

Strabismus

From the ophthalmologist perspective

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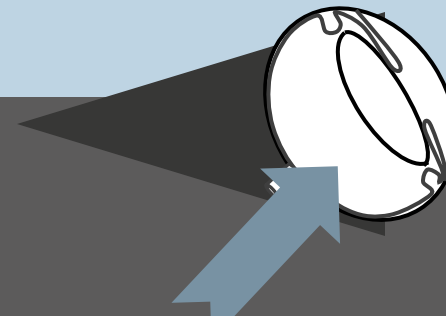
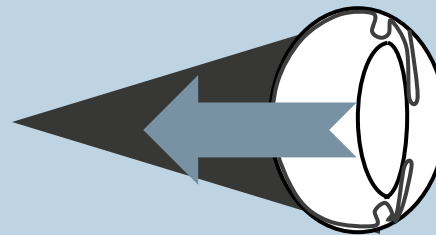
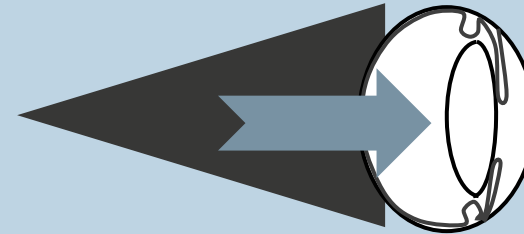
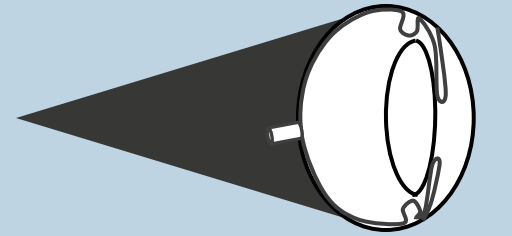
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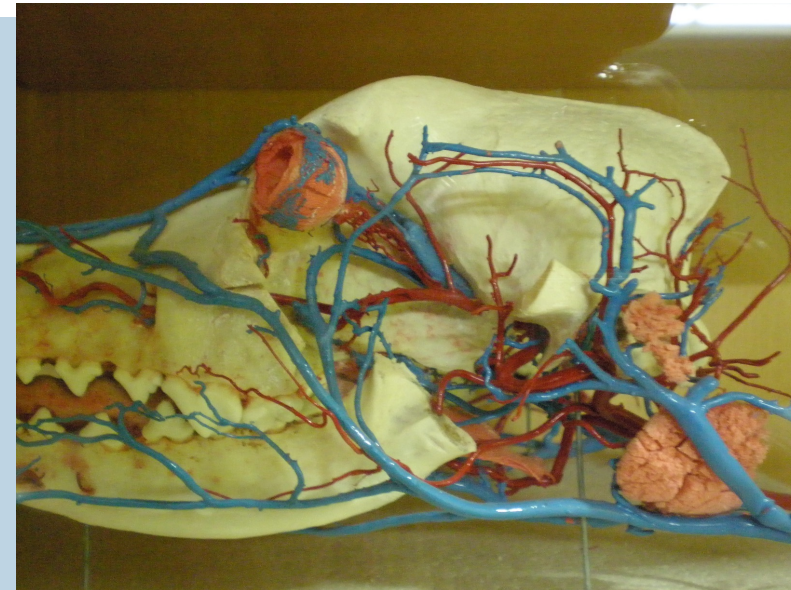
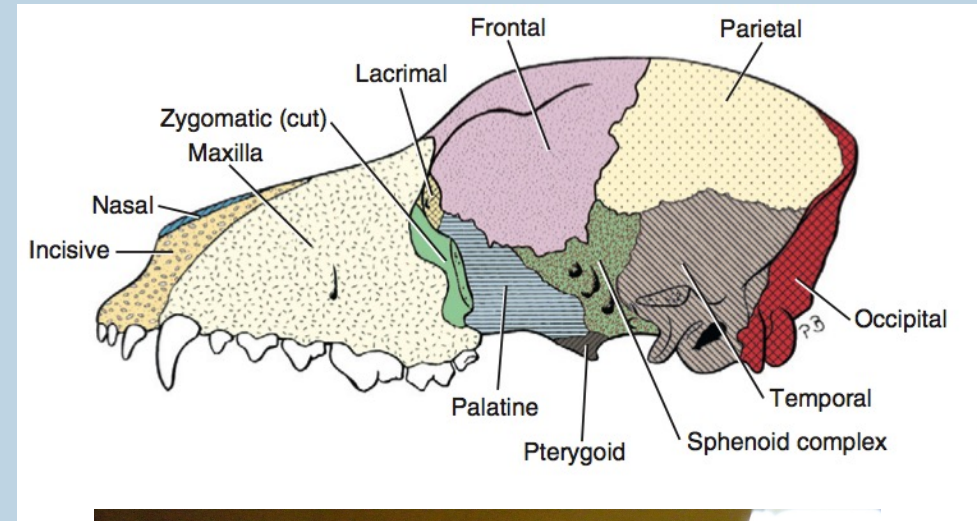
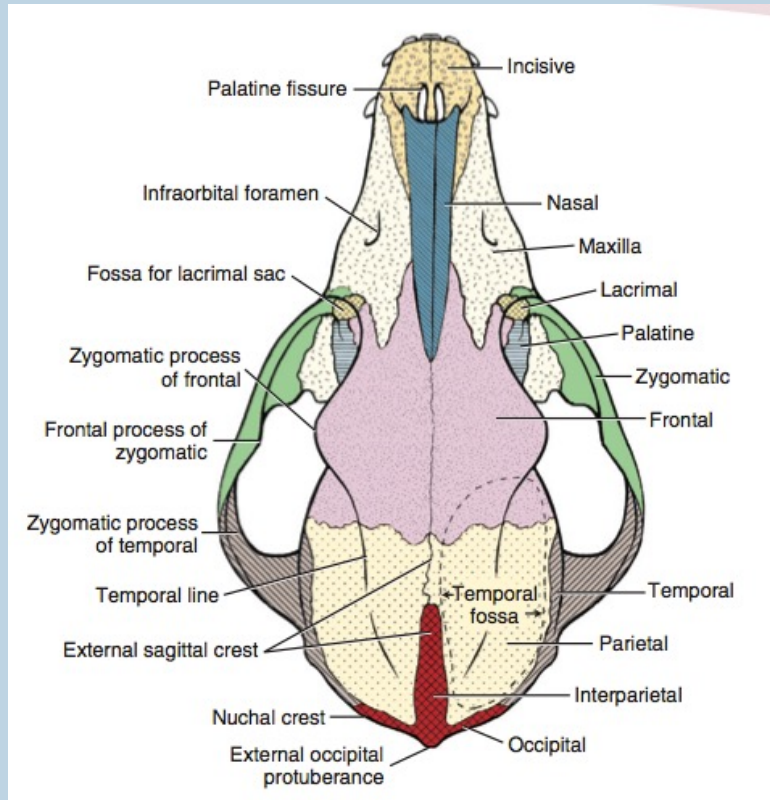
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Clinical signs in orbital disease

- Normal Orbit
- Exophthalmos
- Enophthalmos
- Globe deviation



Orbital anatomy



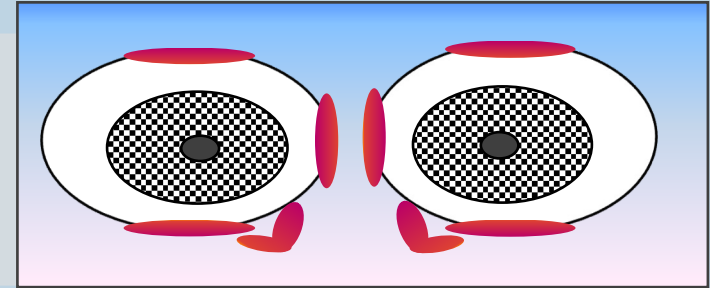
Clinical signs in orbital disease

- **Protrusion of the nictitans membrane (NM)**
- Periocular swelling
- Conjunctival hyperhaemia
- Chemosis
- Epiphora
- Mucopurulent ocular discharge
- Lagophthalmia (+/- exposure keratitis)
- Keratoconjunctivitis sicca
- **Pain or difficulty opening mouth**
- Hyporexia
- **Changes in ipsilateral side of pterygopalatine fossa**
- Reduction of oculovestibular movements
- **Neurologic deficits from cn. II to VI**
- Mild elevation of IOP
- Retinal folds /solid retinal detachment
- Scleral indentation
- Papilledema

EOM Innervation

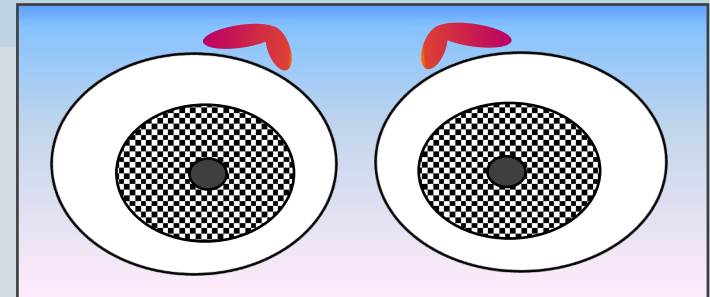
cn. III Oculomotor

- Rectus dorsalis
- Rectus ventralis
- Rectus medialis
- Ventral oblique



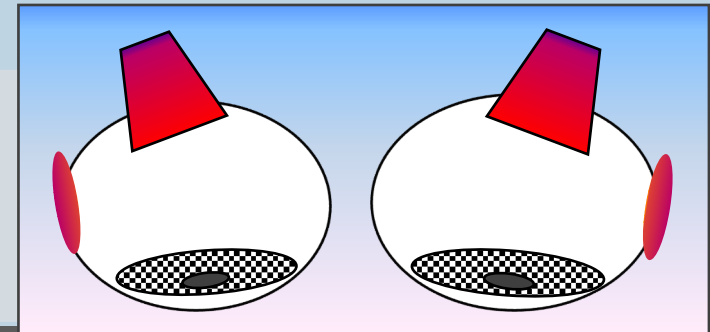
cn. IV Troclear

- Dorsal oblique

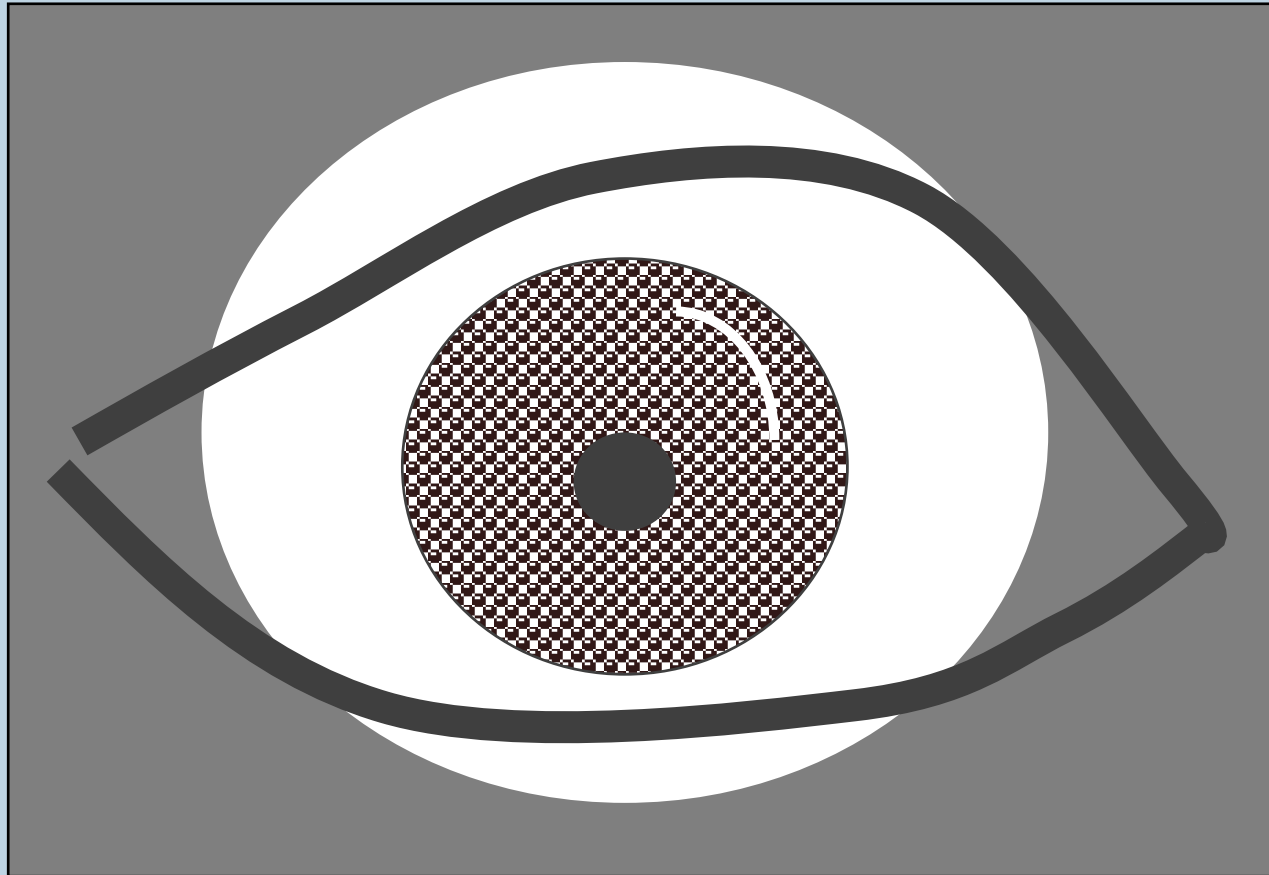


cn. VI Abducens

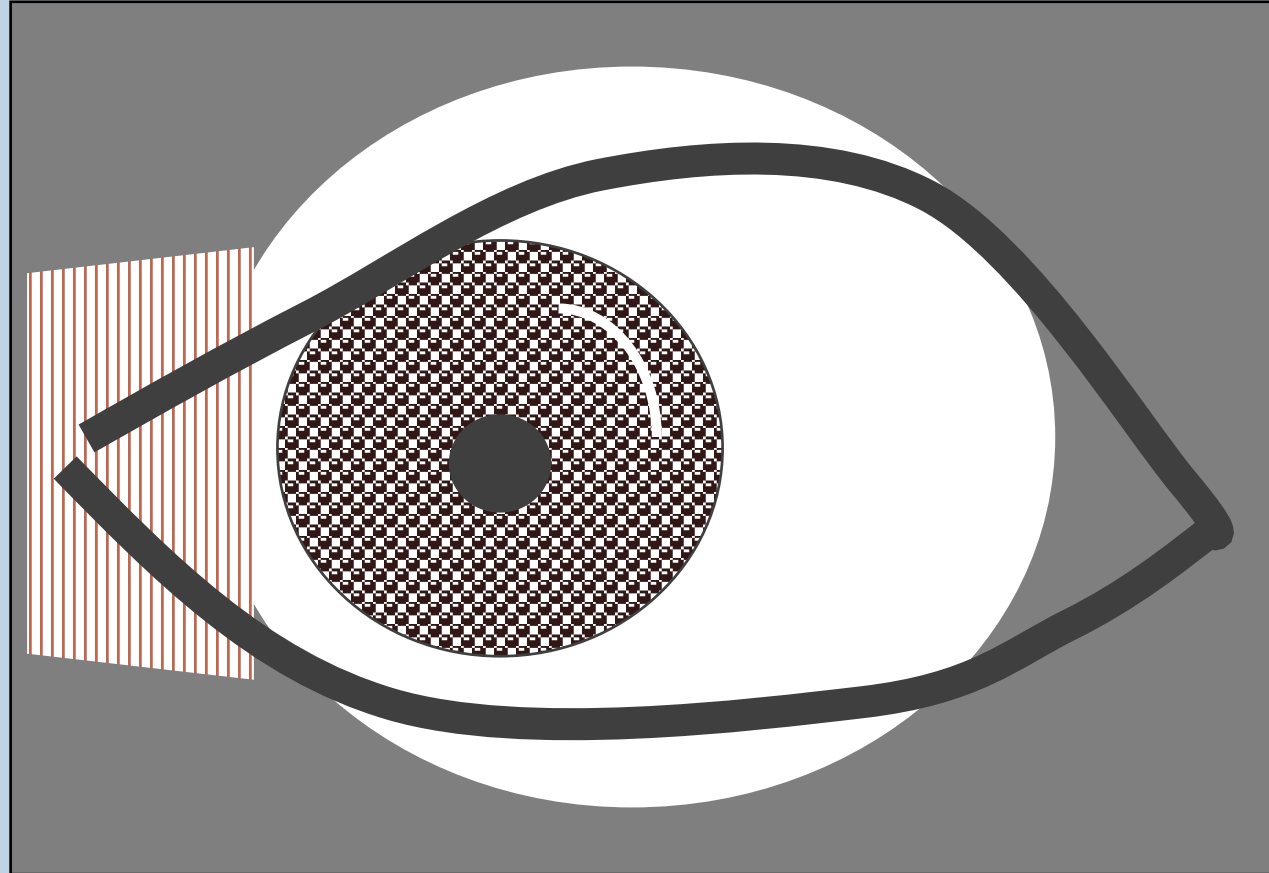
- Rectus lateralis
- Retractor globus oculi



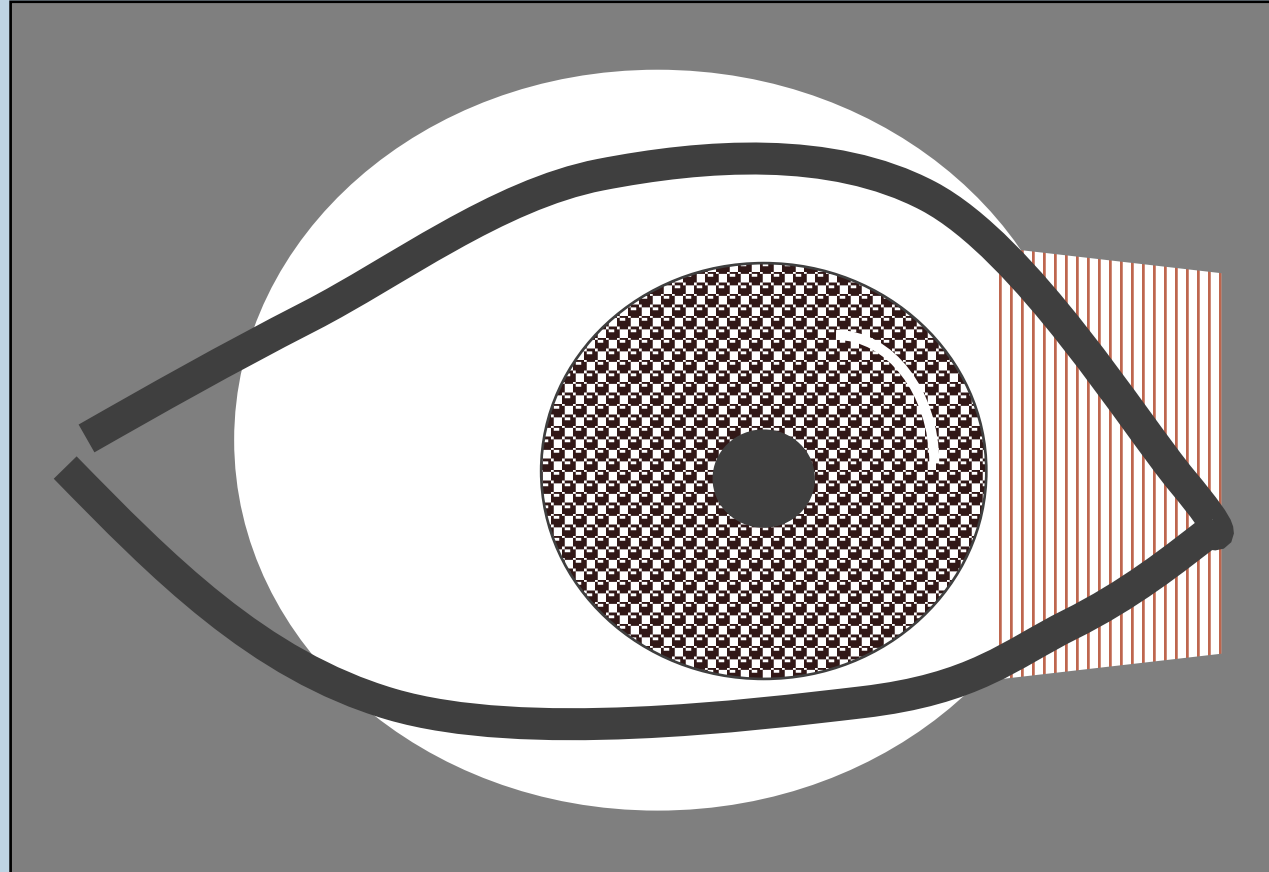
OD



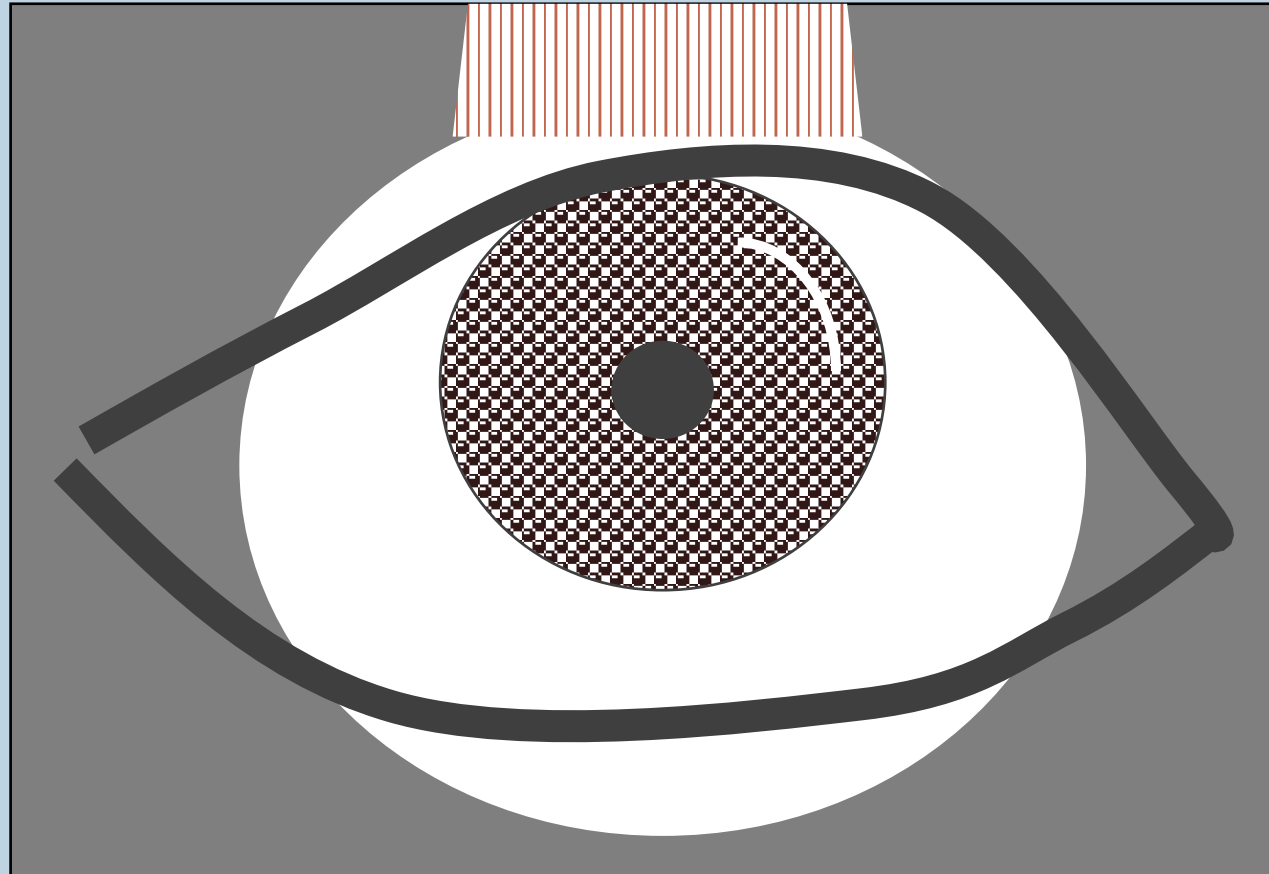
Rectus lateralis



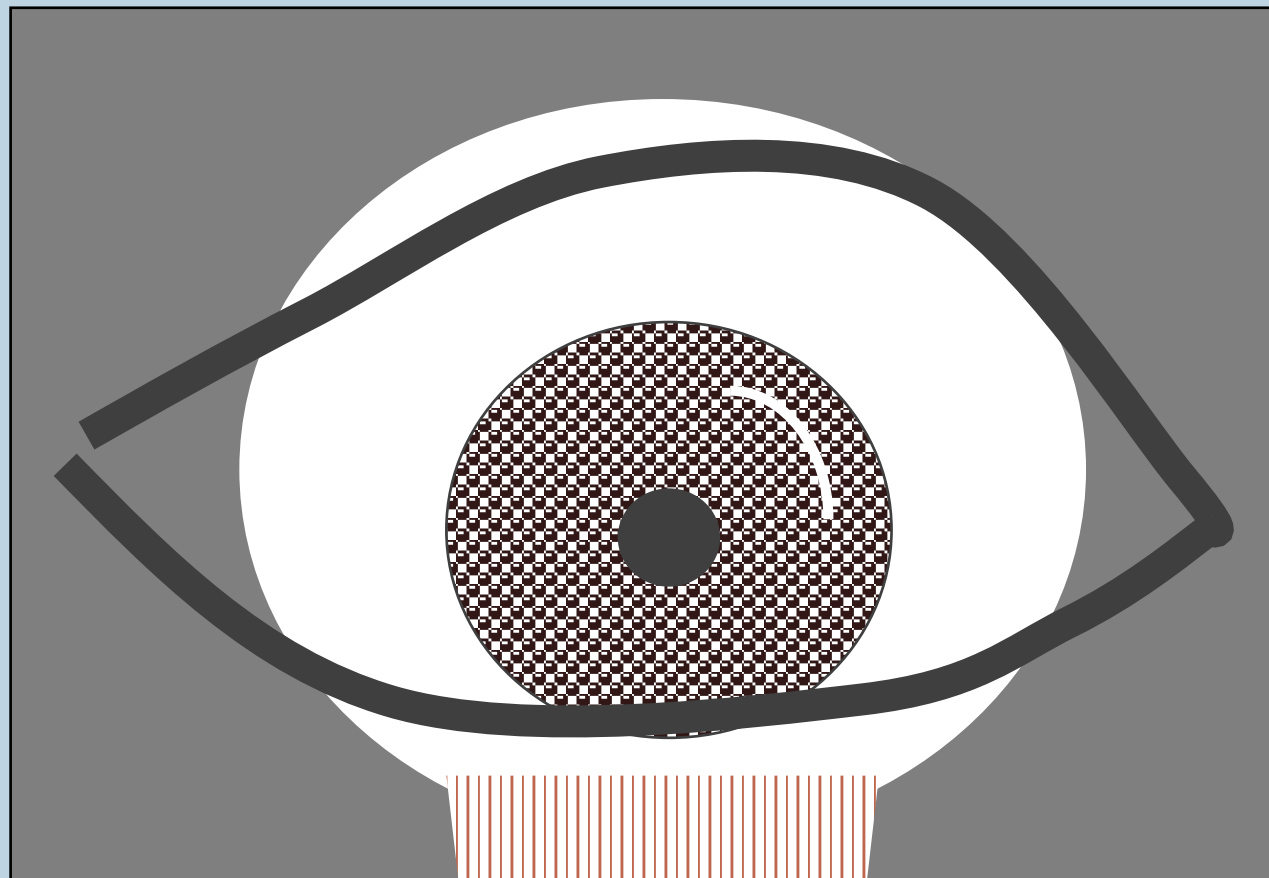
Rectus Medialis



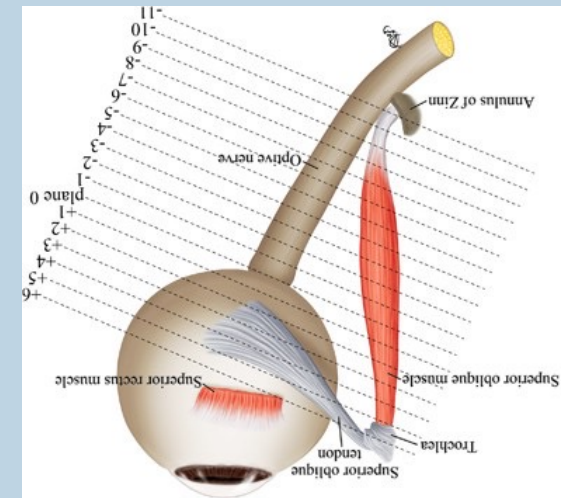
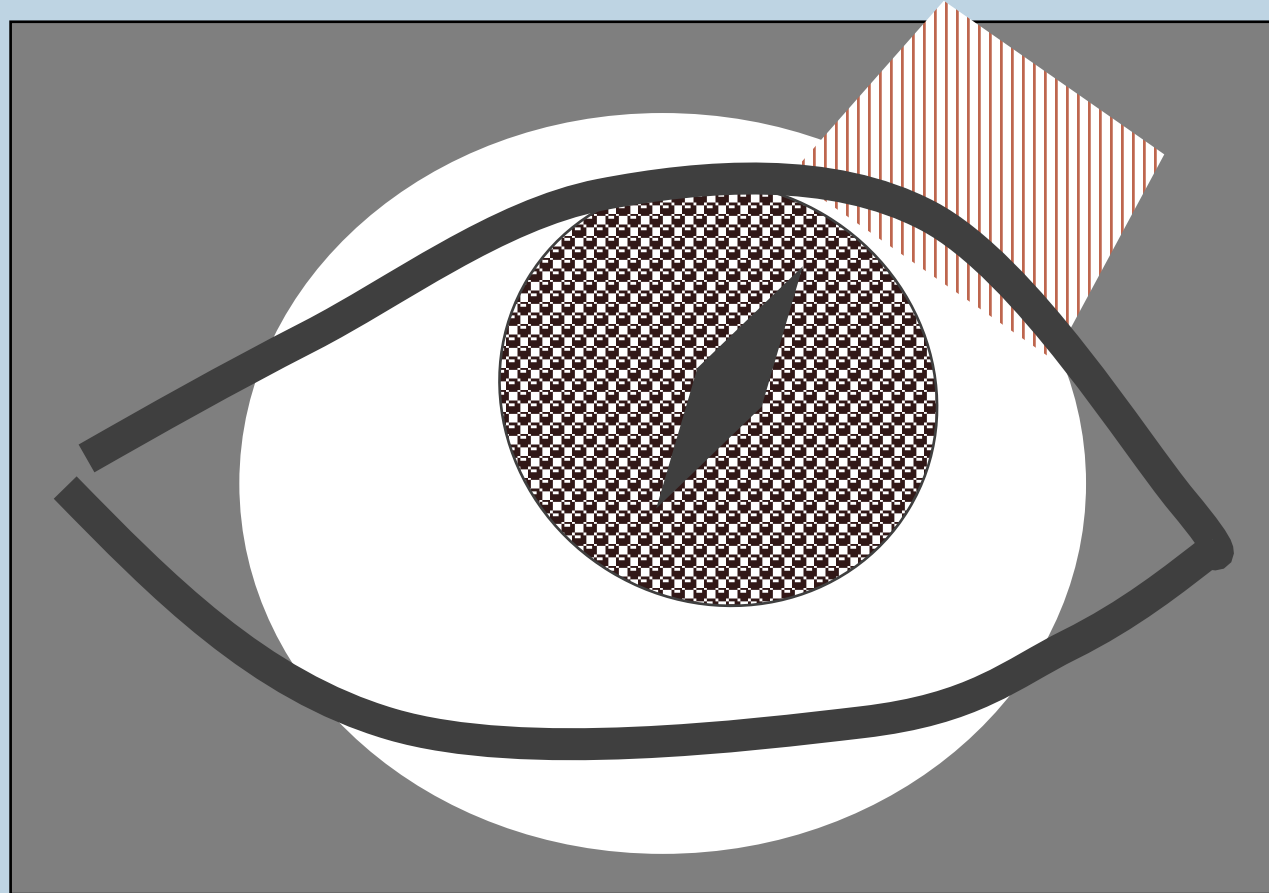
Rectus dorsalis



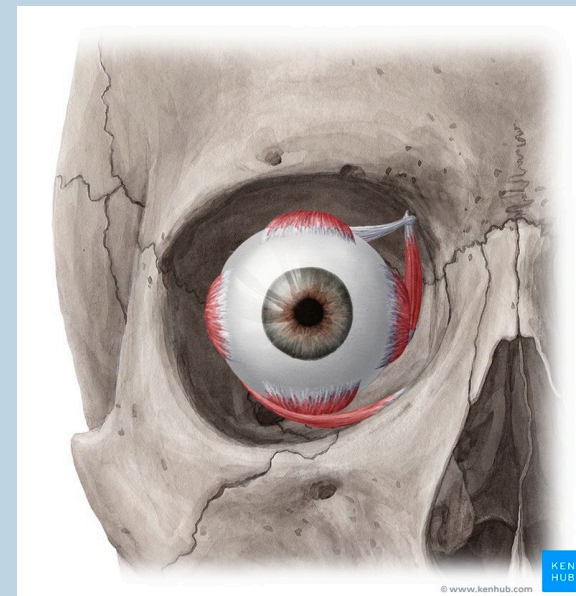
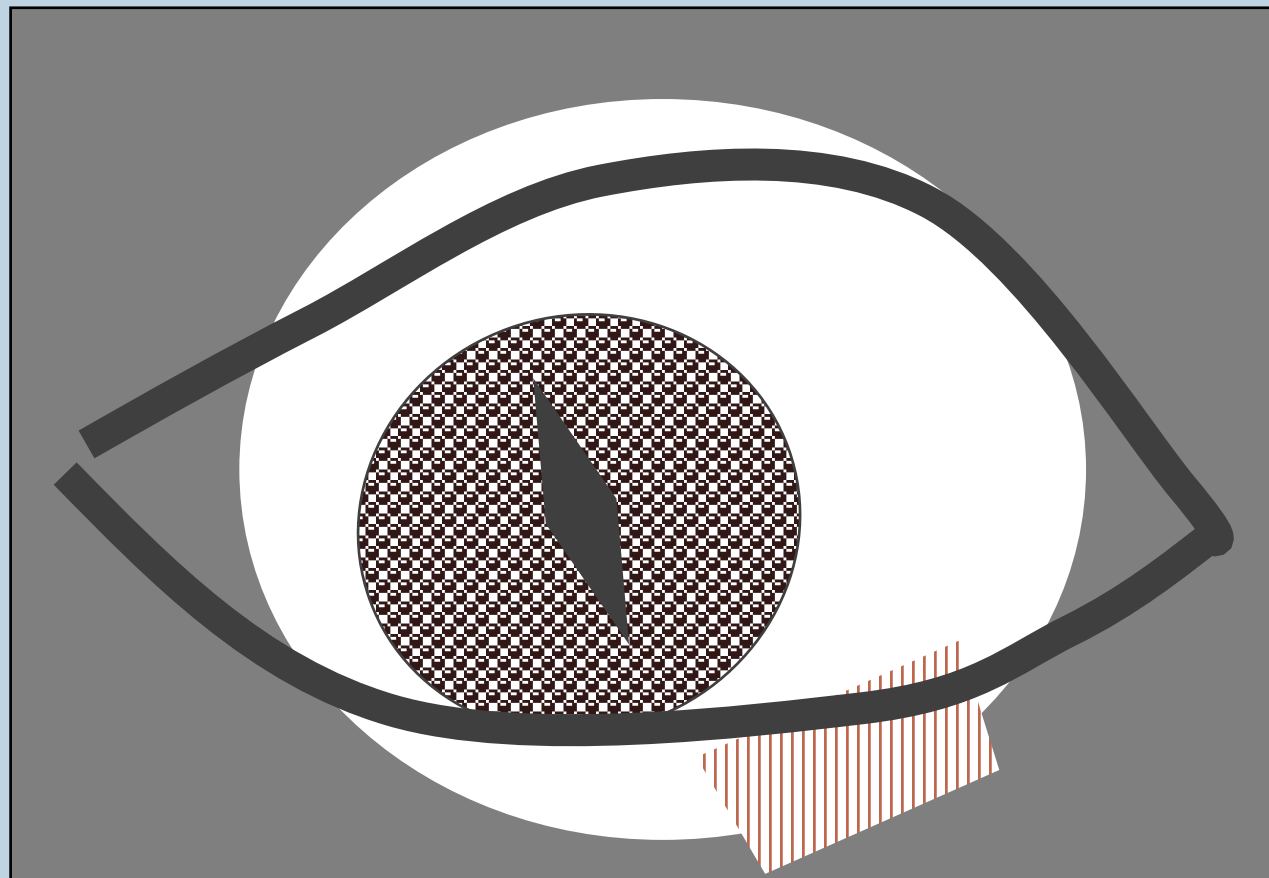
Rectus ventralis



Dorsal oblique



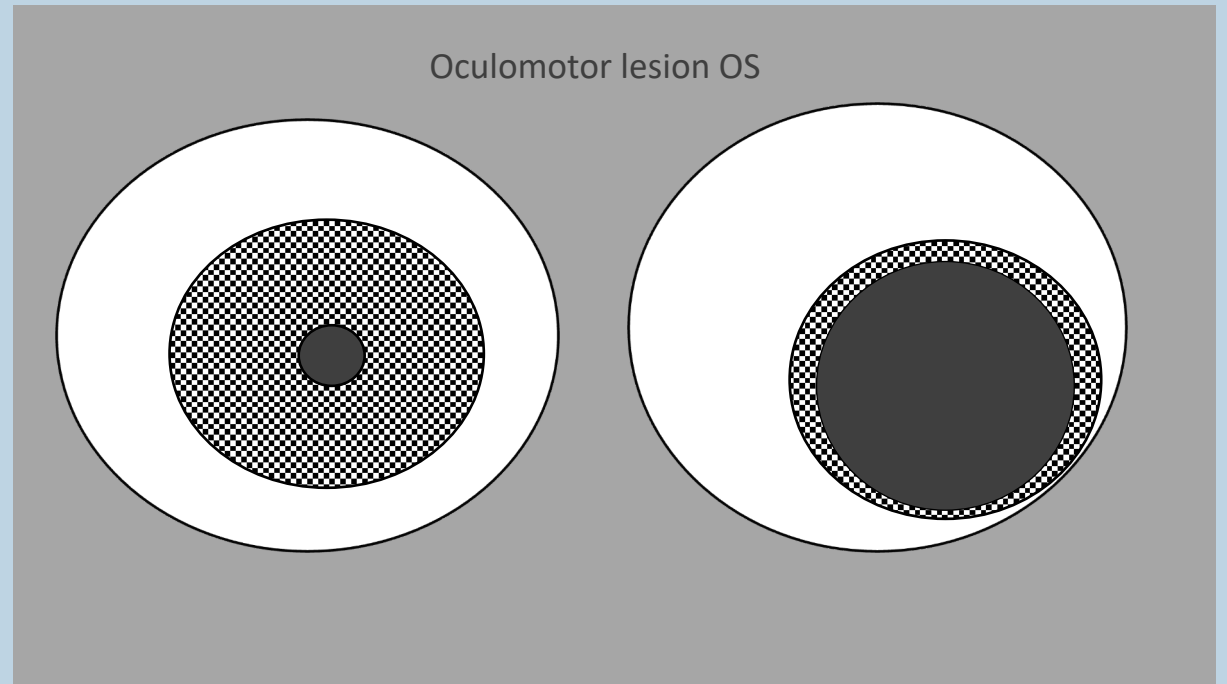
Ventral oblique



Strabismus

CN. III

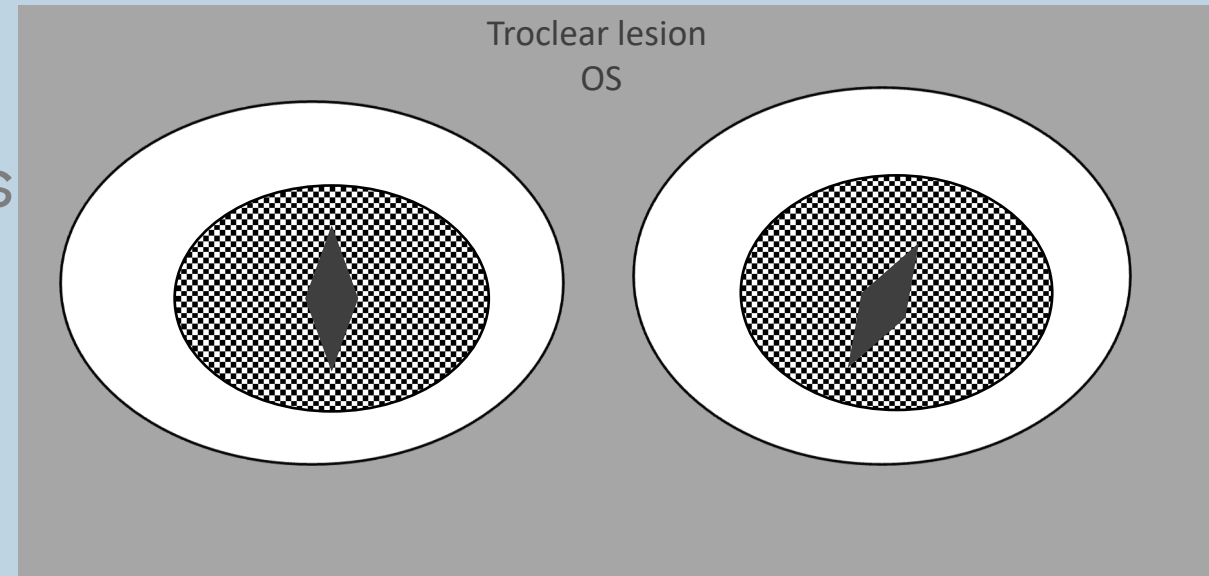
Lateral or ventrolateral
+/- mydriasis



Strabismus

Cn. IV

Extortion of the globe
Only seen in non-round pupils
Evaluation of the retinal vasculature

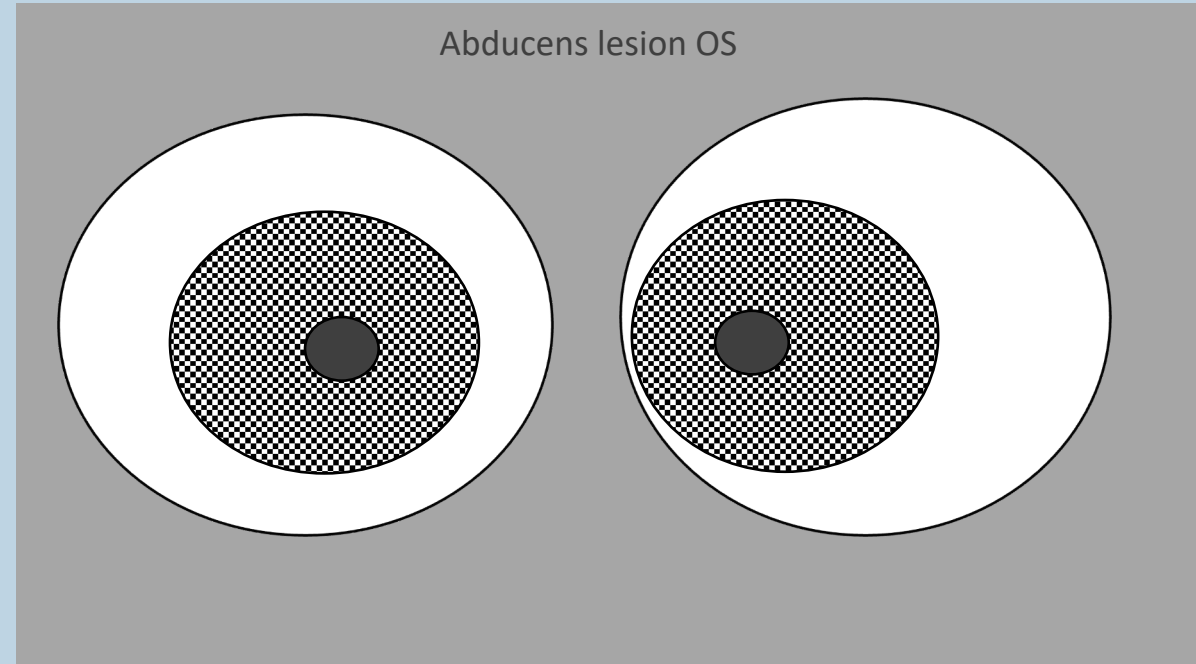


Strabismus

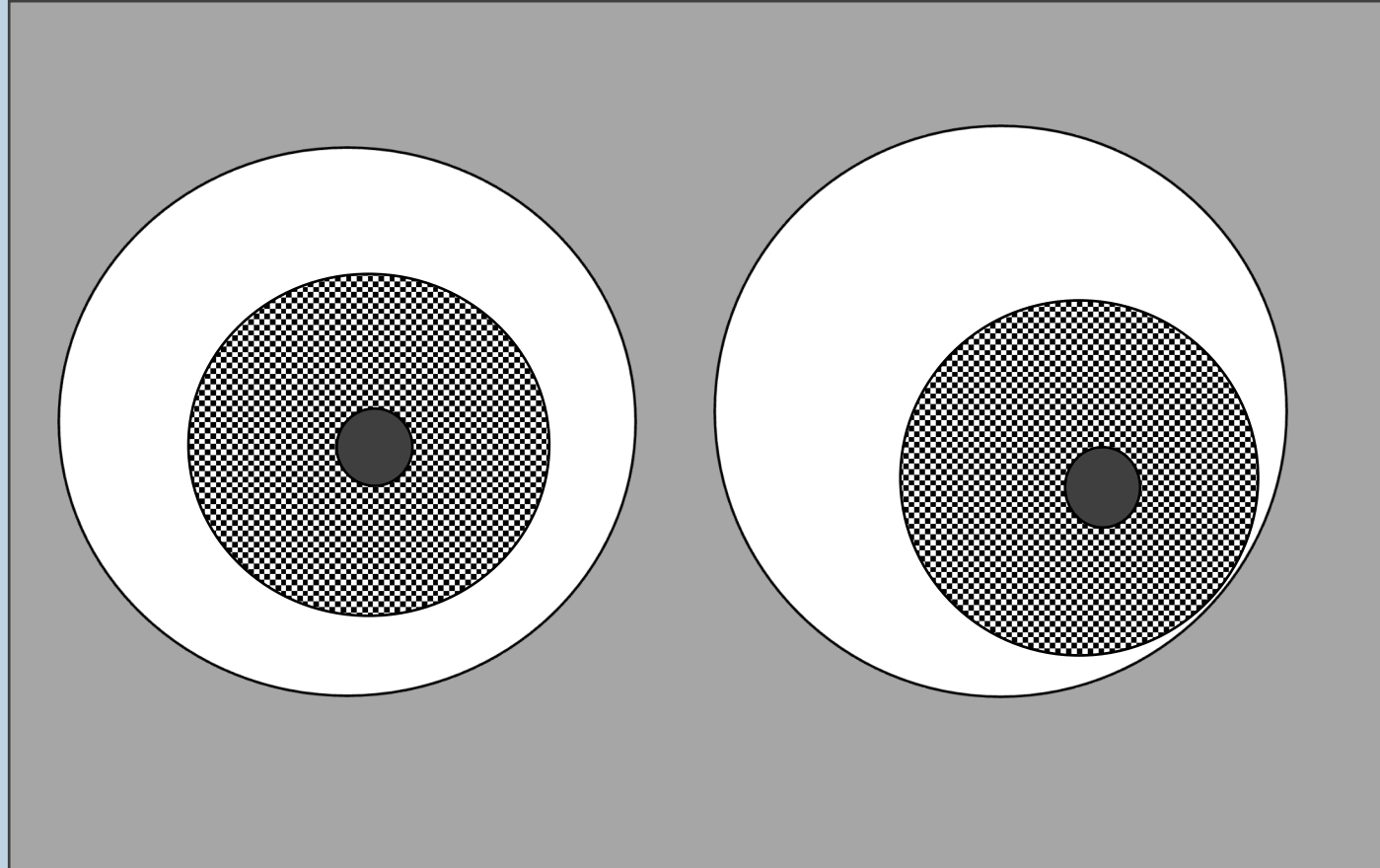
Cn. VI

Medial strabismus

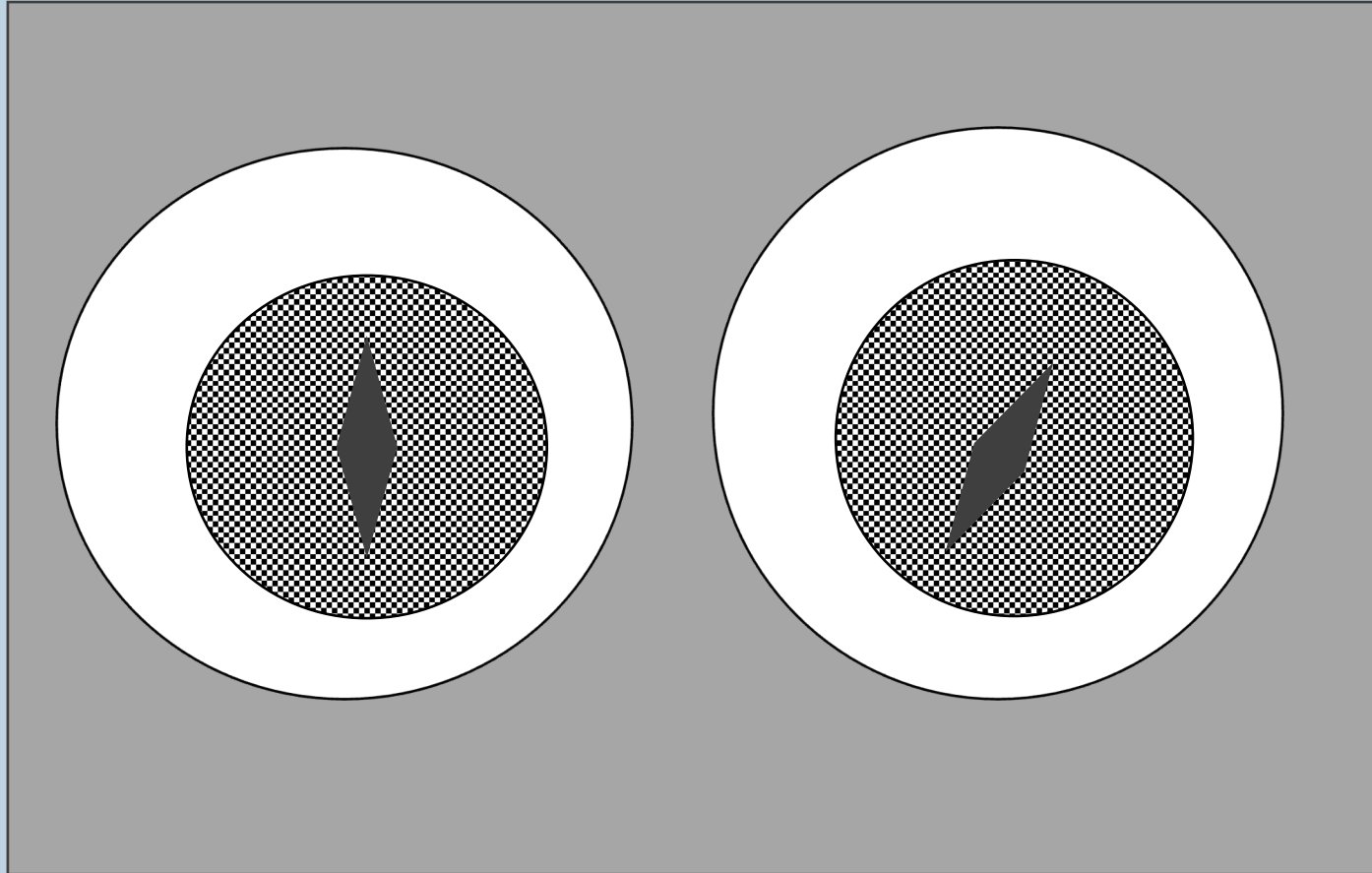
Absent on globe retraction



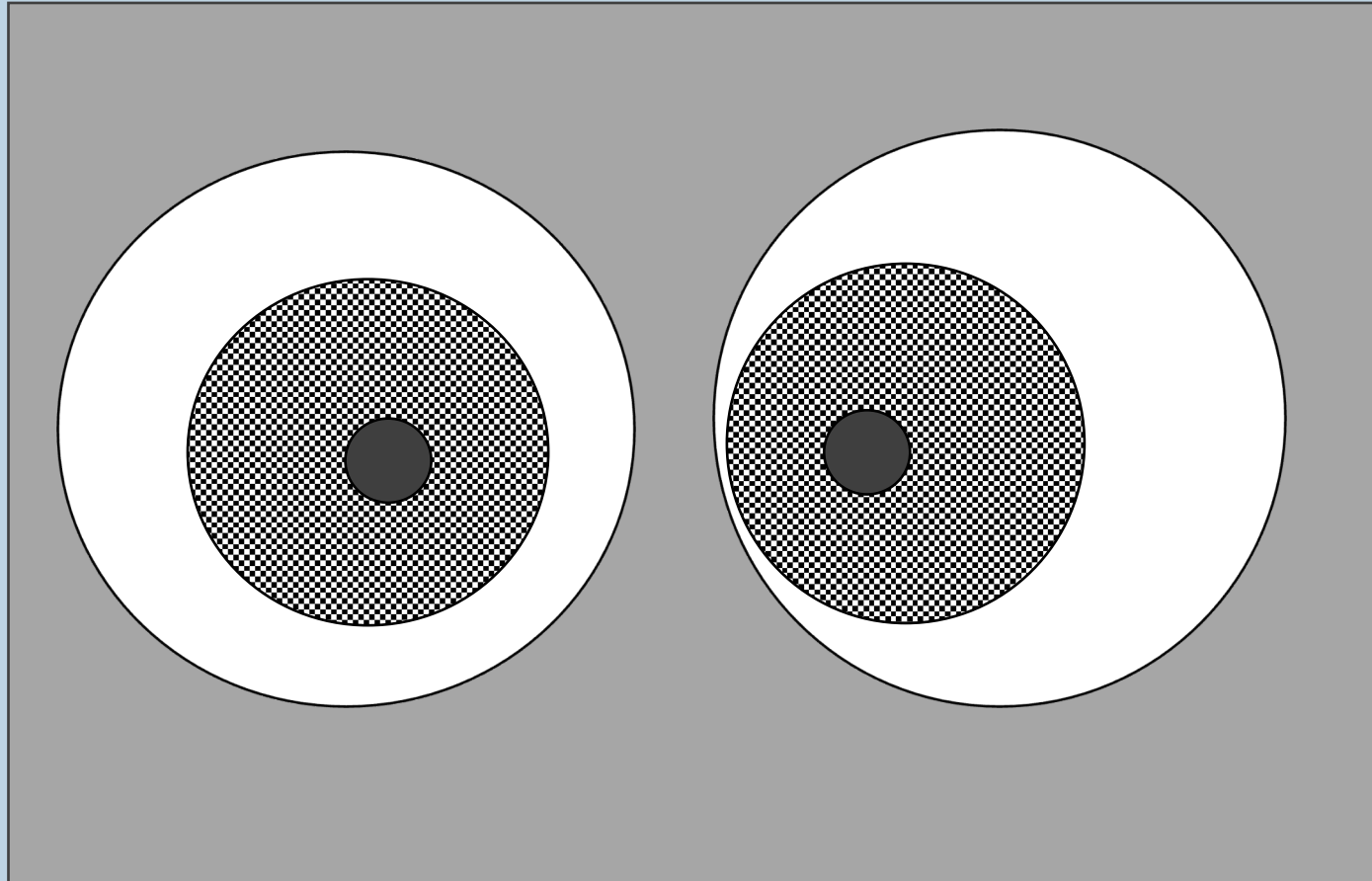
Strabismus cn.III (without autonomic involvement)



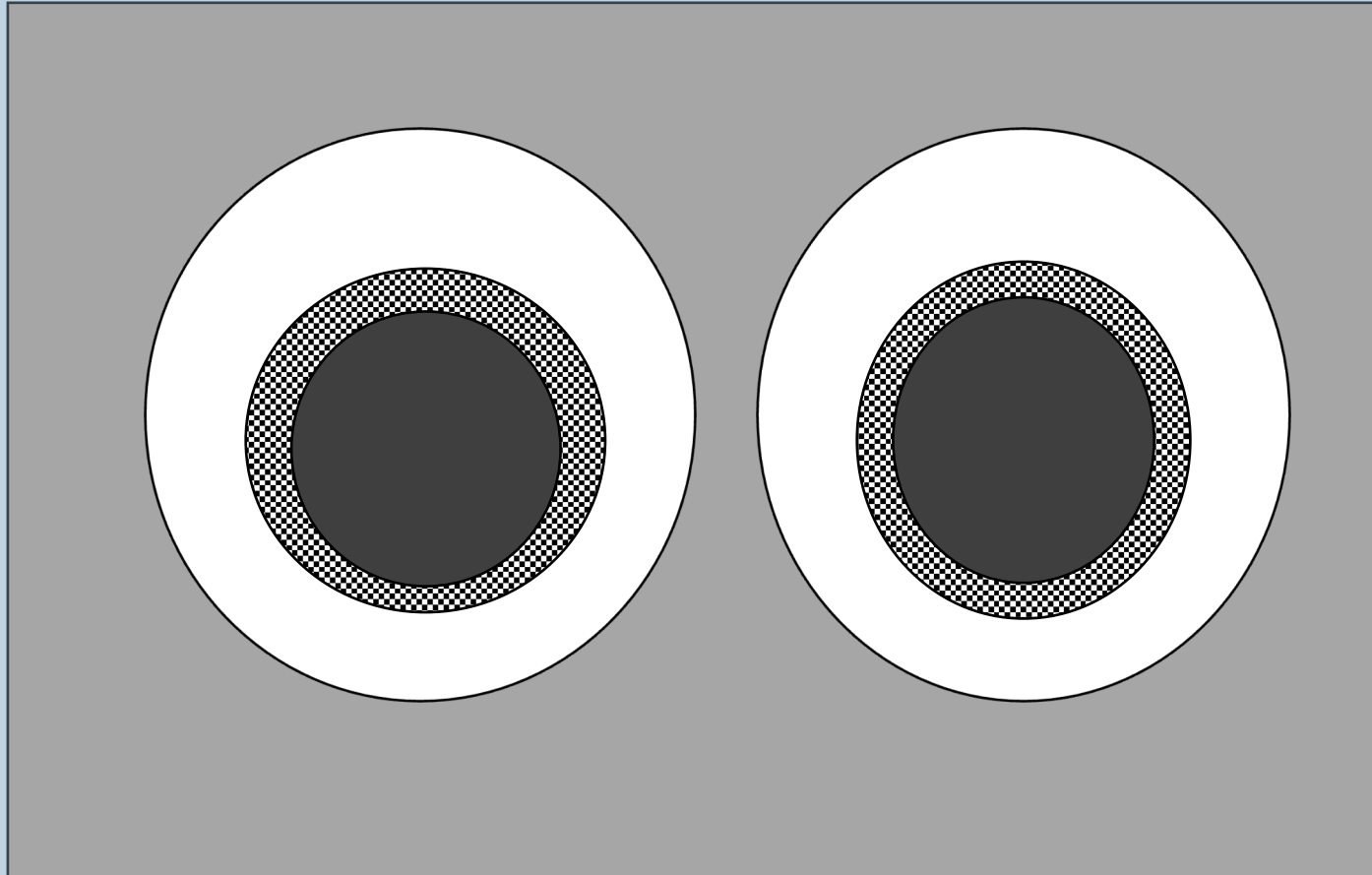
Globe deviation Troclear lesion OS



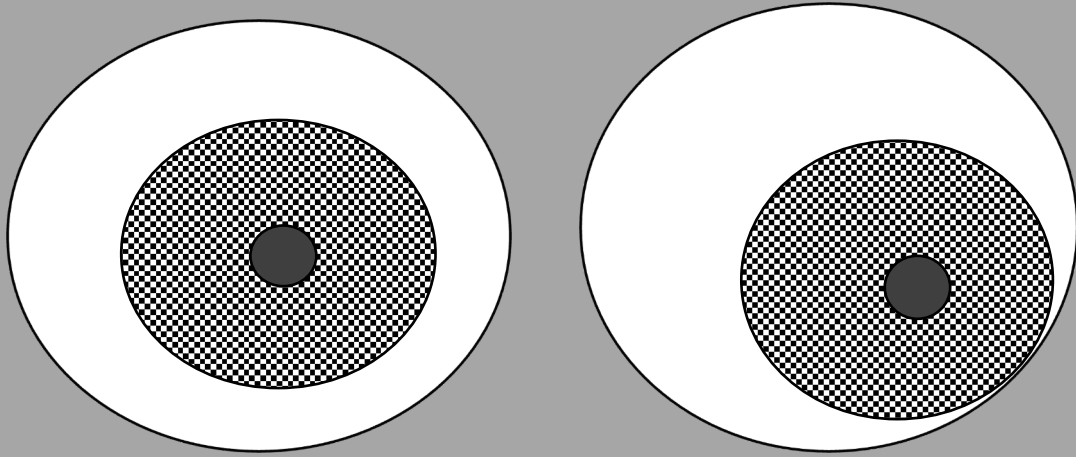
Abducents lesion OS



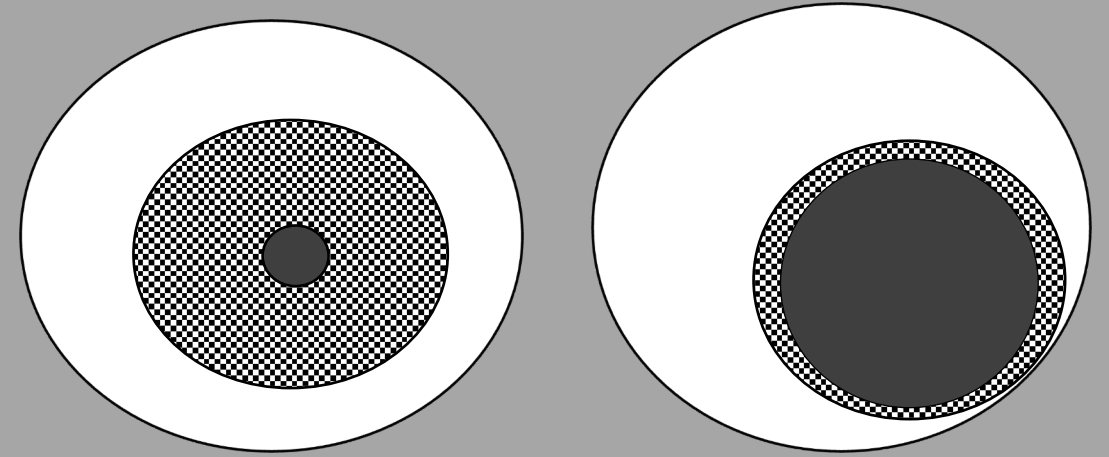
Internal and external ophthalmoplegia OU



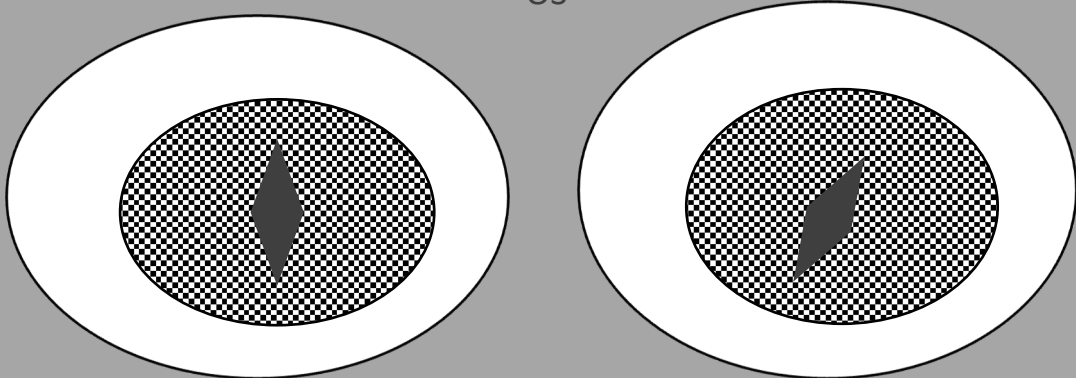
Oculomotor lesion OS



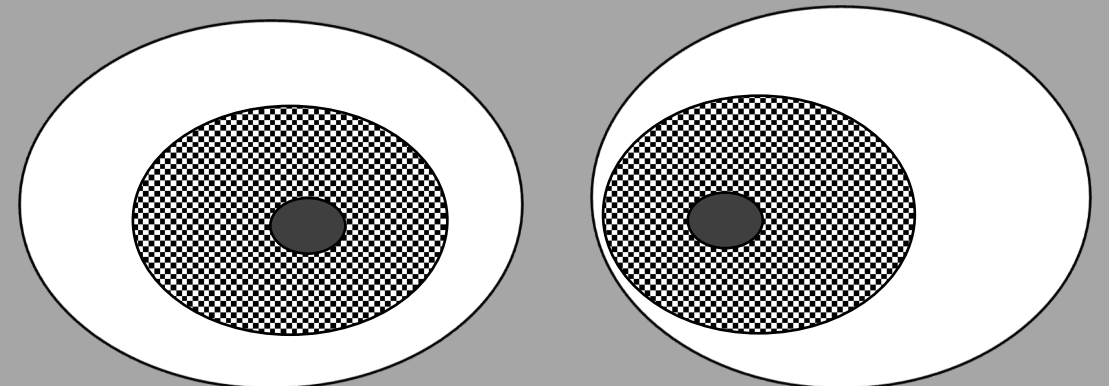
Oculomotor lesion OS



Troclear lesion OS



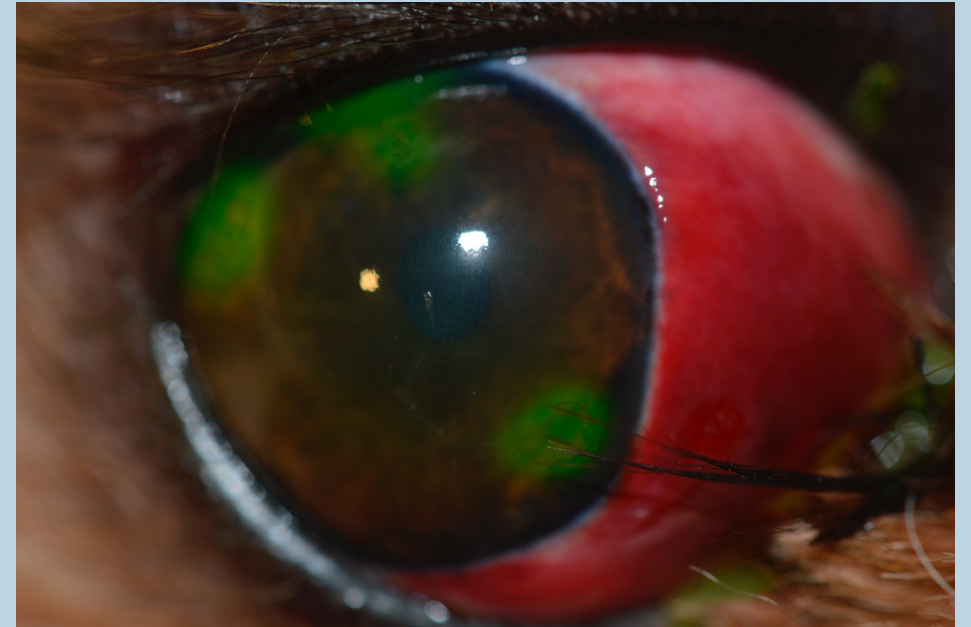
Abducens lesion OS



Orbit - Acquired abnormalities



Orbit - Acquired abnormalities- Trauma



Case 1: Ventral Strabismus OS



Case 1: Ventral Strabismus OS

3y old cross breed MN

Owners report he “looks weird”

Physical exam: NAD

Ophthalmic exam:

STT: 18-20mm/1min OD-OS

IOP: 12-14 mmHg OD-OS

PLR, dazzle reflexes NAD

Menace response +ve OU

Oculovestibular movements: ventral globe deviation OS,
movements OS slightly restricted

No difficulty at retropulsion



AHT

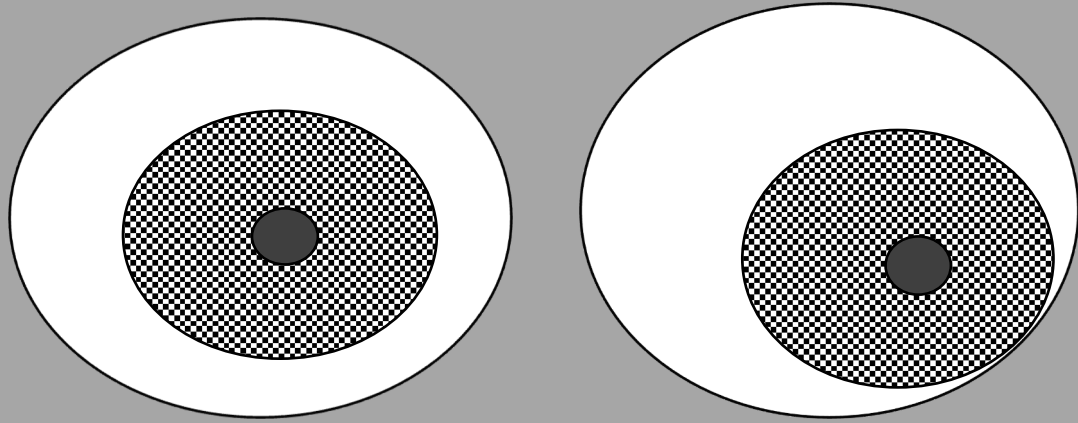
Case 1: Ventral Strabismus OS

Is the globe deviation:

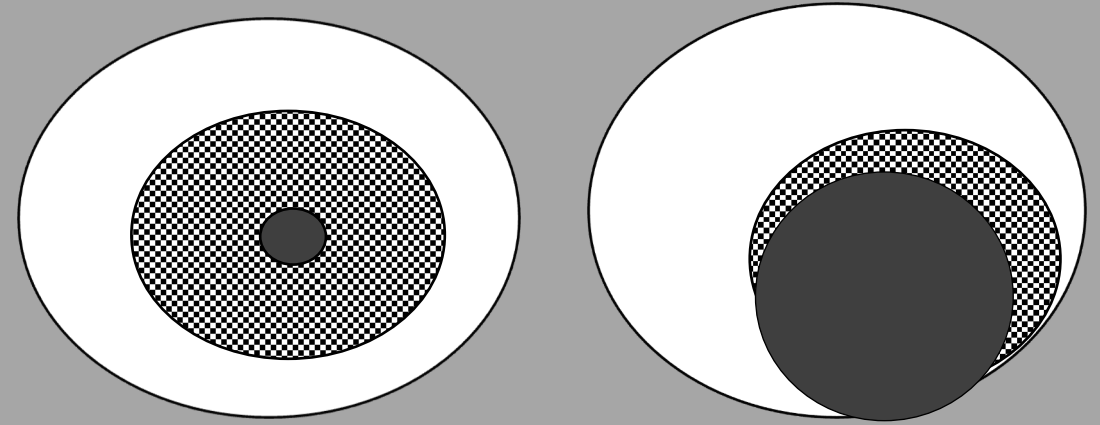
A) due to neurologic condition, if so, which one?

B) due to a mechanical impediment within the orbit? If so, list differentials

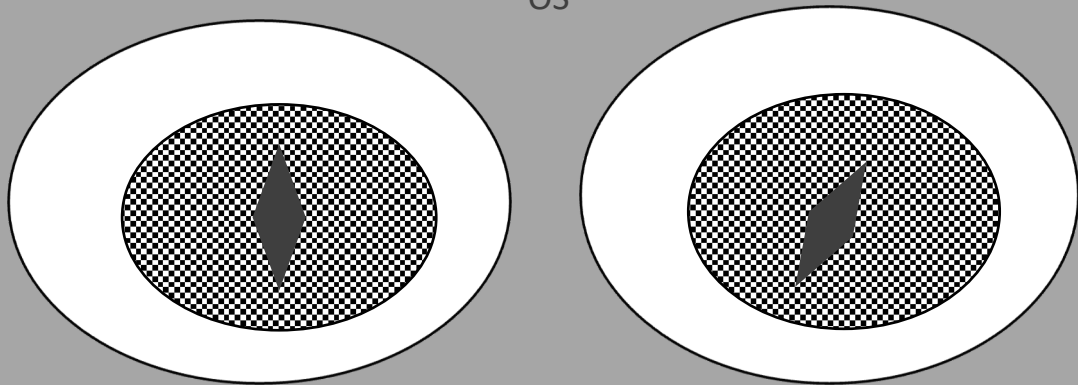
Oculomotor lesion OS



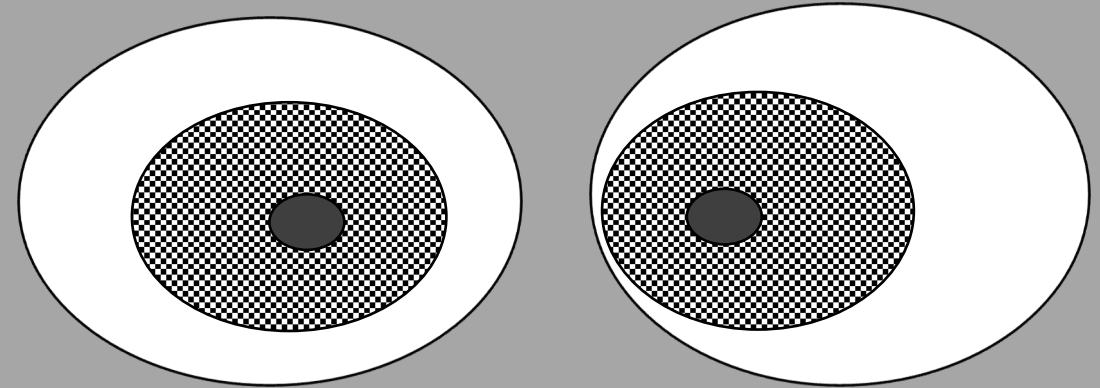
Oculomotor lesion OS



Troclear lesion
OS



Abducens lesion OS



Rectus ventralis myositis



Localization of intra or extraconal process

SLATTER'S FUNDAMENTALS OF VETERINARY OPHTHALMOLOGY,
EDITION 4

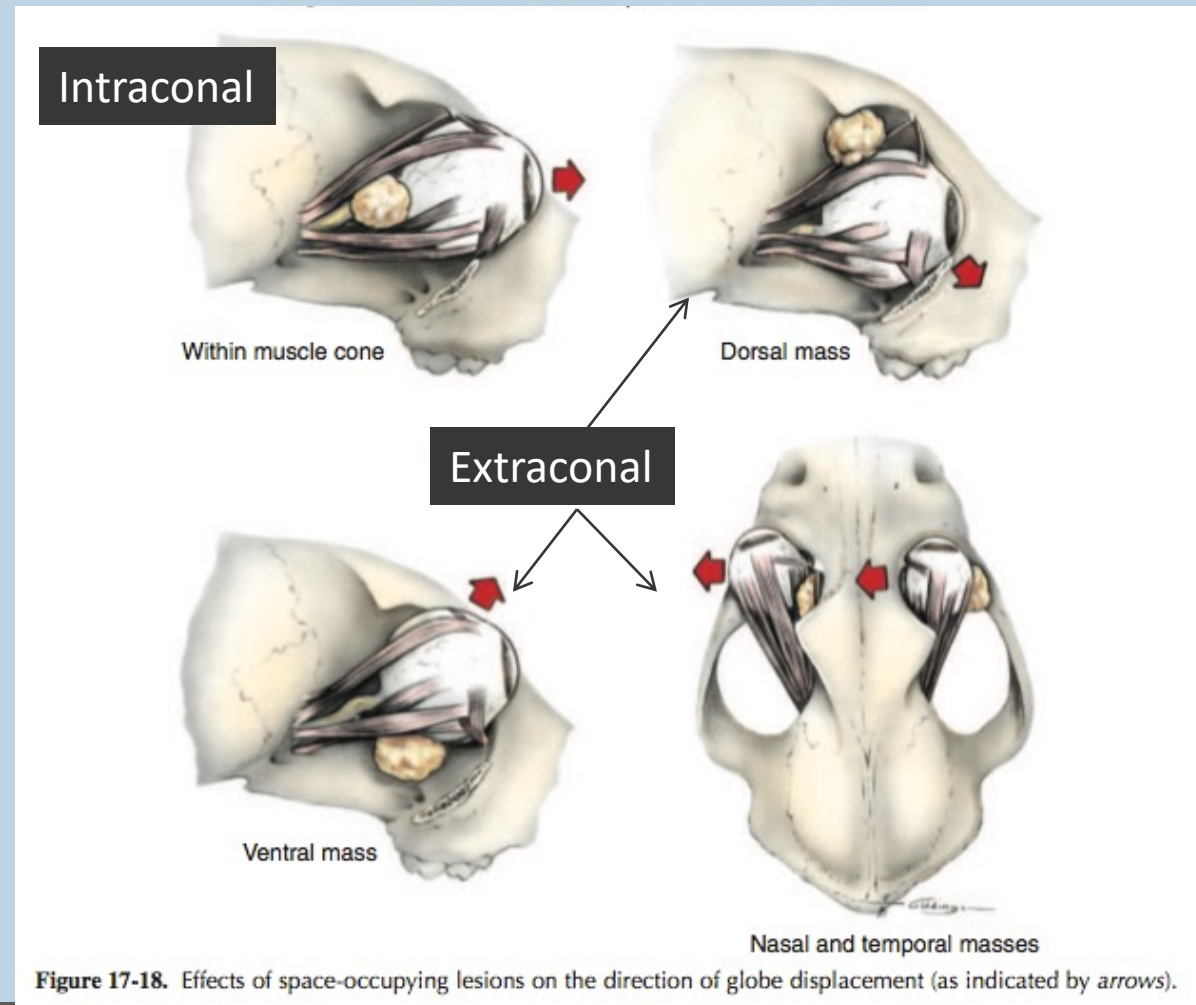


Figure 17-18. Effects of space-occupying lesions on the direction of globe displacement (as indicated by arrows).

Orbit - Acquired abnormalities

Fibrosis extraocular muscle myositis with restrictive strabismus

Rare

Enophthalmos and globe deviation

Visual deficits due to globe deviation

Diagnosis:

- Advanced imaging

- Muscle biopsy of affected EOM

- Lymphocytic/plasmacytic monocelular inflammation

Treatment:

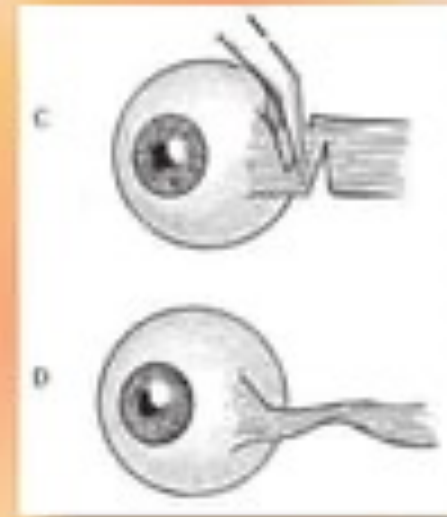
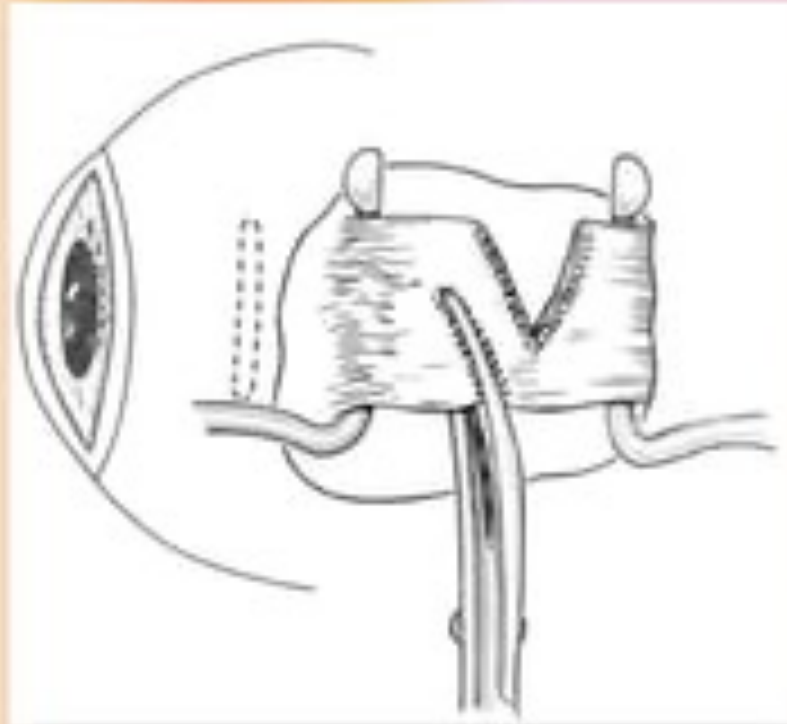
- Respond poorly to immunosuppressive agents

- Surgery can be considered



Small Animal Ophthalmology, a problem oriented approach. Pfeiffer 2009

Marginal Myotomy



Extraocular muscle myositis and restrictive strabismus in 10 dogs

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Abstract

Ten cases of uni- or bilateral restrictive ventromedial strabismus in young dogs of different breeds are reported. Clinically, abnormalities were restricted to the extraocular muscles with sparing of the masticatory muscles and limb muscles. This was supported in some cases by imaging studies, electrophysiology, and immunocytochemical assay for antibodies against type 2M fibers. Histologically, there was variable lymphocytic plasmacytic mononuclear cell infiltration and fibrosis. This disorder is similar in many aspects to chronic masticatory myositis with focal myositis and subsequent fibrosis. Surgical correction may restore eye position and vision.

Key Words: dog, extraocular muscles, fibrosis, myositis, strabismus

Table 1. Summary of the 10 dogs presented with extraocular muscle myositis and restrictive strabismus.

Case	Breed	Age	Gender	Eye	Time since onset (weeks)	History/Ophthalmologic findings
1	Irish Wolfhound	4y	F	OU	4	Ventromedial strabismus, first OD then OS, OD only sclera visible, blind, OS rotated nasally
2	Irish Wolfhound	2y	F	OU	4	Medial strabismus OU, blind, full sister of case 3, two related dogs affected
3	Irish Wolfhound	2y	M	OS	6	Ventral strabismus OS, only sclera visible, blind, two related dogs affected
4	Shar Pei, fawn	5m	M	OU	2	Ventromedial strabismus, blind
5	Shar Pei, black	4m	M	OU	3	Ventromedial strabismus, first OD then OS, blind
6	Akita	2,5y	F	OD	16	Ventral strabismus OD
7	Akita	2y	M	OS	12	Ventral strabismus OS, only sclera visible, blind half sister affected OU
8	Akita	2y	M	OD	3	Medial strabismus OD, only sclera visible, blind
9	Golden Retriever	1y	M	OS	4	Ventral strabismus OS, only sclera visible, blind
10	Dalmatian	2y	F	OD	4	Ventromedial strabismus OD, marked enophthalmus OD

Globe deviations



Extraocular miositis muscle myositis



AHT

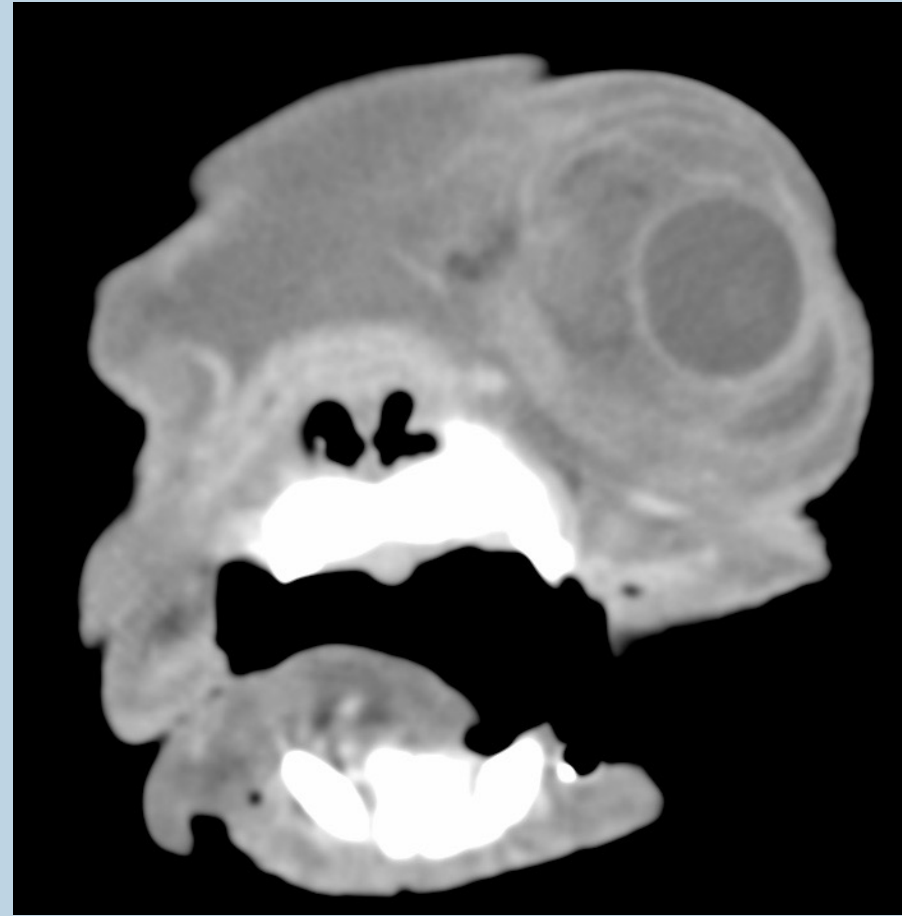


Orbit – Occupying lesions

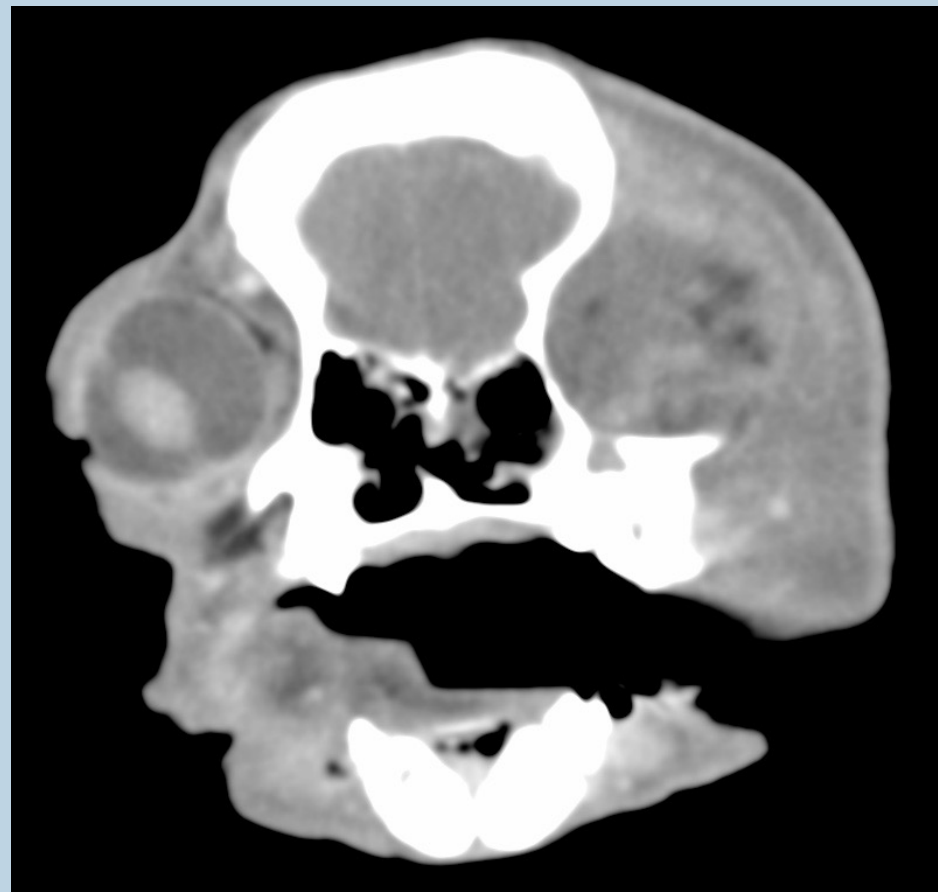
Orbital abscess / Cellulitis / Neoplasia – clinical signs



Vilma, pug 2y, FS

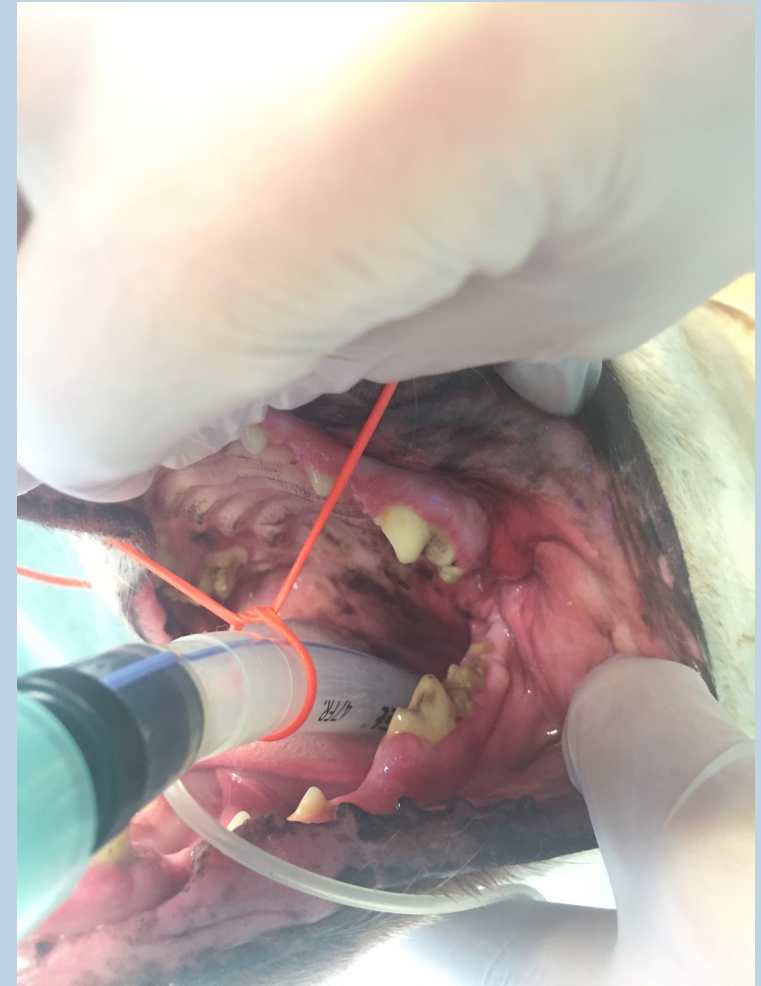


Vilma, pug 2y, FS

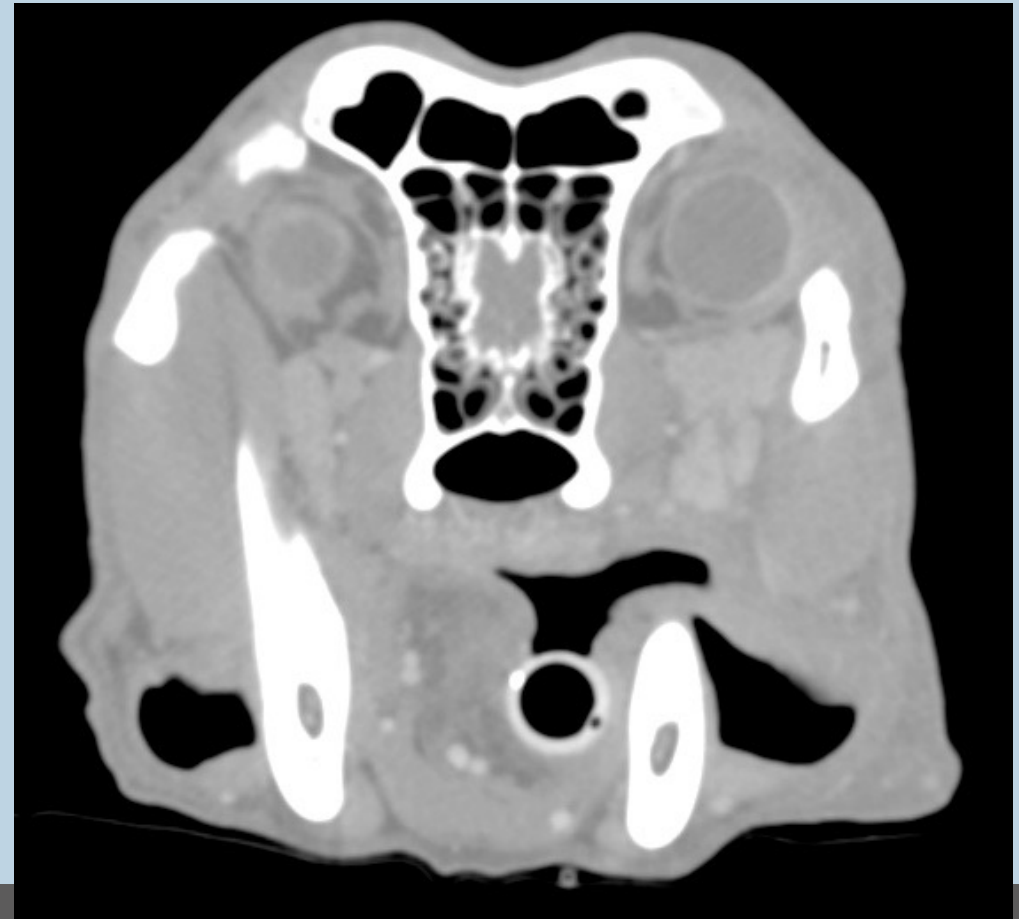


Ziggy, lab 5y old MN

- Swollen left side face
- Hyporexia
- Halitosis
- Reduced retropulsion



Ziggy, lab 5y old MN



Ziggy, lab 5y old MN

- FNA of the affected gland
 - can be disappointing
- If lymphadenopathy, consider FNA

Sialadenitis/osis treatment

- Sialoadenitis/osis
- Etiology unclear
- Treatment controversial
 - Empirical broad spectrum antibiotics and antiinflammatories
- Supportive care of globe if exposure

Retro-orbital disease – rule of thumb

Orbital Neoplasia

- Chronic Insidious
- Middle age / elderly
- Difficulty opening mouth

Origin:

- > Invading orbit from nasal tumours
- > Orbit can invade skull
- > Metastatic

Retro-orbital abscess

- Acute
- Young
- Anorexia
- Difficulty opening mouth

Occupying lesions causing globe deviation



Betty, EBD, FS 4y, FS

Eye abnormal position
Sneezing



Courtesy of Natalia Escanilla

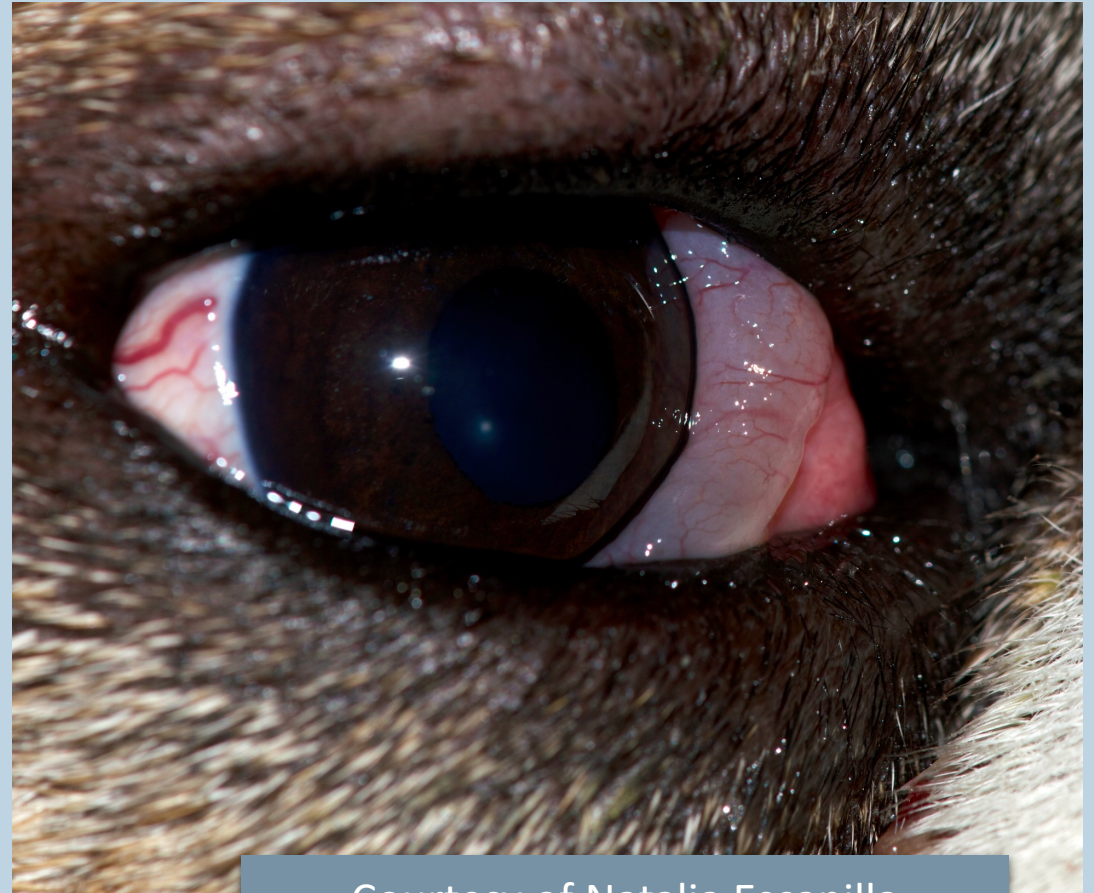
Betty, EBD, FS 4y, FS

Difficulty at retropulsion

Chemosis medially

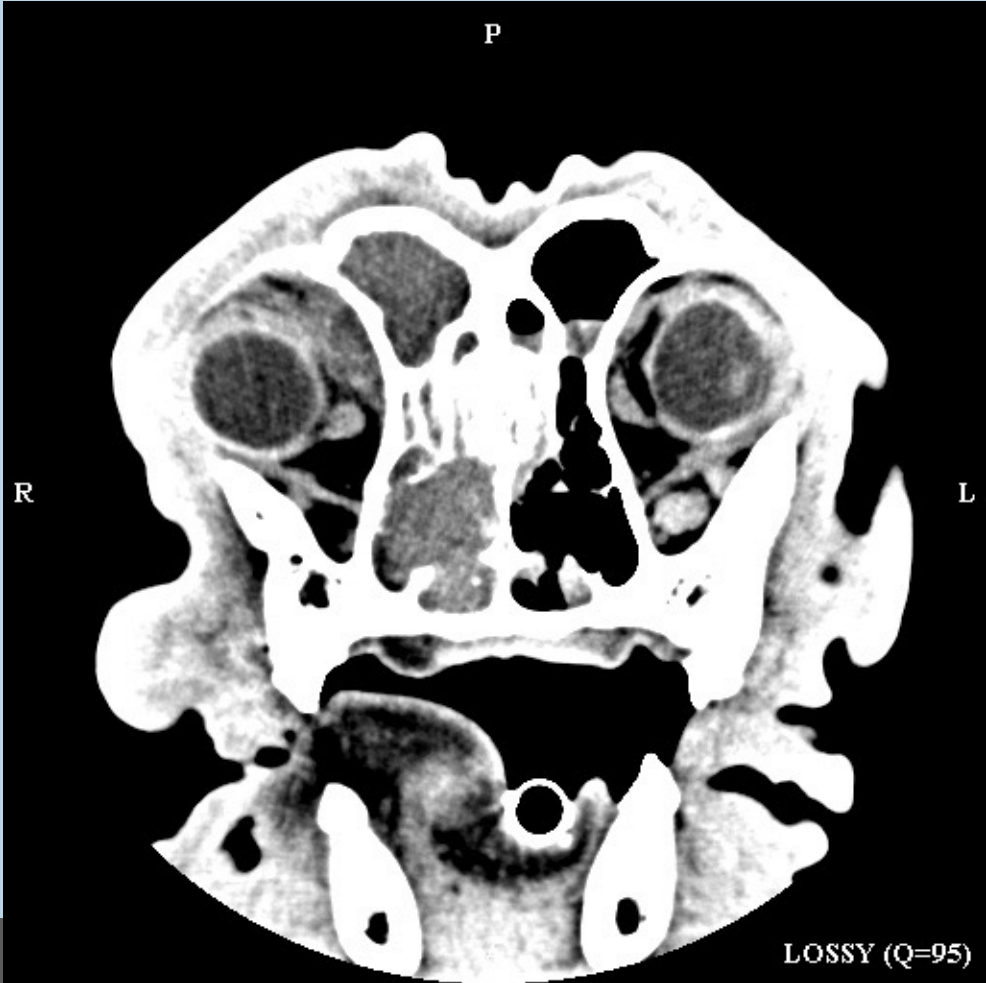
No abnormalities within the globe

No pain when opening the mouth



Courtesy of Natalia Escanilla

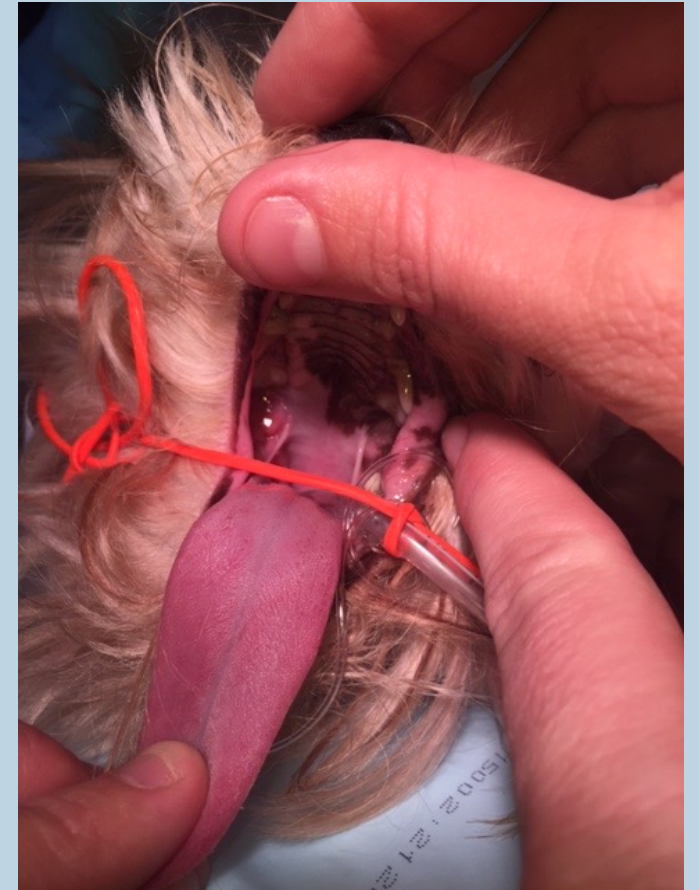
Betty, EBD, FS 4y, FS



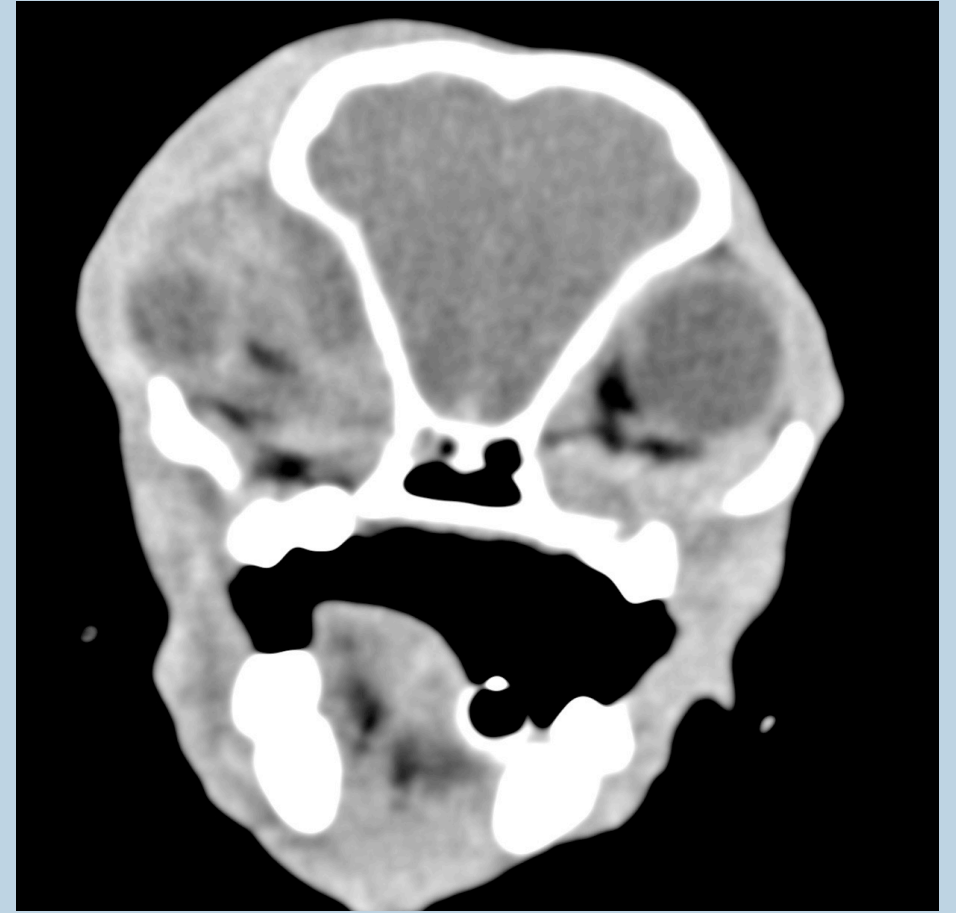
An emergency

- YKT 4 FS
- “Corneal ulcer”, possible globe deviation OS. Swelling of the upper eyelid. OD NAD
- Hyporexic for the last few days
- She was aggressive and could not examine her well awake, but saw:
 - Third eyelid protrusion OS
 - Slight difficulty at retropulsion
 - Superficial corneal ulcer
 - Possible globe deviation

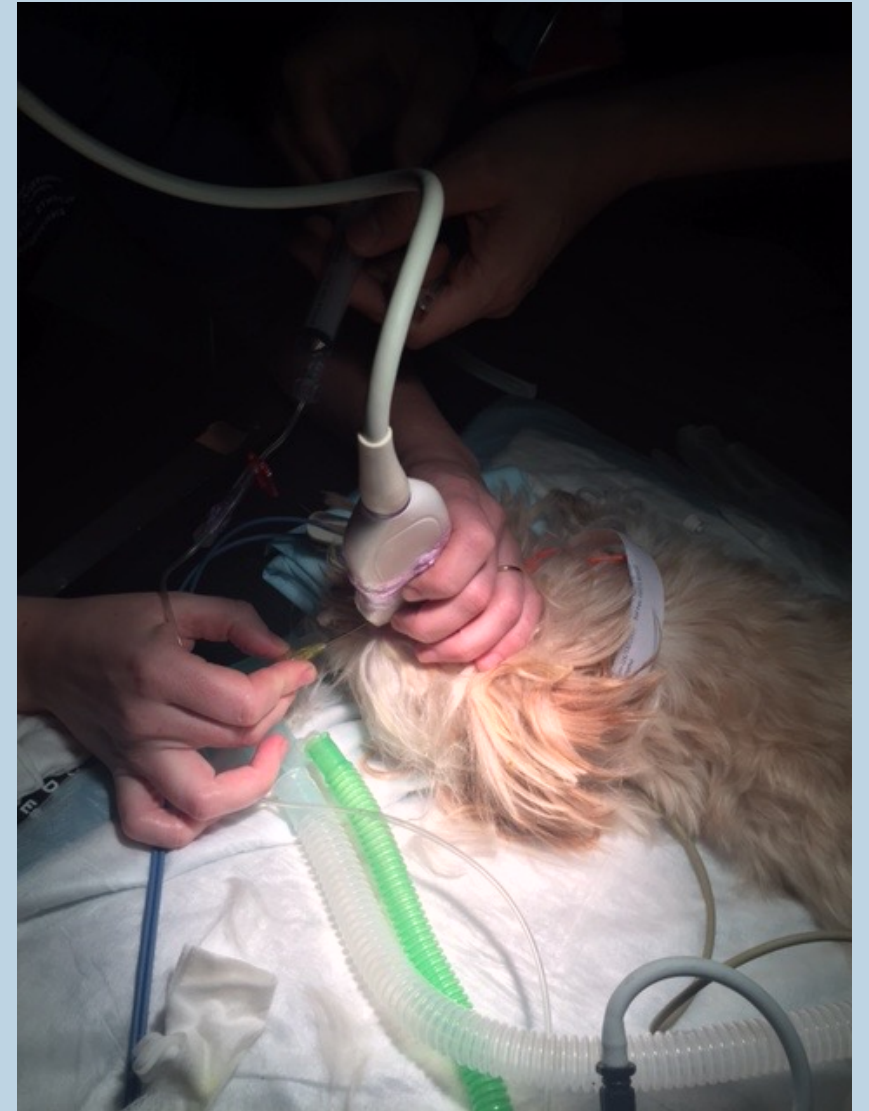
Appreciate the third eyelid protrusion and the upper right eyelid hyperhemia



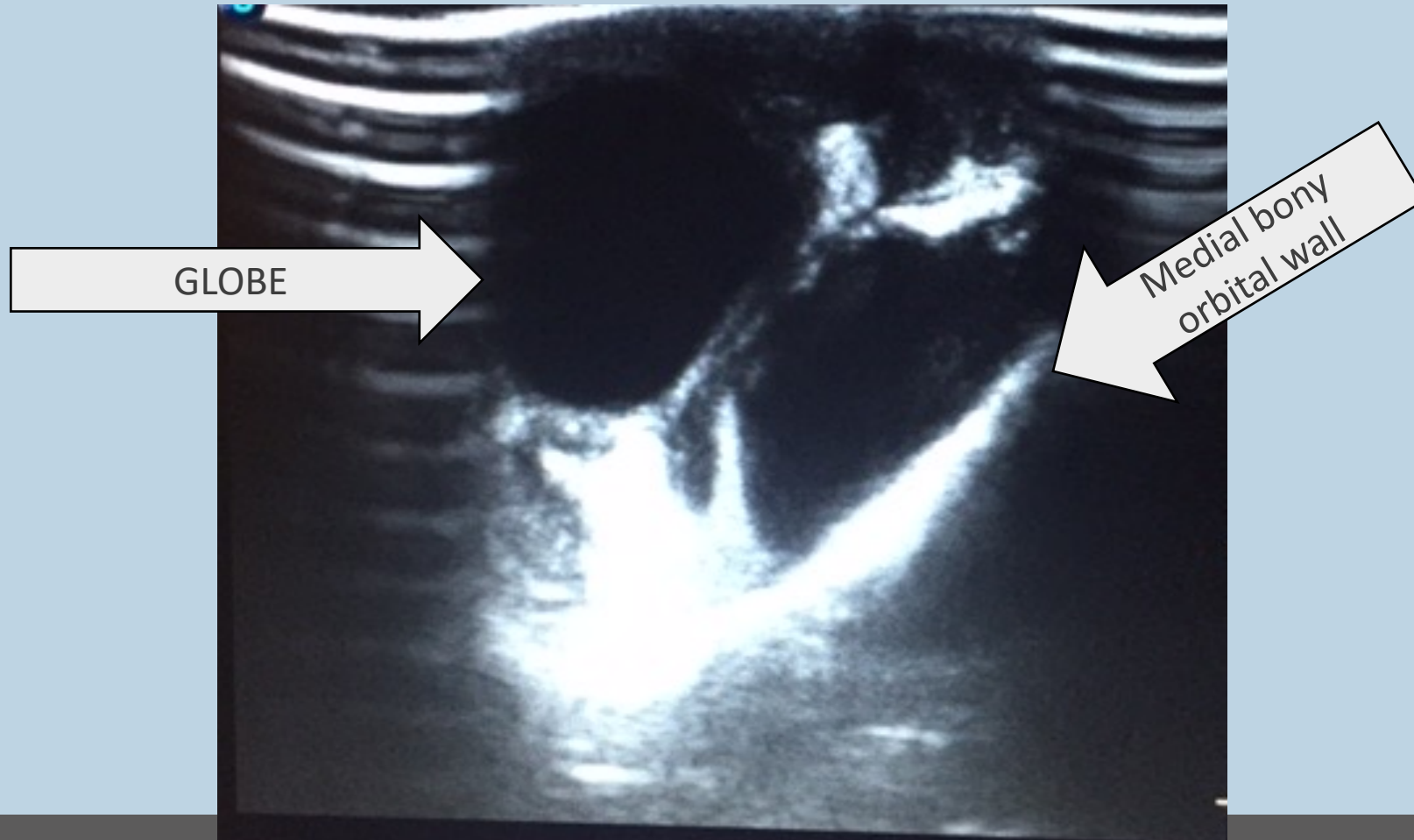
Head CT



Ultrasound guided aspiration



Ultrasound temporal approach



Aims

Be able to identify the neurologic types of globe deviation

Understand EOM anatomy and EOM function

To be able to examine and identify orbital diseases

Plan orbital case work up