Feline Ocular Post-traumatic Sarcoma
FOPTS
Richard R Dubielzig
Anatomic distribution of feline primary ocular neoplasia (n = 2599)

- Globe: 82%
- Conjunctiva: 12.3%
- Eyelid: 4.4%
- Orbit: 1.15%

Cindy Bell and Scott Earnest
Feline tumors of the Globe (n = 2136)

- Melanoma: 1754
- FOPTS, Spindle Cell Variant: 148
- Iridoceiliary Epithelial Tumor: 124
- FOPTS, Round Cell Variant: 64
- FOPTS, Osteo/Chondrosarcoma: 33
- Other: 13
11 Year-old Siamese
Trauma with lens capsule rupture 4 years earlier

Images by Kerry Ketring
Feline Ocular Post-traumatic Sarcoma: 325 of 4035 tumors, or 5.5%

- **Spindle cell variant, 67%**
  - 217 cases, 43 “early”
  - Lens epithelial origin

- **Round cell variant, 21%**
  - 69 cases, 5 “early”
  - Variant of lymphoma

- **Osteosarcomas/Chondrosarcoma, 10%**
  - 33 OSA cases
  - 6 Chondrosarcoma cases
  - Unknown cell of origin
Feline Ocular Post-traumatic Sarcoma:

- Breeds (300 with recorded breed)
  - DSH: 223
  - DLH: 33
  - Maine Coon: 8
  - Siamese: 5
  - Other: 31 (none more than 3)

- Eye Affected (279 with recorded data)
  - OD: 139
  - OS: 135
  - OU: 5
Feline Ocular Post-traumatic Sarcoma

- **Sex (306 with recorded sex)**
  - Females: 101 (33%) *43% for entire non-trauma database*
    - Intact: 15
    - Spayed: 86
  - Males: 205 (67%) *57% for entire non-trauma database*
    - Intact: 16
    - Neutered: 189

- **Feline trauma (excluding PTS) 391 cases**
  - Females: 42%
  - Males: 58%
Feline Ocular Post-traumatic Sarcoma:

- Almost all cases have documented chronic eye disease
  - 81 cases have a documented traumatic event
  - Time between trauma and enucleation
    - 60 cases have the dates recorded
    - Average time is 6.35 years
    - Range is 1 to 17 years

Thanks to Skye Greenler
Feline Ocular Post-traumatic Sarcoma:

• List of Traumas:
  – Shot by bullet, pellet, or BB (6)
  – Surgery (7)
  – Cat fight (10)
  – Other animal fight (coyote or raccoon) (2)
  – Fall from 18-story building (1)
  – Cactus thorn puncture (1)
  – Blunt trauma (1)
  – Impaled by shrapnel (1)
  – Hit by stick (1)
  – Hit by car (1)

Thanks to Skye Greenler
Feline Ocular Post-traumatic Sarcoma
Spindle-cell Variant

Time between trauma and enucleation

Average: 6.2 years
Range: 1 - 17 years
n = 36

Thanks to Skye Greenler
Feline Ocular Post-traumatic Sarcoma
Spindle-cell Variant

- Mean Age at Enucleation: **Early** 9.7 yrs
  These are usually removed prophylactically
  Range: 1 to 18 yrs
  $n = 45$

- Mean Age at Enucleation: **Excluding Early**, 11.7 yrs
  These are usually removed because of troublesome eye disease
  Range: 2 to 21 yrs
  $n = 266$

- Late minus Early = 2 years

Thanks to Melissa DeLombaert
Feline Ocular Post-traumatic Sarcoma
Spindle-cell Variant

**PTS Early vs Late**

- PTS Late
  - N=266
- PTS Early
  - N=45

**Percentage of Samples**

**Age**

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Feline Ocular Post-traumatic Sarcoma

Spindle-cell Variant

PTS Early vs Late

- Percentage of Samples
- Age

PTS Late
N=266

PTS Early
N=45
Reasons to Believe Spindle Cell FOPTS is Derived from Lens Epithelial Cells

- Lens capsule rupture in all cases
- History of trauma or abnormal eye
- Early cases develop within and around the lens
- Early tumors are avascular
- Early tumors express cytokeratin and SMA
- Lens-capsule-like basement membrane
- Alpha A crystallin expression
Feline Ocular Post-traumatic Sarcoma, Spindle Cell Variant
Cellular Features of Spindle Cell FOPTS

- Collagen 4
- Vimentin
- αA Crystallin
Cellular Features of Early Spindle Cell FOPTS
Reasons to believe FOPTS is derived from lens epithelial cells

- Immunohistochemistry
Early Spindle Cell Variant FOPTS
Tumor Distribution in the **Spindle Cell Variant**

Bone
Feline Ocular Post-traumatic Sarcoma, Spindle Cell Variant
Feline Ocular Post-traumatic Sarcoma, Spindle Cell Variant
Follow-up Spindle Cell Variant

- Cases which have extended beyond the sclera have a bad prognosis
  - Local recurrence
  - Extension towards the brain
- Cases removed within the sclera have a good prognosis
- 8% of traumatized globes removed prophylactically have early FOPTS
Feline Ocular Post-traumatic Sarcoma
Round-cell Variant

Time between trauma and enucleation

Average: 6.8 years
Range: 2 - 12 years
n = 13

Thanks to Skye Greenler
Round Cell Variant FOPTS
Round Cell Variant FOPTS
Round Cell Variant FOPTS
Round Cell Variant FOPTS
Feline Ocular Post-traumatic Sarcoma
Osteosarcoma/Chondrosarcoma

Time between trauma and enucleation

Average:  6.3 years
Range:  2 - 10  years
n = 11

Thanks to Skye Greenler
Feline FOPTS: Osteosarcoma
What is the Cell of Origin for Osteosarcoma or Chondrosarcoma?

Canine Globe with Scleral Rupture and Metaplastic Bone
What is the Cell of Origin for Osteosarcoma or Chondrosarcoma?

Feline Primary Ocular Chondrosarcoma
What is the Cell of Origin for Osteosarcoma or Chondrosarcoma?

Canine Primary Ocular Osteosarcoma
FOPTS in Cats after Lens Surgery

10 cases in the COPLOW archive
Average time from surgery to enucleation was 4.8 years
5 cats had cataract surgery
    4 spindle-cell variant and one osteosarcoma
5 cats had lens removal surgery
    4 round-cell variant and one osteosarcoma

3 cases with a history of gentamicin injection
2 spindle-cell and one round-cell

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MVOS 2011

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ECVO 2011

Travis Strong  
MVOS 2011
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