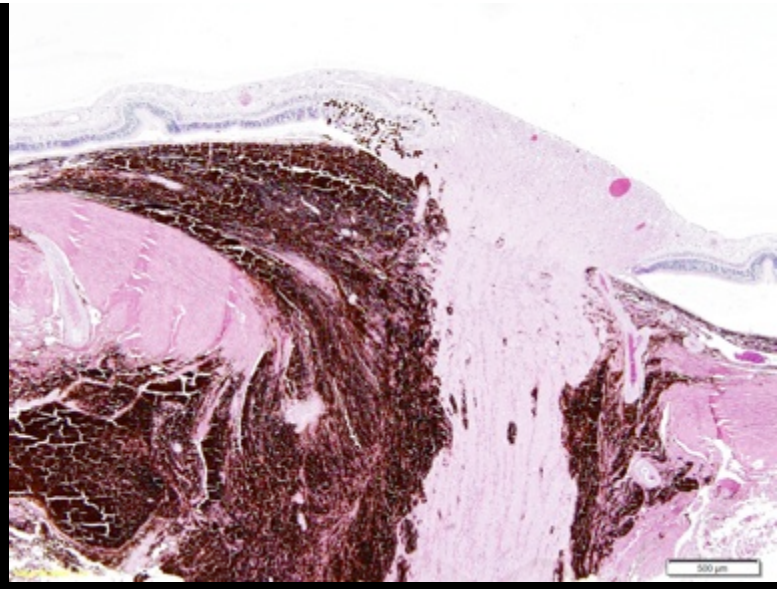
Choroidal Melanocytic Tumors
86 Benign & 11 Malignant



Choroidal Melanocytic Tumors







After 2.5 years this dog developed neruologic signs and was euthanized.

After 4 years the dog developed neurologic disease, presumed to be secondary to invasion of the optic foramen

Canine Iridociliary Epithelial Tumors

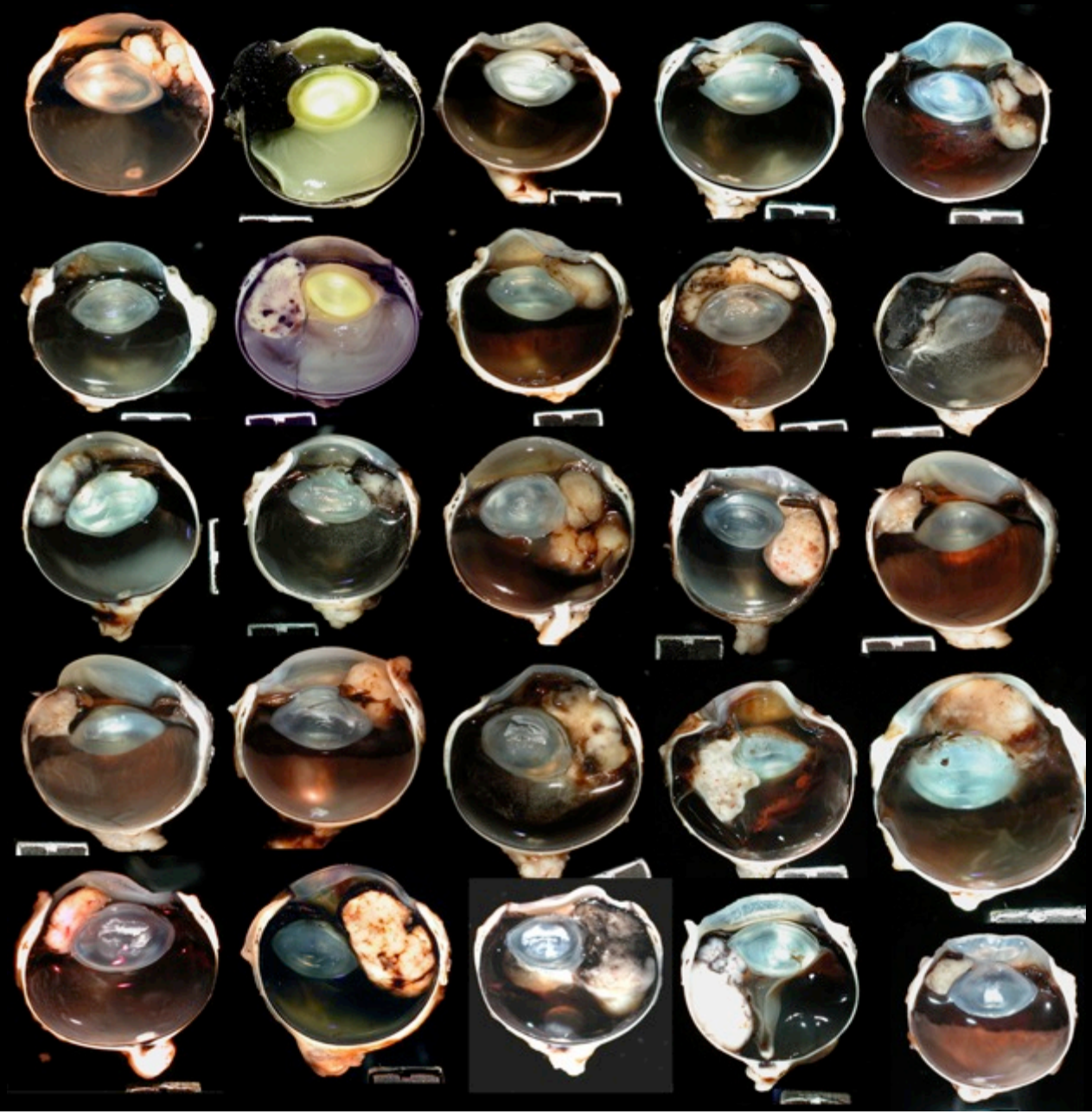
1327 Cases

160 are Adenocarcinoma

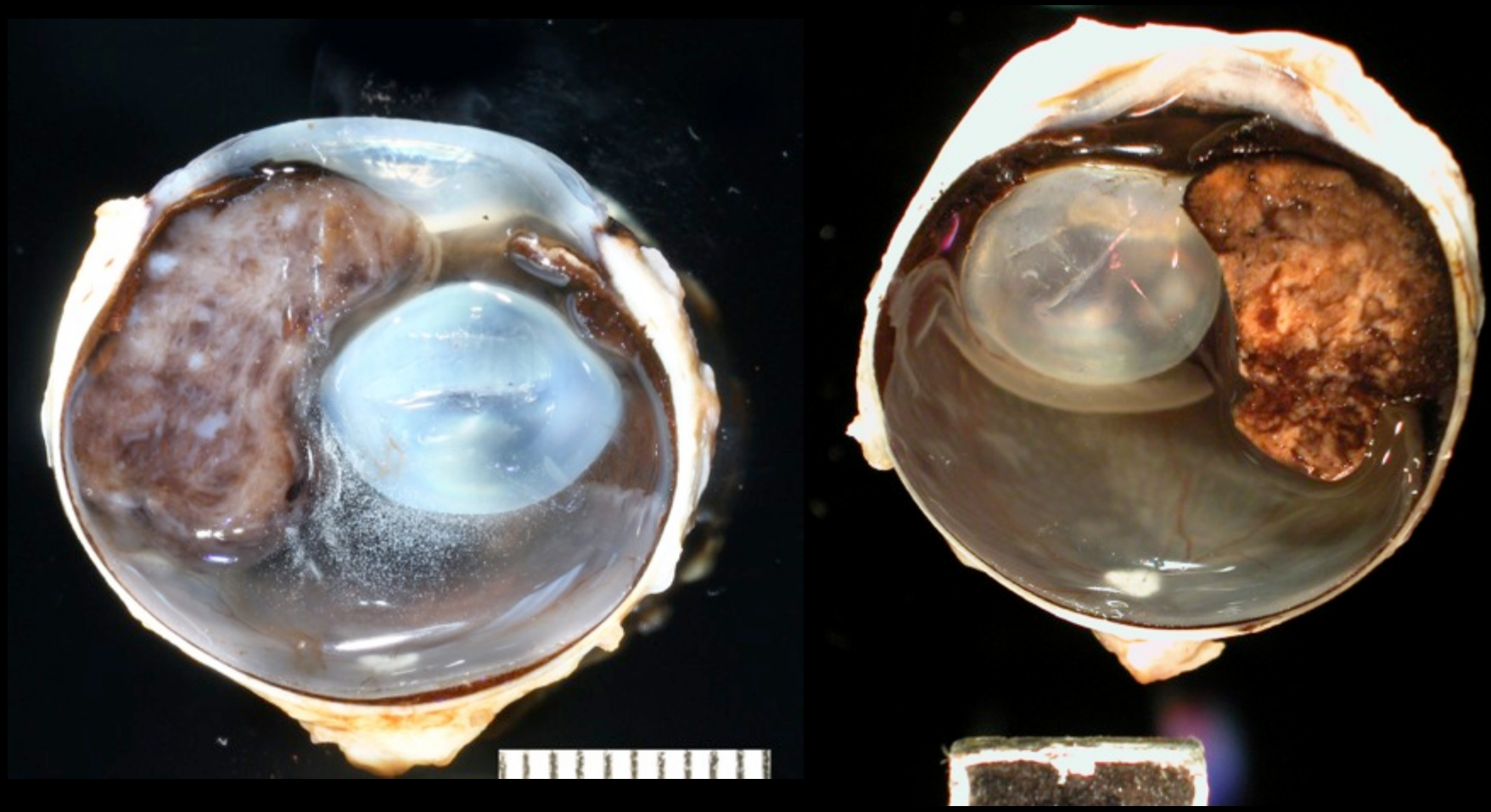
16 Cases of Malignant Adenocarcinoma with features of Pleomorphic Adenocarcinoma

Dubielzig RR, Steinberg H, Garvin H, Deehr A.J, Fischer B. (1998) Iridociliary epithelial tumors in 100 dogs and 17 cats: a morphological study. *Vet. Ophthal*. 1: 223-231.

Canine Iridociliary Epithelial Tumors

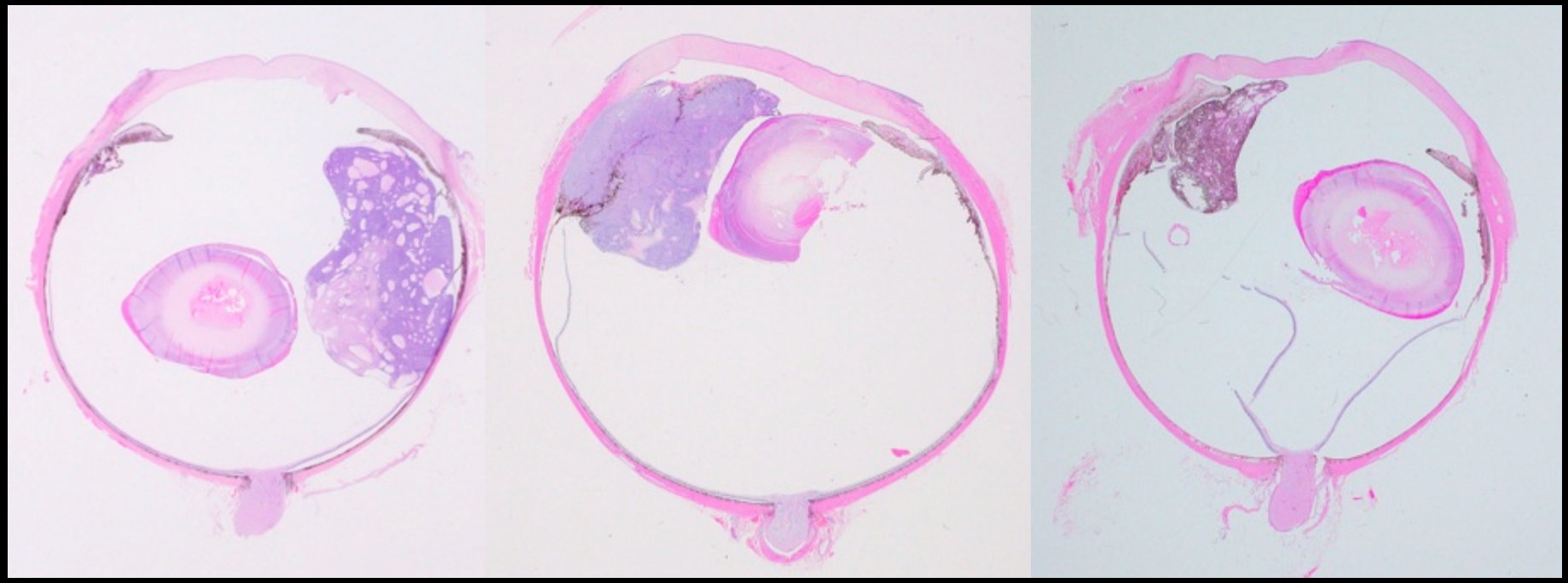


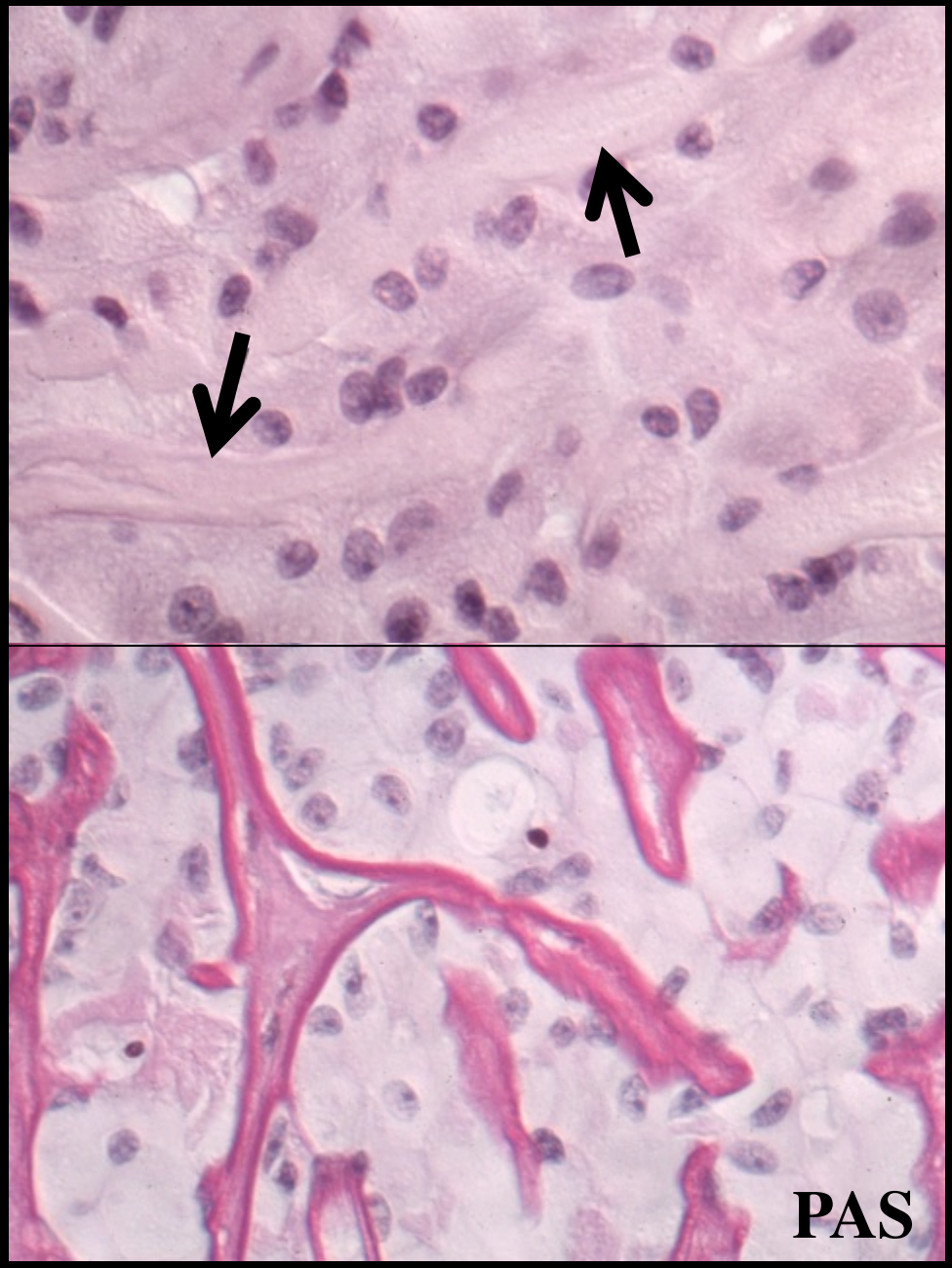
Pigmented Iridociliary Adenoma



Pigmented tumors can look like melanocytomas

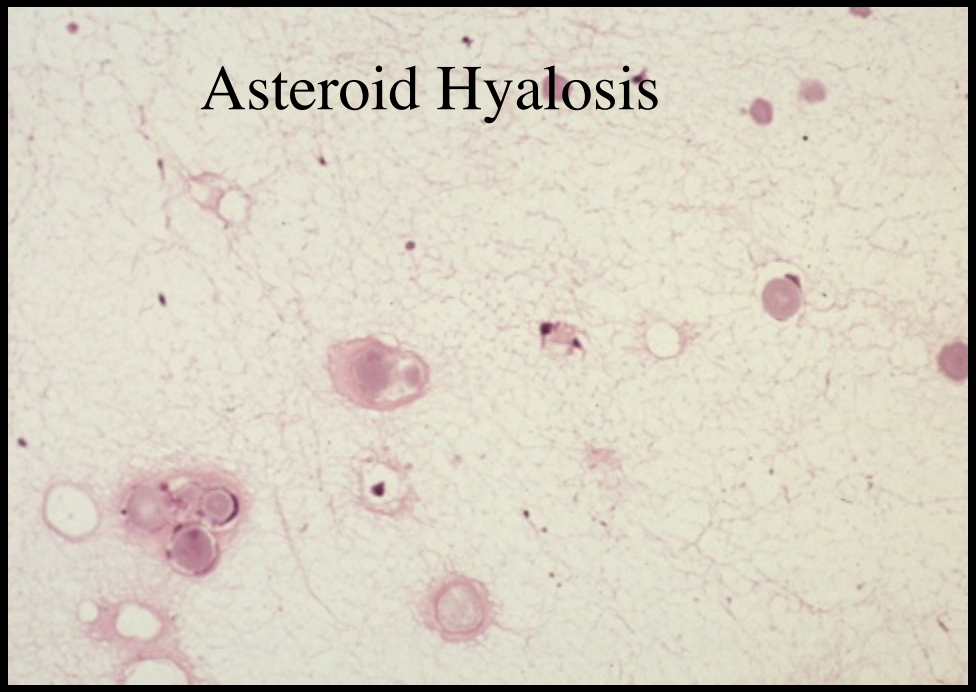
Iridociliary Adenoma

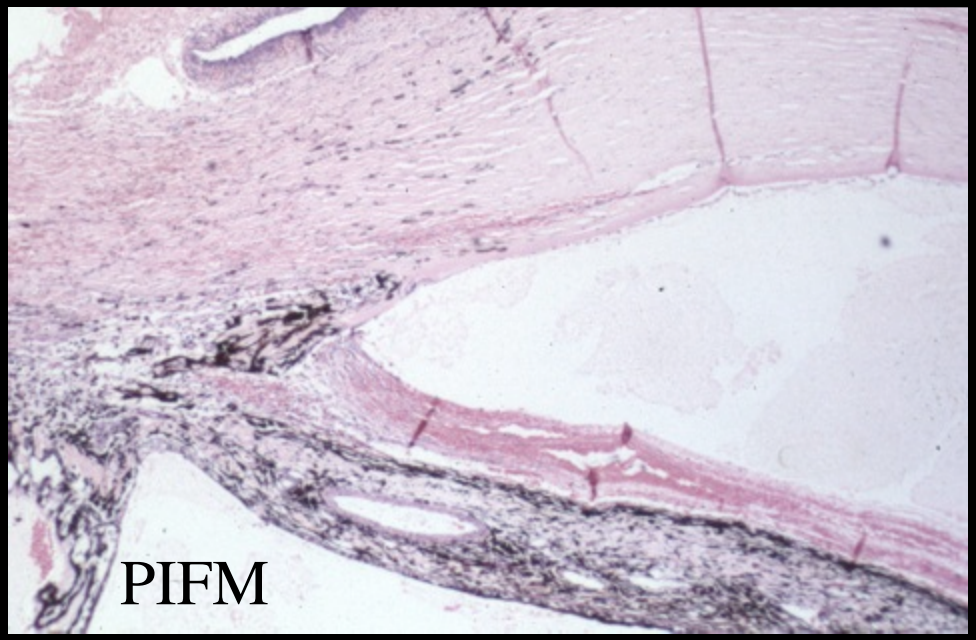




Iridociliary Adenoma

Basement Membranes

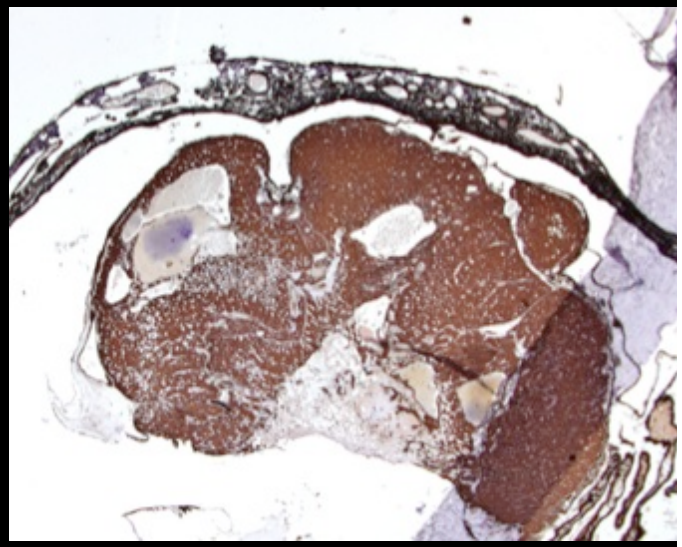
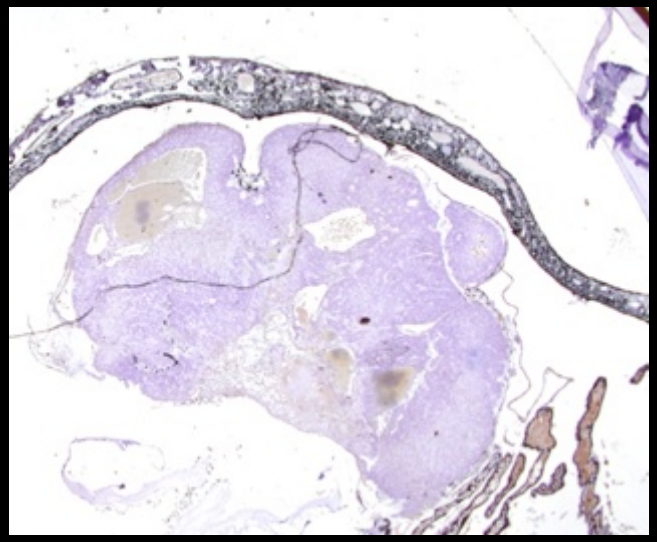
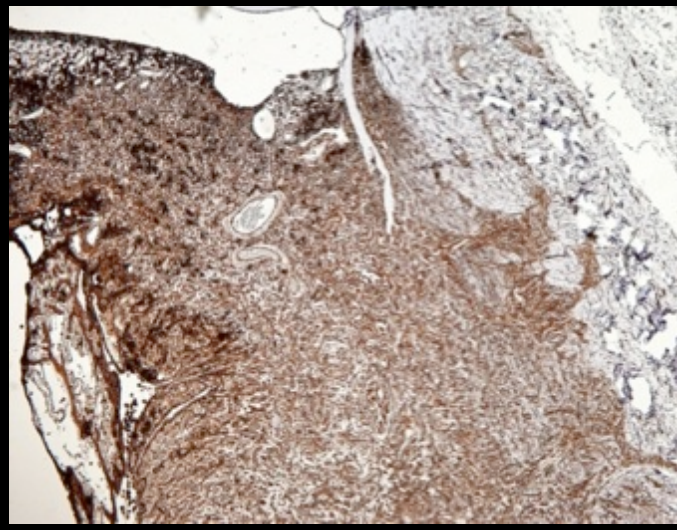
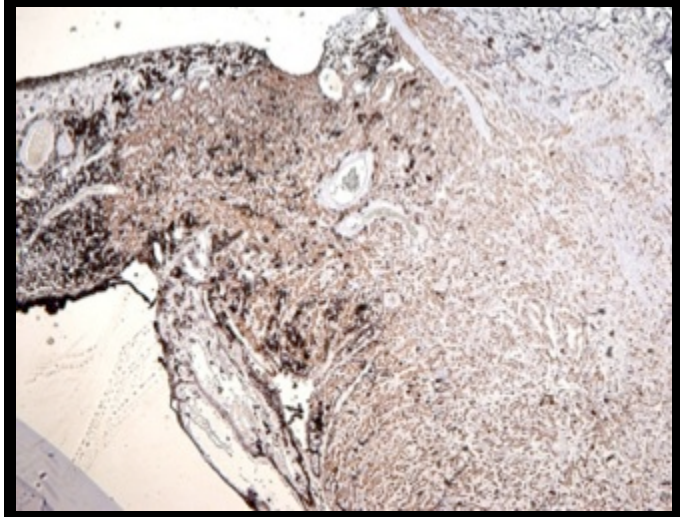




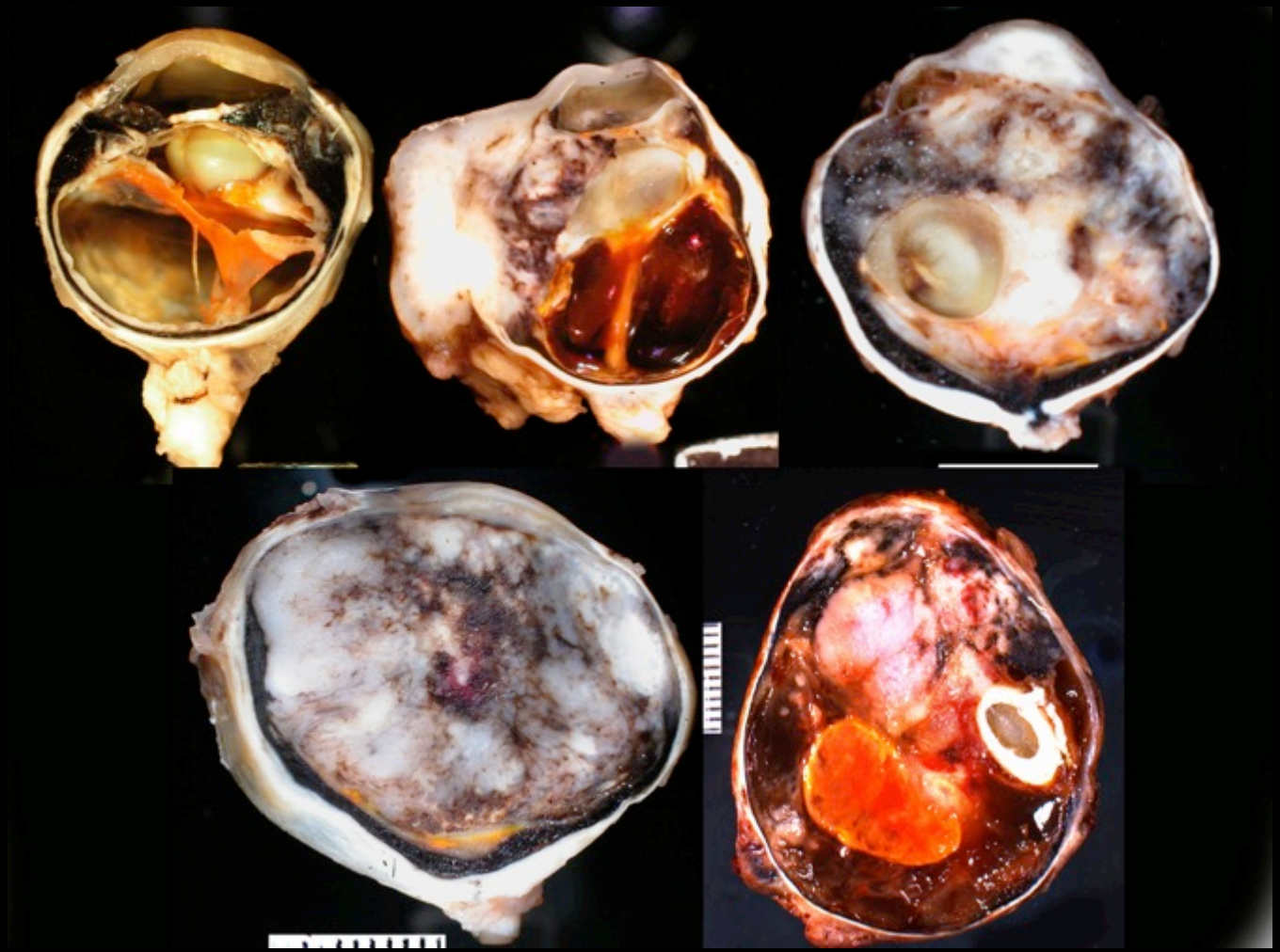
Iridociliary Adenoma

Immunohistochemistry of Canine Iridociliary Epithelial Tumors

- Vimentin+
- Cytokeratin- (Malignant tumors tend to become +)
- S100 +
- NSE +

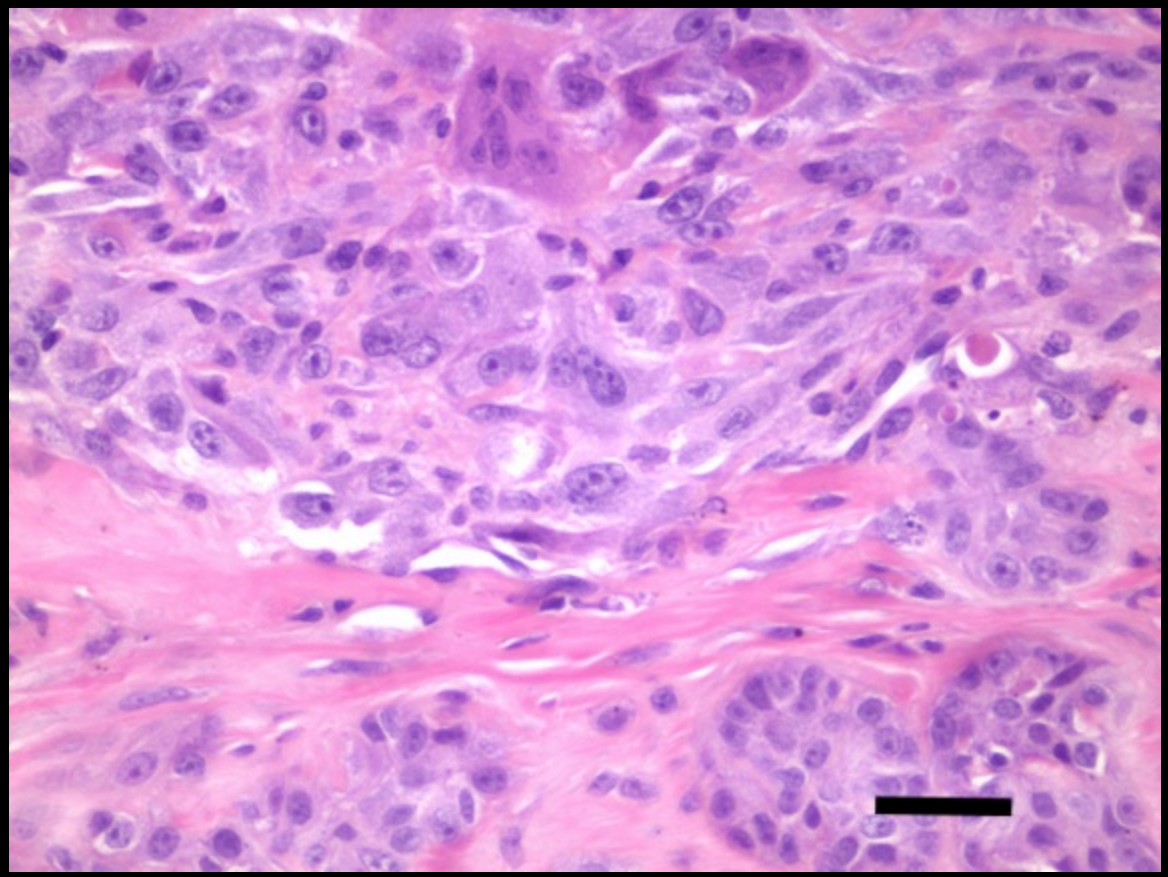
	Vimentin	Pancytokeratin
Non-uveoinvasive (n = 7)		
	100% positive	**14% positive**
Adeno-CA (n = 7)		
	100% positive	**57% positive**

Malignant Variant of Iridociliary Epithelial Tumor (Pleomorphic Adenocarcinoma) 16 Cases



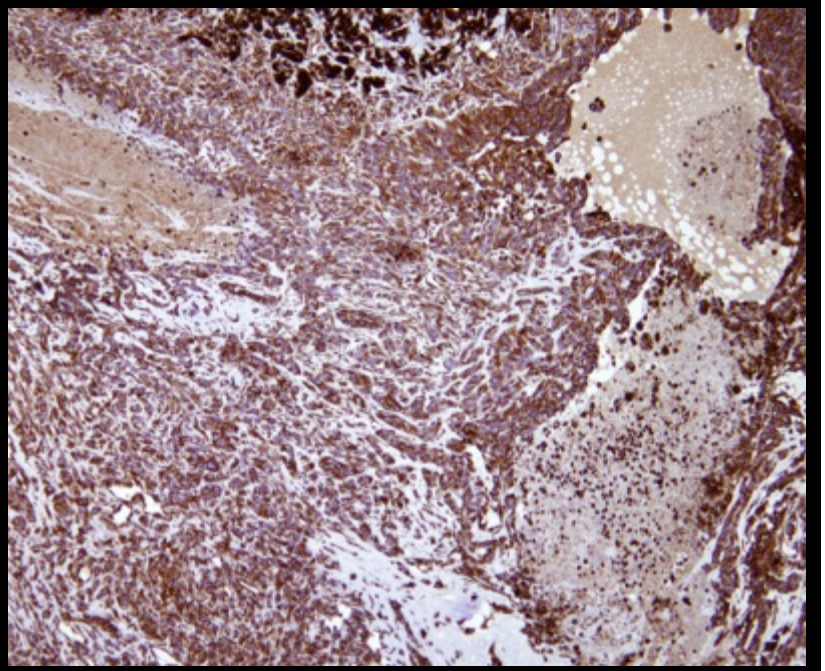
Zarfoss MK, Dubielzig RR. (2007) Metastatic iridociliary adenocarcinoma in a Labrador retriever. *Vet. Pathol.* 44: 672-676.

Pleomorphic Adenocarcinoma



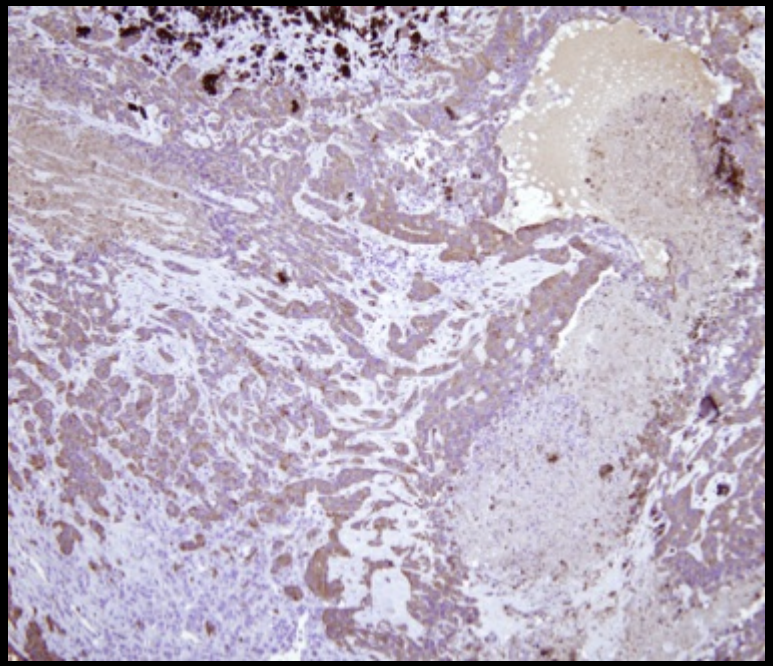
Pleomorphic Adenocarcinoma

Vimentin



100% positive (n = 16)

Pancytokeratin



75% positive (n = 16)

Pleomorphic Adenocarcinoma

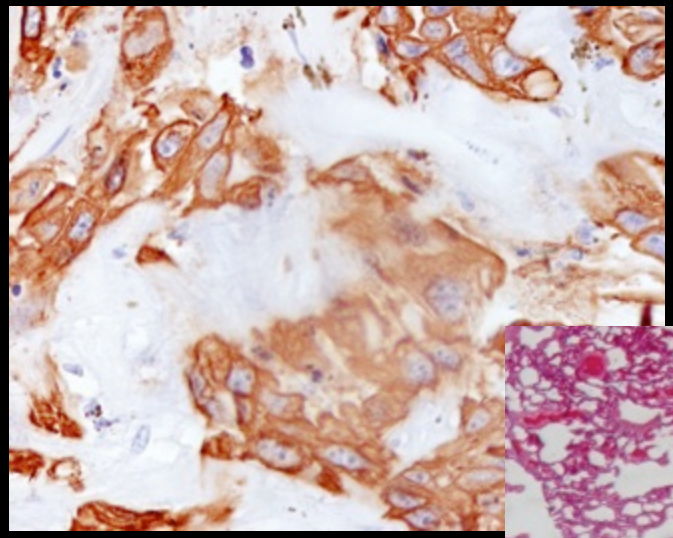
- Four (25%) dogs had received an intraocular gentamicin injection 2-10 mo (ave 4.25 mo) prior to diagnosis
- 7 (44%) dogs had a history of chronic eye disease of at least one year

Pleomorphic Adenocarcinoma—
survival and outcome of 16 cases

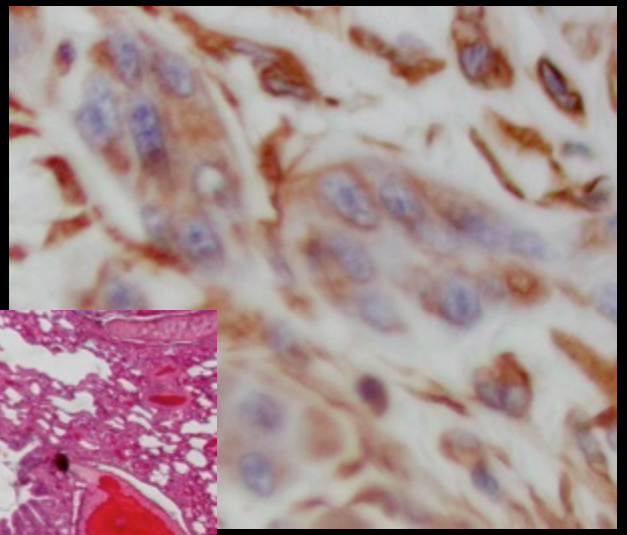
Outcome	# cases	Site of confirmed or suspected metastasis (#cases)	Survival (months)
Documented metastasis	2	Lung (2), kidney (1)	9, 30
Suspected metastatic disease	4	Lung (2), liver (1), abdominal mass (1)	4, 4, 7, 10
Dead for unknown reason	6	N/A	2, 3, 10, 22, 24, 39
Alive	2	N/A	2, 41
Lost to follow-up	2	N/A	N/A

Survival times in red are dogs that received gentamicin

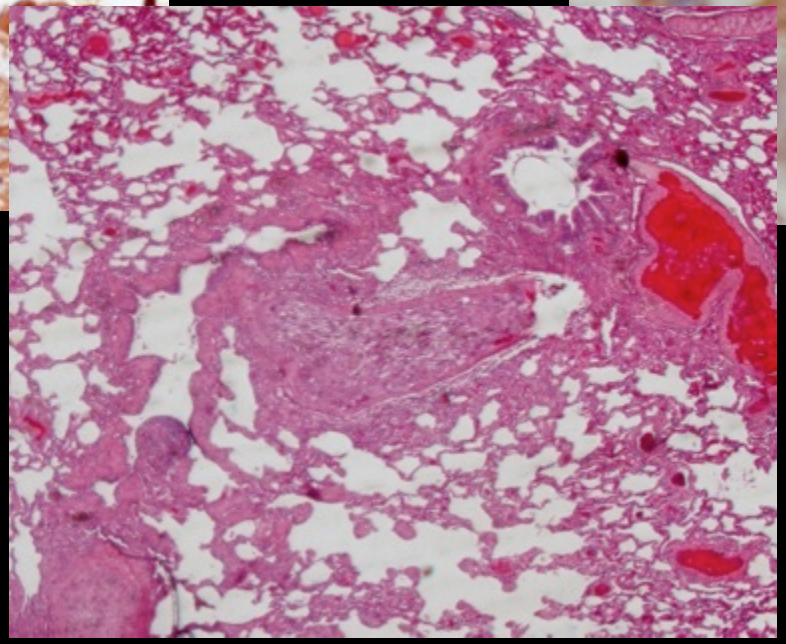
Malignant Variant of Iridociliary Epithelial Tumor (Pleomorphic Adenocarcinoma)



Cytokeratin



Vimentin



Lung Metastasis

Uveal Schwannomas of Blue-Eyed Dogs

Formerly, Spindle-cell tumor of blue-eyed dogs

97 cases

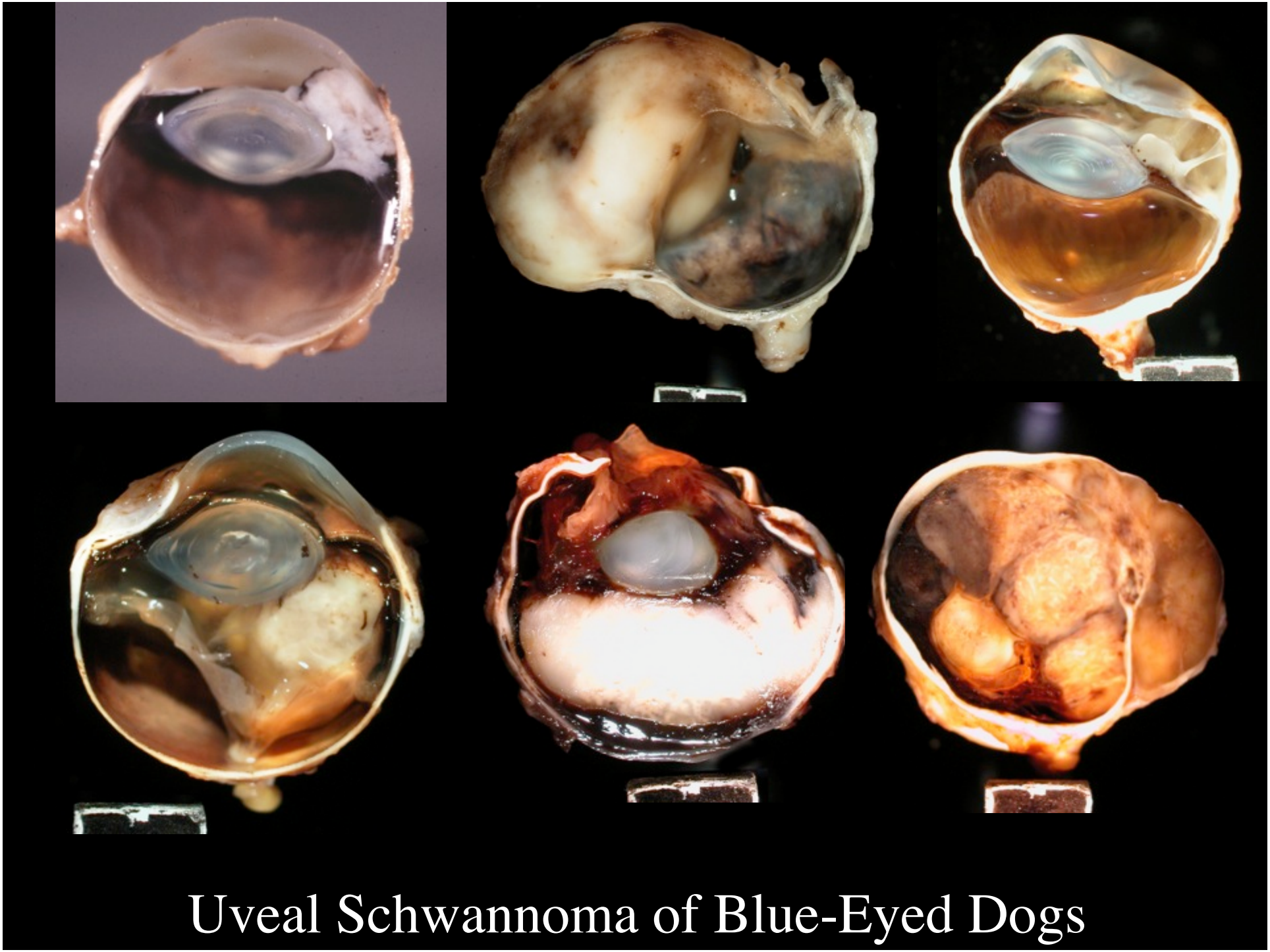
Zarfoss MK, Klauss G, Newkirk K, Kiupel M, Jones Y, Colitz CMH, Dubielzig RR. (2007) Uveal spindle cell tumor of blue-eyed dogs: an immunohistochemical study. *Vet Pathol*. 44: 276.

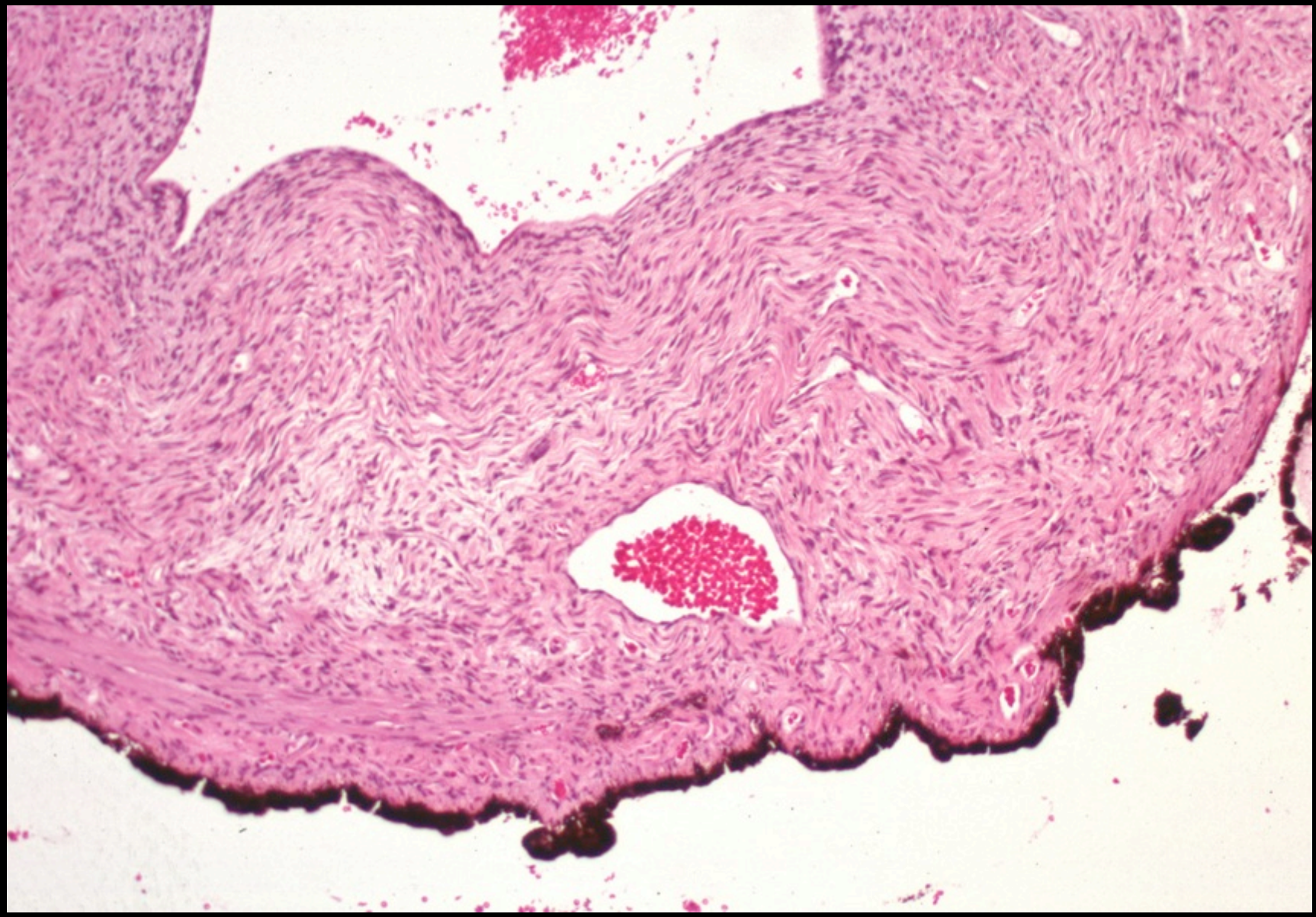
The blue-eye histology

Uveal Schwannoma of Blue-Eyed Dogs

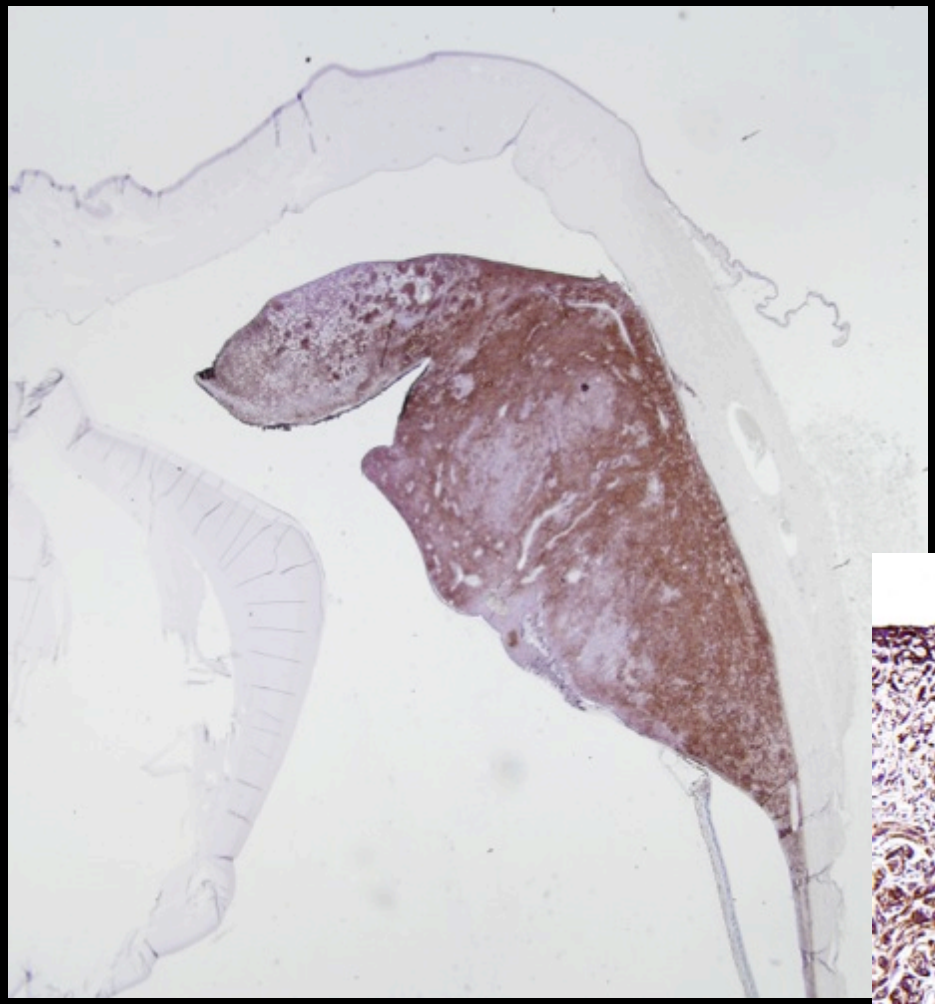
- Median age = 8.3 years
- Gender equal
- Laterality equal
- Siberian Husky *(42 cases)*, Australian Shepherd *(9 cases)* Catahoula Leopard dog *(5 cases*), and other breeds with blue or partly-blue eye

USBED

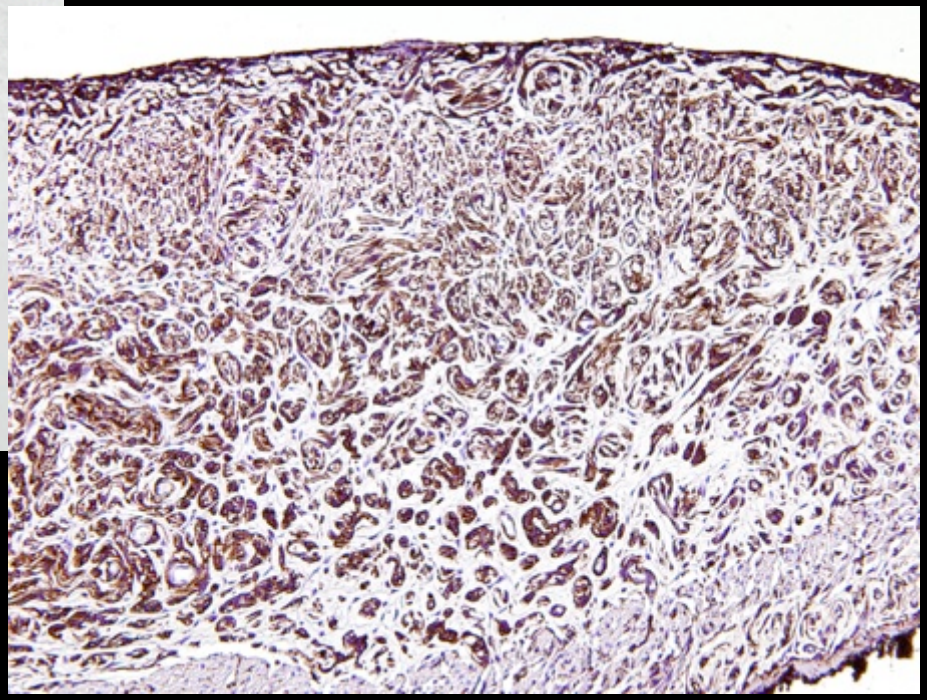

Uveal Schwannoma of Blue-Eyed Dogs



USBED



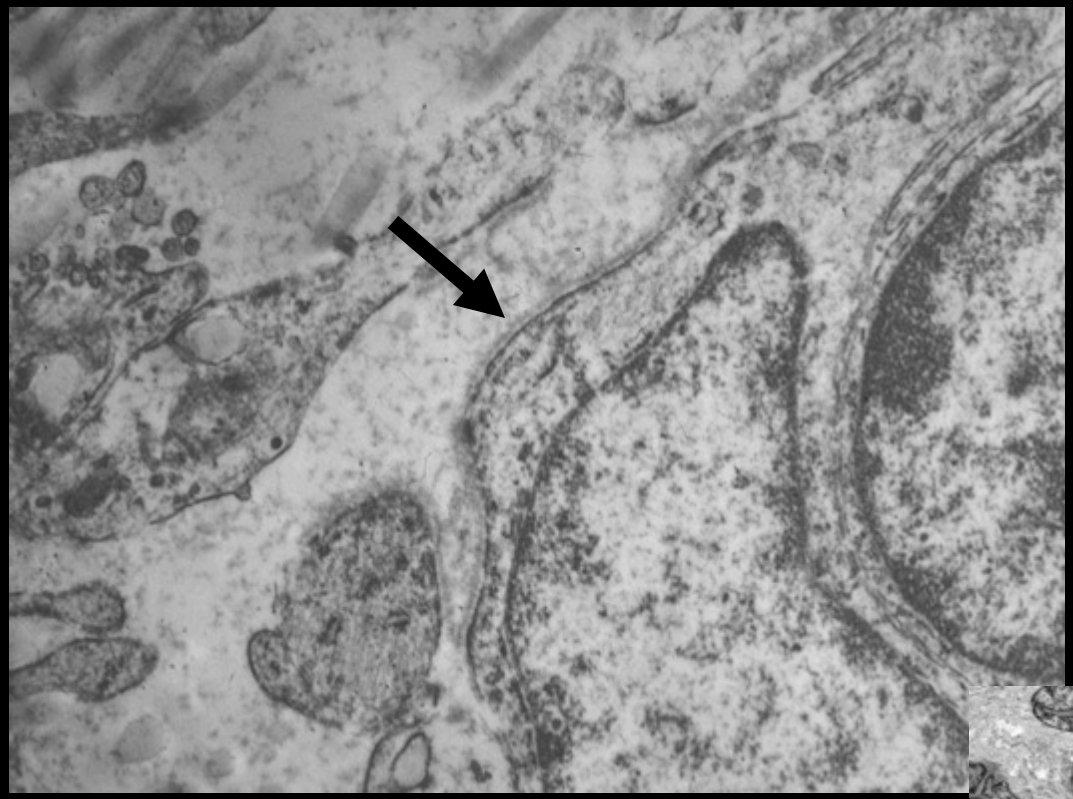
Uveal Schwannoma of
Blue-Eyed Dogs



GFAP

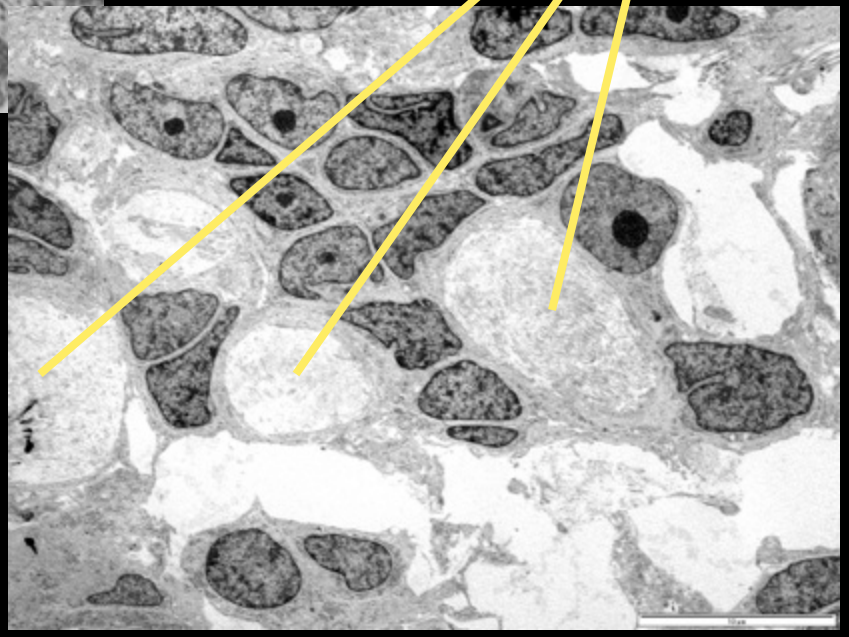
Stains Schwann cells
of non-myelinating nerve fibers

Uveal Schwannoma of Blue-Eyed Dogs

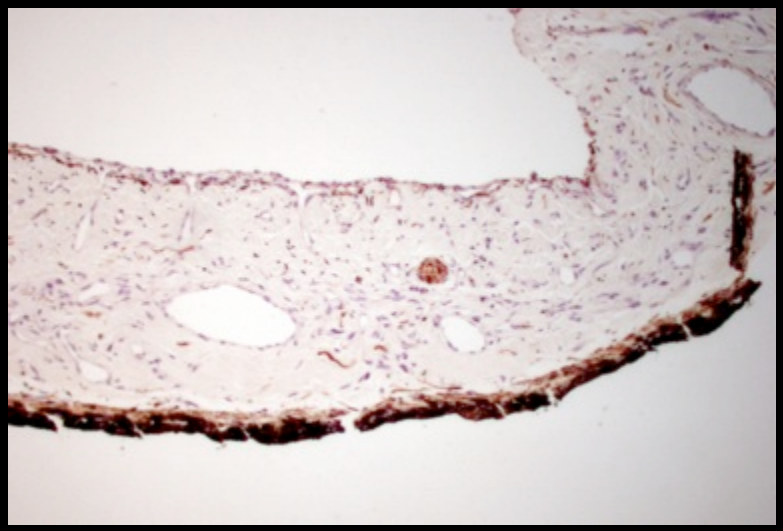


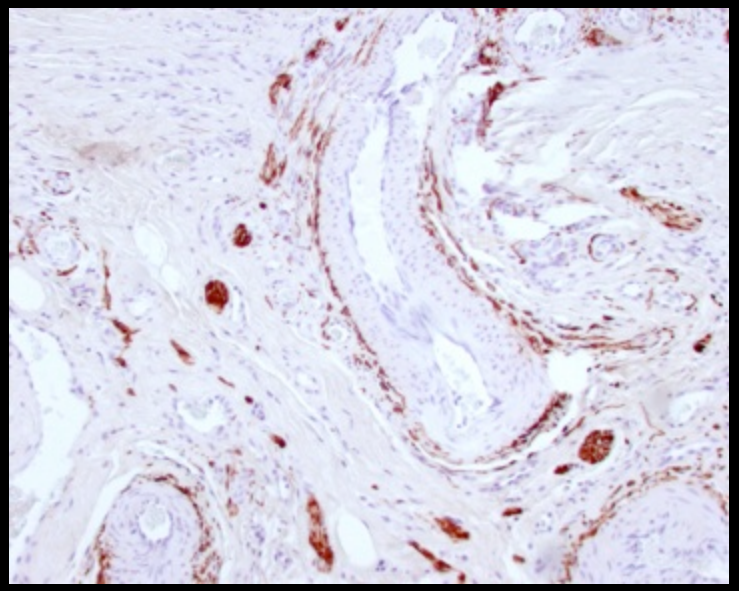
Basal Lamina

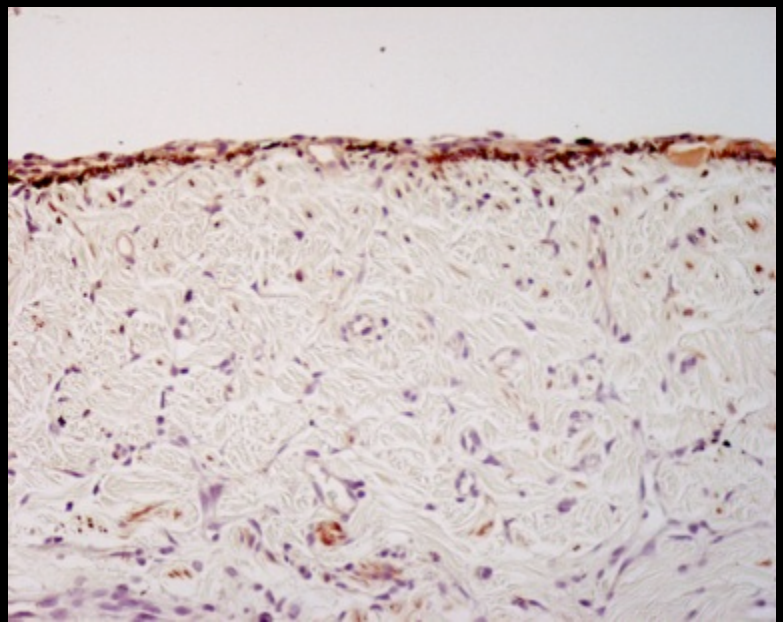
Collagen

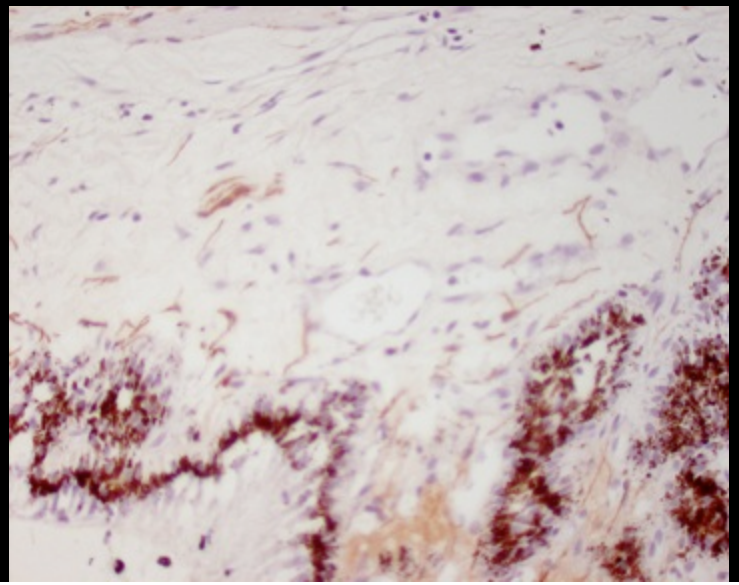


Distribution of GFAP+ Cells in the Uvea of Blue-Eyed Dogs

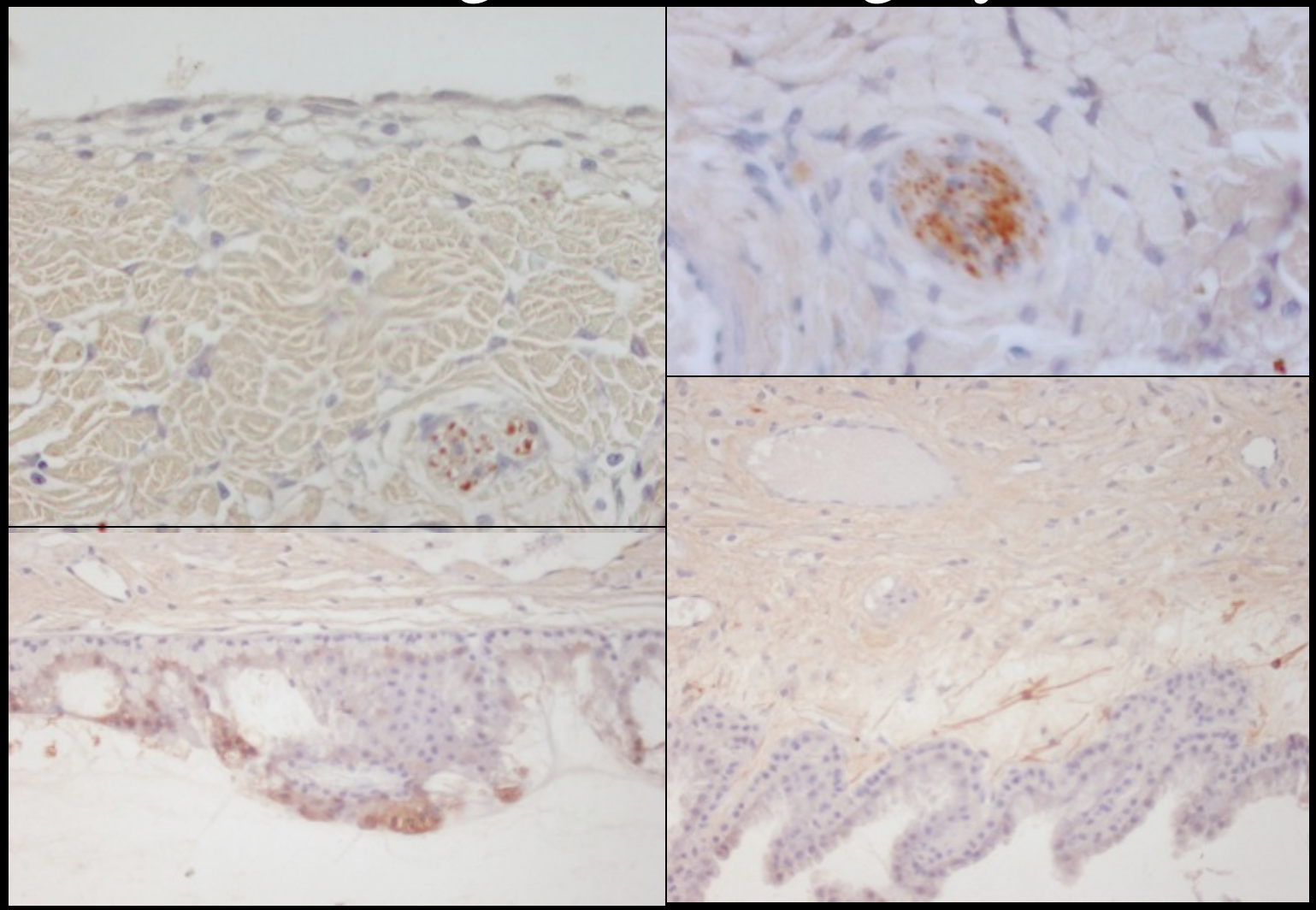








Distribution of GFAP+ Cells in the Uvea of Pigmented Dog Eyes



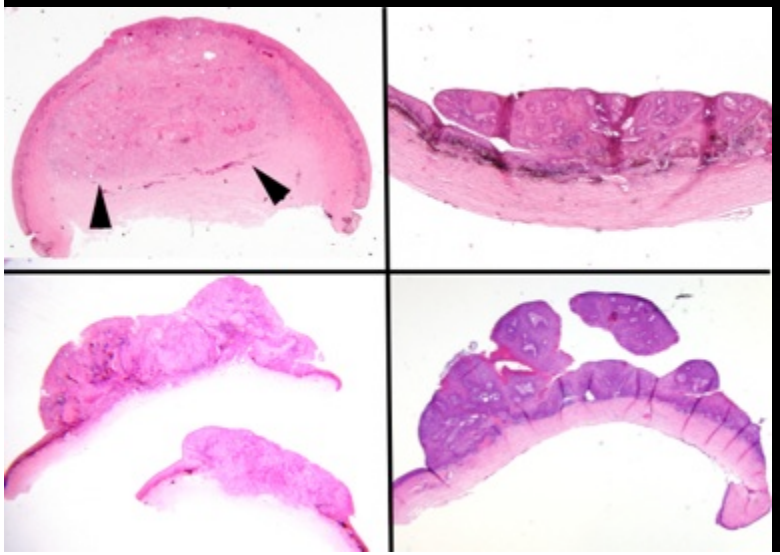
Corneal Squamous Cell Carcinoma

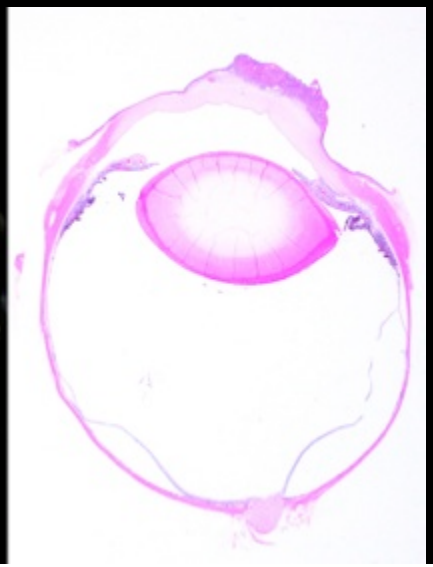
- 79 cases in the COPLOW Database
  - 33 Pug
  - 4 Bulldog
  - 9 Shih Tzu
  - 3 English Bulldog

Dreyfus J, Schobert CS, Dubielzig RR. (2011) Superficial corneal squamous cell carcinoma occurring in dogs with chronic keratitis. *Vet Ophthal*. 14: 161-168.

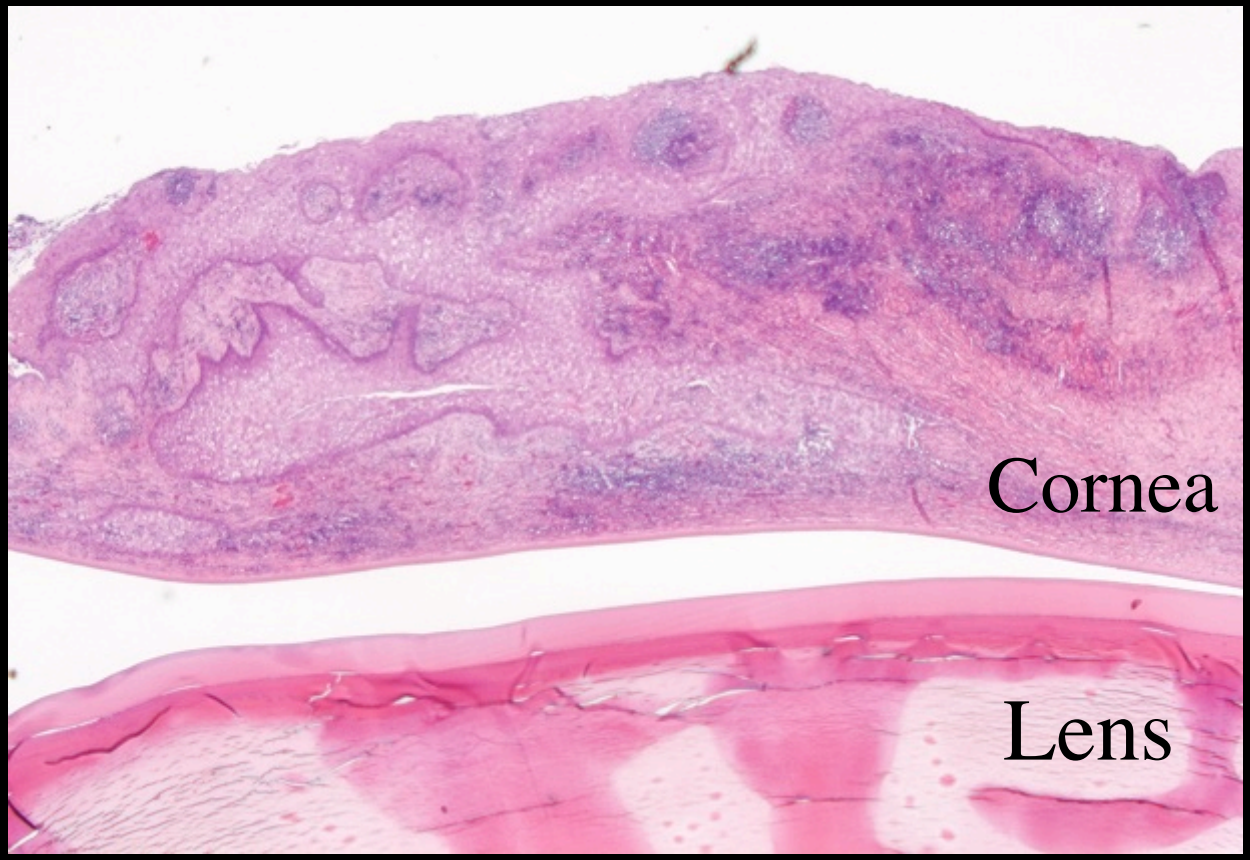
Corneal Squamous Cell Carcinoma

- All cases have superficial chronic keratitis
- Most but not all cases had prior treatment with either tacrolimus or cyclosporine
- Most cases develop axially
- Most cases superficial with little deep invasion
- Most cases treatable with superficial keratectomy





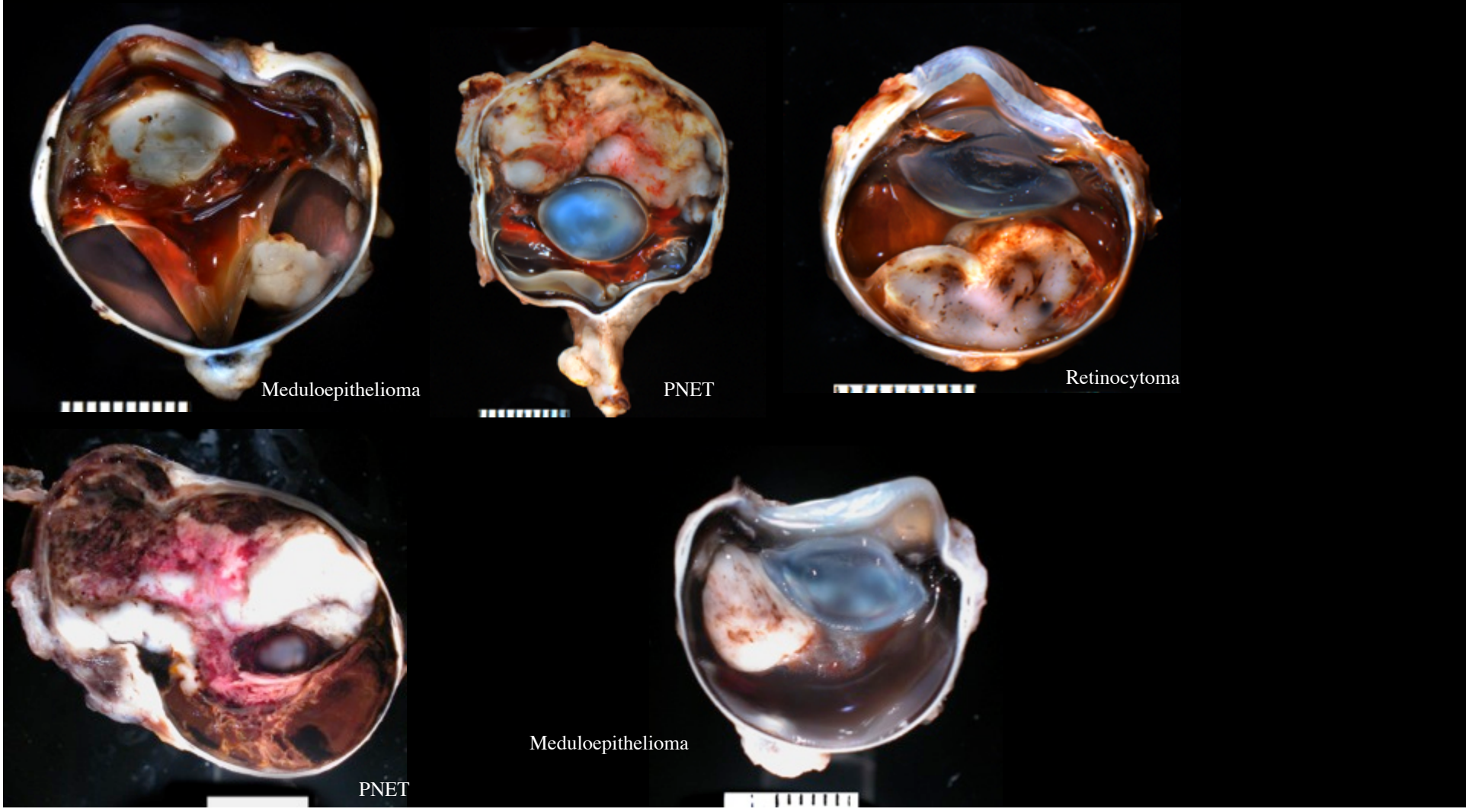
Corneal Squamous Cell Carcinoma



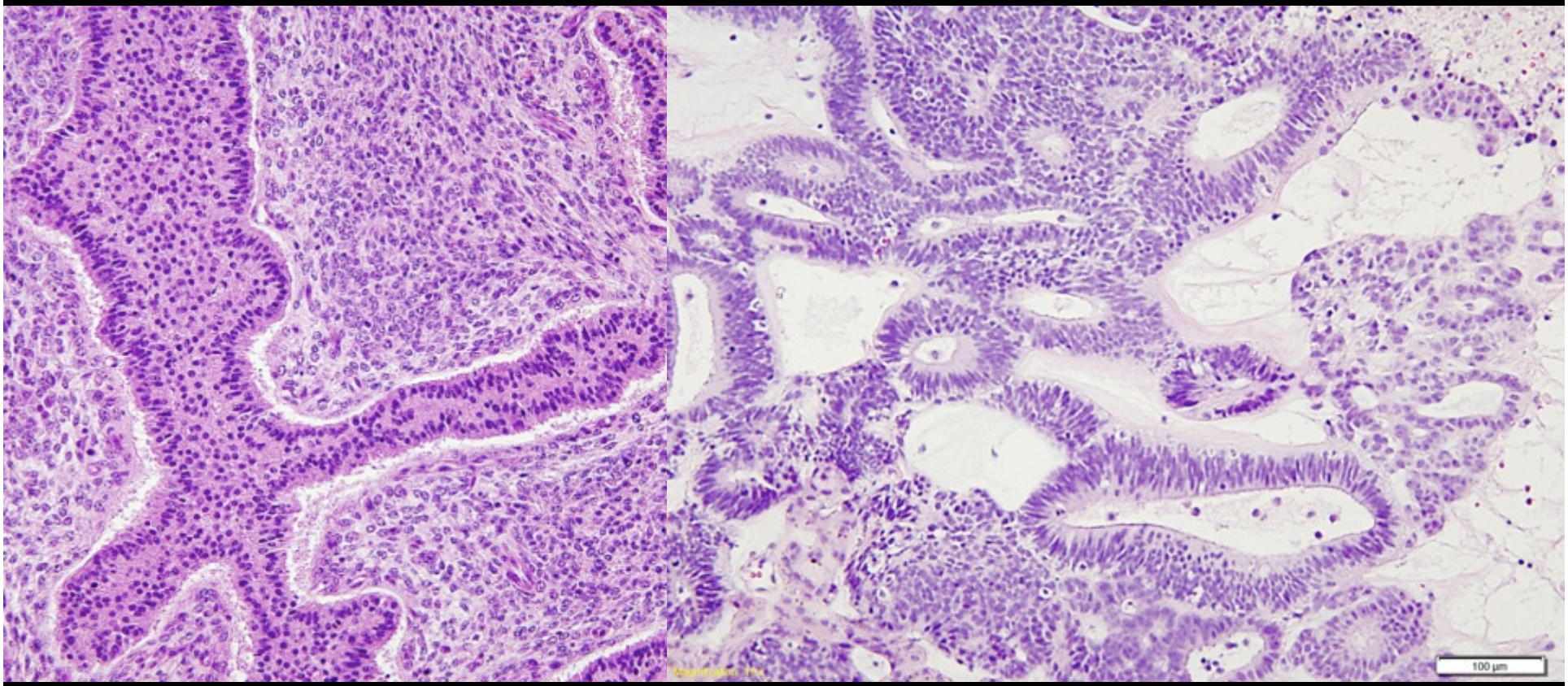
Multiple recurrences
extending deep into
the corneal stroma
and requiring enucleation
in this case

Canine Primitive Neuroectodermal Tumors (PNET) *39 cases*

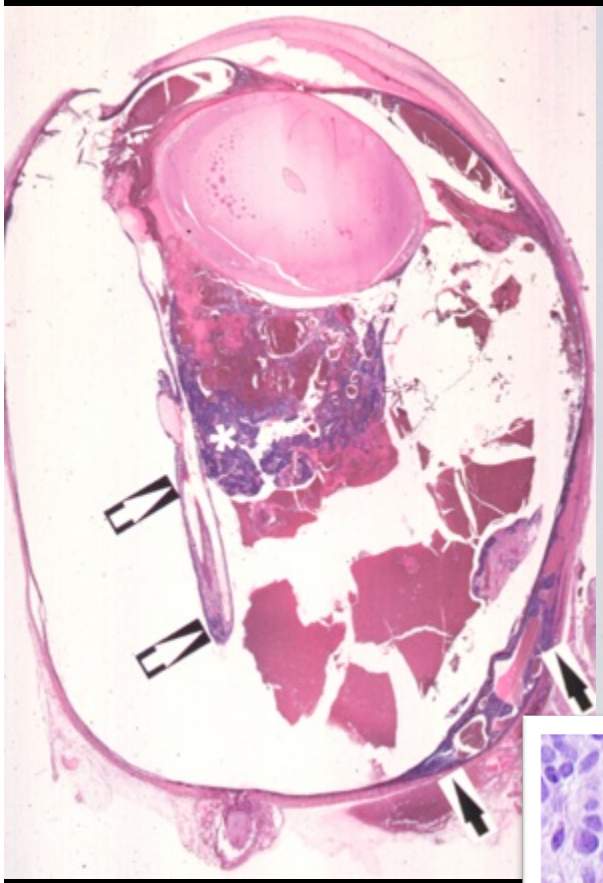
Medulloepithelioma, Retinoblastoma and Retinocytoma



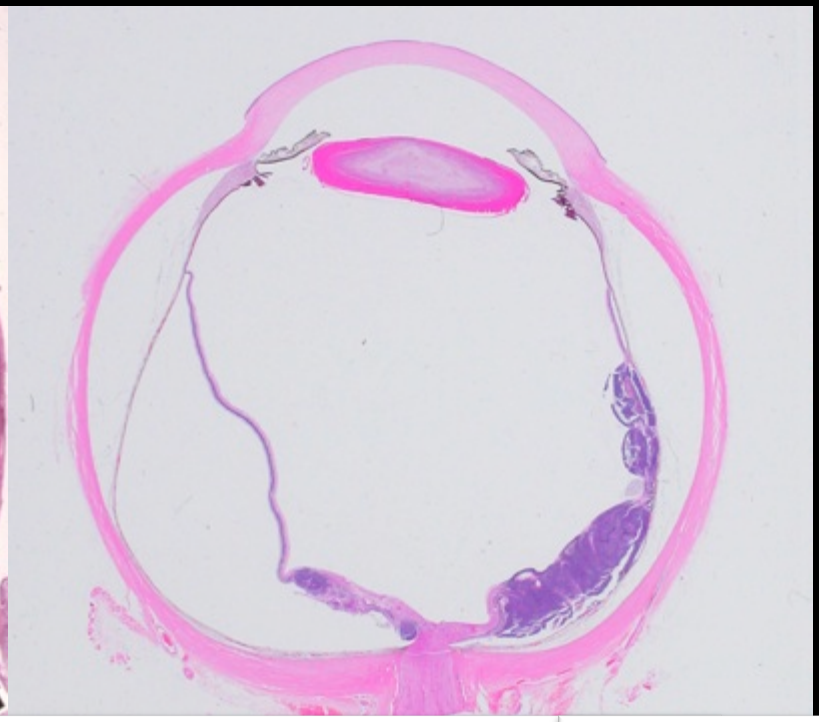
Medulloepithelioma



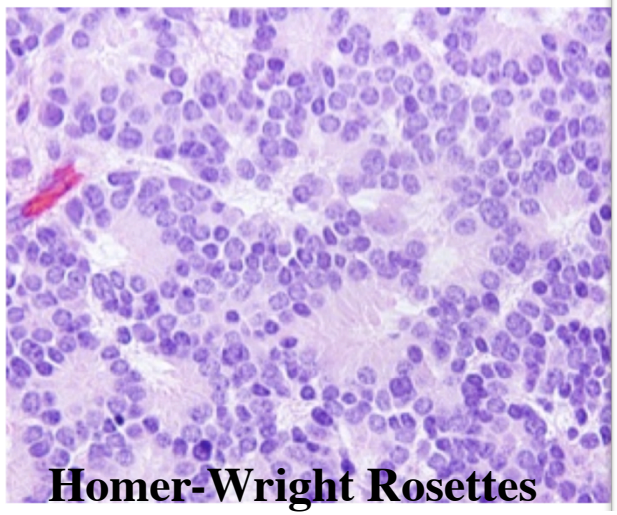
Retinoblastoma



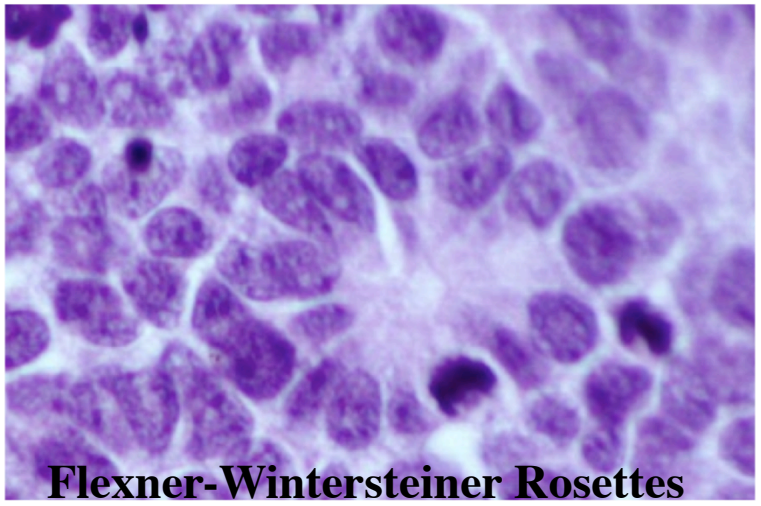
Canine



Human



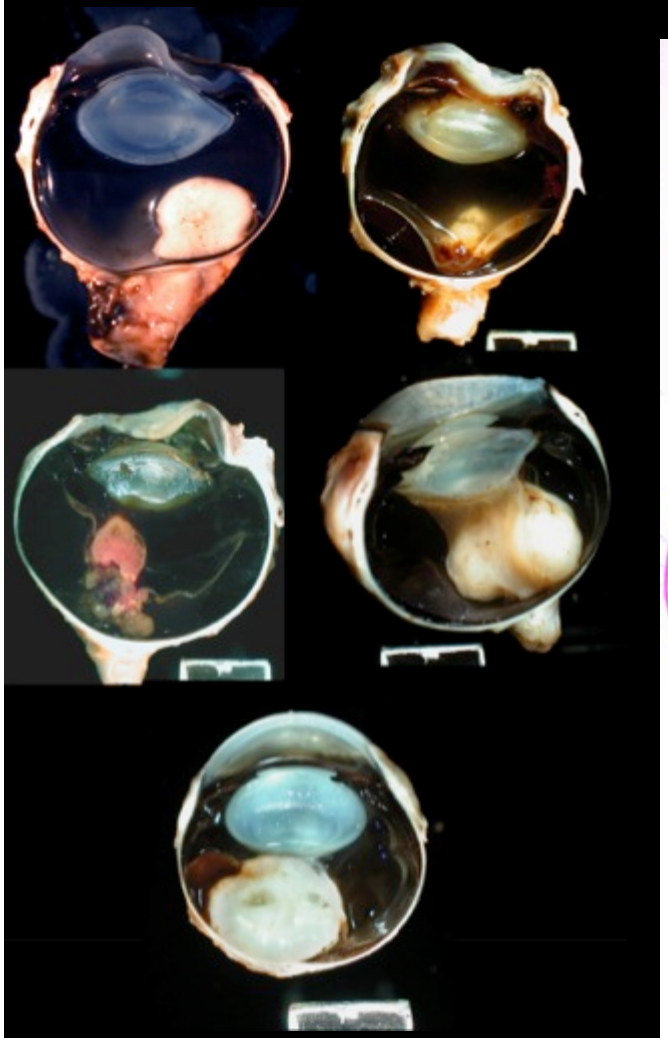
Homer-Wright Rosettes

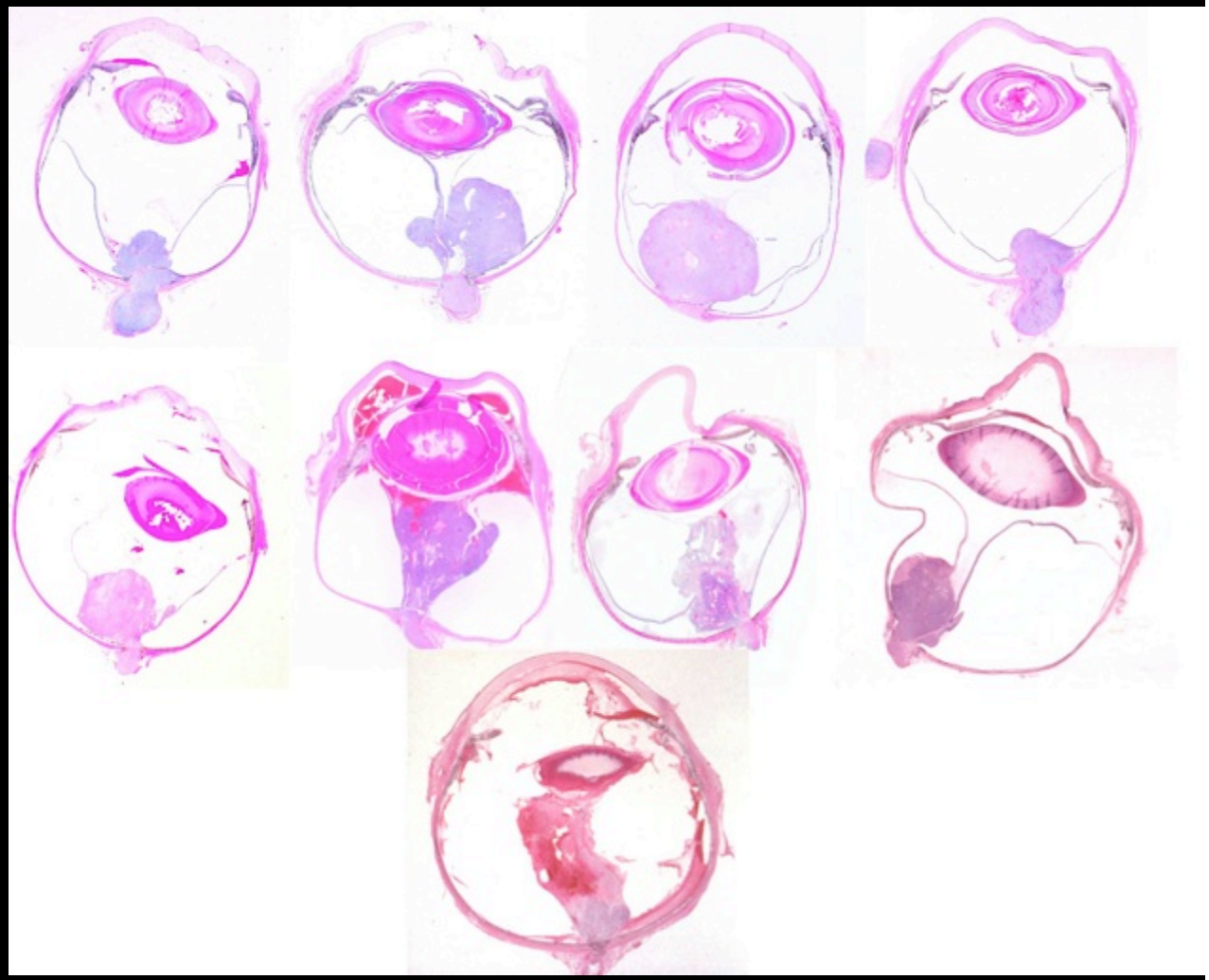


Flexner-Wintersteiner Rosettes

Optic Nerve or Retinal Glioma

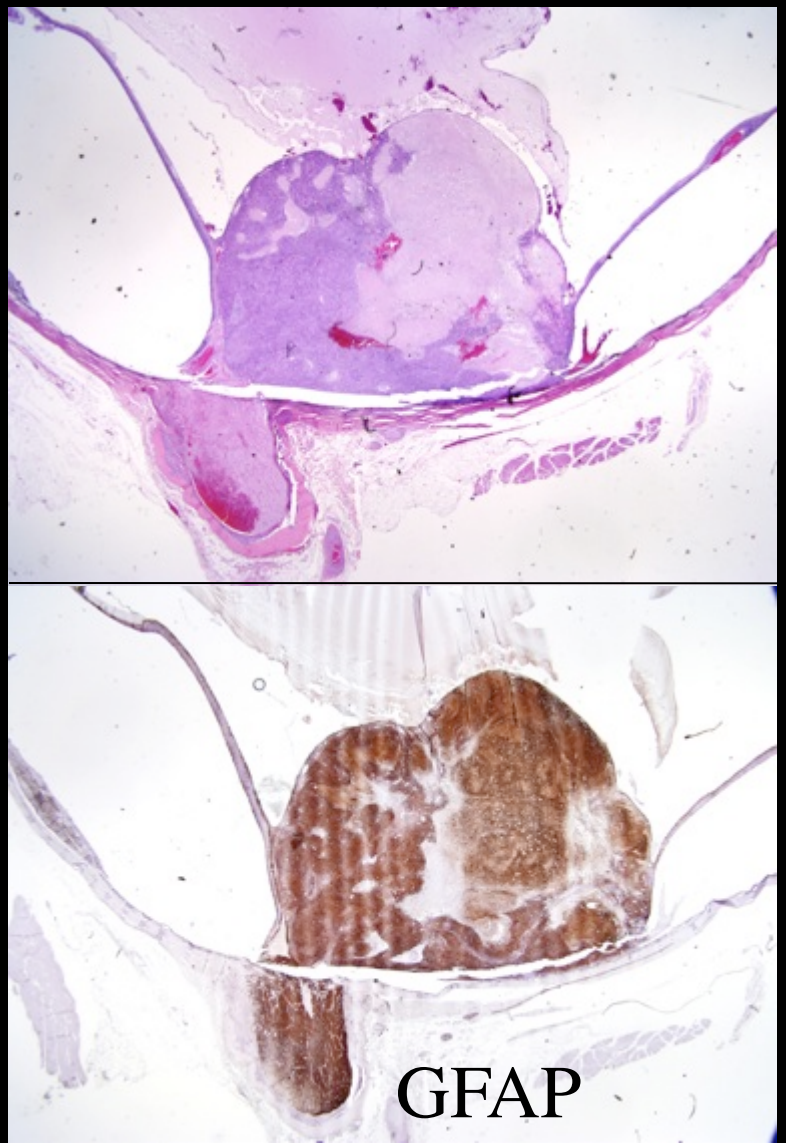
(19 cases)





Naranjo C, Schobert C, Dubielzig RR. (2008) Canine ocular gliomas: a retrospective study. *Vet. Ophthalmol*. 11 (6): 356-362.

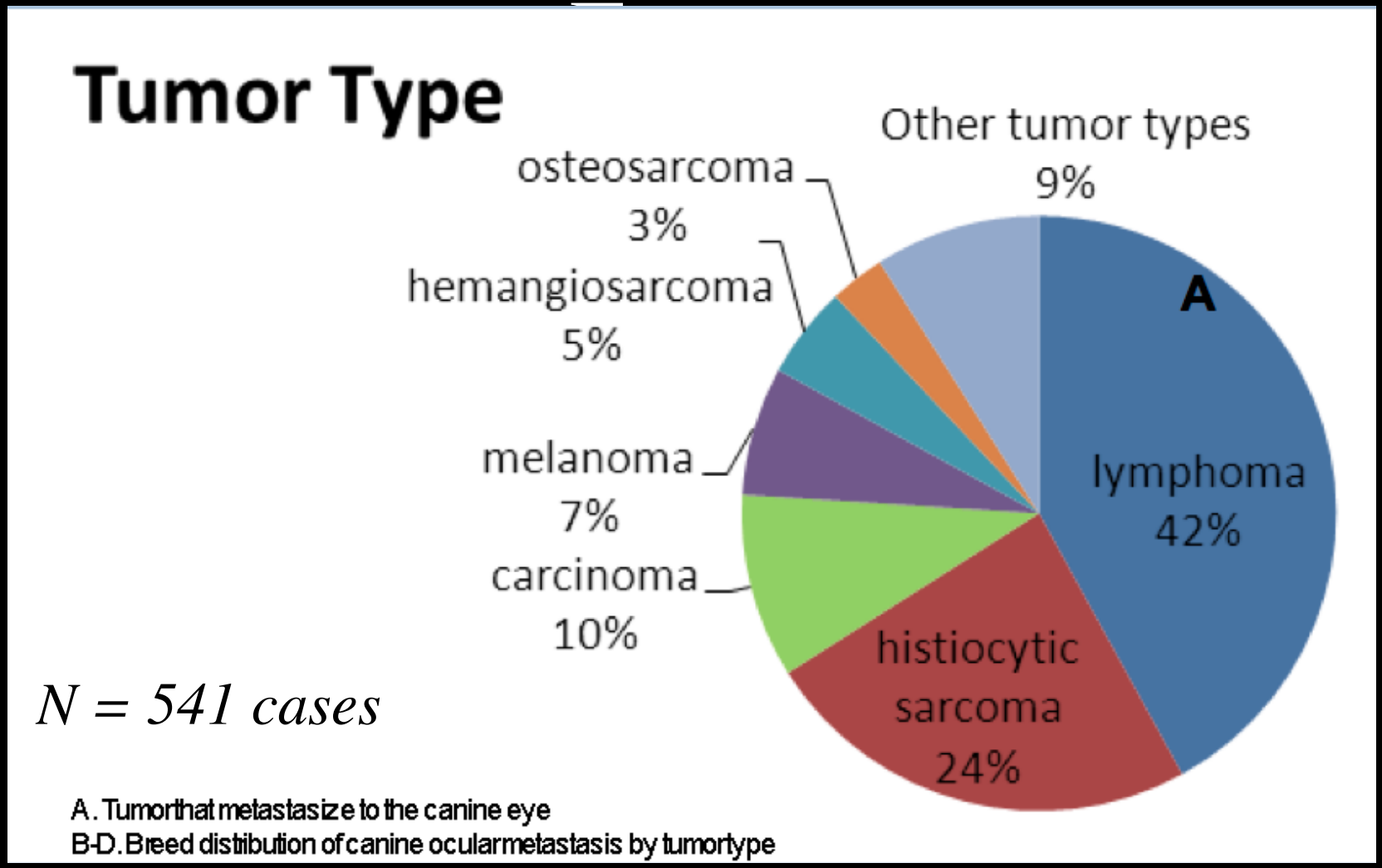
Optic Nerve or Retinal Glioma



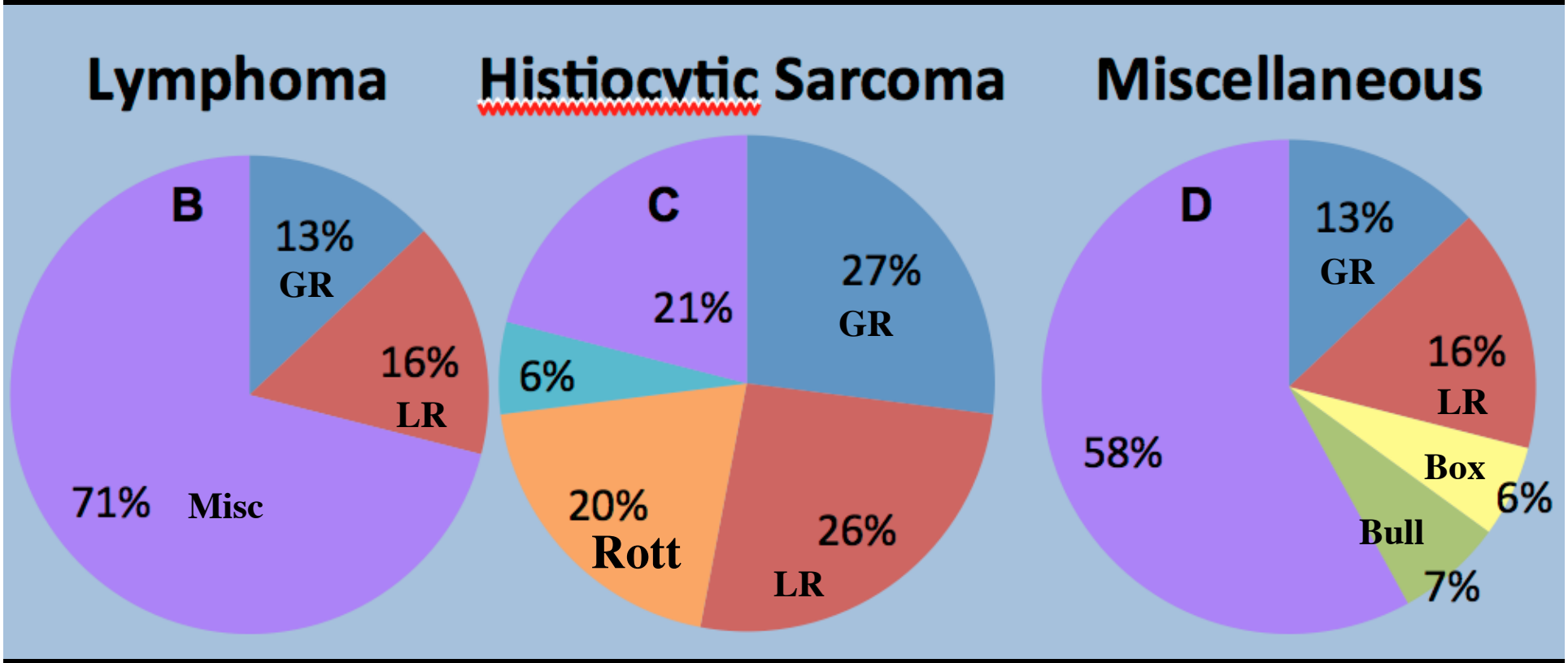
GFAP

GFAP

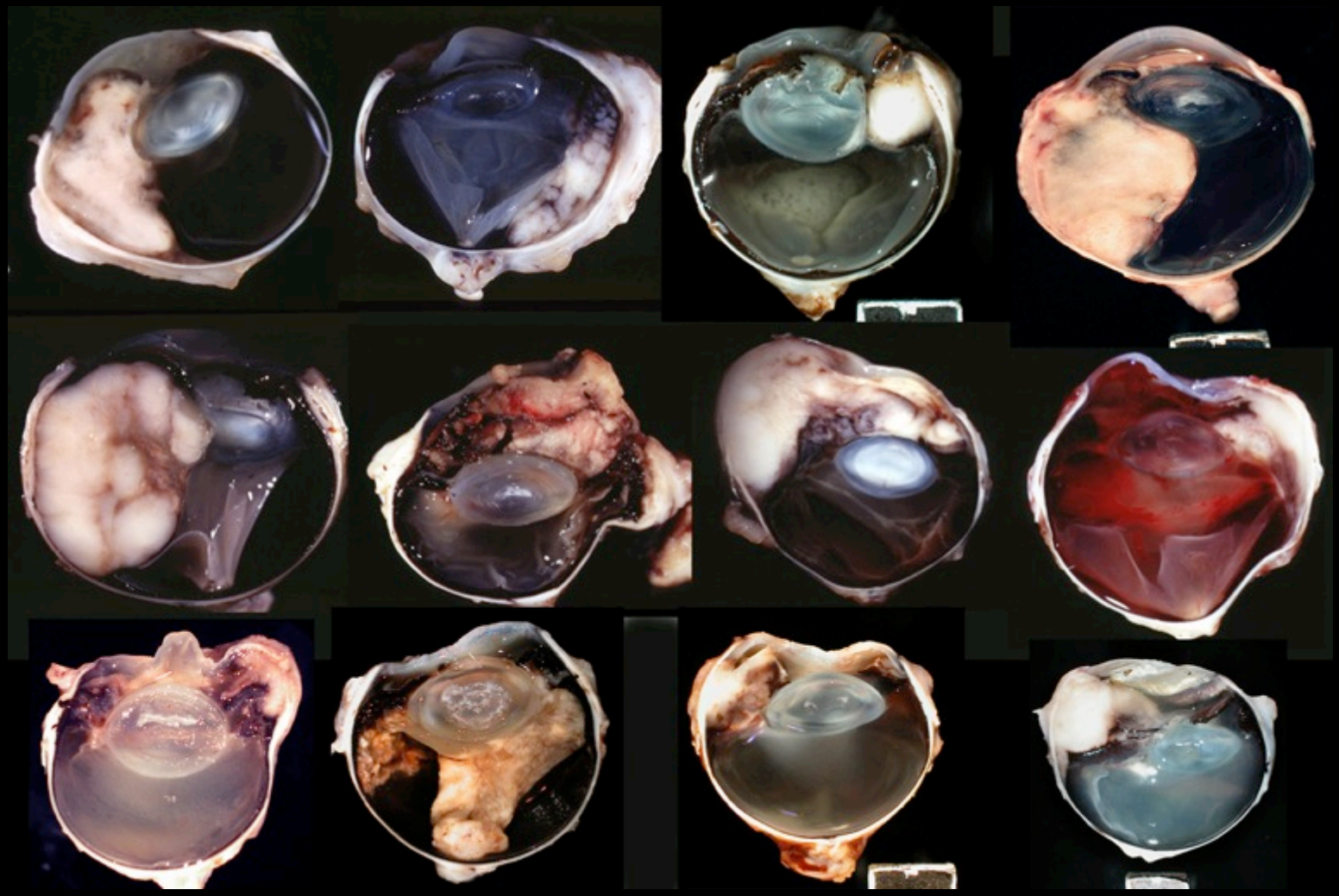
Metastatic Tumors to the Canine



Metastatic Tumors to the Canine Eye



Metastatic Tumors to the Canine Eye



Histiocytic Sarcoma