Feline Ocular Tumors Following Gentamicin Injection

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“Injection of substances in the vitreous with the purpose of chemical ablation of the ciliary body should be avoided in cats because of the potential risk of post traumatic sarcoma.”

“This procedure must be used cautiously in cats because of the association with ocular trauma and intraocular sarcoma development.”

“[T]his procedure is controversially discussed in cats because of the risk of sarcoma formation after penetrating ocular trauma…”
Intraocular Gentamicin for the Irreversibly Blind, Painful Eye

<table>
<thead>
<tr>
<th>The Good</th>
<th>The Bad</th>
<th>The Ugly</th>
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<tbody>
<tr>
<td>- Ablates CB epithelium</td>
<td>- 50% success</td>
<td>- Tumorigenic</td>
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<td>- Inexpensive</td>
<td>- Phthisical eye</td>
<td>- Trauma to lens capsule</td>
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<td>- Brief anesthesia</td>
<td>- Insufficient</td>
<td>- Chronic inflammation</td>
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<td>- Good cosmesis</td>
<td>- 1° glaucoma</td>
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<tr>
<td></td>
<td>- Hemorrhage</td>
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<tr>
<td></td>
<td>- Inflammation</td>
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<td></td>
<td>- Infection</td>
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<tr>
<td></td>
<td>- Trauma</td>
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## Tumors Associated with IO Gentamicin Injection

<table>
<thead>
<tr>
<th>Post Traumatic Sarcomas</th>
<th>Melanomas</th>
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<tbody>
<tr>
<td>• Three cases in COPLOW</td>
<td>• Two cases in COPLOW</td>
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<tr>
<td>• 2 spindle cell variants</td>
<td>• Feline diffuse iris melanoma</td>
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<tr>
<td>• 1 round cell variant</td>
<td>• Frequently leads to secondary glaucoma</td>
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<tr>
<td>• Ocular trauma disrupts lens capsule</td>
<td>• Aggressive, effacing, potentially metastatic</td>
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<tr>
<td>• Lens epithelium metaplasia</td>
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<tr>
<td>• Aggressive, infiltrative, and locally extensive</td>
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Diffuse Iris Melanoma

Case 1
• Feline Diffuse Iris Melanoma

Case 2
• Feline Diffuse Iris Melanoma
  • Amelanotic
Post Traumatic Sarcoma

Case 3
- Early post-traumatic sarcoma
- Spindle cell variant

Case 4
- Early post-traumatic sarcoma
- Spindle cell variant

Case 5
- Advanced post-traumatic sarcoma
- Round cell variant
Case 1: Diffuse Iris Melanoma

- Presented to primary vet in 12/93
  - Glaucoma
  - Lens luxation
  - Buphthalmos
  - Pain
- 3 IO gentocin treatments
- Presented to VMTH in 11/95
  - Infected, lagophthalmic
  - Enucleated
Case 1: FDIM
Effaced ciliary body and iris
Cellular proliferation extended into sclera
Retina effaced, choroid infiltrated
Infected corneal ulcer
Neoplastic cellular/nuclear features
  Highly pleomorphic, high mitotic index, etc.
Case 3: FPTOS
Spindle Cell Variant

- Presented to referring vet on 4/4/00 for OS evaluation
  - Glaucoma
  - Uveitis
  - Cataract
- IO gentamicin on 4/18/00
- Changes observed over following 2 years
  - Fibrin
  - Vascularization
  - Tissue growth
- Enucleation on 3/22/02
Case 3: FPTOS

Spindle Cell Variant
Histopathology

- Inflammatory infiltrate in anterior uvea
- Lens capsule wrinkled, ruptured, nearly empty
- Spindle cell proliferation inside/outside of capsule
- Spindle cells coated inner lining of choroid
- PAS positive staining around spindle cells
- Smooth muscle actin & cytokeratin +
Case 5: FPTOS
Round Cell Variant

- Presented to original vet in 10/01
- Primary glaucoma OS
- IO gentocin 10/01
- Presented to veterinary ophthalmologist 9/06
- Squinting
- Corneal ulcer
- Large, white IO mass
- Enucleation on 11/15/06
Case 5: FPTOS
Round Cell Variant
Histopathology

- Corneal neovascularization and inflammation
- Round cells infiltrating iris and retina
  - Carpeting inner aspect of cornea, ciliary body, choroid
- Pattern of survival around vessels
  - Necrosis away from vessels
- Several neoplastic cellular/nuclear features
- Lens capsule highly wrinkled but ostensibly intact
Now Time for Some Hand Waving

“hand waving”
– noun: insubstantial words, arguments, gestures, or actions used in an attempt to explain or persuade.
Just Who is this Gentamicin Guy?

Suspect 1: The Upright Citizen
  - Gentamicin and tumor are independent

Suspect 2: The Provocateur
  - Gentamicin agitates occult tumor

Suspect 3: The Instigator
  - Gentamicin induces tumor formation de novo
What Can We Reasonably Conclude?

- Actually, not much
  - Only 5 cases
  - Histories are spotty due to age (>10 years ago)
  - Melanomas and FPTOSs may be causally associated

- Arguments for NOT using gentamicin
  - May cause or agitate tumors
  - May lead to a lack of vigilant observation after tx
  - Generic risks of any intraocular injection

- Need to delineate risk associated only to gentamicin
  - Compare to other forms of cycloablation
Acknowledgements

- Dr. Richard Dubielzig (main plow)
- Fellow COPLOW peons (coplowers)
- Referring veterinarians & staff
The End