When
The Beast in the OR
Isn't Your Surgeon

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Patient History

- 47 year old female
- 300+ pounds
- Thyroid problems
- Difficulties with activities of daily living
  - Unable to find food
  - Not socializing with new neighbors
- Ophthalmic exam showed bilateral cataracts and geographic atrophy OS
Cataract Surgery on Gorillas in the United States

- Salt Lake City, UT
  - 1990 Dr. Alan Crandall on Gorgeous
- Dallas, TX
  - January 2009 Dr. Wayne Bowman on Timbo
- Miami, FL
  - October 2009 Dr. Frank Spektor on Josephine

Why a “people” ophthalmologist instead of a veterinary ophthalmologist?

Medical School/Zoo Collaboration

- Ophthalmic Examination of the Captive Western Lowland Gorilla
  - Journal of Zoo and Wildlife Medicine 2005
- All gorillas at the Dallas Zoo examined to determine the norms for gorilla eyes.
## Gorilla vs. Human Eyes

<table>
<thead>
<tr>
<th>Human</th>
<th>Gorilla</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial length</td>
<td>23.5</td>
</tr>
<tr>
<td>Keratometry</td>
<td>42-44D</td>
</tr>
<tr>
<td>Corneal diameter</td>
<td>12.0mm</td>
</tr>
<tr>
<td>IOP</td>
<td>21.0mmHg</td>
</tr>
<tr>
<td>Central cornea</td>
<td>.56mm</td>
</tr>
</tbody>
</table>

## Medical School/Zoo Collaboration

- Ophthalmic Examination of the Captive Western Lowland Gorilla
- Journal of Zoo and Wildlife Medicine 2005
- “These similarities may allow diagnostics, techniques and equipment for human eye surgery, such as those used for cataract extraction and IOL implantation to be successfully utilized for gorillas.”

## Critical Factors

- Surgery location
  - Hospital vs. Zoo
- Surgery Team
- Surgery Date
- Equipment/Supplies
- Which eye first or both eyes at the same time?
- Postoperative Care
Location

- Hospital vs. Zoo
  - Transport
  - Equipment/Supplies
  - Medications

Assembling the Team

- Surgeon
- Assistant
- Circulator
- Scrub person

Assembling the Team

- Geographic atrophy = Retina specialist
  - New retina camera = camera rep + assistant
- IOL measurements = Ultrasonographer
- Phaco machine = Alcon rep
- Microscope = Zeiss rep
- Interested resident + additional cornea fellow
**Surgery Date**

- How about a Tuesday?
- How about a Sunday?

**Critical Factors**

- Equipment (shipped in)
  - Microscope: Zeiss
  - Phaco machine: Alcon
- Equipment (transported from hospital)
  - A scan, Retinal camera, Indirect ophthalmoscope, hand held keratometer
Critical Factors

- Supplies
  - Custom pack
  - Medications
  - Suture
  - Gloves

Which IOL?

- Larger optic for a larger eye
- Foldable
- Lower incidence of posterior capsule opacification
- MC50BM

Which eye first?

- Left eye
  - Geographic atrophy/less visual potential
  - Practice
  - Observe postoperative behaviors
Postoperative considerations

- Unable to instill eye drops
- Rubbing

Veterinarian Concerns

- Safety of the animal
- Safety of the surgical team
- Privacy
  - No photos except those taken by the official Dallas Zoo photographer, Cathy Burkey

Rules for the Zoo

- Respectful of the inhabitants of that setting
  - Wear required personal protective equipment
  - Don’t touch the gorilla without permission
  - Limit conversation to that pertinent to the surgery
Rules for the Zoo

- Flexibility
- Ability to innovate
  - Back table
  - Chairs
  - Wrist rest

Preop

- Tranquilizing dart
- Placed on “OR table”
- Dilating drops
  - Tropicamide
  - Cyclopentolate
  - 2.5% Phenylephrine
- Moved to the OR

In the OR

- Positioned at the top edge of the table
- Endotracheal tube and tubing positioned and secured out of the surgical field
- Bair-hugger warming unit
- Monitors
- Head positioned and secured with tape
Preop exam and test

- Retinal exam
  - Indirect
  - Photos
- Ascan
- Keratometry
IOL Calculations

- Axial length = 27.5mm
- K readings = ??????
Getting in position

- OR table configuration
  - Dimensions
    - 3 feet wide
    - 6 feet long
  - Solid sides
  - Surgeon normally operates temporally but chose to position himself superiorly because he could not reach the eye if he was at the side.

- Can he sit?
  - OR table doesn’t go very low
  - Available chairs don’t go very high
  - Must be able to reach foot pedals
  - Uh-oh
    - Where can we put the foot pedals?
Getting in position

- OR table configuration
  - Thick mattress and base
  - Straight down, no head rest
  - Surgeon’s legs cannot be under patient’s head
  - No room for foot pedals
  - Sat on edge of chair with legs at wide angles

Surgical Prep

- Betadine 10%
  - In the cul de sac
  - Periocular with 4x4 gauze sponges
  - Lid margins with cotton tip applicators
  - 5 minutes
  - BSS rinse
Learn and Teach

- Learn from the veterinarians and zoo staff about what is required to care for these animals
- Teach them about cataract surgery, intraocular lenses
  - Narrate surgery as it was shown on the monitor
  - Answer questions about procedure and different types of IOLs
Variations in the Surgical Procedure

- Anterior capsule tougher and thicker
- Larger eye changed the angles some and made some things slightly more difficult to reach
- Posterior pressure
- 10-0 vicryl stitch in both incision and paracentesis

End of Procedure Medications

- Subconjunctival injections
  - Cefazolin
  - Gentamicin
  - Kenalog
  - Polysporin ointment
    - Both eyes to prevent exposure keratitis during the wake up period

Post op first eye

- Moved to her gorilla “condo”
- Woke up about 1 hour later
- No analgesics
- Snack and juice in the afternoon
- Did not rub eye
Post op day #1
- Area kept dim to allow acclimation to new vision
- Some problems with depth perception
  - Bumped into mesh that is the wall of her habitat
  - Difficulty passing items through the mesh

One week post op
- Surgeon did face to face exam
  - Appeared clear
  - No redness or discharge noted
- Second eye scheduled for one week later

Second eye surgery
- Two weeks after first
- First eye looked quiet, vicryl stitches still in place
- Uneventful post op
One month post second surgery

- Face to face exam in gorilla house
- Came to mesh and took peanuts
- Vision test
- Ate other food: carrots, lettuce
- Purred
- More active, looking into research station