

Cataract removal surgery in an African hedgehog - case presentation

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Abstract: This paper presents a case of ophthalmic microsurgery performed on an African pygmy hedgehog (*Atelerix albiventris*) diagnosed with senile cataract in the left eye. Although hedgehogs have poorly developed and predominantly monochromatic vision, visual function still plays an important role in orientation and behavior. The hedgehog in question, aged 9 years, underwent an ophthalmological examination due to vision loss, general weakness, and a withdrawn, cautious behavior. The surgical intervention involved the removal of the affected lens using an extracapsular extraction technique, employing ophthalmic microsurgical instruments under microscopic guidance. The procedure was carried out in several steps, after pharmacokinetic pupil dilation with tropicamide, an incision was made at the lower edge of the cornea, the anterior chamber was stabilized with a viscoelastic substance and by incising the anterior capsule of the lens, the cataracted lens was extracted with the help of ophthalmic forceps, with precision and delicacy, resulting in a satisfactory outcome.

Keywords: hedgehog, cataract, microsurgery, ophthalmology, exotic pet

• Introduction

Hedgehogs are small, insectivorous, nocturnal mammals belonging to the order Eulipotyphla, family Erinaceidae. This study aims to show and to evaluate the procedure and outcome of cataract surgery in an elderly hedgehog with a focus on regaining vision and improving quality of life, in the current conditions of an increasingly longer life of these companion animals.

• Material and method

For the therapeutical cataract treatment of hedgehog's left eye, a surgical method was chosen, extra-capsular lens extraction. A magnifying head microscope with lamp, with two 10x tilting binoculars with wide field, 50W LED lighting system (Figure A1) was used. The surgical instruments used were the ophthalmic surgery instruments: curved Castroviejo corneal scissors, corneal forceps, conjunctival forceps, Castroviejo straight corneal forceps, Mackool Barraquer 0.5 mm spatula, single-use eye cannula (Figure A2).

Presurgical preparation

A 1–2 hour fast was recommended before anesthesia. The surgical site was prepared by using diluted povidone–iodine concentrate.

Anesthesia

Isoflurane is commonly used for induction and maintenance in hedgehogs. After a period of preoxygenation, a common approach is to use 4%–5% isoflurane via chamber for induction, then 1%–2% via facemask for maintenance.

Surgery Technique

Although the approach of extra capsular cataract extraction is primitive, it has been still recommended in cataract cases of dogs due to size, density of cataractous lens and thick capsule [Patil et al., 2014]. This method was chosen because of the small size of the hedgehog eye.

• Results and discussions

Before starting the surgery technique, we induced mydriasis with topical tropicamide 20-to-30-minute prior the surgery. Anesthesia of the hedgehog was done with isoflurane. Retrobulbar anesthesia was performed with lidocaine (Figure A5). The eyeball was fixed with some mononylon wires sutures to surgical drape (Figure A6).

A stab incision was made through the lateral clear cornea using a single-use corneal surgical blade 2.8 mm, that was extended with corneal scissor (Figure A7). After the entry in anterior chamber, anterior chamber collapsed which was partially filled with viscoelastic solution to maintain it and prevent injury to corneal epithelium. Then, the capsule was tear with double bended 23 G needle, which was passed horizontally and then twisted to 90° to perform capsulotomy. We used a blue colorant to mark the anterior capsule. Then, slowly proceed to capsulorhexis, when the capsule was torn at weaker equatorial region of lens. After removal of the anterior capsule, the cortical and nuclear material of lens luxated in the anterior chamber from where we removed them without disturbing posterior lens capsule, with the use of a capsulorhexis clamp (Figure A8).

We perform a gentle irrigation of anterior chamber using saline water and after we closed the sclera suturing with 8-0 mononylon and the conjunctiva in three separate stitches, after filing the anterior chamber with saline water, with a good aspect of the eye, with no hemorrhagically residues (Figure A9).

In the literature, the most common ophthalmic condition reported in these animals is ocular proptosis [Williams, 2012]. This condition occurs mainly due to excessive fat accumulation or inflammation at the orbital level. In hedgehogs with unilateral proptosis, tarsorrhaphy may be indicated as a prophylactic measure [Wheller, 2001]. The proximity of the spines to the ocular surface together with the hedgehogs' tendency to crouch often produces trichiasis at the ocular level. This results in epiphora and conjunctivitis and can even lead to traumatic eye injuries [Williams, 2012]. Cataract surgery in hedgehogs are rarely described in literature. Duffy and Bennet [2021] described surgical techniques including ovariectomy, ovariectomy, and orchiectomy are described. Paraphimosis and managing foot injuries are also described.

• Conclusions

This case supports the view that lens extraction in animals affected by cataracts can and should be successfully applied across various exotic pet species, contributing to the improvement of general health, particularly in geriatric animals.

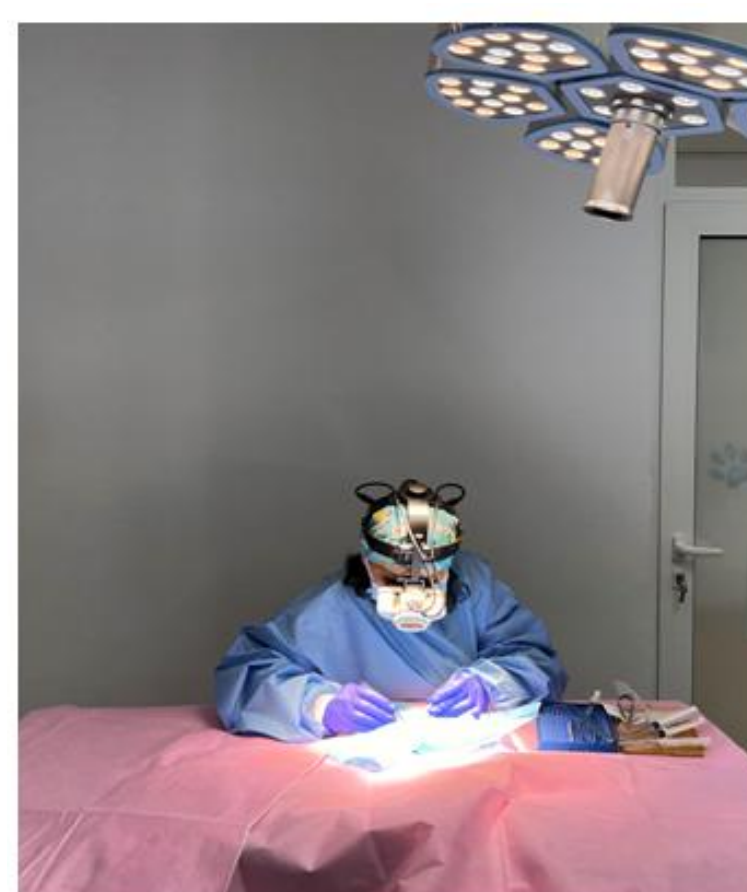


Figure A1. Surgery room set up



Figure A2. Ophthalmological surgical instruments



Figure A3. Diagnostic of mature cataract right eye



Figure A4. Diagnostic of mature cataract left eye



Figure A5. Retrobulbar anesthesia

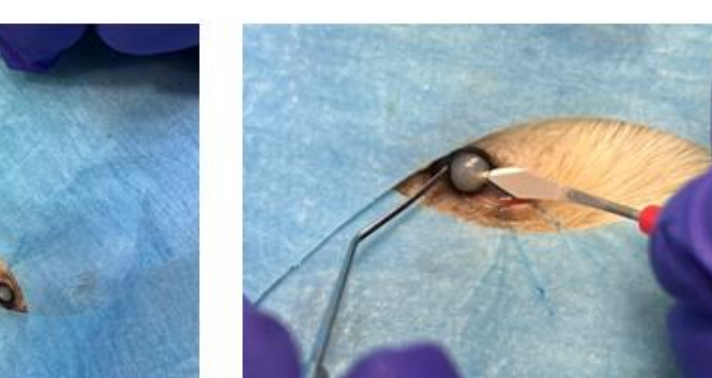


Figure A6. Eye fixation



Figure A7. Stab incision in the anterior chamber through lateral clear cornea



Figure A8. Removal of the cataracted lens

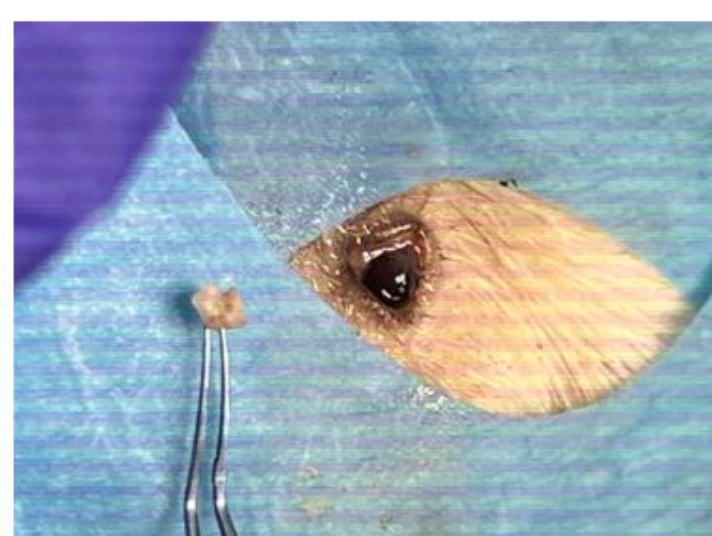


Figure A9. Aspect of the eye at the end of surgery