

Clinical Commentary

Corpora nigra/iris cysts in the horse

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Significance of eye disease to vision in horses

Complaints concerning the visual capacity or ability of horses present a major problem. Veterinarians and veterinary ophthalmologists must be, and generally are, quite cautious when giving opinions on the visual consequences of ocular pathology, as correlating the degree of functional vision to the amount of anatomic ocular pathology is arbitrary and difficult (Brooks and Matthews 2007). Ophthalmic examination may easily define ocular lesions, but their significance in terms of the animal's ability to see is often uncertain. Vision tests in horses are thus necessarily empirical. There is at present no means of truly scientifically assessing vision or assigning a specific level of visual capability or disability to horses unless the horse is completely blind. Even blind horses may use other senses to 'pretend to see' and function in their environment.

Corpora nigra and/or iris cysts

The main differential diagnoses for pigmented iris masses in horses are iris melanomas and iris cysts (Fig 1). Iris melanomas exhibit invasive tissue behaviour and are common to horses. Uveitis, glaucoma, hyphaema and lens luxations are associated with aggressive equine iris melanomas. The term iris cyst is

generally used to refer to cystic enlargement of the *corpora nigra* in horses as iris cysts of the iris stroma are much less common in horses. Iris and *corpora nigra* cysts have a rounded smooth surface and thin walls, and although reported to affect vision in some animals, were not, until the recent Byam-Cook and Knottenbelt (2007) publication, believed to be associated with ocular pathology in horses. *Corpora nigra* arise from separation of the posterior iris epithelial layers and are pigmented, cystic vascular remnants of the embryonic optic vesicle. They are normally present in a small group across the dorsal pupillary margin of horses (Smith 1894). A few very small ones may normally be found at the ventral pupillary rim. *Corpora nigra* (also known as *granula iridica*) are believed to function in reducing sunlight-induced glare, and to form at least 2 small visual 'pinhole' pupils (one lateral and one nasal) to increase visual clarity in daylight (Smith 1894). These 'pinhole' pupils are formed by movement of the dorsal *corpora nigra* against the ventral pupillary margin. *Corpora nigra* are lined by a layer of neuroectodermal cells that can in some instances secrete a viscous fluid that causes the *corpora nigra* to enlarge and become more cystic (Figs 2 and 3). This enlargement generally occurs very slowly in a majority of cases, but I have seen instances of rapid cyst enlargement. Cystic *corpora nigra* are not stationary structures as they can

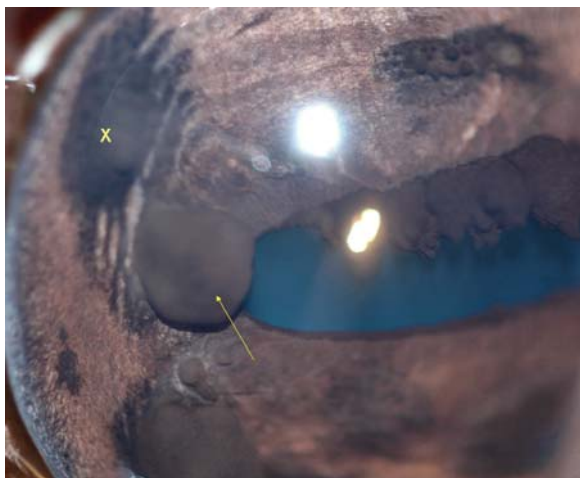


Fig 1: An iris cyst of the stroma (arrow), large dorsal pupillary margin corpora nigra and invasive iris melanomas (X) are present in the eye of this grey horse.

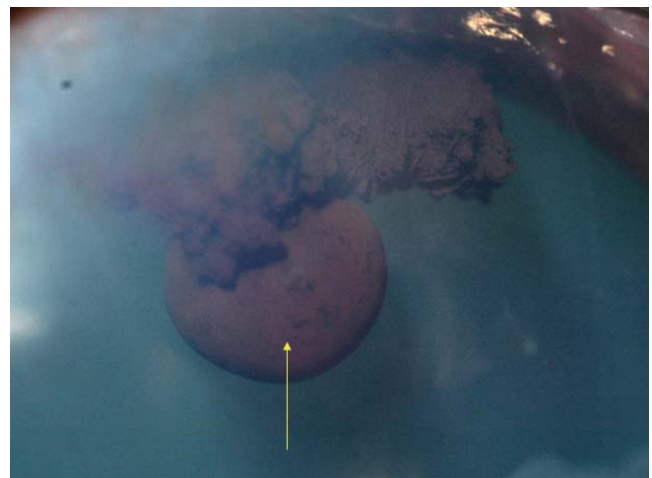


Fig 2: Cystic enlargement of the dorsal corpora nigra (arrow) in this Thoroughbred gelding is not causing visual or behavioural problems.



Fig 3: This cystic corpora nigra (arrow) of the ventral pupil is obstructing vision in bright light conditions.

exhibit subtle motion, and are in some cases associated with erratic behaviour, impaired vision in the visual field obstructed by the cyst, head shaking, and refusal to jump or perform. Other horses with cysts obstructing the pupil do not appear visually bothered by them.

Clinical case example

A 10-year-old Quarter Horse gelding was examined for unpredictable and intermittent behaviour.

Left eye findings

The pupil was normal in size but the *corpora nigra* were slightly more cystic in size than normal on the dorsal pupillary rim (Fig 4). The cysts caused dramatic pupil blockage in bright



Fig 4: Arrow points to corpora nigra cysts in left eye. There was no digital enhancement of this image other than slight cropping and adding the arrows.

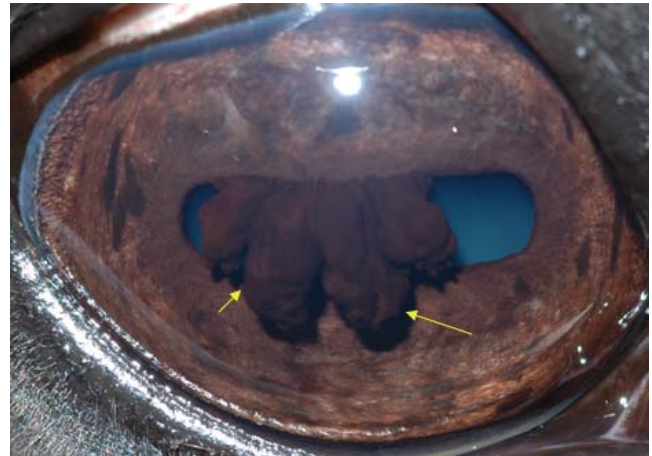


Fig 5: Arrows point to cystic corpora nigra in the right eye. There was no digital enhancement of this image other than slight cropping and adding the arrows.

light. A tiny lateral 'pinhole' pupil and larger nasal pupil were present under bright light conditions. Several persistent pupillary membranes were present. There was no evidence of active or quiescent uveitis. The lens, vitreous and retina were normal for his age.

Right eye findings

The pupil was normal in size. Several persistent pupillary membranes were present. The dorsal *corpora nigra* were cystic (Fig 5). When the eye was exposed to extremely bright light from the slit lamp and/or direct ophthalmoscope the resulting miosis caused the ventral cyst to touch the cystic dorsal *corpora nigra* to obscure the ventral pupillary rim and obstruct the pupillary opening. This movement resulted in partial occlusion of the lateral pupil although a small diameter area of patent pupil was still present laterally. The medial pupil became miotic but was still patent during these bright light conditions. It was



Fig 6: Argon laser energy is being delivered through the cornea to rupture an iris cyst in a standing horse.

still possible to view the retina and tapetal reflection through this resulting 'pinhole' pupil when using the direct ophthalmoscope. There was no evidence of active or quiescent uveitis. The lens, vitreous and retina were normal for his age.

Treatment

Corpora nigra or iris cysts are deflated with anterior chamber needling/aspiration of the cyst, or transcorneal laser or endolaser photocoagulation (**Fig 6**) in order to remove the obstruction to vision. A previously published report (Gilger *et al.* 1997) of 8 cases of iris cysts causing behaviour or vision problems in horses found that the problems resolved in all cases following laser disruption of the cyst or cysts. Laser photocoagulation can be done under sedation and does not require general anaesthesia. Thin areas of cysts would be an ideal place to aim the laser beam if they can be identified. The laser photocoagulation will coagulate any blood vessels in the cyst to minimise the risk of intraocular haemorrhage, and either immediately or slowly over a few days result in cyst destruction. Some *corpora nigra* cysts have very thick walls and are difficult to immediately deflate with the laser. The cysts will slowly collapse, but may need multiple laser treatments. The cyst lasering induces some anterior uveitis although there are minimal risks to the eye or the horse's general health with this lasering procedure. The laser

procedure will cause release of a thick liquid into the anterior chamber that is present for less than one day.

We chose transcorneal argon laser photocoagulation of the *corpora nigra* cysts in the mentioned clinical case. The cysts were targeted up to 450 times each. The cysts gradually collapsed over a one month period, but some pupillary obstruction remained and the aberrant behaviour persisted to a lesser degree. It is possible that horses with such iris lesions could 'learn' to shy or become scared when approached suddenly by other horses or by people on the affected side, but such horses could be retrained out of this behaviour if it existed post lasering.

References

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