Exophthalmia in an Aquarium Fish

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Signalment and History

- Male, 174 gm, African cichlid fish, *Protomelas spilonotus*
- Unilateral exophthalmia
- Otherwise BAR
- Firm, 1 x 2 cm, white mass with black stippling protruding from right orbit
- Right eye enucleated
Gross Pathology

• Corneal opacification
• Pigmentary keratitis
• Neovascularization
• 1.5 x 1.5 x 2.0 cm mass occupied the posterior chamber and infiltrated the retrobulbar fat
Histopathology

- Additional features
  - High mitotic index (8/hpf)
  - Large areas of necrosis
  - Multifocal lymphocytic inflammation
Diagnosis

• Neuronal embryonal tumor
Neuronal Embryonal Tumors

• Derived from neuroectodermal progenitor cells
  – Potential to produce various neural cell types and structures
  – Ocular tumors include retinoblastomas and medulloepitheliomas
  – Additional types: neuroblastomas, ependymoblastomas, and primitive neuroectodermal tumors

• Ocular types uncommon in domestic animals
Neuronal Embryonal Tumors

- **Diagnosis:**
  - Signalment and location
  - Histologic features
    - High cellularity
    - Elongate cells
    - Palisading rosette formation
    - Necrotic foci
  - Ultrastructure
  - Immunohistochemistry
    - Usually positive for neuronal markers: synaptophysin, neuron-specific enolase, S-100
    - Medulloepitheliomas usually vimentin positive
    - Poorly differentiated tumors often negative
Neuronal Embryonal Tumors in Fish

• Sporadic reports of retinoblastomas and less frequently medulloepitheliomas in fish
• Classification hindered by:
  – Often-anaplastic appearance
  – Vague or absent rosette formation
  – Lack of reliable immunohistochemical markers (synaptophysin, neuron-specific enolase, S-100, vimentin negative)
• Surgical cure and recurrence both reported
  – Neoplastic tissue extended to all surgical margins

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Thank You!