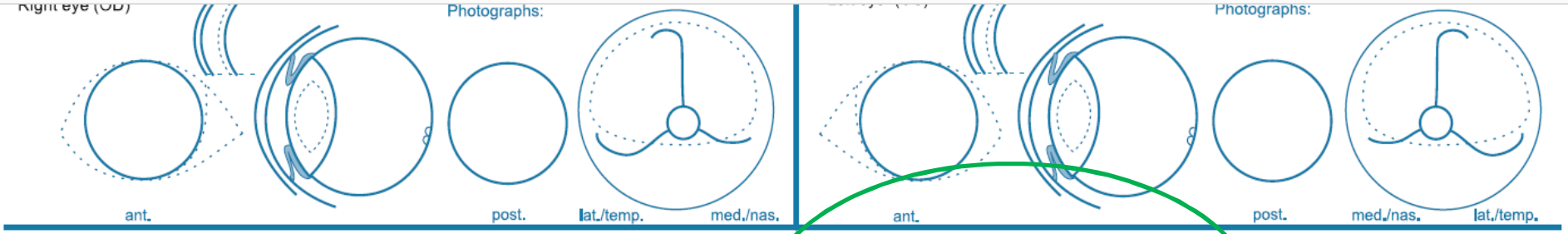
HED SESSION 2021 - KAHOOT

Dr. Marianne Richter
(Switzerland)

Dr. Claus Bundgaard Nielsen
(Denmark)

new ECVO Certificate



Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐		☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis	☐	☐	☐
12. Ectropion / Macroblepharon	☐	☐	☐
13. Distichiasis / Ectopic cilia	☐	☐	☐
14. Corneal dystrophy	☐	☐	☐
15. Cataract (non-congenital)	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other:	☐	☐	☐

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

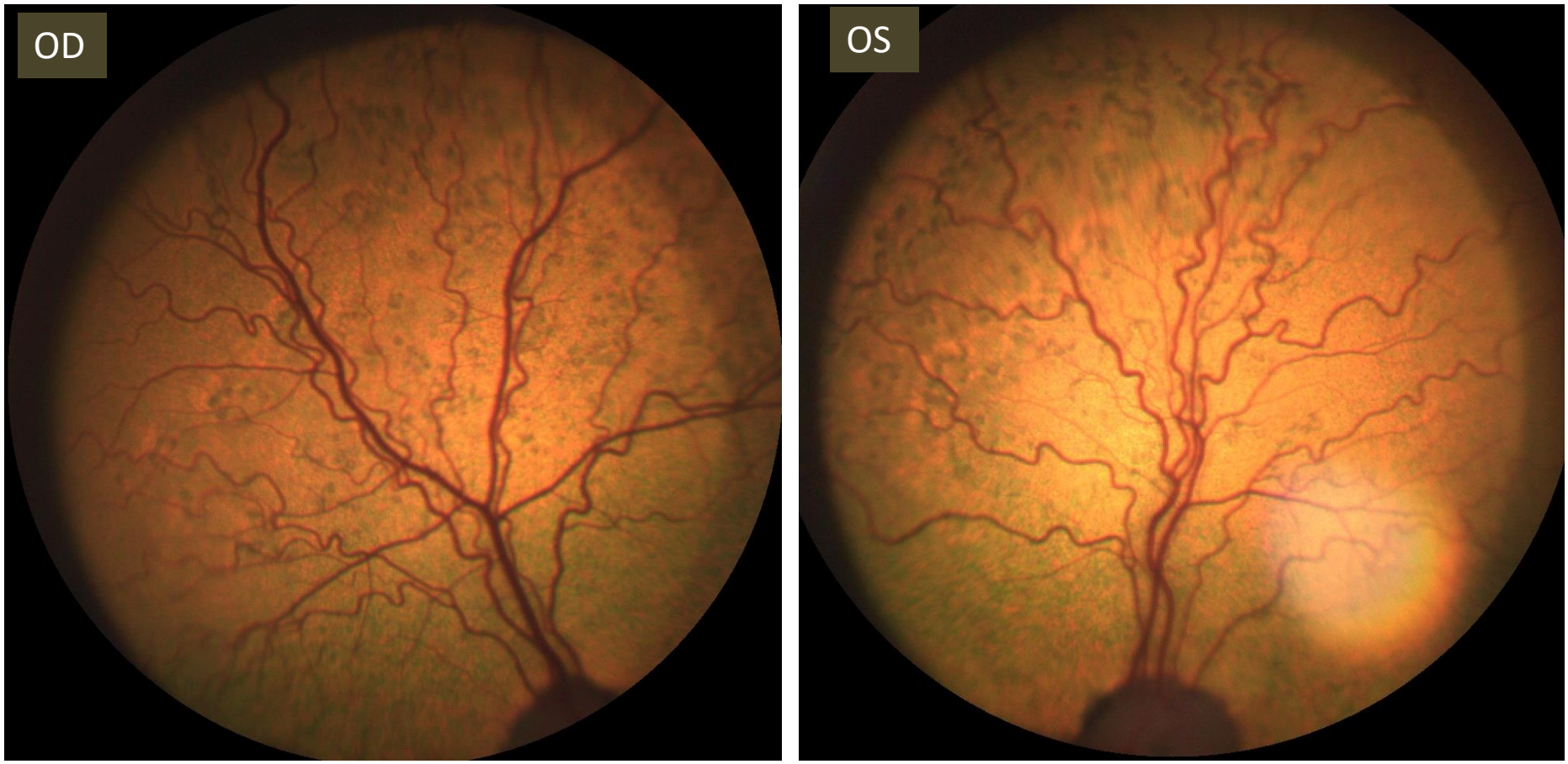
FOR FUTHER INFORMATION: P.T.O. | **Examiner**

HED SESSION – Kahoot!

Case 1

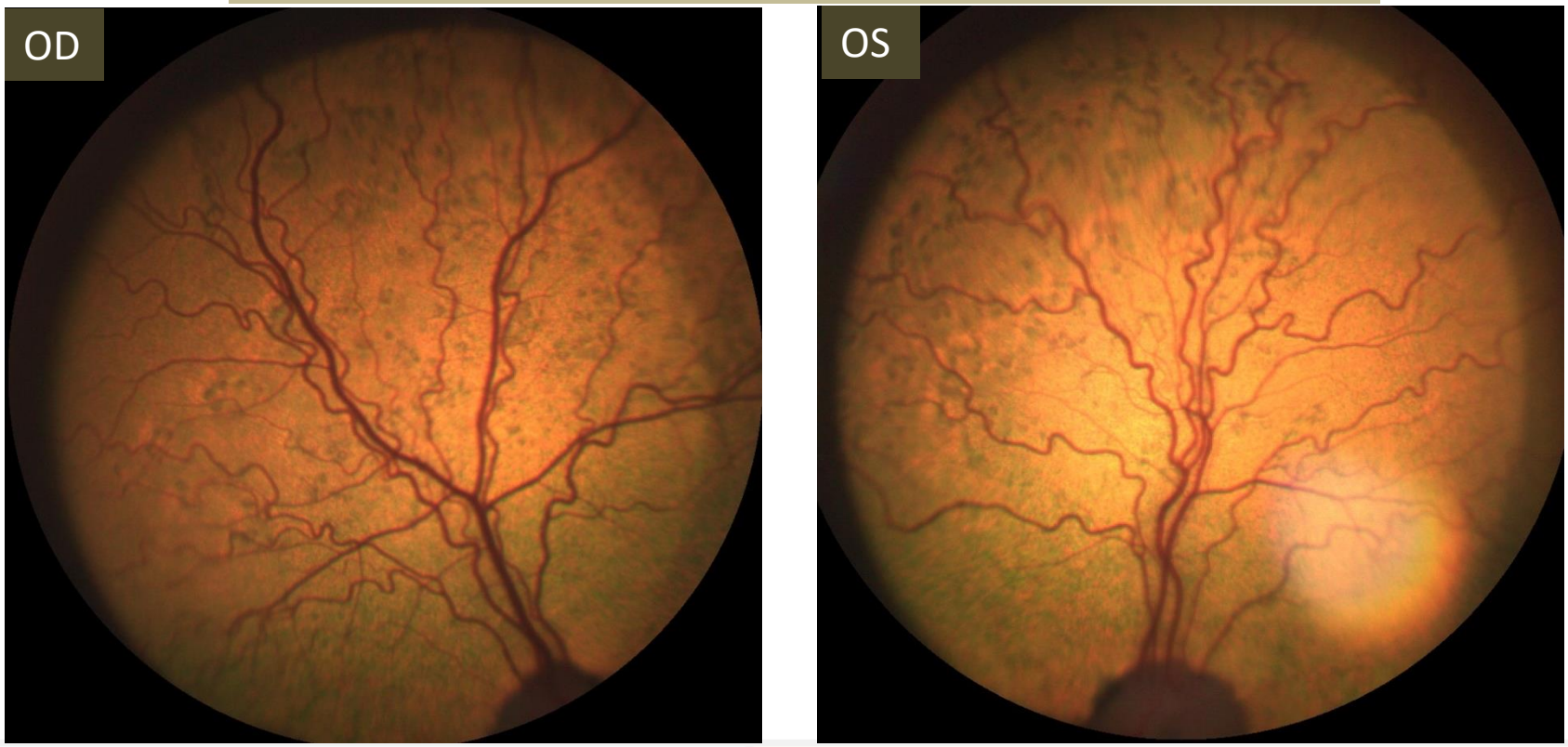
Border Collie, m, 4y, bilateral findings; no clinically noticeable visual disorders

Slides: M.Richter



Border Collie, m, 4y, bilateral findings; no clinically noticeable visual disorders

Slides: M.Richter



▲ Comments: chorioretinal scars

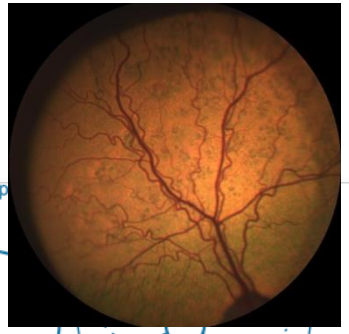
◆ 4. Retinal dysplasia (multi)focal

● 18. Other: Canine multifocal retinopathy (CMR)

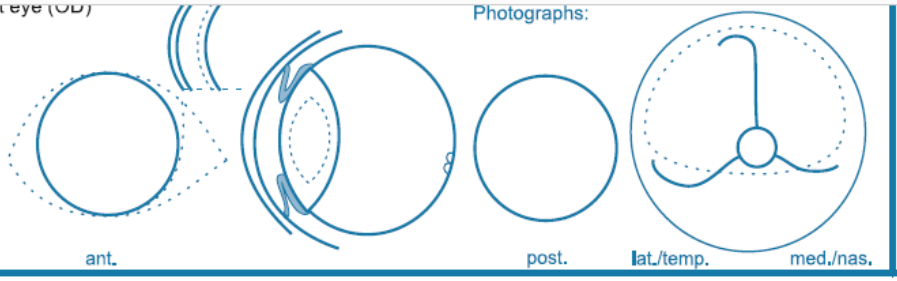
■ 18. Other: other presumed hered. retinal degeneration

ECVO CERTIFICATE
new printed form

Border Collie, m, 4y, bilateral findings;



Right eye (OD) Photographs:



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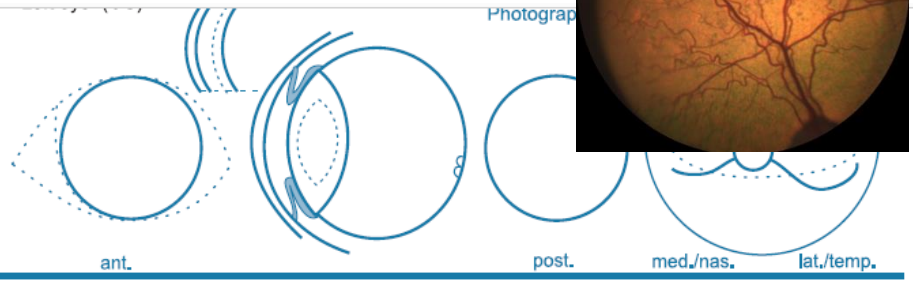

Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

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3. Cataract (congenital)	☐	☐	☐
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis	☐	☐	☐
12. Ectropion / Macroblepharon	☐	☐	☐
13. Distichiasis / Ectopic cilia	☐	☐	☐
14. Corneal dystrophy	☐	☐	☐
15. Cataract (non-congenital)	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other:	☐	☐	☐

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Retinal dysplasia:** KP-HED; abnormal development of the retina with ophthalmoscopic changes observed early in life, characterized by neuroretinal folding (s), rosettes and partial or total retinal detachment; non-progressive and generally recognized to have three forms: (multi)focal, geographic and total.

- **Retinal dysplasia- (multi)focal:** seen ophthalmoscopically as linear (vermiform), triangular, curved or curvilinear foci of retinal folding that may be single or multiple. When seen in puppies this condition may partially or completely resolve with maturity. Its significance to vision is unknown. The two other forms of retinal dysplasia (geographic and complete) which are known to be hereditary in some breeds and, in their most severe form, may cause blindness. The genetic relationship between folds and more severe forms of retinal dysplasia is undetermined.

HED Manual Chapter 6 Guidelines

- **Retinal Dysplasia (RD):**
  - Tick at “4: Retinal dysplasia” and “(multi)focal” “affected”

HED Manual Chapter 8 Vet Advice

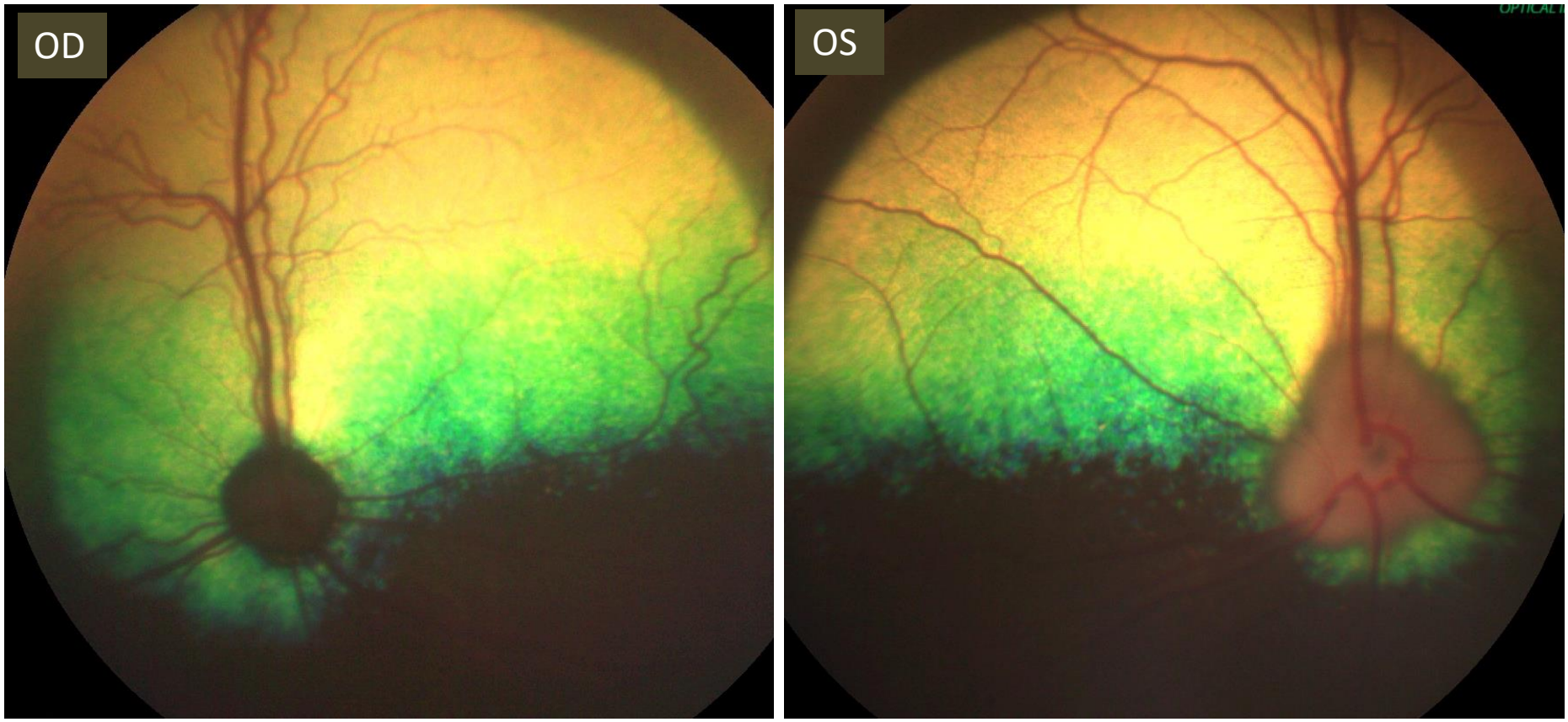
- **Retinal Dysplasia (RD):**

  - (Multi)focal form in any breed: OPTIONAL.
  Note: different advice may be given for specific breeds by the breeding clubs

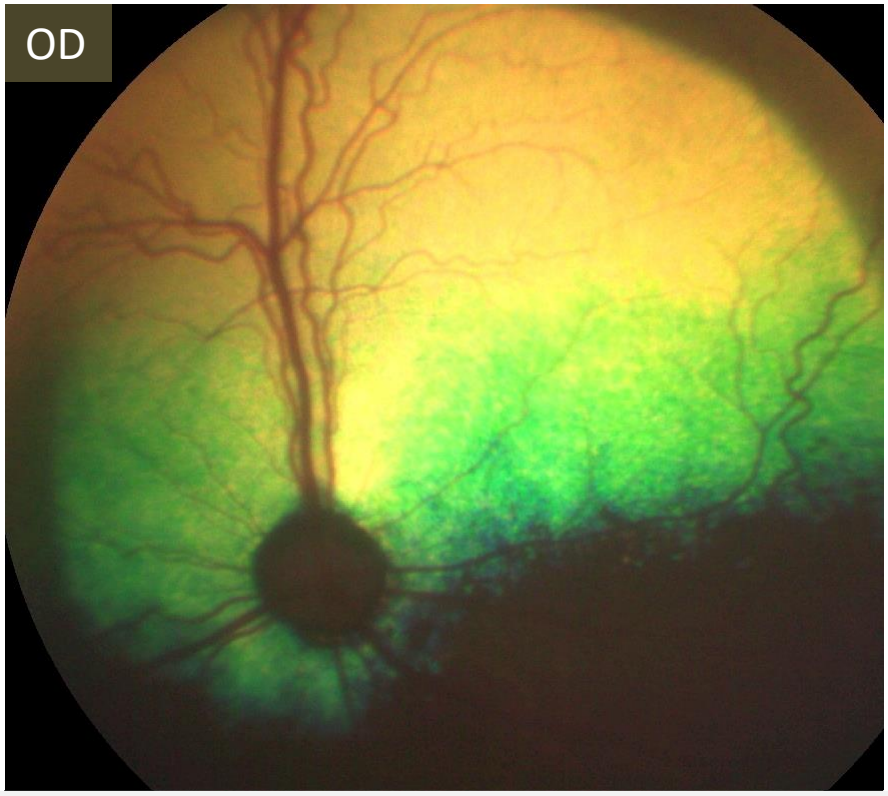
HED SESSION – Kahoot!

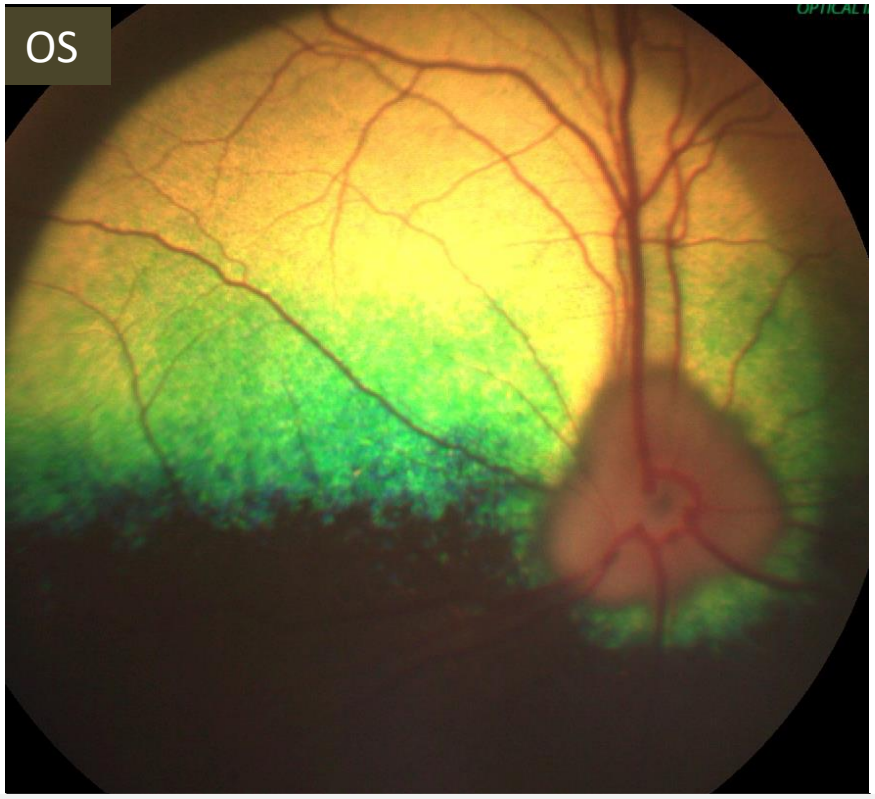
Case 2

Labrador Retriever, m, 1y, menace response OU Slides: M.Richter



Labrador Retriever, m, 1y, menace response OU Slides: M.Richter





▲ 7. Other: Optic disc coloboma

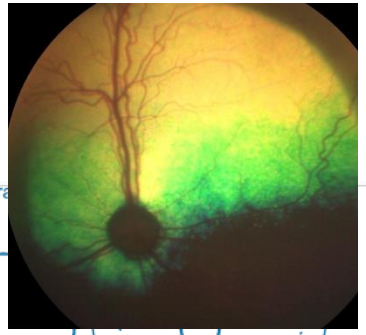
♦ 18. Other: Primary glaucoma

● 5. Hypolastic-/Micro-papilla

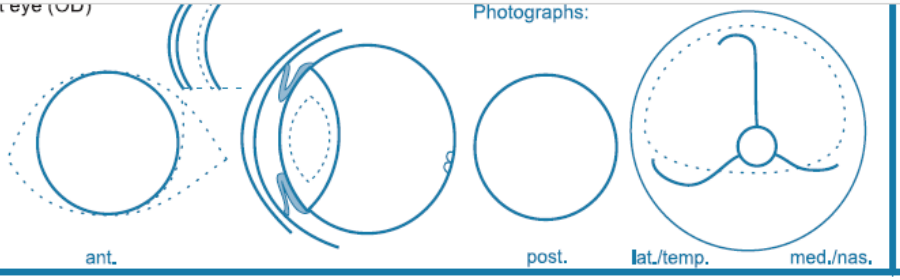
■ Comments: Micropapilla

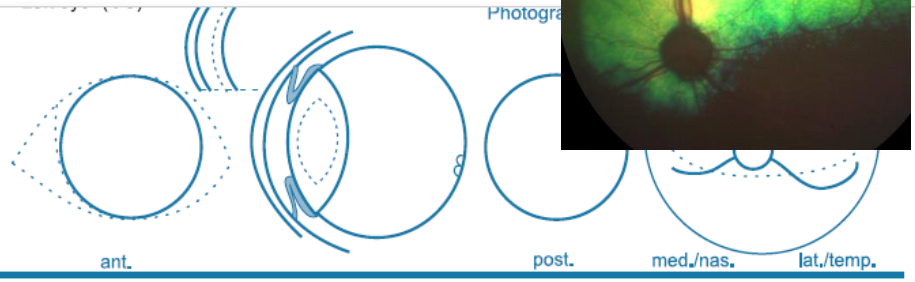
ECVO CERTIFICATE
new printed form

Labrador Retriever, m,
1y, menace response OU



Right eye (OD) Photographs:





Descriptive comments:

Menace response positive OU

Eye disease no. ..... ☐ severe

15. Cataract other:
- ☐ punctata
- ☐ suture line tip
- ☐ suture line
- ☐ nuclear ring
- ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA
- ☐ mild
- ☐ moderate
- ☐ severe

ICA (width)
- ☐ narrow (moderate)
- ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED	
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
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3. Cataract (congenital)	☐	☐	☐	
4. Retinal Dysplasia (RD)	☐	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☒	
6. Collie Eye Anomaly (CEA)	☐	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐	
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED	
11. Entropion / Trichiasis	☐	☐	☐	
12. Ectropion / Macroblepharon	☐	☐	☐	
13. Distichiasis / Ectopic cilia	☐	☐	☐	
14. Corneal dystrophy	☐	☐	☐	
15. Cataract (non-congenital)	☐	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐	
17. Retinal degeneration (PRA)	☐	☐	☐	
18. Other:	☐	☐	☐	

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Hypoplasia-/ optic disc hypoplasia:** KP-HED; congenital failure of development of the optic nerve which causes visual deficit or blindness and abnormal pupil response in the affected eye. It can often not be differentiated from micropapilla on a routine (dilated) ECVO eye examination.
- **Micropapilla:** KP-HED; small optic disc which is not associated with vision impairment. It may not be differentiated from hypoplastic papilla/optic disc on a routine, dilated ECVO-eye examination.

HED Manual Chapter 6 Guidelines

- **Micropapilla** is difficult to differentiate from hypoplasia with vision impairment. For this reason, on the Certificate, the entity is ticked as a KP-HED at “5. Hypoplastic-/Micropapilla” “affected”.

HED Manual Chapter 8 Vet Advice

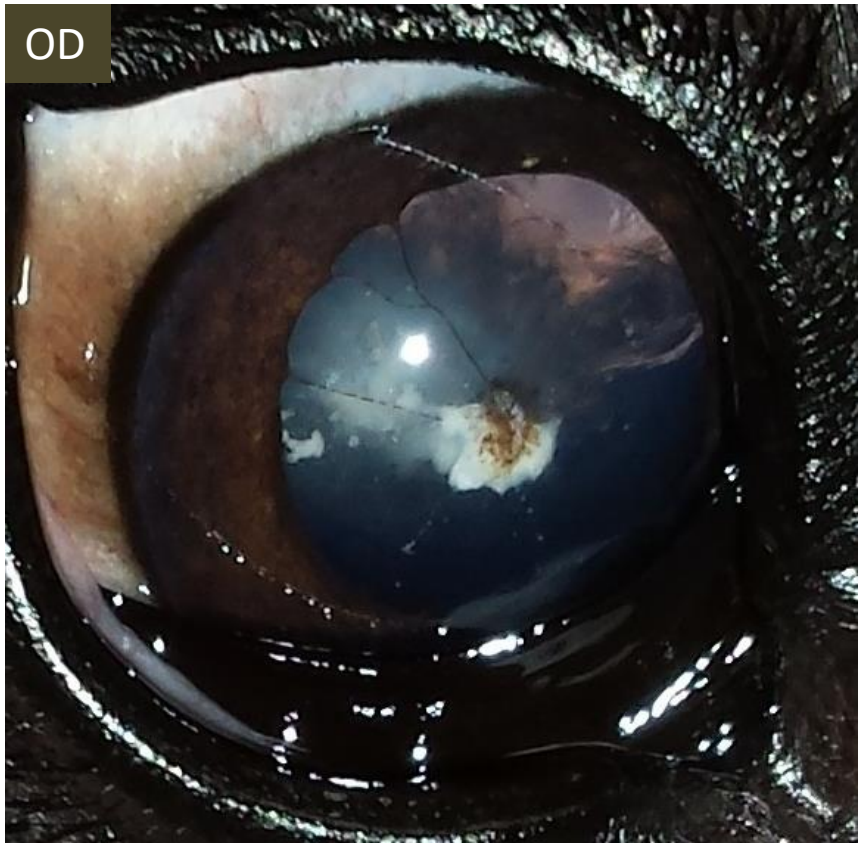
- **Micropapilla/Optic Nerve Hypoplasia:** NO BREEDING from the affected animal

HED SESSION – Kahoot!

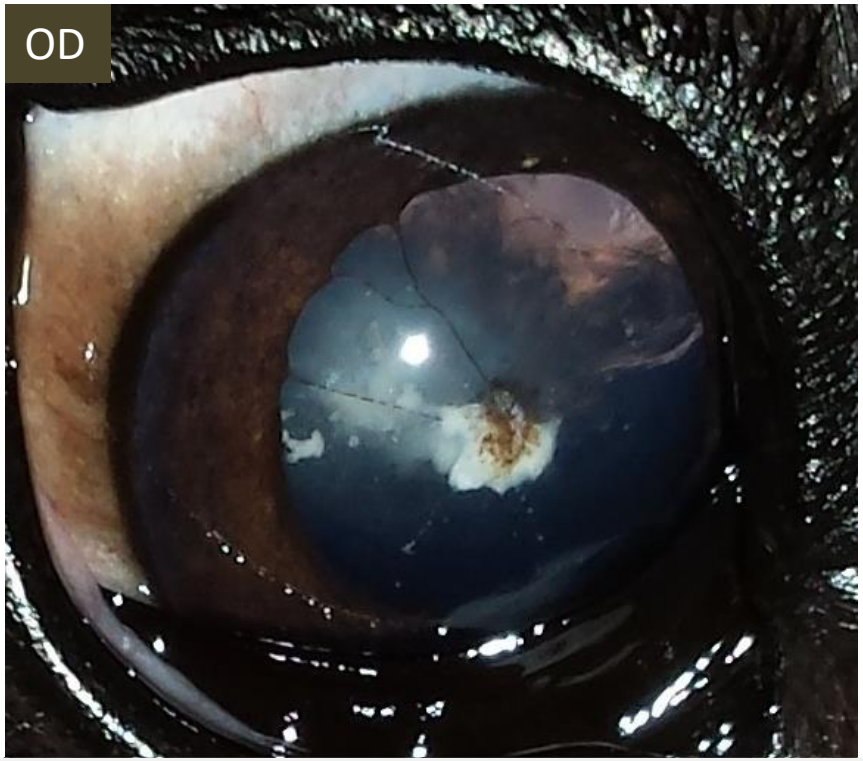
Case 3

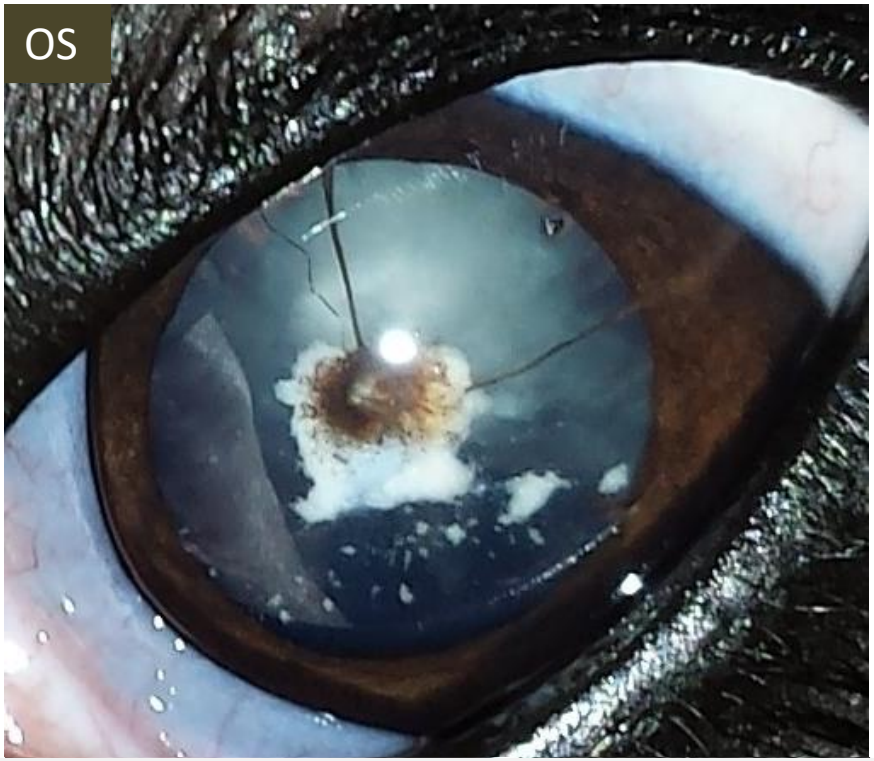
Basenji-Mix; f, 3y bilateral findings

Slides: M.Richter



Basenji-Mix; f, 3y bilateral findings Slides: M.Richter





▲ 1. PPM iris-lens
3. Cataract congenital
15. Cataract(non-congen.) – cortical

◆ 7. Other: Multiple other KP-HED (2 or more KP-HED anomalies)

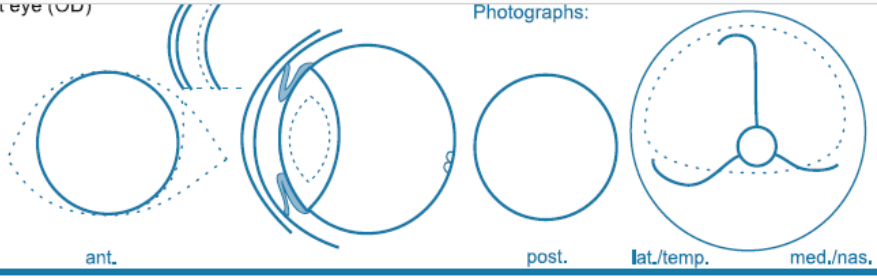
● 1. PPM iris-lens

■ 1. PPM iris-lens
3. Cataract - congenital

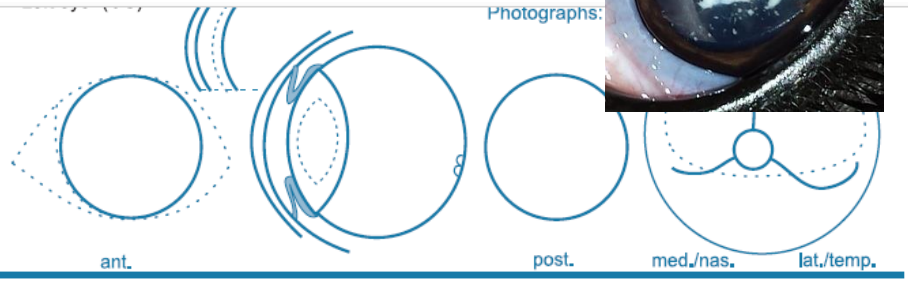
ECVO CERTIFICATE
new printed form

Basenji-Mix; f, 3y
bilateral findings

Right eye (OD) — Photographs:



Photographs:



Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

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2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☒	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☒
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☒	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis	☒	☐	☐
12. Ectropion / Macroblepharon	☐	☐	☐
13. Distichiasis / Ectopic cilia	☐	☐	☐
14. Corneal dystrophy	☐	☐	☐
15. Cataract (non-congenital)	☐	☐	☒ ☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other:	☐	☐	☐

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

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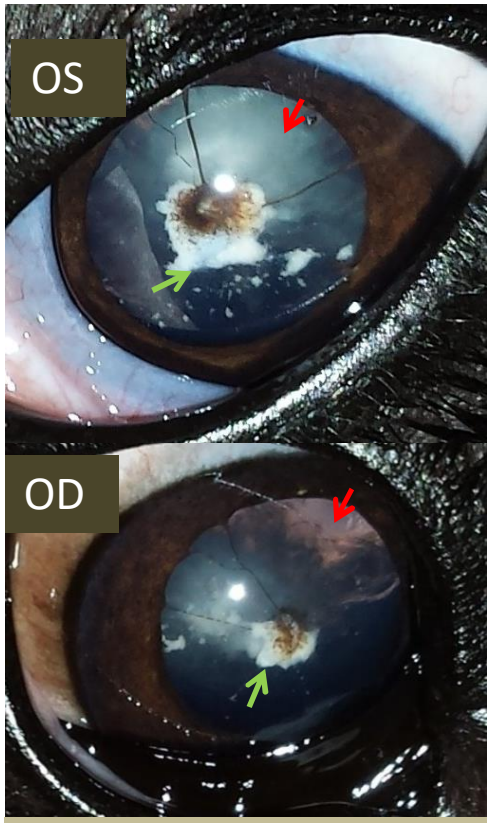
FOR FUTHER INFORMATION: P.T.O. | Examiner

Explanation:

If the opacity on the lens is limited to the insertion of the PPM on the capsule, do NOT tick the box for cataract

Comment: The lens opacity is NOT limited to the attachment of the PPM; **adjacent to the PPM** there are whitish opacities (cataract) **extending into** the lens cortex which are likely **congenital**; there are also opacities in the **posterior lens cortex** which may be **non-congenital**.



Basenji-Mix; f, 3y
bilateral findings

Slides: M.Richter

HED Manual Chapter 5 Definitions

- **Persistent pupillary membrane (PPM):** KP-HED; in which blood vessel remnants of the embryological vascular network in the anterior part of the lens fails to regress which normally occurs during the first 4 to 5 weeks of life. These remnants may be found on the surface of the iris at the colarette, the lens capsule or against the corneal endothelium or strands may bridge from iris to iris, iris to cornea, iris to lens, with or without sheets of tissue in the anterior chamber. The last three forms pose the greatest threat to vision and, when severe, vision impairment may occur.

HED Manual Chapter 6 Guidelines

- **Persistent pupillary membrane (PPM)**

Remnants of the pupillary membrane, still distinctly present after pupil dilatation, from the iris collarette, with corneal, and/or with lens involvement, are ticked at “1. PPM” “affected” and the relevant box of other parts involved:

- **Strands from iris to lens:** boxes PPM, iris and lens are ticked; *

New text

* If the opacity on the lens is limited to the insertion of the PPM on the capsule, do NOT tick the box for cataract (congenital). Only, if a whitish opacity extends into the lens cortex adjacent to this, also tick the box “affected” for cataract (congenital). If there are other lens opacities not adjacent to the PPM, which might not be congenital, tick the relevant box at “15. Cataract (non-congenital)”.

HED Manual Chapter 6 Guidelines

Section Results:

- The box for the KP-HED (1-6, 11-17) on the certificate and the specifying box, if available (e.g. for type or grade) are ticked.

- *If there is no specific box available* on the certificate for the KP-HED, the box at number “7. Other” and/or at number “18. Other” is to be ticked and the definition name of the disease (in the list in chapter 5) is written (online: is used). *Only if there are more than one KP-HEDs present which are not listed* in the results field under no 1-6 and no 11-17, the box “affected” at “7. Other” and/or at “18. Other” is ticked and the term "Multiple other KP-HEDs" is written (online: is used); the KP-HEDs must also be specified in the comment field using the definition name in the list in chapter 5.

  e.g. “7. Other”: Persistent hyaloid artery (PHA) + Iris hypoplasia

HED Manual Chapter 8 Vet Advice

- **Persistent Pupillary Membrane (PPM):**
  - Strands iris to lens: NO BREEDING from the affected animal

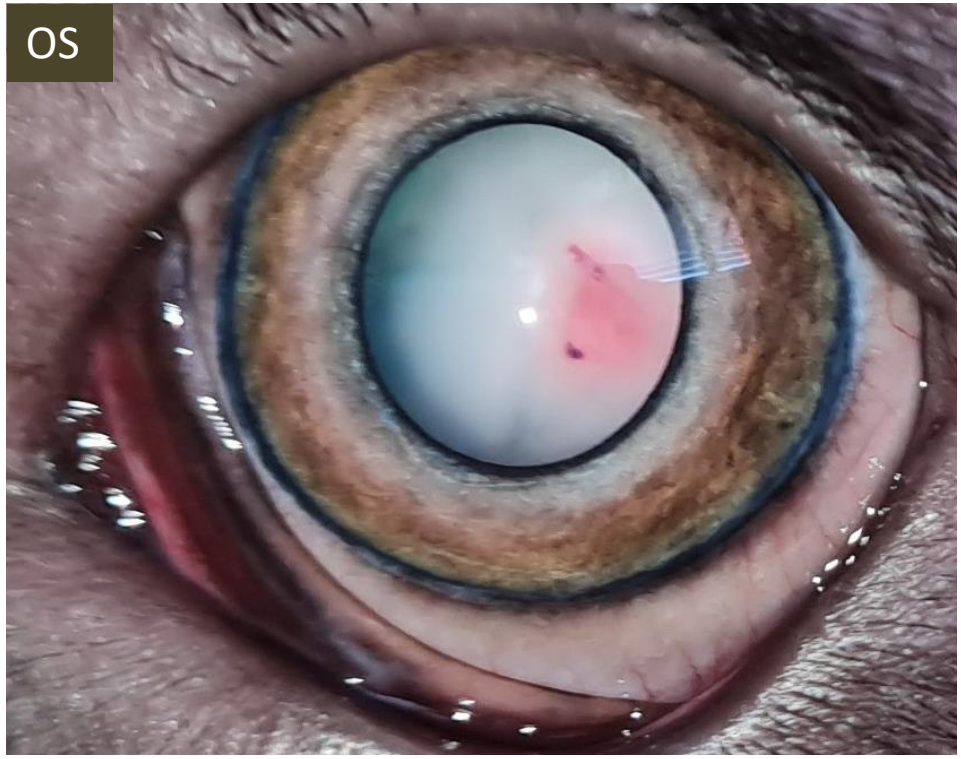
- **Cataract (congenital):** NO BREEDING from the affected animal

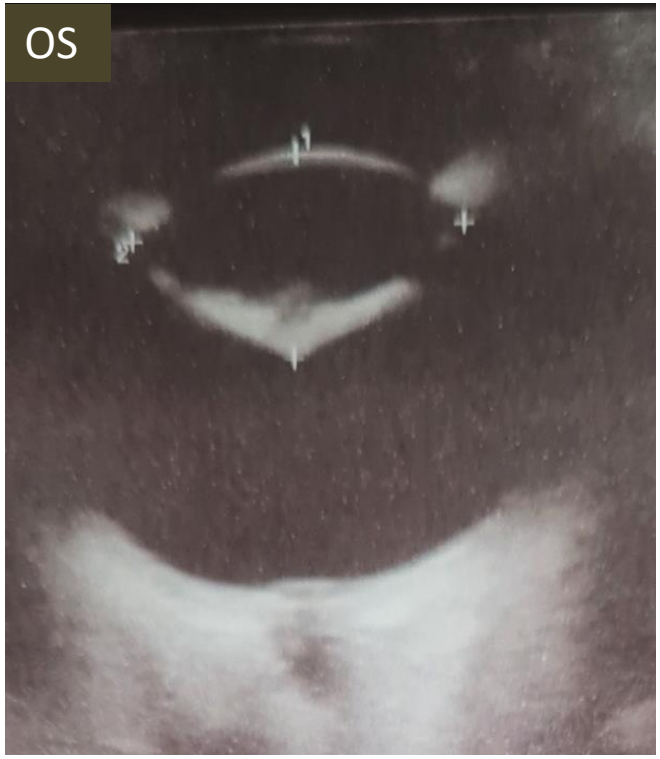
- **Cataract (hereditary, non-congenital):**
  - Cataract „cortical“: NO BREEDING from the affected animal

HED SESSION – Kahoot!

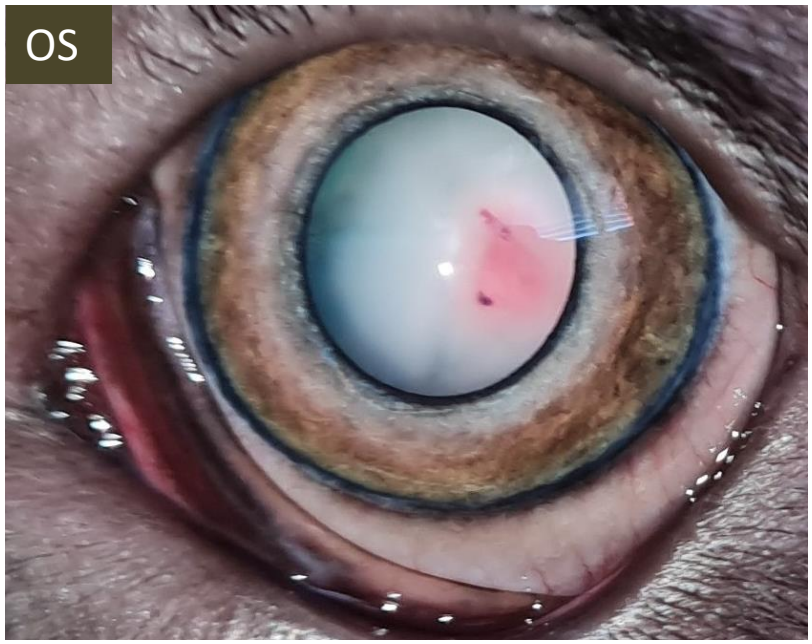
Case 4

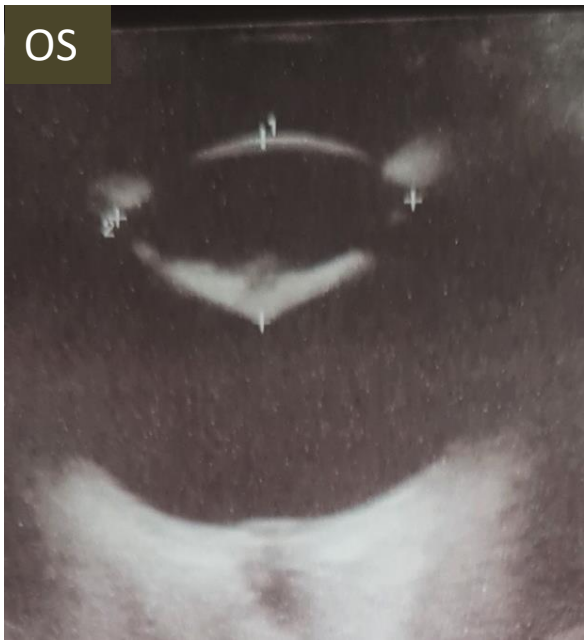
Cane Corso, m, 6m, OS (unilateral) Slides: M. Richter





Cane Corso, m, 6m, OS (unilateral) Slides: M. Richter





▲ 3. Cataract (congenital)
7. Other: Persist. Hyaloid Artery

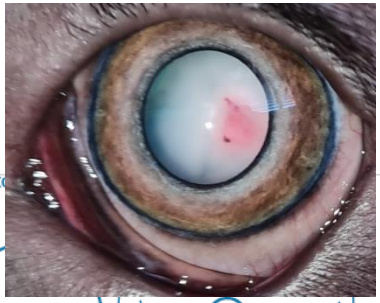
♦ 2. PHTVL/PHPV grade 2-6

● 2. PHTVL/PHPV grade 2-6
3. Cataract (congenital)

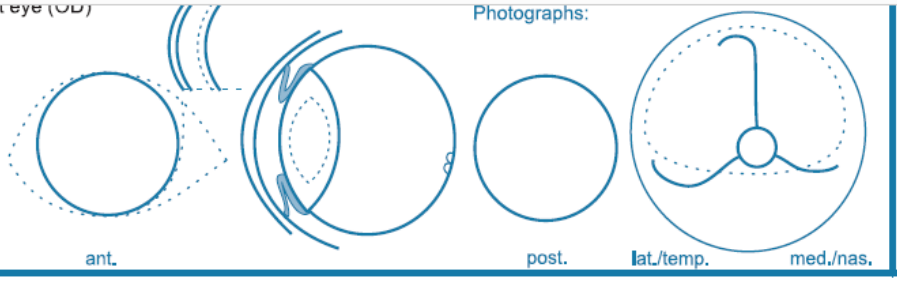
■ 7. Other: Lenticonus

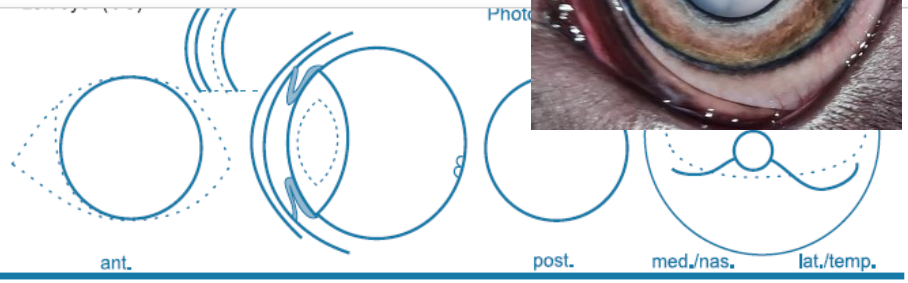
ECVO CERTIFICATE
new printed form

Cane Corso, m, 6m,
OS (unilateral)



Right eye (OD) Photographs:





Descriptive comments:

.....

.....

.....

Eye disease no. ..... ☐ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis	☐	☐	☐
12. Ectropion / Macroblepharon	☐	☐	☐
13. Distichiasis / Ectopic cilia	☐	☐	☐
14. Corneal dystrophy	☐	☐	☐
15. Cataract (non-congenital)	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other:	☐	☐	☐

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Persistent hyperplastic tunica vasculosa lentis/persistent hyperplastic primary vitreous (PHTVL/PHPV):** KP-HED; congenital eye disease which results from failure of regression of the embryologic vascular network, surrounding the developing lens and primary vitreous. The latter fails to regress within the first 2-3 weeks after birth. The defect is currently graded in 6 levels of severity, in which grade 1 is characterized by uni- or bilateral small, yellow to brown dots of fibrous tissue mainly centrally, retrolentally on the posterior capsule of the lens. These are stationary and do not affect vision. The more severe forms (2-6) usually occur bilaterally and cause visual impairment or blindness. Known hereditary e.g. in the Dobermann and the Staffordshire Bull Terrier.

HED Manual Chapter 6 Guidelines

- ***Persistent hyperplastic tunica vasculosa lentis/persistent hyperplastic primary vitreus (PHTVL/PHPV)***

  …The severe forms (grades 2–6) usually occur bilaterally and may lead to visual problems. A plaque of white fibrovascular tissue can remain on the back of the posterior capsule, accompanied by grade 1 retrolental dots. In addition, other parts of the hyaloid system can persist and more severe malformations of the lens (such as pigment or blood in the lens or behind it, lens hypoplasia, spherophakia), elongated ciliary processes and/or microphthalmia may be present. Unilateral or bilateral forms of grades 2-6 are ticked at “2. PHTVL/PHPV” “affected” and the specifying box “grade 2-6”. Cataract and/or other lenticular abnormalities are part of the entity and are therefore **not** ticked at “3. Cataract (congenital)” and/or at “7. Other”.

HED Manual Chapter 8 Vet Advice

- **Persistent hyperplastic tunica vasculosa lentis/persistent hyperplastic primary vitreus (PHTVL/PHPV):**

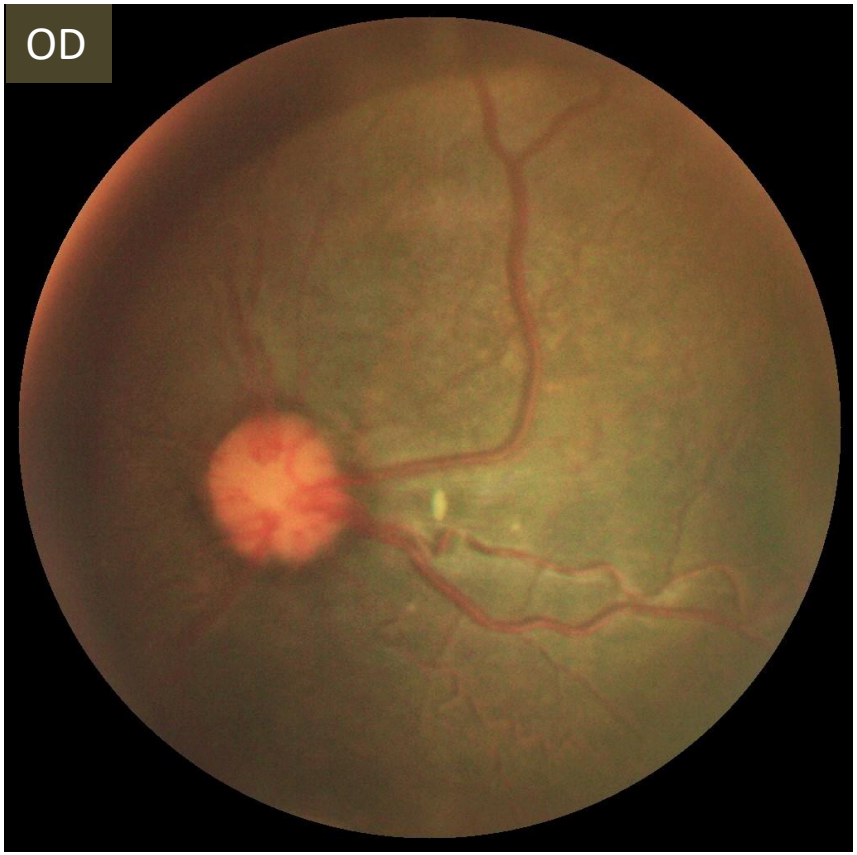
  -Grade 1: OPTIONAL
  -Grade 2-6: NO BREEDING from the affected animal

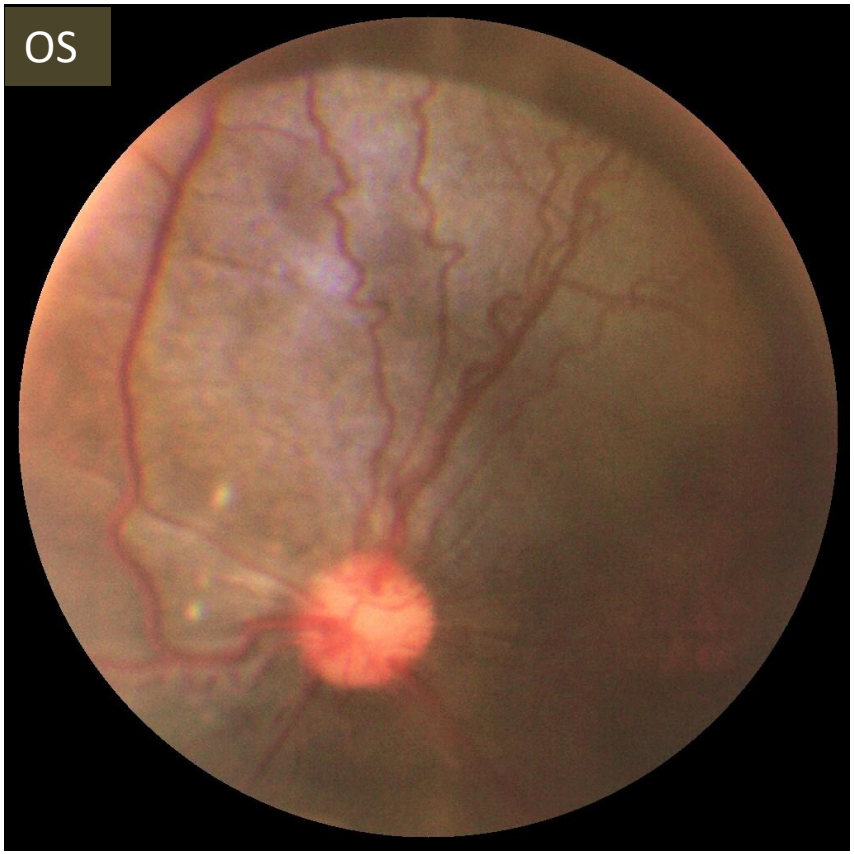
HED SESSION – Kahoot!

Case 5

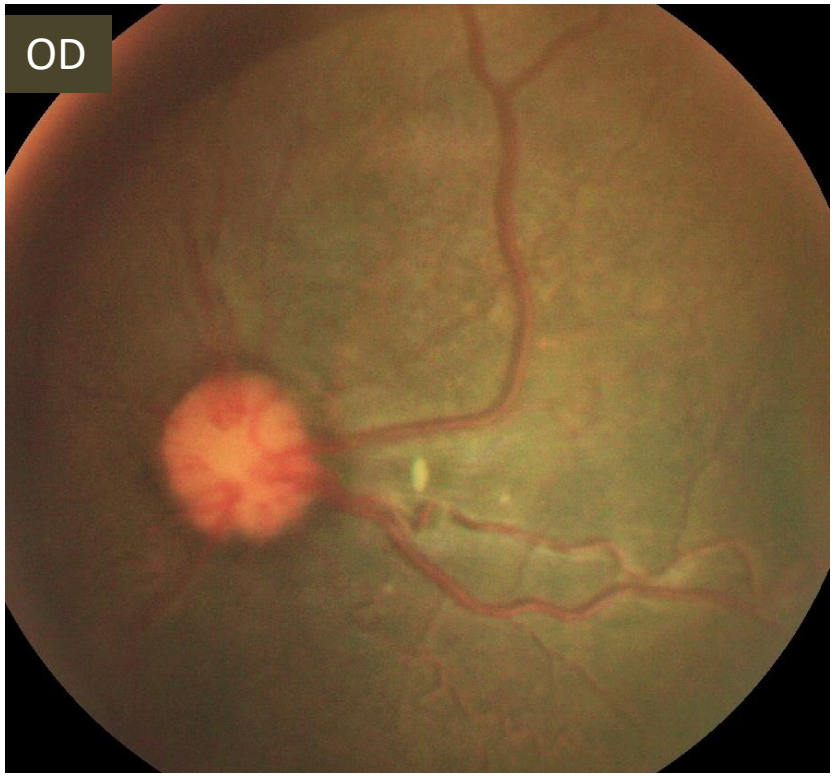
Collie, puppy 8 weeks, bilateral finding

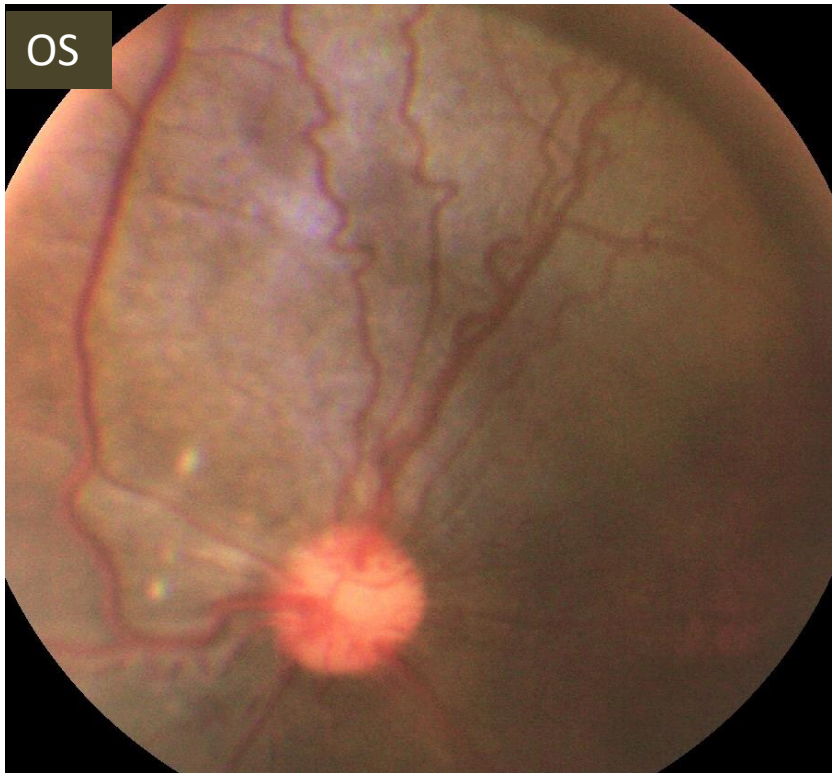
Slides: S.Borer





Collie, puppy 8 weeks, bilateral finding Slides: S.Borer





▲ 4. Retinal dysplasia (multi)focal

♦ Comments: Chorioretinitis

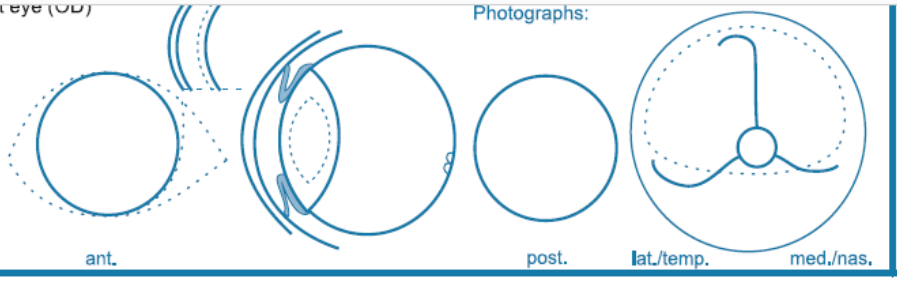
● Comments: retinal folds

■ 6. CEA – choroid. Hypoplasia +Comments: retinal folds

ECVO CERTIFICATE
new printed form

Collie, puppy 8 weeks, bilateral

Right eye (OD) Photographs:



Descriptive comments:

OU: retinal folds

Eye disease no. ..... ☐ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis	☐	☐	☐
12. Ectropion / Macroblepharon	☐	☐	☐
13. Distichiasis / Ectopic cilia	☐	☐	☐
14. Corneal dystrophy	☐	☐	☐
15. Cataract (non-congenital)	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other:	☐	☐	☐

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Retinal dysplasia:** KP-HED; abnormal development of the retina with ophthalmoscopic changes observed early in life, characterized by neuroretinal folding (s), rosettes and partial or total retinal detachment; non-progressive and generally recognized to have three forms: (multi)focal, geographic and total.
- **Retinal dysplasia- (multi)focal:** seen ophthalmoscopically as linear (vermiform), triangular, curved or curvilinear foci of retinal folding that may be single or multiple. Its significance to vision is unknown. When seen in puppies this condition may partially or completely resolve with maturity. The two other forms of retinal dysplasia (geographic and complete) which are known to be hereditary in some breeds and, in their most severe form, may cause blindness.

HED Manual Chapter 6 Guidelines

- **Retinal Dysplasia (RD):**
  - Linear (vermiform), triangular, curved or curvilinear foci of retinal folding that may be single or multiple seen ophthalmoscopically, the boxes at “4: Retinal dysplasia” and “(multi)focal” “affected” are ticked.
  - **In puppies**, linear or round juvenile folds, usually in the peripapillary area, may be observed as a result in inequity in the relative growth rates of the optic cup and these folds resolve as the animal matures. These folds are not accurately referred to as dysplasia and should be ticked “unaffected” but have to be described in the comments area. In the English Springer Spaniel, Golden Retriever, Labrador Retriever and Samoyed these juvenile folds are considered as retinal dysplasia (RD) and should be ticked “undetermined” or “affected”.

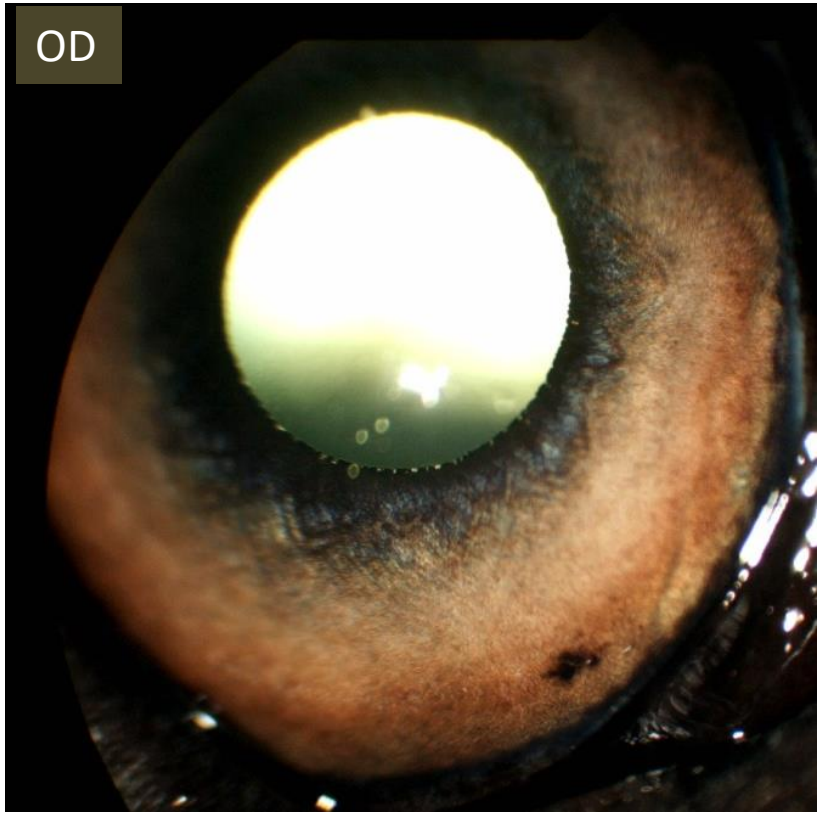
HED Manual Chapter 8 Vet Advice

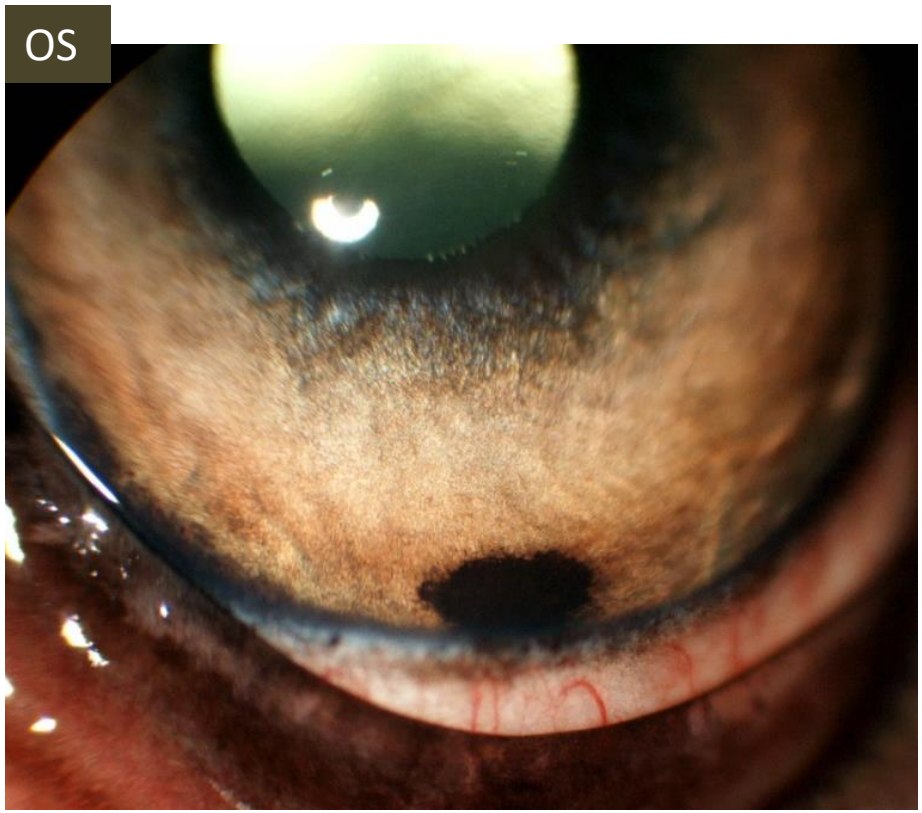
- **Retinal folds** (in puppies or as sequelae post inflammation or retinal reattachment): no restriction

HED SESSION – Kahoot!

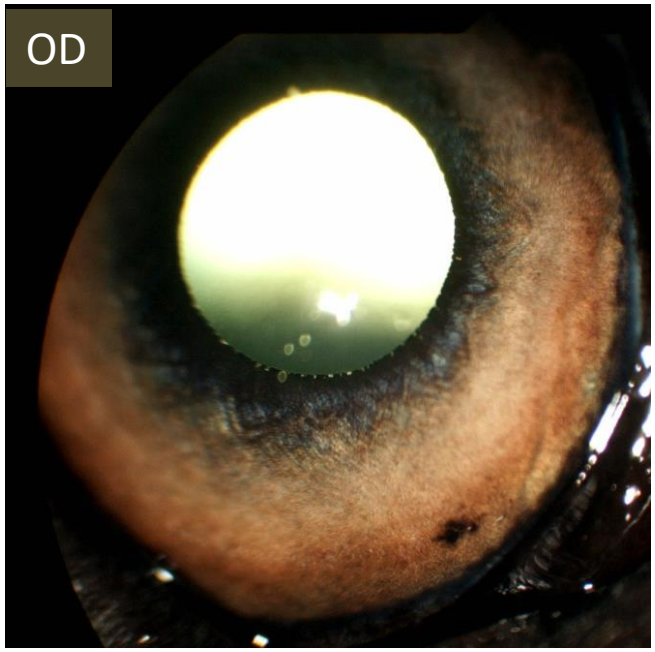
Case 6

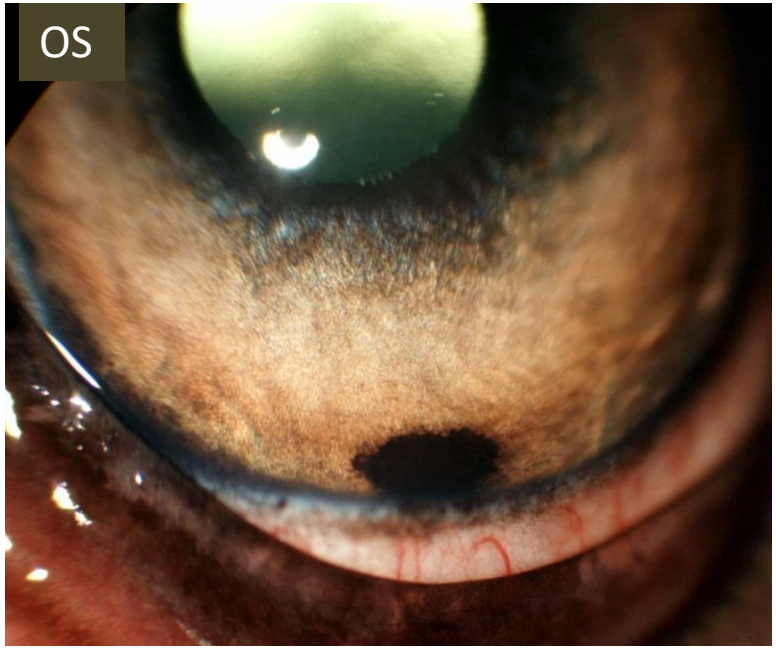
Boerboel, f, 10 months, bilateral finding Slides: Birgit Lohmann





Boerboel, f, 10 months, bilateral finding Slides: Birgit Lohmann





▲ Comments: iris naevus

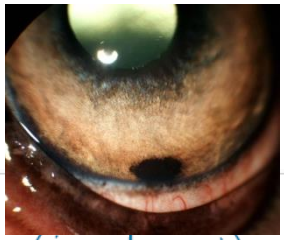
♦ 18: Other: uveal cysts

● 7. Other: iris hypoplasia

■ 18. Other: iris melanoma - suspicious

ECVO CERTIFICATE
new printed form

Boerboel, f, 10 months, bilateral finding



Right eye (OD) — Photographs: — ant. — post. — lat./temp. — med./nas.

Photographs: — ant. — post. — med./nas. — lat./temp.

Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED	
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐	
4. Retinal Dysplasia (RD)	☐	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐	
6. Collie Eye Anomaly (CEA)	☐	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐	
8. IridoCorneal Angle Abnormality. (ICAA)	☐		☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED	
11. Entropion / Trichiasis	☐	☐	☐	
12. Ectropion / Macroblepharon	☐	☐	☐	
13. Distichiasis / Ectopic cilia	☐	☐	☐	
14. Corneal dystrophy	☐	☐	☐	
15. Cataract (non-congenital)	☐	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐	
17. Retinal degeneration (PRA)	☐	☐	☐	
18. Other: Iris melanoma	☐	☒	☐	

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in 12 months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

New text

- **Iris melanoma:** KP-HED; a neoplasm caused by malignant transformation of melanocytes in the iris. Occurs with a higher than normal incidence in the Labrador Retriever. Left untreated it may result in secondary glaucoma and/or metastasis. Without a histological examination, an iris melanoma cannot be differentiated from a benign melanocytoma in every case. A distinction may become possible depending on the further development.

HED Manual Chapter 6 Guidelines

New text

- **Iris melanoma**
  - If there are typical "clinical" signs of an iris melanoma (raised, black-brown lesion in the iris whose growth has been noted), at "18. Other": "Iris melanoma" is written (online: is used) and the box "affected" is ticked.
  - If a small, non-raised pigmentation is noticed for the first time, and no information about an increase in size is available, at "18. Other": "Iris melanoma" is written (online: is used) and the box “suspicious” is ticked and re-examination in 6-12 months required.
  - If the lesion is not progressive, tick “unaffected” and write in “descriptive comments”: “Pigmented lesion on the iris – to be observed”.
  - If the lesion is progressive, tick “affected”.

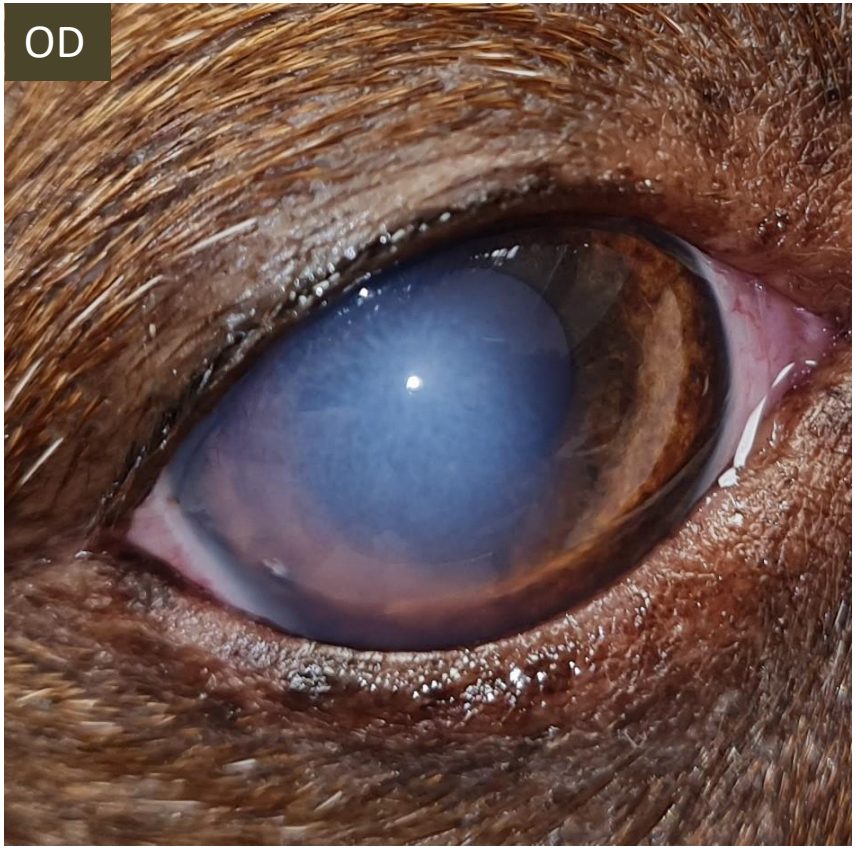
HED Manual Chapter 8 Vet Advice

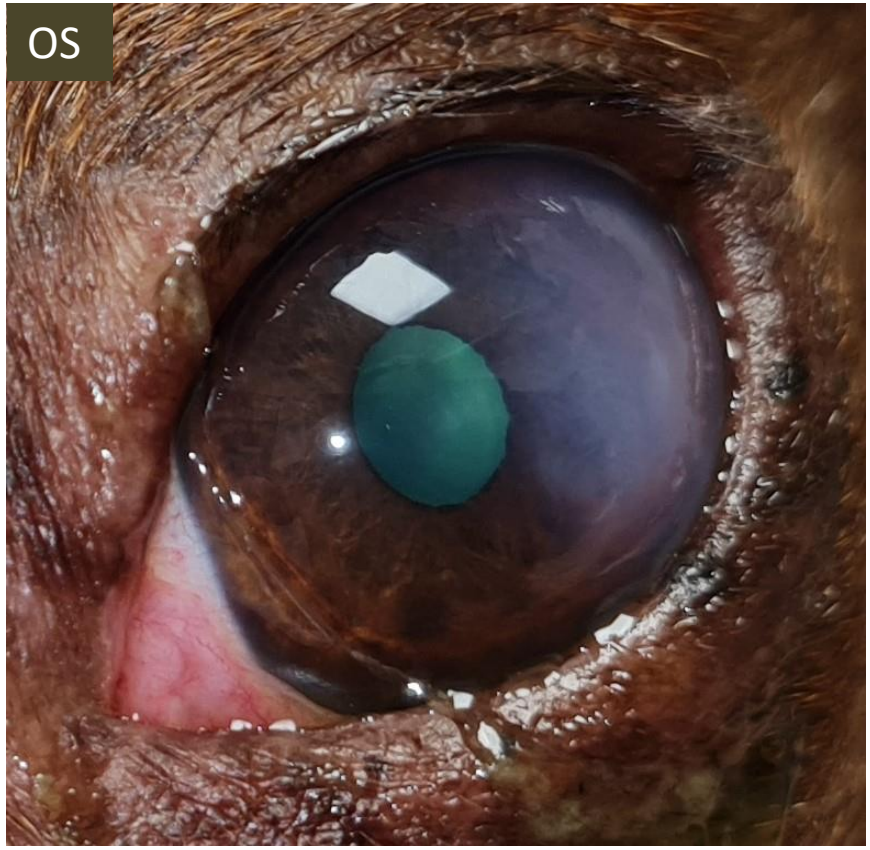
Å **Iris melanoma:** NO BREEDING from the affected animal

HED SESSION – Kahoot!

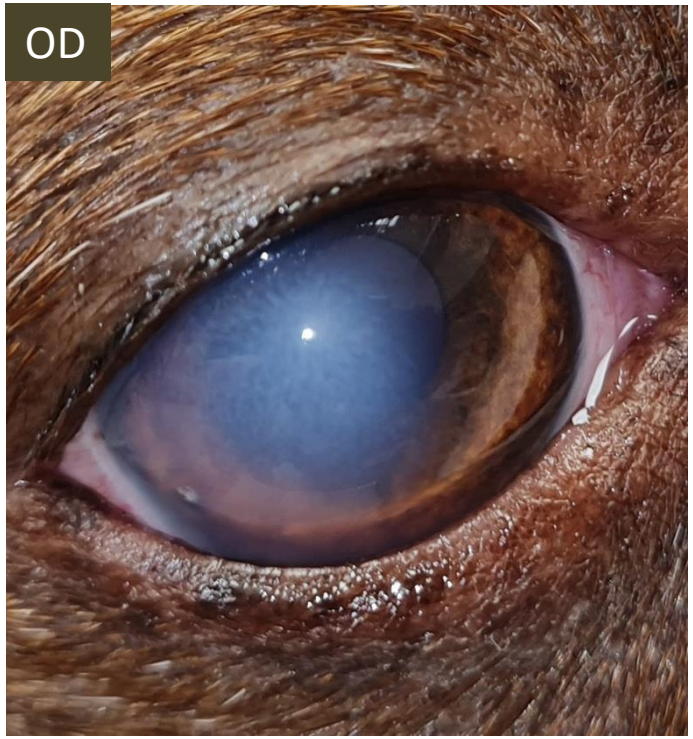
Case 7

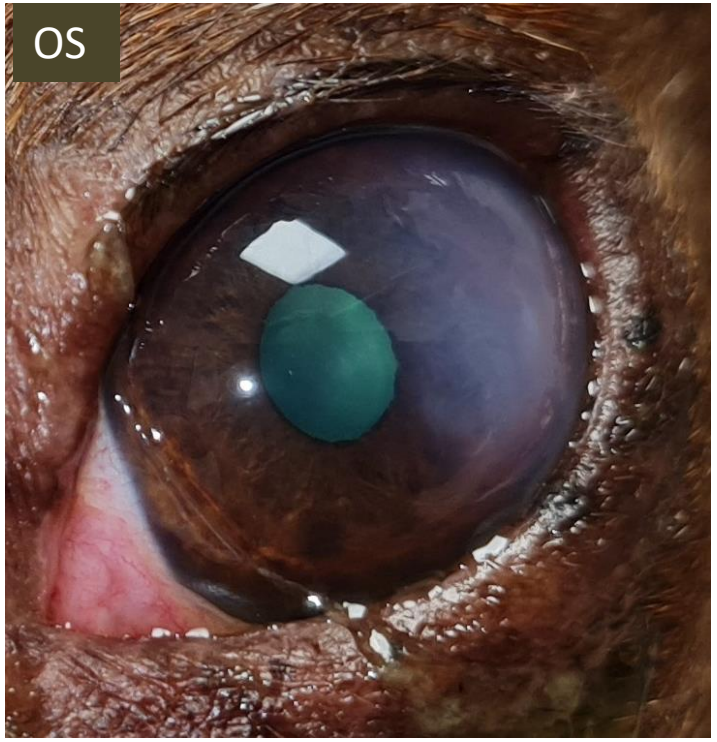
Boston Terrier; m, 5y, bilateral findings Slides: M.Richter





Boston Terrier; m, 5y, bilateral findings Slides: M.Richter





▲ Comments: corneal edema

♦ Comments: lipid keratopathy

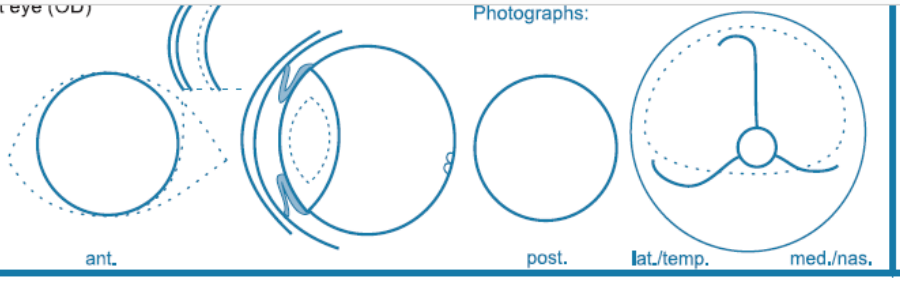
● 14. Corneal dystrophy, severe

■ 18. Other: chronic. superf. Keratitis (CSK)

ECVO CERTIFICATE
new printed form

Boston Terrier;
m, 5y, OU

Right eye (OD) Photographs:



Descriptive comments: Corneal dystrophy, endothelial

Eye disease no. 14 severe

15. Cataract other: punctata; suture line tip; suture line; nuclear ring; nuclear fiberglass/pulverulent

8. ICAA: PLA: mild; moderate; severe
ICA (width): narrow (moderate); closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED
1. Persistent Pupillary Membrane (PPM)			iris; lens; cornea; lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)			grade 1; grade 2-6
3. Cataract (congenital)			
4. Retinal Dysplasia (RD)			(multi)focal; geographical; total
5. Hypoplastic-/Micro-papilla			
6. Collie Eye Anomaly (CEA)			choroid. hypoplasia; coloboma; other:
7. Other:			
8. IridoCorneal Angle Abnormality. (ICAA)			mild; moderate; severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis			
12. Ectropion / Macroblepharon			
13. Distichiasis / Ectopic cilia			
14. Corneal dystrophy			
15. Cataract (non-congenital)			cortical; post. pol.; nuclear; other
16. Lens luxation (primary)			
17. Retinal degeneration (PRA)			
18. Other:			

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Corneal dystrophy:** KP-HED; non-inflammatory corneal opacity in one or more of the corneal layers (epithelium, stroma, endothelium). It is usually bilateral but not always symmetrical. The onset in one eye may precede the other.
- **Corneal dystrophy, endothelial:** KP-HED; abnormal loss of the inner lining (endothelium) of the cornea causing progressive fluid retention (edema) leading to increased corneal thickness, keratitis, corneal clouding and decreased vision.

HED Manual Chapter 6 Guidelines

- **Corneal dystrophy** is to be ticked “affected” at “14. Corneal dystrophy”, and the details described in the field Descriptive comments.
  In cases of endothelial dystrophy (bilateral progressive diffuse, deep corneal edema, e.g. in Chihuahua, Boston Terrier etc.) or macular dystrophy (bilateral diffuse haziness of the cornea with multiple whitish/grey macula like lesions throughout the corneal stroma, periphery slightly less affected, e.g. in Labrador Retriever) or severe forms of stromal dystrophy (e.g. in Siberian Husky) is recognized, also the box “severe” is to be ticked in the comment area.

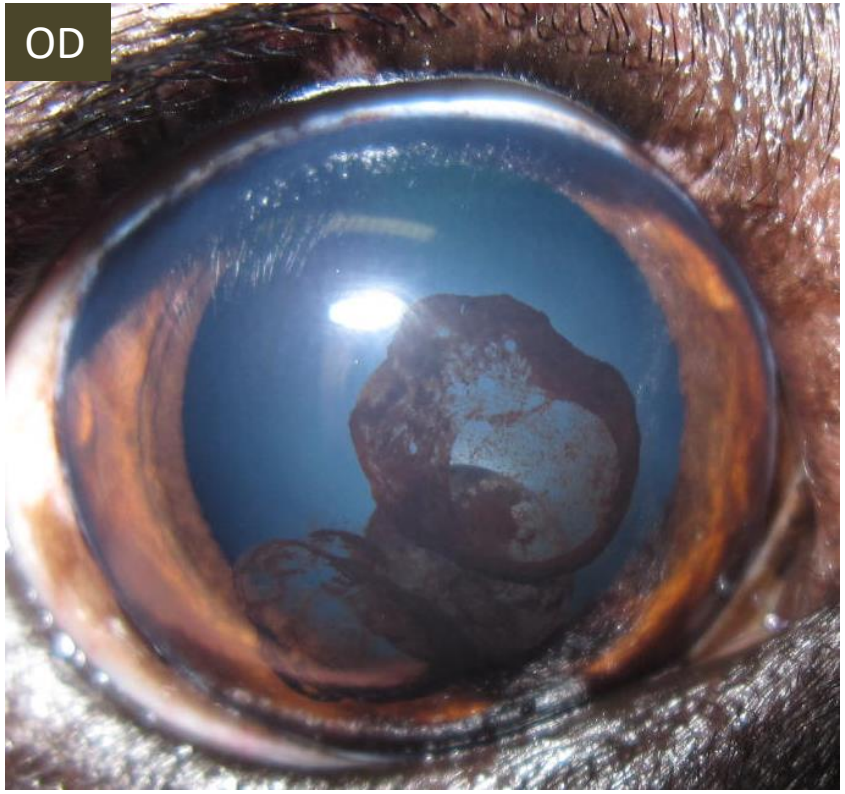
HED Manual Chapter 8 Vet Advice

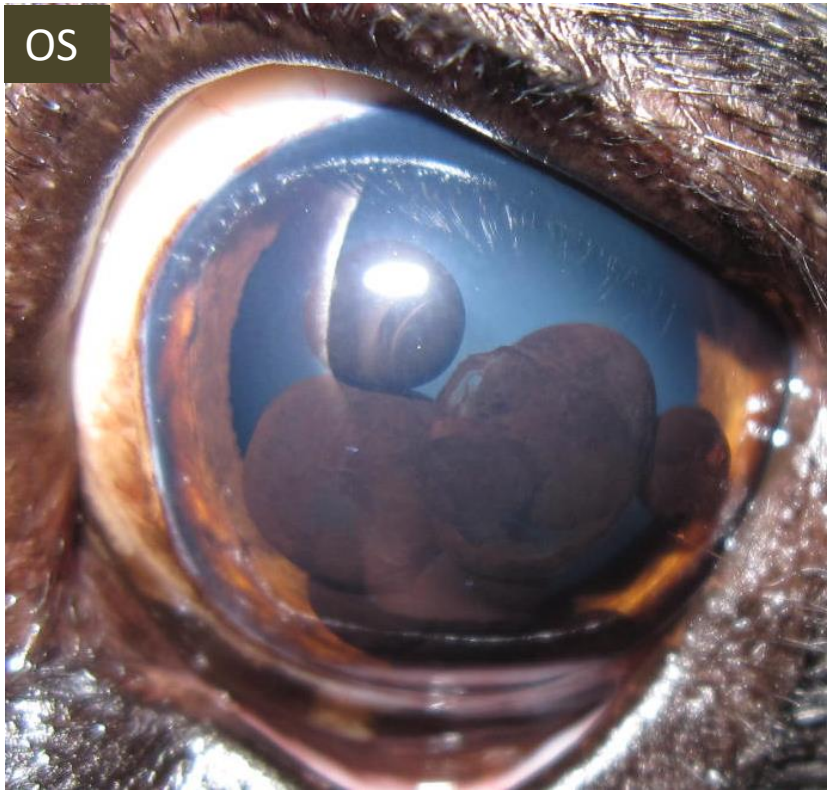
- **Corneal Dystrophy:**
  - **Endothelial dystrophy** (e.g. Chihuahua, Boston Terrier, Dachshund): NO BREEDING from the affected animal

HED SESSION – Kahoot!

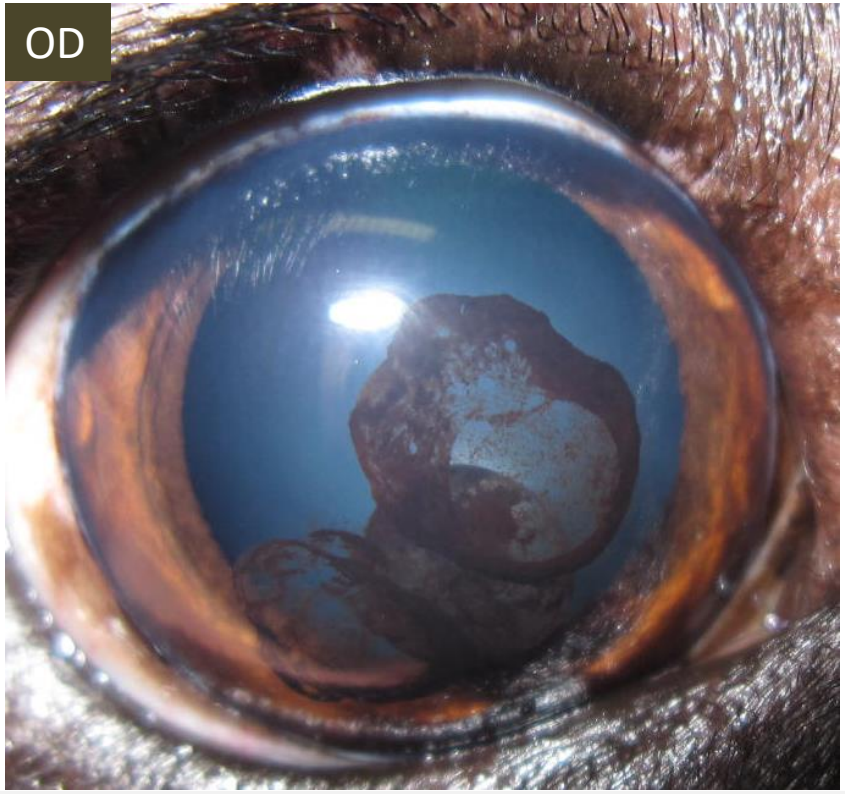
Case 8

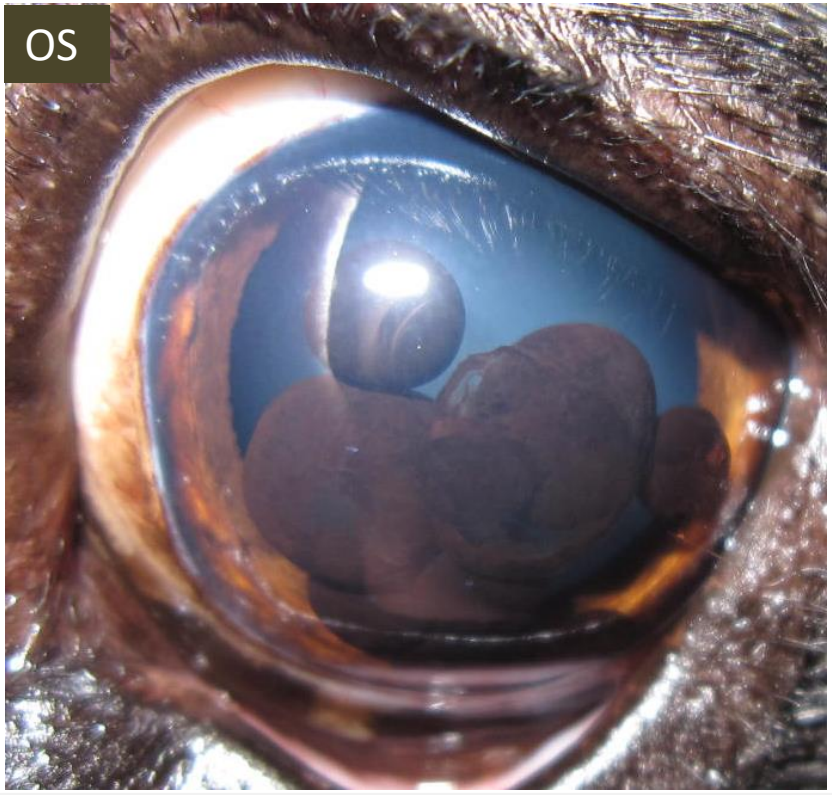
Labrador Retriever; m, 8y6m, bilateral findings Slides: M.Richter





Labrador Retriever; m, 8y6m, bilateral findings Slides: M.Richter





▲ 18. Other: uveal cysts, severe

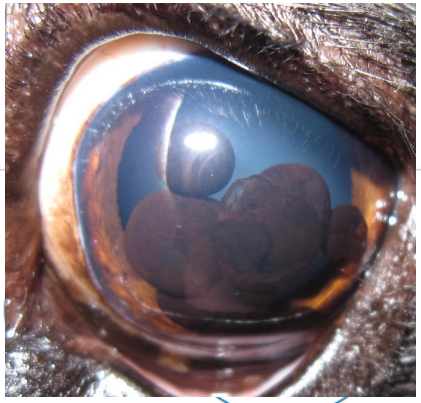
♦ 18. Other: uveitis, pigmentary

● 18. Other: uveal cysts

■ Comments: uveal cysts

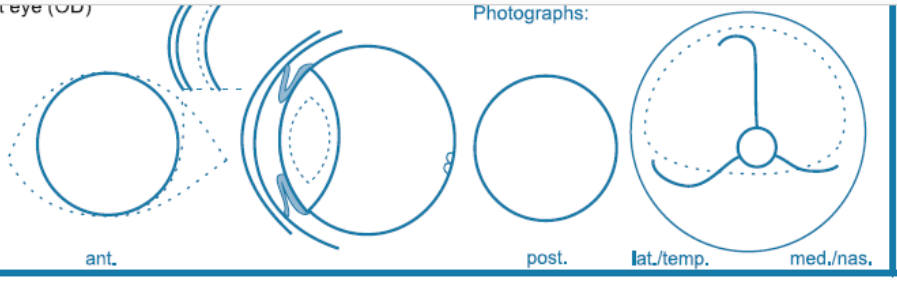
ECVO CERTIFICATE
new printed form

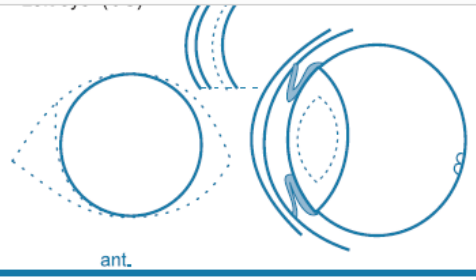
Labrador Retriever;
m, 8y6m, OU



Right eye (OD)

Photographs:





Descriptive comments: .....

.....

.....

Eye disease no. 18 ..... severe

15. Cataract other:
- punctata
- suture line tip
- suture line
- nuclear ring
- nuclear fiberglass/pulverulent

8. ICAA: PLA
- mild
- moderate
- severe

ICA (width)
- narrow (moderate)
- closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED	
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐	iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐	grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐	
4. Retinal Dysplasia (RD)	☐	☐	☐	(multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐	
6. Collie Eye Anomaly (CEA)	☐	☐	☐	choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐	
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐	mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED	
11. Entropion / Trichiasis	☐	☐	☐	
12. Ectropion / Macroblepharon	☐	☐	☐	
13. Distichiasis / Ectopic cilia	☐	☐	☐	
14. Corneal dystrophy	☐	☐	☐	
15. Cataract (non-congenital)	☐	☐	☐	cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐	
17. Retinal degeneration (PRA)	☐	☐	☐	
18. Other: Uveal cysts	☐	☐	☒	

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Uveal cyst:** KP-HED; usually pigmented membrane spheres of various sizes, arising from posterior pigmented epithelial cells of the iris/ciliary body and which remain attached, or break free floating as more or less pigmented spheres in the anterior chamber. When reaching maximal size, cysts tend to adhere to the endothelial surface in the center of the cornea, thus causing visual impairment. Severe cases which occur with a higher than normal incidence in the Great Dane (Deutsche Dogge) and in the Golden Retriever and may lead to secondary glaucoma.

HED Manual Chapter 6 Guidelines

- **Uveal Cysts:** If there are only 1-3 free separate floating cysts and no connected signs of glaucoma and/or uveitis at “18. Other”: “uveal cyst(s)” is written, and the box “affected” is ticked. Only if there are several cysts and/or signs of uveitis and/or glaucoma also the box “severe” is to be ticked in the comment area. Tonometry before dilation is recommended.

HED Manual Chapter 8 Vet Advice

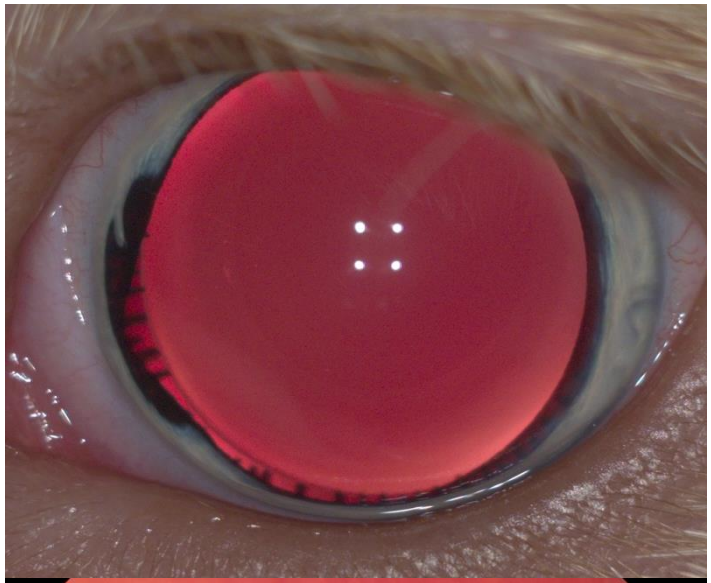
- **Uveal Cysts:** OPTIONAL, Note: In severe cases the advice may be: NO BREEDING from the affected animal

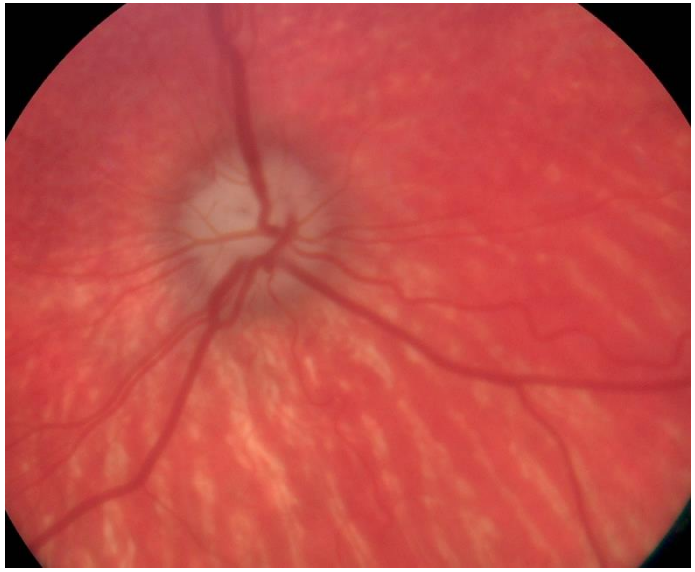
HED SESSION – Kahoot!

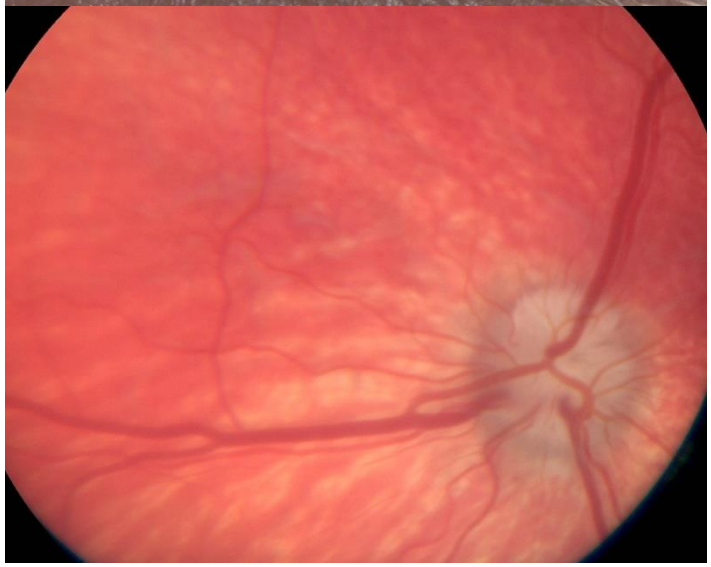
Case 9

Australian Shepherd (red merle); f, 3y, bilateral findings Slides: R.Eördögh

Before dilating the pupils (bilateral finding)

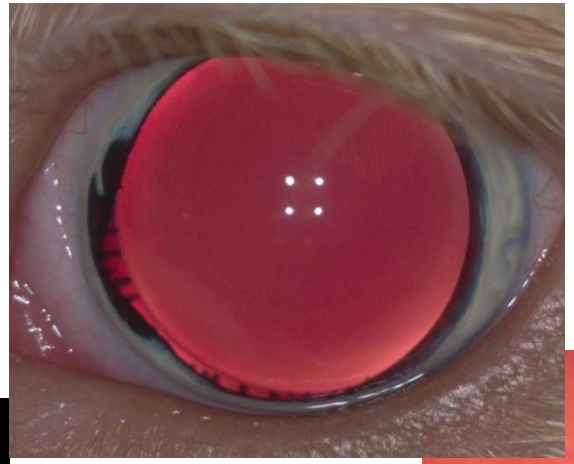


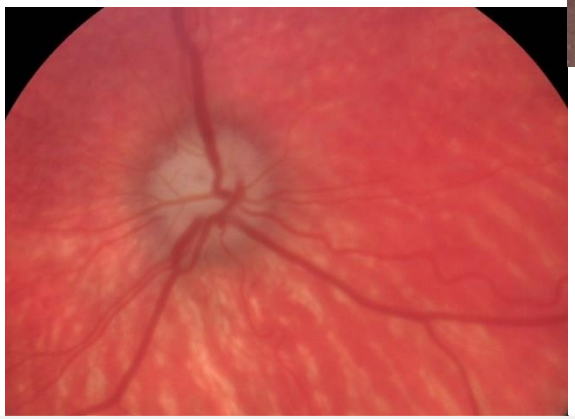


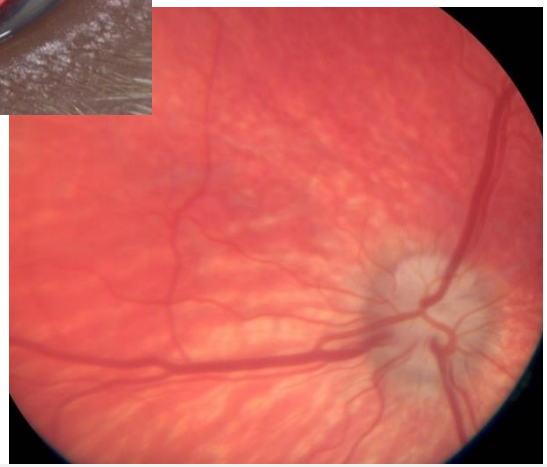


Australian Shepherd (red merle); f, 3y, bilateral findings

Before dilating the pupils (bilateral finding)







▲ 6. CEA – choroid. Hypoplasia
7. Other: Iris hypoplasia, severe

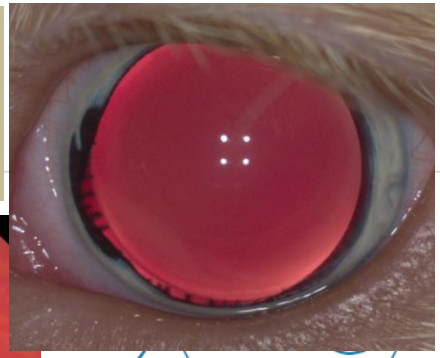
♦ 7. Other: lens hypoplasia

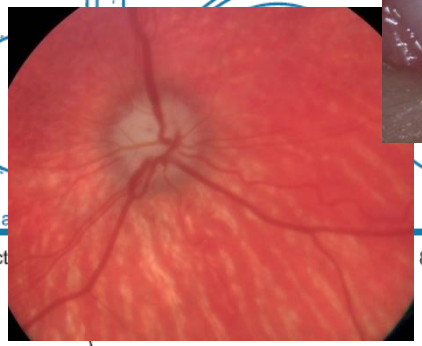
● 6. CEA – choroid. Hypoplasia
7. Other: microphakia

■ 7. Other: Iris hypoplasia, severe

ECVO CERTIFICATE
new printed form

Australian Shepherd (red merle); f, 3y, OU, before dilating pupils





Right eye (OD) Photographs:

ant. post. lat./temp. med./nas.

post. med./nas. lat./temp.

Descriptive comments: .....

.....

.....

15. Cataract
- nuclear ring
- nuclear fiberglass/pulverulent

8. ICAA: PLA
- mild
- moderate
- severe

ICA (width)
- narrow (moderate)
- closed (severe)

Eye disease no. ..... 7 ..... ✖ severe

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED	
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐	
4. Retinal Dysplasia (RD)	☐	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐	
6. Collie Eye Anomaly (CEA)	☐	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: Iris hypoplasia	☐	☐	✖	☐ mild ☐ moderate ☐ severe
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐	

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED	
11. Entropion / Trichiasis	☐	☐	☐	
12. Ectropion / Macroblepharon	☐	☐	☐	
13. Distichiasis / Ectopic cilia	☐	☐	☐	
14. Corneal dystrophy	☐	☐	☐	
15. Cataract (non-congenital)	☐	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐	
17. Retinal degeneration (PRA)	☐	☐	☐	
18. Other:	☐	☐	☐	

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Iris hypoplasia:** KP-HED; characterized by congenital thinning and/or absence of iris (sphincter) tissue or colobomatous defects due to failure in closure of the optic fissure. It may be a separate disorder or associated with other ocular malformations.

- **Lens hypoplasia:** KP-HED; characterized by congenital incomplete formation of the lens equator, previously called lens coloboma.

HED Manual Chapter 6 Guidelines

Iris hypoplasia: At "7. Other": "Iris hypoplasia" is written (online: is used), and the box "affected" is ticked.
Only if uni- or bilateral iris tissue is missing (full thickness) or failed to develop (developmentally colobomatous) e.g. in one of the specific breeds Australian Shepherd, Dalmatian, Rottweiler, also the box "severe" is to be ticked in the comment area.

Note: if there is a congenital lack of tissue in the iris or lens, the term "hypoplasia" is used: iris hypoplasia, lens hypoplasia. Reason: iris tissue can be absent full-thickness or partially (hypoplastic); the lens may have a flattened curvature due to abnormal development of zonular fibers or ciliary processes.

HED Manual Chapter 8 Vet Advice

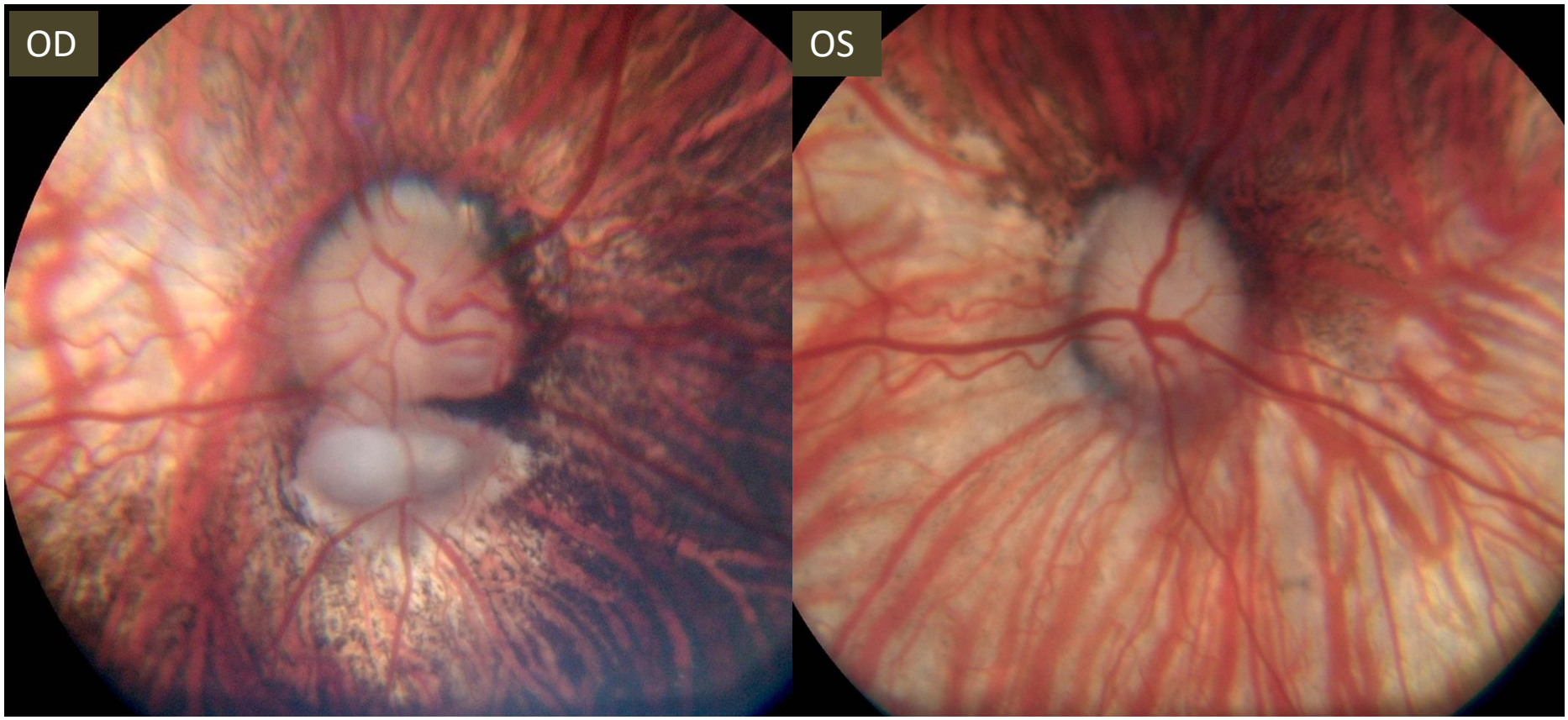
Hypoplasia:

- **Iris:** OPTIONAL, Note: In severe cases: NO BREEDING from the affected animal

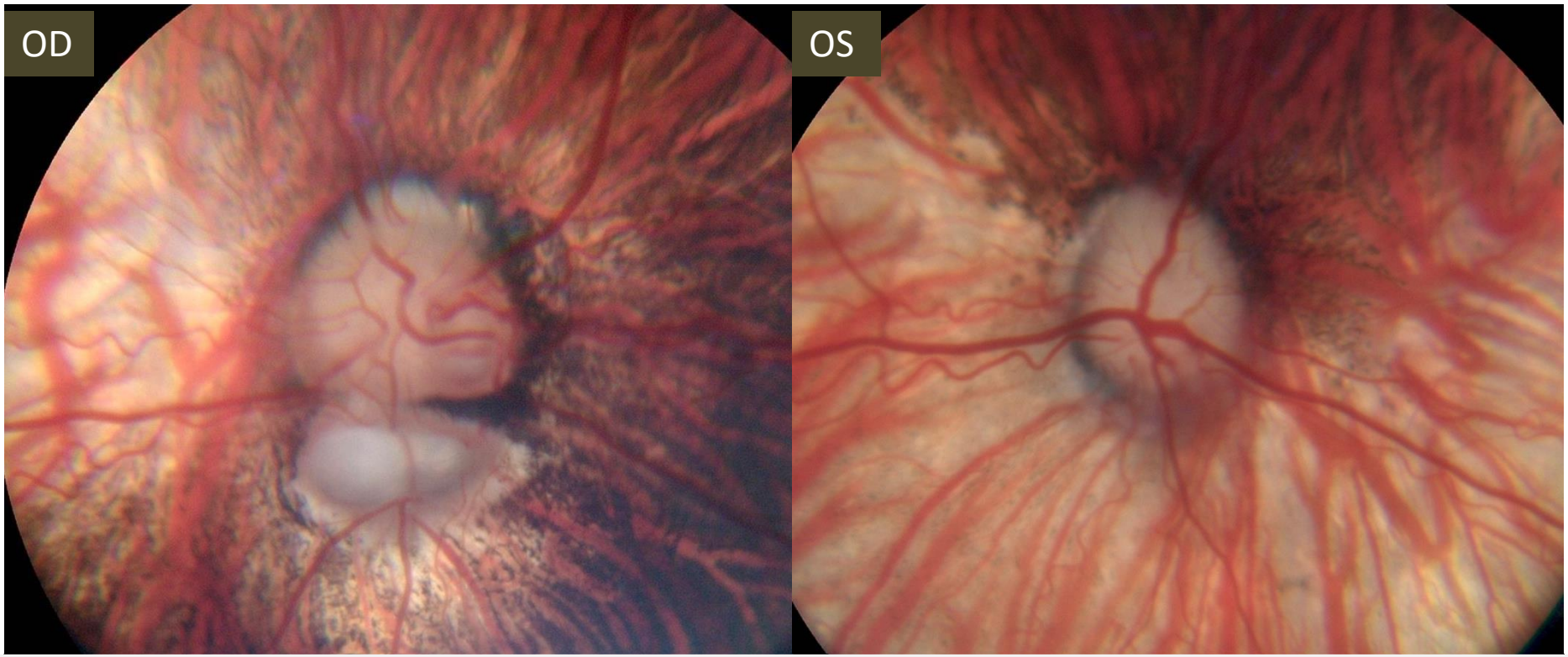
HED SESSION – Kahoot!

Case 10

Collie (blue merle); f, 2y, bilateral findings Slides: R.Eördögh



Collie (blue merle); f, 2y, bilateral findings Slides: R.Eördögh



▲ 6: CEA – choroid. hypoplasia

♦ 6: CEA – choroid. hypoplasia & coloboma

● 18: Other: optic disc coloboma

■ 6: CEA – coloboma

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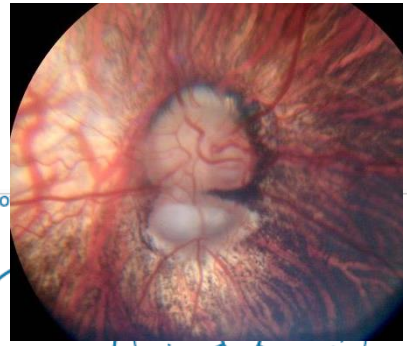
new printed form

Collie (blue merle); f, 2y, bilateral findings



Right eye (OD) Photographs: Pho

ant. post. lat./temp. med./nas. ant. post. med./nas. lat./temp.

Descriptive comments: .....

.....

.....

Eye disease no. ..... ☐ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐
8. ~~IridoCorneal Angle Abnormality~~ (ICAA)	☐		☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis	☐	☐	☐
12. Ectropion / Macroblepharon	☐	☐	☐
13. Distichiasis / Ectopic cilia	☐	☐	☐
14. Corneal dystrophy	☐	☐	☐
15. Cataract (non-congenital)	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other:	☐	☐	☐

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.

** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.

*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Choroidal (retinal) hypo-(dys-)plasia (CH, CRD):** KP-HED congenital eye disease which is characterized by inadequate development of the choroid present at birth which is non-progressive. Most commonly identified in the Collie breed where it is a manifestation of "Collie Eye Anomaly"
- **Collie Eye Anomaly (CEA):** KP-HED; a congenital syndrome of ocular anomalies mainly in Collie breeds affecting the choroid and sclera and indirectly the retina and optic disc. It is characterized by bilateral and often symmetrical defects including choroidal hypoplasia (CH or CRD) with or without coloboma, retinal detachment and intraocular haemorrhage. Vision varies with the degree to which an individual is affected and may be minimally compromised to having severe visual impairment or blindness. DNA-tests for choroidal hypoplasia in specific breeds are available.

HED Manual Chapter 5 Definitions

- **Coloboma:** congenital defect of a portion of the eye due to a failure in closure of the body halves; most frequently affecting the iris* or the optic nerve at the 6 o'clock position. The latter is a presumed hereditary congenital eye disease that if large, may cause retinal detachment resulting in blindness or visual impairment.

  *use the term "iris-hypoplasia"

HED Manual Chapter 6 Guidelines

- **Collie eye anomaly (CEA):**
  - At no 6. Colly Eye Anomalie (CEA) tick boxes “affected” and “choriod. hypoplasia” + “coloboma”
    In cases where the animal displays clinical features that could possibly fit this KP-HED, but the changes are not specific enough, the result of the examination is: “undetermined”. In dogs of a relevant breed that were not examined until after the 8th week of age, CEA can be masked (“go normal”) later in life. In such cases the breeder/owner is advised to distinguish the status of the animal by e.g. DNA testing. The box “affected – other” has to be specified in the comment area of the ECVO certificate (retinal detachment or –haemorrhage)

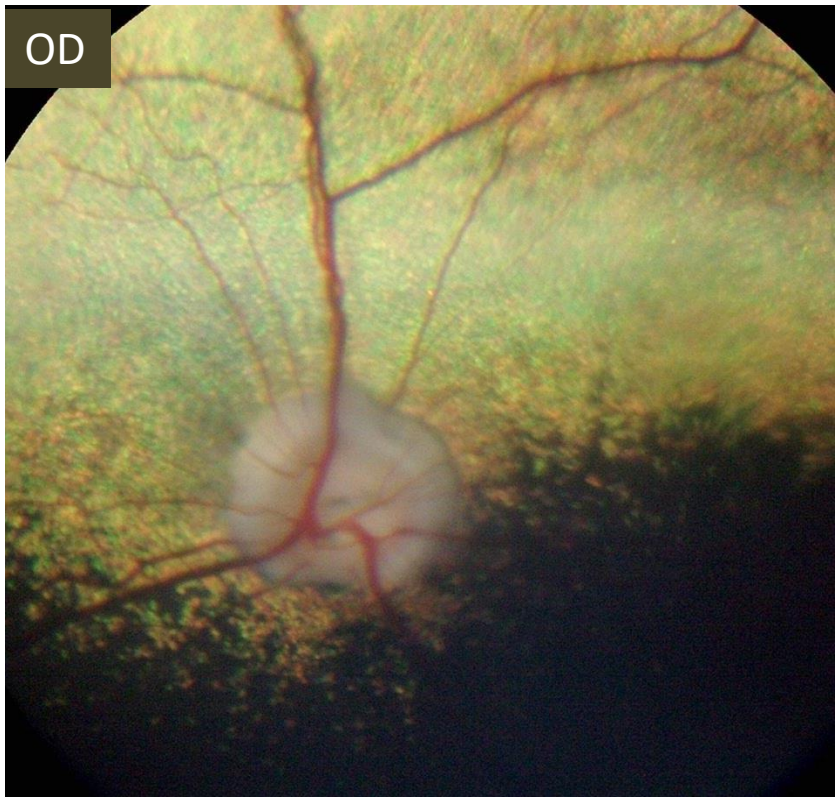
HED Manual Chapter 8 Vet Advice

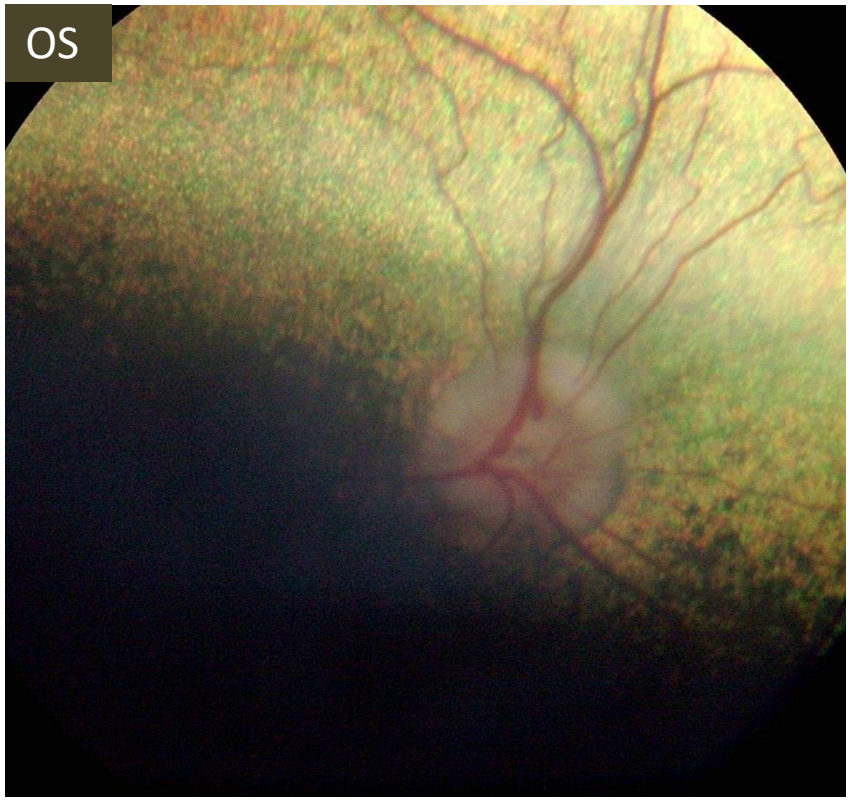
- **Collie Eye Anomaly (CEA):**
  - Choroidal hypoplasia (CH)/chorioretinal dysplasia (CRD): OPTIONAL
  - Coloboma and other defects (retinal detachment, haemorrhage): NO BREEDING from the affected animal

HED SESSION – Kahoot!

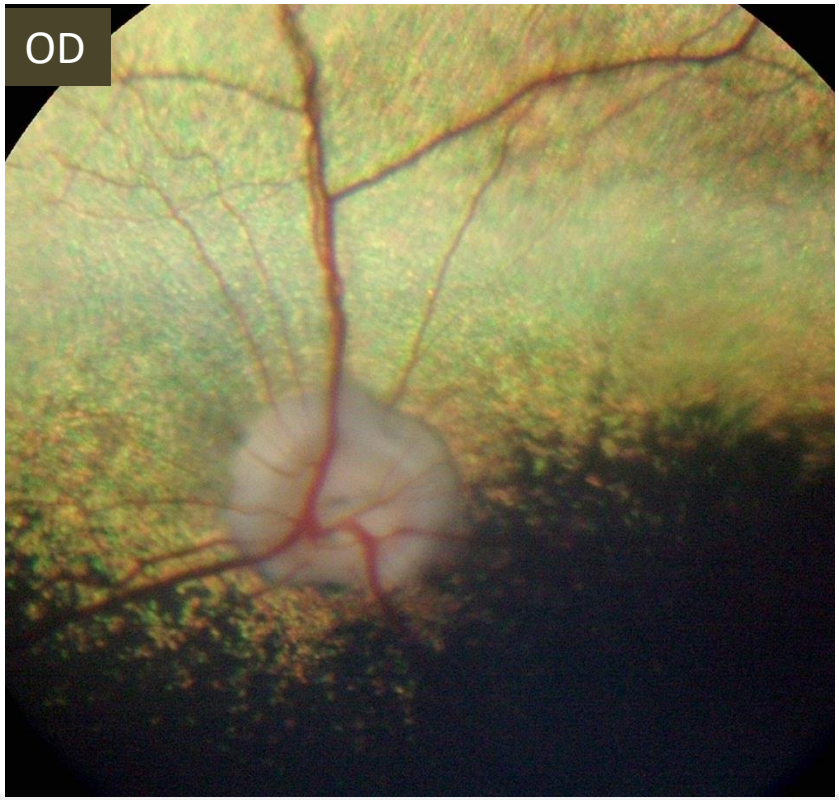
Case 11

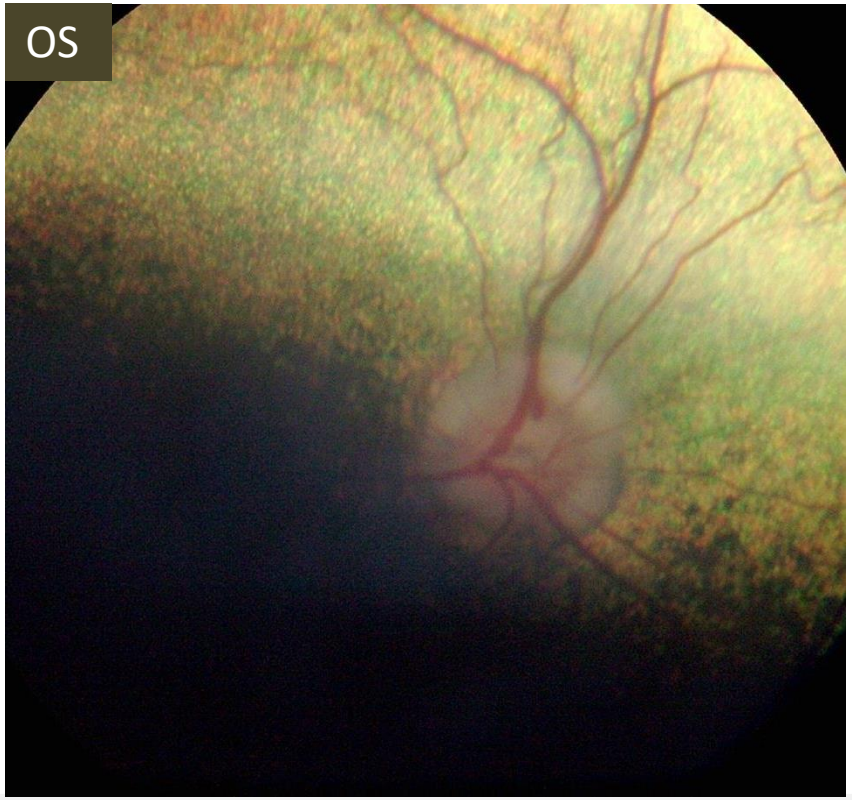
Bouvier des Flandres; f, 3y, bilateral findings Slides: R.Eördögh





Bouvier des Flandres; f, 3y, bilateral findings Slides: R.Eördögh





▲ Comments: retinal edema

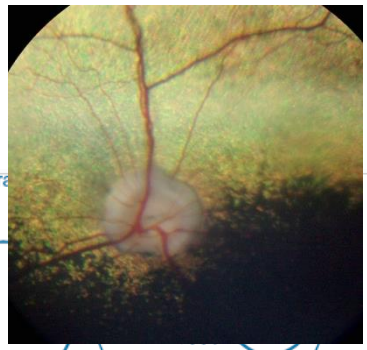
♦ 17. Retinal degeneration (PRA) - suspicious

● 18. Other: other presumed hereditary retinal degenerations

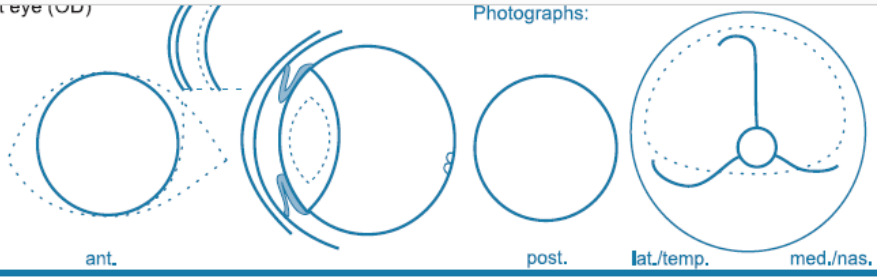
■ Normal/"unaffacted"

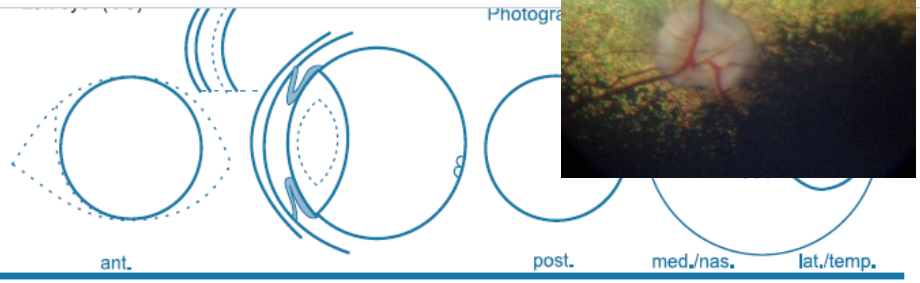
ECVO CERTIFICATE
new printed form

Bouvier des Flandres;
f, 3y, OU



Right eye (OD) Photographs:





Descriptive comments:

ERG recommended

Eye disease no. ..... ☐ severe

15. Cataract other:
- ☐ punctata
- ☐ suture line tip
- ☐ suture line
- ☐ nuclear ring
- ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA
- ☐ mild
- ☐ moderate
- ☐ severe

ICA (width)
- ☐ narrow (moderate)
- ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED	
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐	
4. Retinal Dysplasia (RD)	☐	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐	
6. Collie Eye Anomaly (CEA)	☐	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐	
8. IridoCorneal Angle Abnormality. (ICAA)	☐		☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED	
11. Entropion / Trichiasis	☐	☐	☐	
12. Ectropion / Macroblepharon	☐	☐	☐	
13. Distichiasis / Ectopic cilia	☐	☐	☐	
14. Corneal dystrophy	☐	☐	☐	
15. Cataract (non-congenital)	☐	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐	
17. Retinal degeneration (PRA)	☐	☒	☐	
18. Other:	☐	☐	☐	

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in 12 months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

Retinal degeneration/Progressive Retinal Atrophy (PRA): KP-HEDs; a group of bilateral, hereditary dysplastic and /or degenerative diseases of the photoreceptors primarily, progressing to blindness in both eyes simultaneously. The onset of the blindness depends on the affected breed and the type of process (dysplasia and/or degeneration). The photoreceptor abnormalities can be detected by an electroretinogram (not part of a routine ECVO Scheme eye examination) before there are detectable fundus changes observed by ophthalmoscopy. These funduscopic changes consist in the early disease of a change in reflectivity with greyish discoloration mainly in the periphery and mid-periphery in the tapetal area of the fundus accompanied by slight vascular attenuation. With progression of the disease there are more generalized changes with hyperreflectivity of the tapetal fundus, depigmentation and uneven pigment distribution in the non-tapetal fundus, severe vascular attenuation and a pale optic disc. There are multiple genetic types of PRA including different forms of rod-cone dysplasia and degeneration (rcd 1-4) and progressive rod cone degeneration (prcd). DNA-tests for specific forms and breeds are available.

Retinal degeneration can also be due to non-hereditary causes, e.g. inflammation and/or infection, toxicity, etc., affecting retinal structures with degeneration of cells or entire cellular layers. The end-stage is often complete retinal atrophy, which may appear ophthalmoscopically similar to (hereditary) PRA.

HED Manual Chapter 6 Guidelines & Chapter 3 Eye Scheme

- **Retinal Degeneration/Progressive Retinal Atrophy (PRA):** At number 17. Retinal degeneration (PRA) tick box "**suspicious**"
- If an animal displays minor, but specific clinical signs of the KP-HED mentioned, **"suspicious"** is ticked for the relevant disease (no 11-18 on the certificate). Further development will confirm the diagnosis. It is required that "suspicious" cases are re-examined after the period prescribed on the Certificate, by a minimum of three members of the National Panel or by a Chief or deputy Chief Panellist, whose decision is final. (see Chapter 3 Eye Scheme)
- **Electroretinography (ERG)** using the standardized protocol of the ECVO (Ekesten B et al. "Guidelines for clinical electroretinography in the dog: 2012 update", Doc Ophthalmol, 2013 Oct;127(2):79-87)
- **DNA-tests** for specific forms and breeds are available.

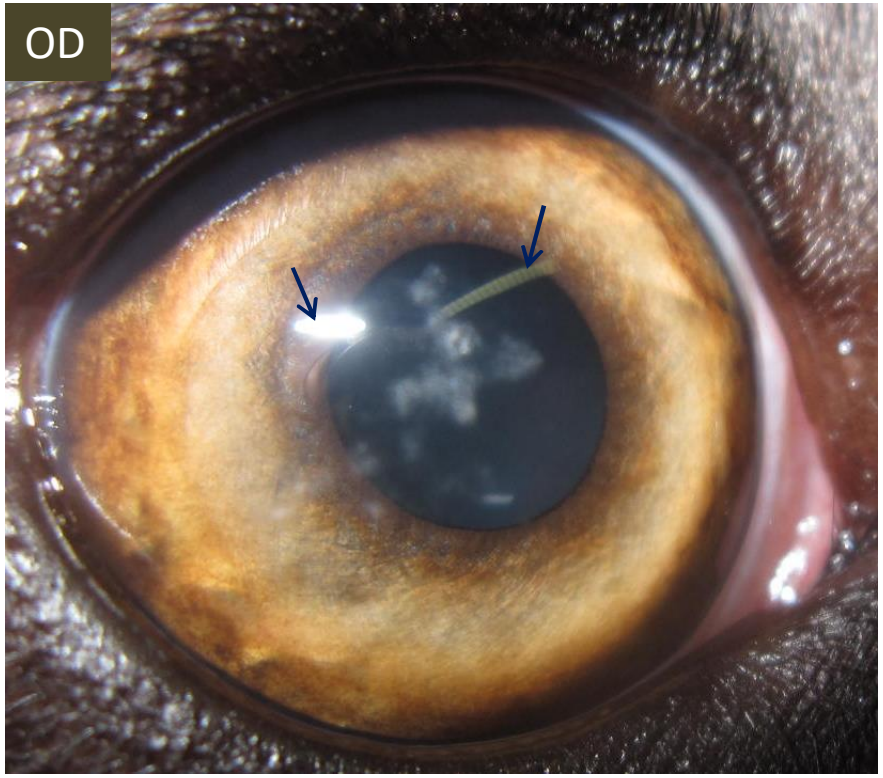
HED Manual Chapter 8 Vet Advice

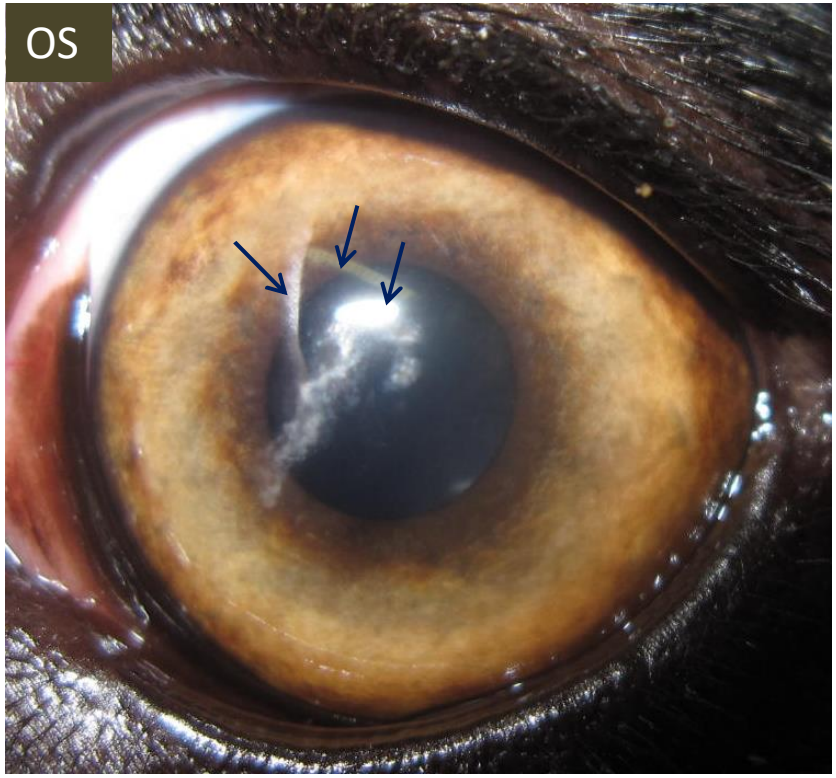
- **Retinal Degeneration/Progressive Retinal Atrophy (PRA):**
  NO BREEDING from the affected animal, its parents or offspring.
  In instances where a DNA-based genetic test for recessive PRA is available breeders may choose to breed from carrier animals that have outstanding characteristics while still avoiding production of affected offspring. All such matings should be carefully controlled and all offspring subjected to DNA-based testing.

HED SESSION – Kahoot!

Case 12

Border Collie; m, 1y, bilateral findings Slides: M.Richter

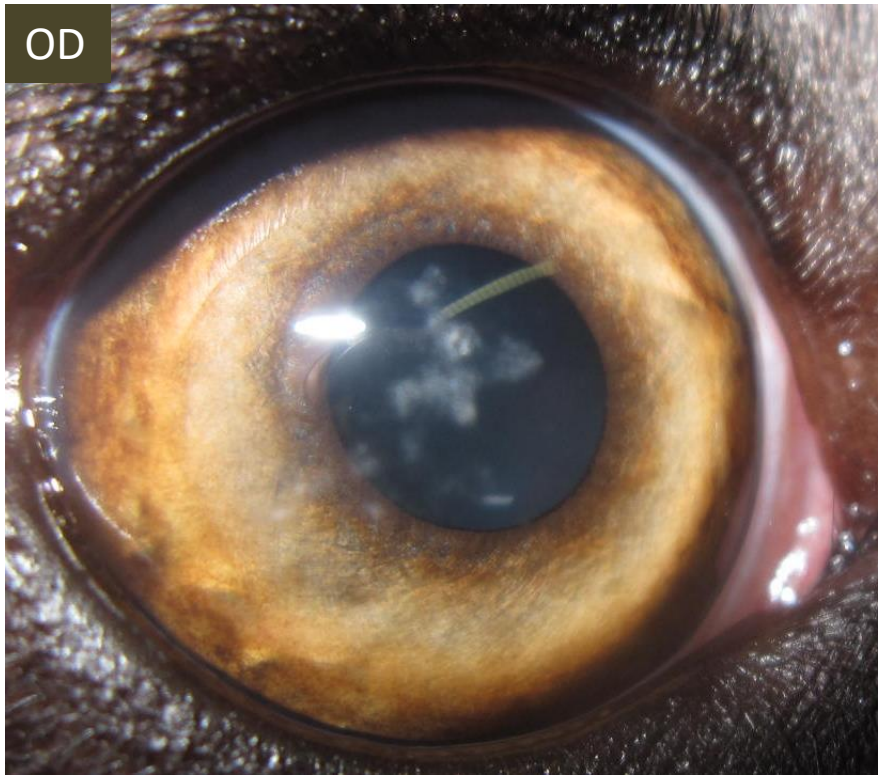


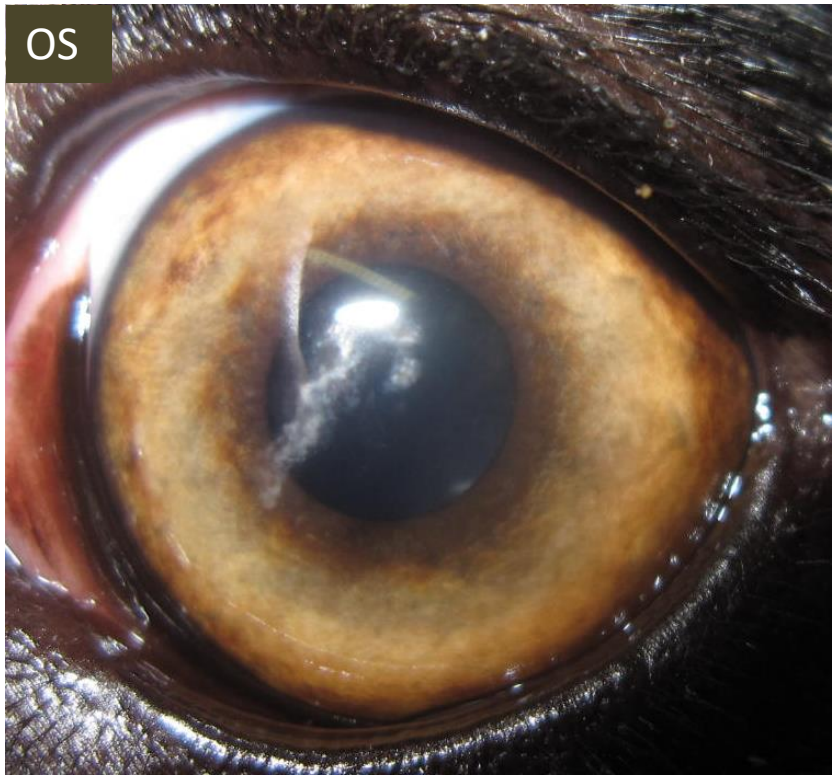


⟶ Light reflections

Border Collie; m, 1y, bilateral findings

Slides: M.Richter





▲ 18. Other: Keratitis: Chronic superficial keratitis (CSK)

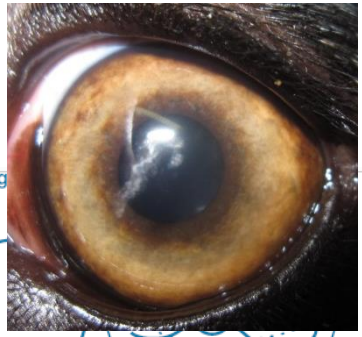
♦ 18. Other: Keratitis, Punctate

● Comments: lipid keratopathy

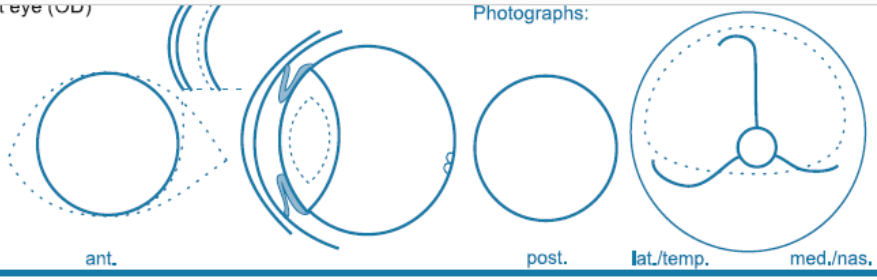
■ 14. Corneal dystrophy

ECVO CERTIFICATE
new printed form

Border Collie; m, 1y, bilateral findings



Right eye (OD) Photographs:



Descriptive comments:

Corneal dystrophy: epithelial/stromal

Eye disease no. ..... ☐ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other:	☐	☐	☐
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis	☐	☐	☐
12. Ectropion / Macroblepharon	☐	☐	☐
13. Distichiasis / Ectopic cilia	☐	☐	☐
14. Corneal dystrophy	☐	☐	☒
15. Cataract (non-congenital)	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other:	☐	☐	☐

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Corneal dystrophy:** KP-HED; non-inflammatory corneal opacity in one or more of the corneal layers (epithelium, stroma, endothelium). It is usually bilateral but not always symmetrical. The onset in one eye may precede the other.
- **Corneal dystrophy, epithelial/stromal:** non-inflammatory corneal opacity (white to grey with crystalline appearance) in one or more of the corneal layers. Often it is associated with deposits of cholesterol and other lipids (or fats) within the cornea.

HED Manual Chapter 6 Guidelines

- **Corneal dystrophy** is to be ticked “affected” at “14. Corneal dystrophy”, and the details described in the field Descriptive comments.
  In case of endothelial dystrophy (bilateral progressive diffuse, deep corneal edema, e.g. in Chihuahua, Boston Terrier etc.) or macular dystrophy (bilateral diffuse haziness of the cornea with multiple whitish/grey macula like lesions throughout the corneal stroma, periphery slightly less affected, e.g. in Labrador Retriever) or severe forms of stromal dystrophy (e.g. in Siberian Husky) is recognized, also the box “severe” is to be ticked in the comment area.

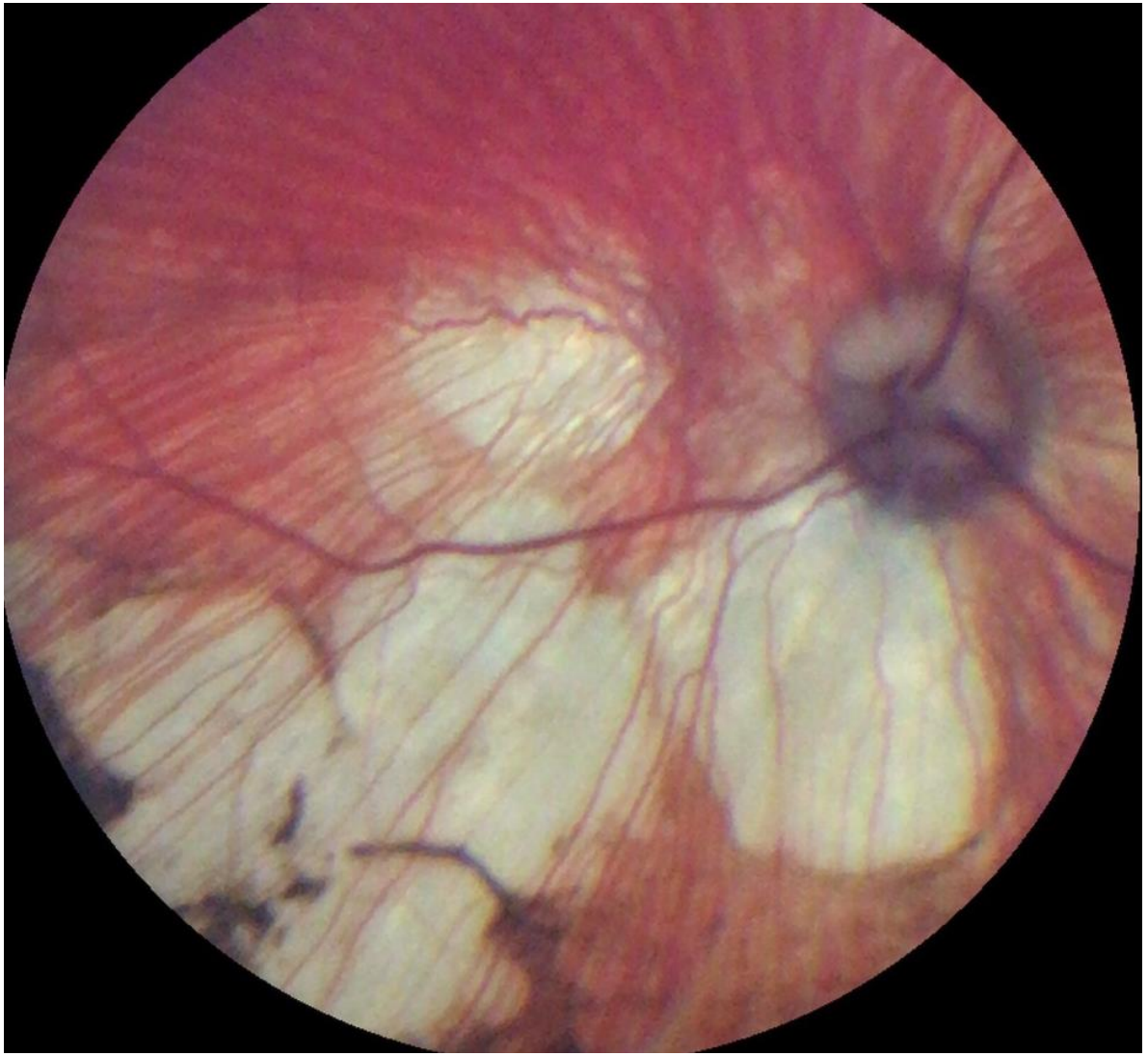
HED Manual Chapter 8 Vet Advice

- **Corneal Dystrophy:**
  - **Epithelial and/or stromal:** OPTIONAL; Note: In severe cases that cause visual problems and/or pain for the dog, e.g. in Siberian Husky or Shetland Sheepdog: NO BREEDING from the affected animal.

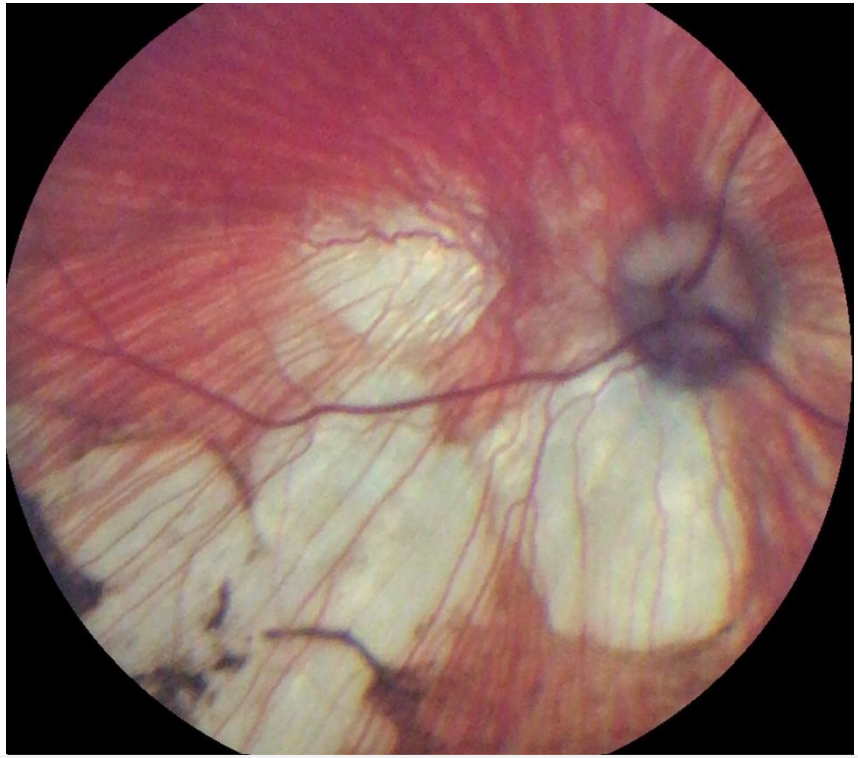
HED SESSION – Kahoot!

Case 13

Siberian Husky; m, 2y, bilateral findings Slides: J.Bolliger



Siberian Husky; m, 2y, bilateral findings Slides: J.Bolliger



▲ 18. Other: uveodermatologic syndrome

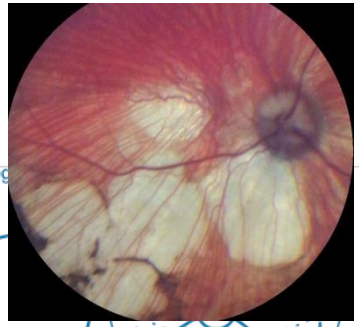
◆ 7. Other: Choroidal hypoplasia in Non-Collie breeds

● 7. Other: choroidal coloboma
17. Retinal degeneration (PRA)

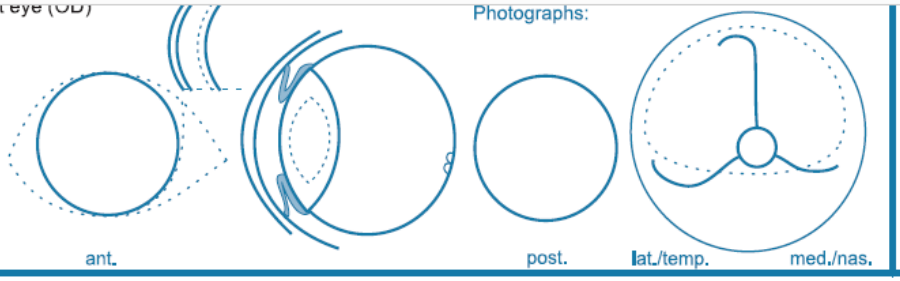
■ 7. Other: choroidal coloboma

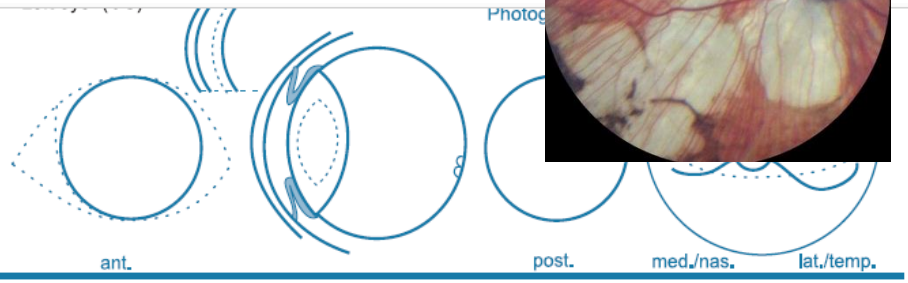
ECVO CERTIFICATE
new printed form

Siberian Husky;
m, 2y, OU



Right eye (OD) Photographs:





Descriptive comments: .....

.....

.....

Eye disease no. ..... 7 ..... ☒ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED	
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐	
4. Retinal Dysplasia (RD)	☐	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐	
6. Collie Eye Anomaly (CEA)	☐	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: ..... Choroidal coloboma	☐	☐	☒	
8. ~~IridoCorneal Angle Abnormality~~ (ICAA)	☐	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED	
11. Entropion / Trichiasis	☐	☐	☐	
12. Ectropion / Macroblepharon	☐	☐	☐	
13. Distichiasis / Ectopic cilia	☐	☐	☐	
14. Corneal dystrophy	☐	☐	☐	
15. Cataract (non-congenital)	☐	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐	
17. Retinal degeneration (PRA)	☐	☐	☐	
18. Other:	☐	☐	☐	

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Coloboma:** congenital defect of a portion of the eye due to a failure in closure of the body halves; most frequently affecting the iris* or the optic nerve at the 6 o'clock position. The latter is a presumed hereditary congenital eye disease that if large, may cause retinal detachment resulting in blindness or visual impairment.

  * use the term: "iris hypoplasia"

HED Manual Chapter 6 Guidelines

- **Coloboma:**
  - At “7. other” tick box “affected” and write “choroidal coloboma”
  - For number “7. Other”: known and presumed hereditary eye anomalies (congenital/developmental, non-progressive) that are not yet mentioned on the form are mentioned here. The terminology for the diseases can be found in "Definitions", Chapter 5, which are to be used (and are listed in the drop-down menu in the computerized forms).

Note: for congenital absence of tissue of the eyelid, retina, choroidea, sclera or optic nerve/papilla use the term “coloboma”, e.g. choroidal coloboma

HED Manual Chapter 8 Vet Advice

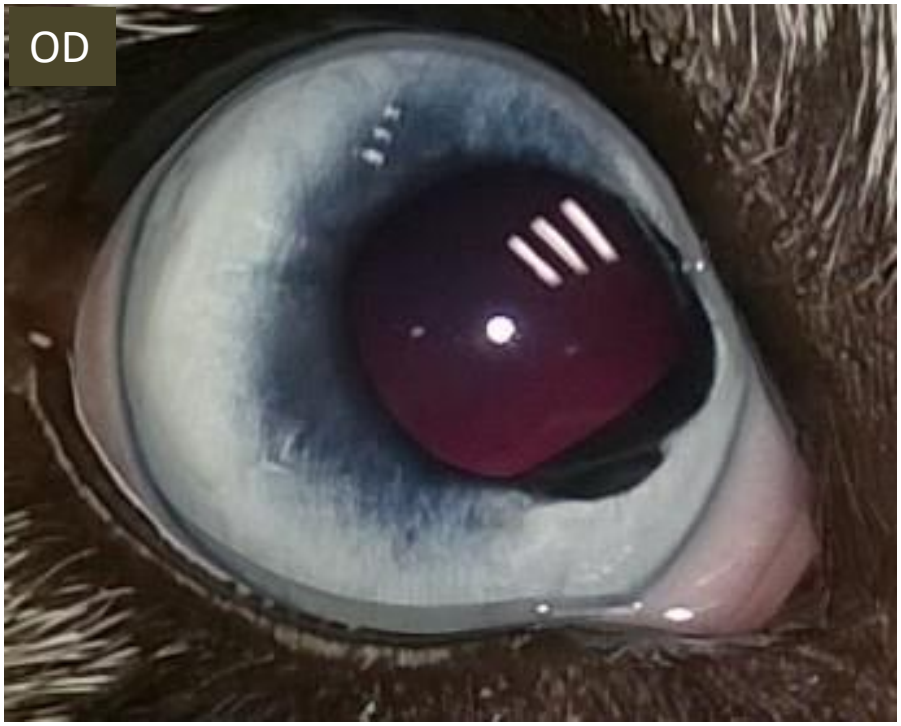
Coloboma:

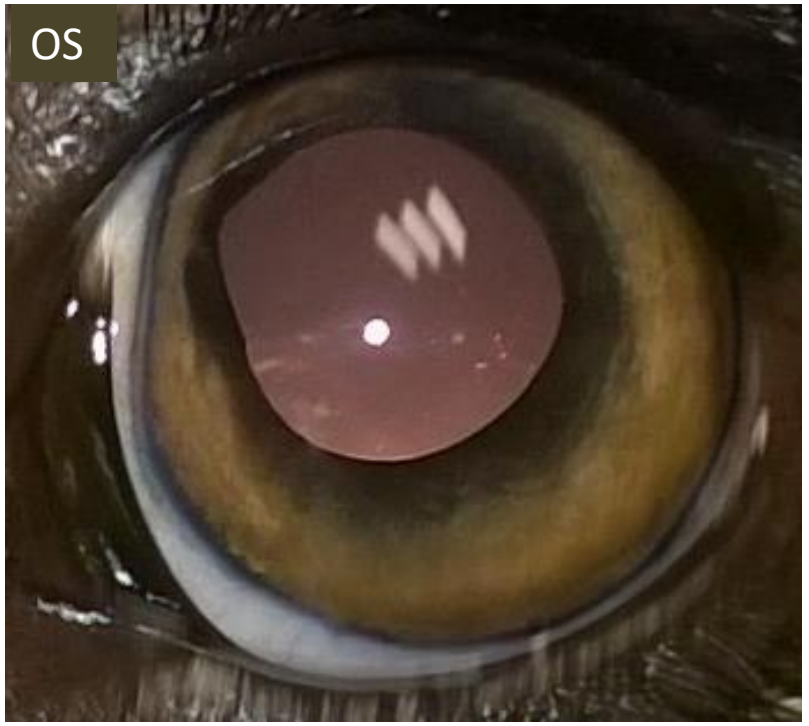
- Eyelid: NO BREEDING from the affected animal
- Papilla: NO BREEDING from the affected animal
- Retina: NO BREEDING from the affected animal
- Choroidea: NO BREEDING from the affected animal
- Sclera: NO BREEDING from the affected animal

HED SESSION – Kahoot!

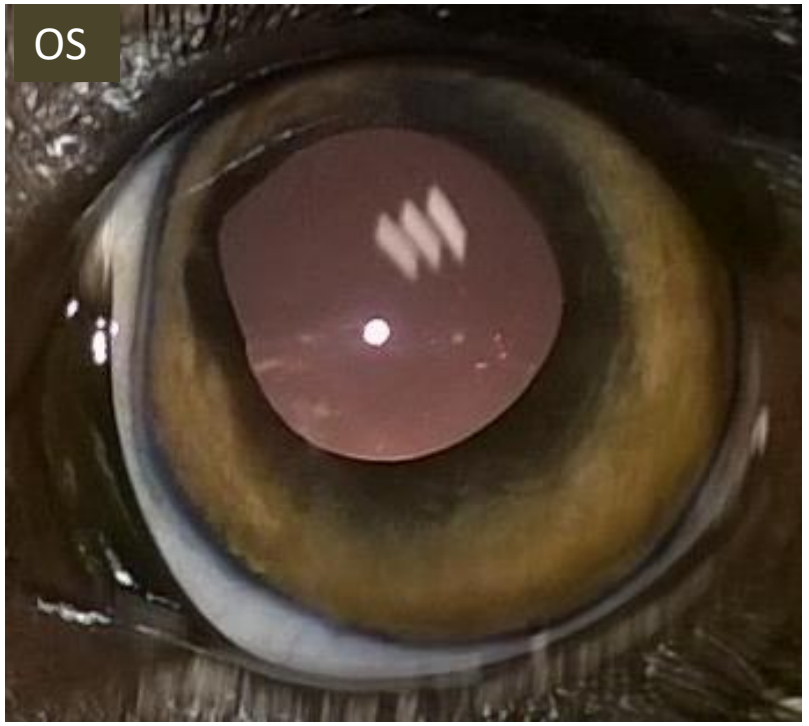
Case 14

Australian shepherd, 2y, bilateral findings Slides: C. Bundgaard





Australian shepherd, bilateral findings Slides: C. Bundgaard



▲ Comments: ectopic pupil

♦ 7. Other: uveal cysts

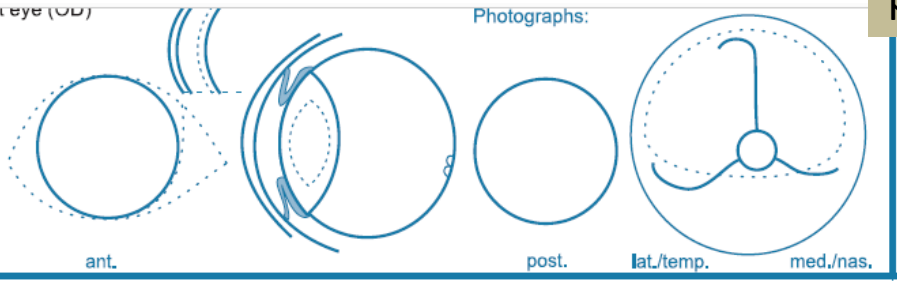
● 7. Other: iris coloboma

■ 7. Other: iris hypoplasia, severe

ECVO CERTIFICATE
new printed form

Australian Shepherd
OU, before dilating pupils

Right eye (OD) Photographs:



Descriptive comments: .....

.....

.....

Eye disease no. ..... 7 ..... ☒ severe

15. Cataract other: ☐ punctata ☐ suture line tip ☐ suture line ☐ nuclear ring ☐ nuclear fiberglass/pulverulent

8. ICAA: PLA ☐ mild ☐ moderate ☐ severe

ICA (width) ☐ narrow (moderate) ☐ closed (severe)

Results for the known or presumed hereditary eye diseases (KP-HED):

	* UNAFFECTED	** UNDETERMINED	* AFFECTED
1. Persistent Pupillary Membrane (PPM)	☐	☐	☐ iris ☐ lens ☐ cornea ☐ lamina
2. Persistent Hyperpl.Tunica Vasculosa Lentis/Primary Vitreous (PHTVL/PHPV)	☐	☐	☐ grade 1 ☐ grade 2-6
3. Cataract (congenital)	☐	☐	☐
4. Retinal Dysplasia (RD)	☐	☐	☐ (multi)focal ☐ geographical ☐ total
5. Hypoplastic-/Micro-papilla	☐	☐	☐
6. Collie Eye Anomaly (CEA)	☐	☐	☐ choroid. hypoplasia ☐ coloboma ☐ other:
7. Other: Iris hypoplasia	☐	☐	☒
8. IridoCorneal Angle Abnormality. (ICAA)	☐	☐	☐ mild ☐ moderate ☐ severe

Results valid for 12 months

	* UNAFFECTED	*** SUSPICIOUS	* AFFECTED
11. Entropion / Trichiasis	☐	☐	☐
12. Ectropion / Macroblepharon	☐	☐	☐
13. Distichiasis / Ectopic cilia	☐	☐	☐
14. Corneal dystrophy	☐	☐	☐
15. Cataract (non-congenital)	☐	☐	☐ cortical ☐ post. pol. ☐ nuclear ☐ other
16. Lens luxation (primary)	☐	☐	☐
17. Retinal degeneration (PRA)	☐	☐	☐
18. Other:	☐	☐	☐

Interpretation

* "Unaffected" signifies that there is no clinical evidence of the known or presumed hereditary eye diseases (KP-HED) specified, whereas "affected" signifies that there is such evidence.
** The animal displays clinical features that could possibly fit the KP-HED mentioned, but the changes are inconclusive.
*** The animal displays minor, but specific clinical signs of the KP-HED mentioned. Further development will confirm the diagnosis. Reexamination in .....months.

FOR FUTHER INFORMATION: P.T.O. | Examiner

HED Manual Chapter 5 Definitions

- **Iris hypoplasia:** KP-HED; characterized by congenital absence of iris (sphincter) tissue or colobomatous defects due to failure in closure of the optic fissure. It may be a separate disorder or associated with other ocular malformations.

HED Manual Chapter 6 Guidelines

Iris hypoplasia: At "7. Other": "Iris hypoplasia" is written (online: is used), and the box "affected" is ticked.
Only if uni- or bilateral iris tissue is missing (full thickness) or failed to develop (developmentally colobomatous) e.g. in one of the specific breeds Australian Shepherd, Dalmatian, Rottweiler, also the box "severe" is to be ticked in the comment area.

Note: if there is a congenital lack of tissue in the iris or lens, the term "hypoplasia" is used: iris hypoplasia, lens hypoplasia. Reason: iris tissue can be absent full-thickness or partially (hypoplastic); the lens may have a flattened curvature due to abnormal development of zonular fibers or ciliary processes.

HED Manual Chapter 8 Vet Advice

Hypoplasia:

- **Iris:** OPTIONAL, Note: In severe cases: NO BREEDING from the affected animal