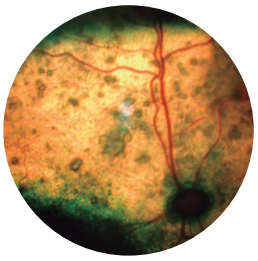
How to perform an eye examination to assess lesions associated with hypertension in geriatric cats?

Target organ damage (TOD) occurs when the SBP is consistently >140mmHG. The four most common organs/ organ systems affected are the eyes, the kidneys, the heart and the nervous system.

Up to 83% of hypertensive cats present with a primary complaint of sudden or progressive blindness and the frequency of ocular lesions has been reported to be as high as 100% in cats with hypertension[1,2]. Common lesions seen in the eyes of cats with hypertension include, retinal oedema, retinal detachment, hyphaema, retinal vessel tortuosity and retinal haemorrhage. So, a good place to start is with an ophthalmic exam when looking for TOD to support your diagnosis of hypertension.

Evaluating ocular TOD in practice is commonly done via direct and indirect ophthalmoscopy. In the following how-to guide, we will show you how to perform these examinations successfully.

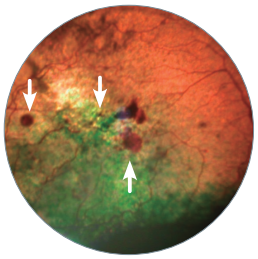
With all ophthalmic examinations the best results are gained if the patient is allowed to acclimatise to its surrounding and is examined in a calm and quite environment with minimal restraint. The patient can be positioned in a standing or sitting position, on a table if possible. An assistant can then support the head in a fixed position by holding the animal underneath the chin. Working in a darkened room helps with observations.



RetinalOedema

Retinal Detachment

Vessel Tortuosity



Retinal Haemorrhage

Distant Direct Opthalmoscopy:

- Initially, direct a bright focal light source into the anterior chamber from various angles and observe.
- Note if there are any abnormal contents such as blood in the anterior chamber (hyphaema). Also assess the pupillary light response (PLR) and compare pupil size between eyes.
- Hypertensive cats will sometimes have secondary glaucoma as a result of their hypertension causing mydriasis and a weak PLR. Be aware stressed cats may also demonstrate similar signs to due sympathetic nervous system activation.
- The patient can then be assessed by distant direct ophthalmoscopy.
- This can be used as an overview without the use of mydriatics, however the visual axis can only be fully examined with a dilated pupil.
- The examination should be conducted at arms length.
- Set ophthalmoscope to 0 (if the examiner wears glasses they should be taken off and the lens dial should be used to adjust the ophthalmoscope depending on the strength of the glasses).
- Find the tapetal reflex by looking into the pupil horizontally.
- The clinician can then assess if any lesions are present in the path of the tapetal reflex (opacities).

Close Direct Ophthalmoscopy:

- This is used to examine the fundus. The image is upright, highly magnified and only allows a narrow field of view.
- *Apply one drop of 1% tropicamide per eye as a mydriatic to dilate the pupil and increase the field of view of the fundus. This should be done 15 minutes before attempting to visualise the fundus (optional).*
- Set the ophthalmoscope to the operator's neutral setting (see distant direct ophthalmoscopy).
- Hold the ophthalmoscope close to the patient's eye to maximise the field of view.
- Find the optic disc and evaluate its size, colour, swelling and the blood vessels that radiate from it.
- Then make a systematic evaluation of the fundus by examining it in quarters; the angle of view will need to be changed to see the periphery.
- Examine the retina observing changes in colour, pigment and reflectivity. Also note if there are any signs of haemorrhage, oedema or detachment.
- Finally focus back through the anterior eye by using progressively more positive dioptres settings to bring anterior structures into focus.

Indirect Ophthalmoscopy:

- Indirect ophthalmoscopy gives an inverted image which is less magnified but gives a much wider field of view.
- It is an excellent survey technique allowing a large field of view and easier examination of the peripheral fundus than direct ophthalmoscopy.
- *Dilate the pupils with 1 drop of 1% tropicamide per eye and wait 15 minutes for the pupils to dilate before performing your examination (optional).*
- A light source (pen torch) is held next to examiner's head and aimed at animal's eye until the fundus reflex is visible.
- Interpose a condensing lens (28-30D) between the light source and the patient's eye with the convex side of the lens facing you.
- The lens can be held stably by resting your hand on top of the patient's head with the lens held a few inches from the patient's eye using thumb and forefinger.
- The whole diameter of the lens should be filled with the image.
- Correct alignment will result in visualisation of the fundus.
- If the image is lost, the lens should be removed from the visual pathway, the fundus reflex should be visualized again and the lens replaced each time.

Special precautions:

The patient will remain sensitive to light for some hours after any mydriatic. Keep away from bright light.

Ref:

- 1. Acierno et al, ACVIM consensus statement: Guidelines for the identification, evaluation, and management of systemic hypertension in dogs and cat, 2018, JVIM.
- 2. Young WM, et al. Visual outcome in cats with hypertensive chorioretinopathy. Vet Ophthalmol. 2018 Apr 18. Epub ahead of print

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