

# ULTRASOUND DIAGNOSIS

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## **History**

A nine-year-old, female terrier dog was presented at the Chulalongkorn University, Small Animal, Veterinary Teaching Hospital with a one-year history of vision loss. At no time had she received any treatment. Clinical examination of both eyes revealed bilateral cataracts with greater opacity in the right lens. Hematology and serum chemistry profiles, including the blood glucose level, were in the normal range. An ocular ultrasonography was performed to evaluate other intraocular abnormalities.

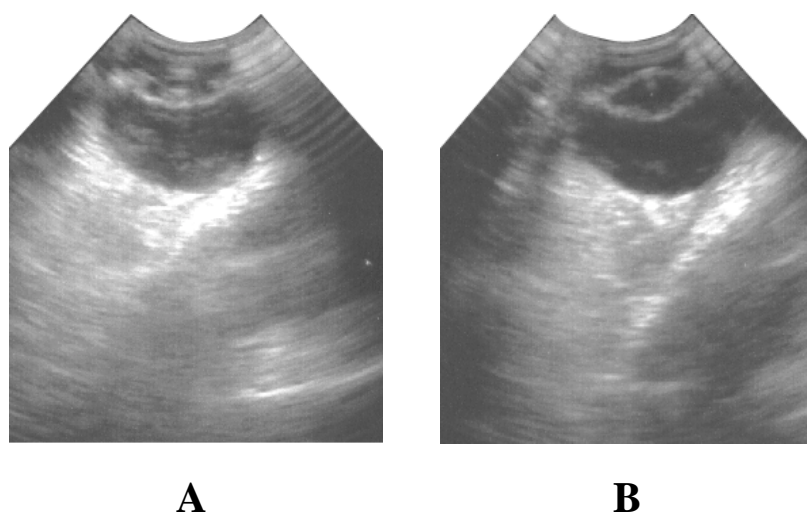
## **Ultrasonographic Findings**

Two dimensional, real-time, ocular ultrasonography was performed while the dog sat with the head held firmly but gently. An 8-5 MHz broadband, convex, phased array transducer was used. The eyelids were held apart

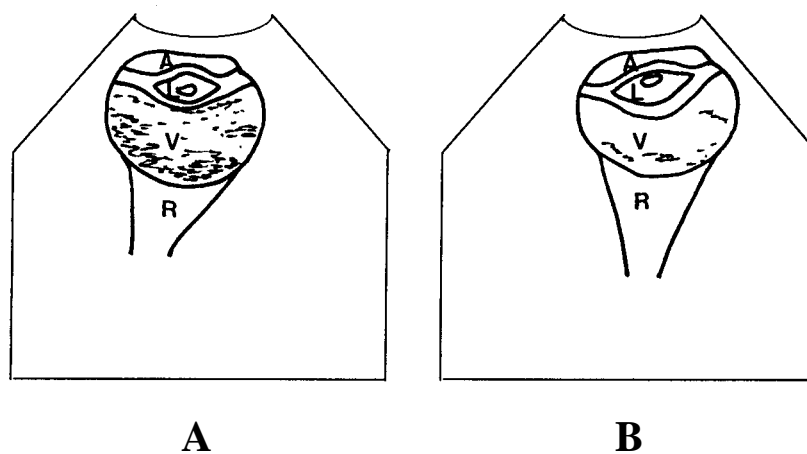
manually and the transducer was gently applied to the corneal surface without using acoustic gel. Horizontal, vertical and oblique positioning of the transducer was used to scan the eye thoroughly. The anterior and posterior cortices of the lens were thickened and appeared as two echogenic linear densities (Fig. 1 and 2). Echogenic foci within the body of the lens were noticed to be larger in the right eye. The right and left lens had an axial diameter of 5.4 and 5.7 mm, respectively. Multiple echogenic areas were seen in the normally anechoic vitreous chambers of both eyes, especially the right one. The kinetic study of these densities revealed marked "after movement". The posterior wall of the eye was seen as an echoic curved line. There was no evidence of retinal detachment. The retrobulbar structures of both eyes had normal echopatterns.

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**Figure 1** Vertical ultrasonographic images of the right (A) and left (B) eyes of a nine-year-old, female terrier dog. The lens cortices were thickened and echogenic foci were present within the body of the lens, indicative of cataract formation. Multiple echodensities in the vitreous cavities were compatible with vitreous degeneration.



**Figure 2** Schematics of the relative positions of the structures scanned in figure 1. A -anterior chamber; L -lens; V -vitreous chamber; R -retrobulbar structure.

## Diagnosis

Ultrasonographic diagnosis ——— Bilateral cataracts with vitreous degeneration.

## Comments

Ocular ultrasonography is noninvasive, quick and can be performed on a conscious animal. It is the best modality for identifying intraocular lesions, when opacity of the anterior segment precludes complete ophthalmoscopic examination. A high-frequency transducer (7.5-15 MHz) is well suited for ocular scanning. The eyelid contact technique is easier to perform, but image quality is definitely inferior compared with the corneal contact technique (Hager, et al., 1987). A standoff pad is generally used to image the most superficial structures of the eye.

Ocular ultrasonographic examination prior to cataract surgical removal is indicated to evaluate other intraocular abnormalities that may influence surgery outcome. A cataract produces an abnormal echo in the normally anechoic lens (Dziezyc et al., 1987). It appears as thick, echogenic, convex and concave, curvilinear echoes that correspond to the anterior and posterior lens cortices, respectively. The entire lens, which is normally anechoic, may become echogenic when the disease is progressive. Ultrasound can differentiate immature,

mature and hypermature cataracts (van der Woerd et al., 1993). Vitreous degeneration is commonly found in such cataracts. It appears as a multiple echogenic opacity within the anechoic vitreous chamber. Vitreous degeneration is easier to detect by increasing the far-field, time-gain, compensation setting. Retinal detachment should always be looked for when a diagnosis of cataract is made. In B-mode scan, the detached retina will appear as a smooth, complete, hyperechoic membrane in the vitreous cavity. Retinal detachment, as well as vitreous degeneration, are more common with hypermature cataracts and uncommon in eyes with immature cataracts.

## References

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