Arhinencephaly
Synophthalmos
Bovine

Congenital and Developmental Eye Disease

Dick Dubielzig
Congenital diseases are seldom submitted to a pathology service

- 2% of cases in the COPLOW collection
- Tends to be cases severe enough to warrant enucleation or euthanasia
Optic vesicle bulges out from the neural tube making contact with the surface ectoderm thus stimulating the local ectoderm to form the lens placode.

Invagination of the optic vesicle to form the optic cup.

Lens placode invaginates to form the lens vesicle which separates from the surface.
Sheep

Failure of Complete Invagination of the Optic Vesicle to form the Optic Cup

Continuity from the eye and the ventricular system of the brain and photorecepter-like differentiation in ependymal cells.
Separation of the Lens Vesicle to form the Anterior and Posterior Chambers

The developing lens is still intimately surrounded by mesenchyme which will eventually disappear making the lens and anterior uveal tissue separate from the chambers of the eye.

Dr Koji Tanaka
Anterior Chamber Cleavage Syndrome
or
Anterior Segment Dysgenesis

Peter’s Anomaly Canine

Mouse: Anterior segment dygene
Sprouting of the neuroepithelium from the margins of the optic cup to form the ciliary and iridal epithelium

Invasion of mesoderm and vessels to form the primary vitreous
Closure of the optic fissure separating the vasculature of the primary vitreous and the mesenchyme outside the optic cup and establishing the formation of a continuous inner neuroretina and an outer retinal epithelium.
Merle and white spot coat color
Microphthalmos with Cyst

Canine: Tiny eye and big cyst

Cyst: Canine
Replacement of the Primary Vitreous with the Secondary (Adult) Vitreous

Primary vitreous with mesenchymal cells and blood vessels, Mouse

Persistant Primary Hyperplastic Vitreous PHPV

Lens
Retinal Maturation

Development of a multilayered neuroretina, axons extension into the optic nerve and retinal blood vessels

Llama
Optic nerve aplasia
Veratrum californicum (Western False Hellebore)
Ingestion by the pregnant ewe on day 14 of gestation
BVD
Collie eye anomaly
Retinal Dysplasia/Folds

- Canine
- Rodent

Retinal folds: Canine

Cataract
Shih Tzu Vitreoretinopathy
The Vitreoretinopathies Oculo-skeletal Dysplasia
Feline Neovascular Vitreoretinopathy

GFAP
Avascular gliotic retina
Lamanin
Microphthalmos in horses
Microphthalmos in White-tailed Deer