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ABSTRACT

Abstracts: Congress of the Brazilian College of Veterinary Ophthalmologists (CBOV), Bahia, Brazil, March 26-28, 2025

Consensus on surgical treatment of ulcerative keratitis in dogs and cats, in Brazil

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Purpose: Surgical techniques described in the literature are indicated for the correction and restoration of vision. These include pedicled conjunctival grafts, free conjunctival and corneal grafts, corneoconjunctival transposition, and keratoplasties. The objective of this study was to establish a consensus on which microsurgical techniques would be applicable to the treatment of corneal ulcers in companion animals, with results aimed at restoring the cornea, based on the experience of veterinary ophthalmology specialists in Brazil, which could serve as a guideline for those practicing in the field.

Methods: During the 18th Brazilian Congress of Veterinary Ophthalmology held in 2023, an electronic questionnaire was administered in a live session to 33 veterinary ophthalmologists certified by the Brazilian College of Veterinary Ophthalmologists (CBOV) regarding the surgical treatment of ulcerative keratitis. The questionnaire included 10 questions about established surgical techniques and their main indications, preferred materials, and resolution time.

Results: Most responses from specialists suggest that for each type of ulcerative keratitis in dogs and cats, there is at least one more suitable surgical technique. The percentages of the use of different techniques were as follows: 84.8% used corneoconjunctival transposition, 60.6% used pedicled conjunctival graft, 51.5% indicated the use of commercially available porcine intestinal submucosa membrane cornea, 33.3% used frozen cornea, and 24.2% used lyophilized amniotic membrane, especially in cases of deep corneal ulcers. Regarding indolent ulcers, 69.7% and 30.3% indicated debridement with a drill and grid keratotomy, respectively.

Conclusion: Given the options of autogenous and commercial biological grafts, it is accepted among specialists that there is a preference for the use of corneoconjunctival transposition and pedicled conjunctival graft for the surgical treatment of corneal ulcers in dogs and cats. It is emphasized that the choice of the ideal type of graft should be directed for each clinical case, considering primarily the location of the corneal lesion, the ocular and systemic health, and the experience of the surgeon.

Key words: questionnaire, microsurgery, keratoplasty, keratotomy, grafts.

In vivo confocal microscopy for the detection of microfilarial keratitis in a dog

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Purpose: To describe a case of keratitis caused by microfilariae in a dog, diagnosed using in vivo confocal microscopy.

Case Report: A 7-year-old intact male Yorkshire Terrier was presented for evaluation of progressive bilateral ocular opacities accompanied by slow visual impairment, without overt signs of discomfort, for approximately 4 months prior to presentation.

Results: Ophthalmic examination revealed bilateral chronic non-ulcerative keratitis characterized by crystalline opacities and corneal vascularization. The remainder of the ophthalmic and routine physical examinations were unremarkable. Ocular ultrasound revealed no intraocular or retrobulbar abnormalities. A corneal biopsy through superficial keratectomy was performed, and histopathological examination revealed numerous microfilariae in the corneal stroma of both eyes. After 1 month of treatment with systemic ivermectin (0.3 mg/kg SID) and 1%

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prednisolone eye drops QID, no improvement was observed. Subsequent in vivo confocal microscopy of both eyes revealed numerous microfilariae in the anterior and mid-stroma, identified as highly reflective individual filiform and C-shaped structures of varying sizes. After 6 months, an extensive superficial keratectomy was performed in both eyes, leading to improved corneal transparency. Histopathological examination revealed only a few corneal microfilariae. Molecular diagnosis was established by qPCR (18s) and nested PCR (ITS1), with the microfilariae species identified as *Cercopithifilaria sp*. through Sanger sequencing.
Conclusions: Combined therapy with oral ivermectin and extensive superficial keratectomy can improve corneal transparency. To the authors' knowledge, this is the first report of utilizing in vivo confocal microscopy as a non-invasive diagnostic tool for keratitis caused by *Cercopithifilaria sp*.
Keywords: keratitis, canine, histopathology, *Cercopithifilaria*.

Visual outcomes after intraocular tumor removal in canine eyes

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Purpose: This case series aimed to evaluate the surgical outcomes of intraocular tumor excision in dogs, highlighting the effectiveness and safety of the procedure.
Methods: A retrospective analysis was conducted on 6 patients who underwent surgical excision of intraocular tumors between January 2021 and December 2023. Preoperative assessments included ophthalmic examination, ocular ultrasound (US), and/or high-frequency ultrasound (HFUS), chest radiography and abdominal ultrasonography. Tumor resection with eye-sparing excision was pursued, through a scleral plasma incision constructed 1.5 mm from the limbus corresponding to the location of the intraocular tumor. At 180° of incision, a 3% sodium hyaluronate was inserted in order to extrude the tumor from the eye. Using surgical sponges, the tumors were gently dissected from the ciliary body and, subsequently, their bases were cauterized using radiofrequency, or sometimes laser. All were sent to histopathology. Postoperative monitoring was performed at 1, 3, and 6 months and 1–2 years post-surgery.
Results: Histopathological evaluation of all tumors revealed iridociliary adenoma. Of the six patients, five were deemed successful with complete tumor removal, while one patient experienced recurrence in the second year of the follow-up period. Vision was preserved in all patients, including the one of recurrence occurring, until a week before enucleation.
Conclusions: This case series demonstrated that the surgical removal of intraocular tumors in dogs is effective and safe, resulting in positive outcomes in terms of tumor control and patient quality of life. Future studies should focus on long-term outcomes and development of refined techniques for better results.
Keywords: canine, eye, intraocular tumors.

Optical coherence tomographic features of heterotopic bone formation and uveitis secondary to cataracts in guinea pig (*Cavia porcellus*): A case report

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Purpose: The objective of this report was to describe the optical coherence tomographic features of a case of heterotopic bone formation and uveitis secondary to cataracts in a guinea pig.
Case Report: A 2-year-old male, not neutered guinea pig, presented conjunctival redness, severe and diffuse corneal edema and vascularization in the left eye and solid, white deposits overlying the trabecular meshwork in the right eye.
Results: On slit-lamp biomicroscopy, severe corneal edema and vascularization were observed in the left eye. Dense diffuse opacity in the cornea was also observed. In the right eye, irregular areas of white discoloration were observed at several points underneath the limbus. A diagnosis of heterotopic bone formation was made in both eyes and uveitis secondary to cataract was present in the left eye. Optical coherence tomography (OCT) revealed thickening of the cornea in the OS and increased reflectivity of the lens. When the sclerocorneal angle OD was assessed, a hyperreflective, irregular projection was noted, obstructing the angle.
Conclusions: To the best of the author's knowledge, this study represents the first *in vivo* OCT documentation of bone formation in the trabecular meshwork and uveitis secondary to cataracts in guinea pigs.
Keywords: trabecular meshwork, osseous metaplasia, cataract, guinea pig, OCT.

Spectaculitis and parasitary ceratoconjuntivitis in Bothrops jararaca

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Purpose: To report on the optic shield, cornea and conjunctiva of Bothrops jararaca (jararaca) caused by a nematode.
Case Report: A specimen of Bothrops jararaca species kept in a scientific breeding facility was seen complaining of a lesion on the optic shield. The patient had a significant inflammatory and infectious condition on the optic shield that had been going on for 30 days and showed signs of intense opacity, edema, an erosive lesion and adhered secretion. A culture and antibiogram, skull x-ray, blood count, and biochemical profiles were carried out for investigation. Treatment was carried out with chloramphenicol ophthalmic ointment every 24 h, enrofloxacin 5 mg/kg every 24 h intramuscularly (IM) and ketoprofen 2 mg/kg every 24 h IM. After starting

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treatment, there was no significant improvement and, based on the antibiogram, the antibiotics were replaced with tobramycin sulphate eye drops 0.3% and amikacin 2.5 mg/kg every 72h IM. In view of the unfavorable evolution, enucleation was performed and the ocular structure sent for histopathological examination.
Results: Radiography and blood tests showed no noteworthy alterations. The culture of shield lesion isolated the bacteria Klebsiella sp. and Serratia sp. and, in contralateral shield, Staphylococcus sp. Histopathological examination revealed multiple elongated parasite larvae in the optic shield, conjunctiva and cornea. A coproparasitological examination was performed and identified significant nematode infestation.
Conclusions: Although there are few reports associating helminths with ophthalmic alterations in snakes, this hypothesis should be considered as a differential diagnosis in cases of spectaculitis and keratoconjunctivitis, especially those that are not progressing well with treatment. Therefore, early investigation increases the chances of restoring visual function.
Keywords: snake, eye, helminth.

Assessment of central corneal thickness and iridocorneal angle in French bulldogs via optical coherence tomography

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Purpose: To establish reference values for central corneal thickness (CCT), corneal epithelial thickness (CET), and the iridocorneal angle in healthy eyes of French bulldogs via optical coherence tomography (OCT).
Methods: Measurements were taken from 18 dogs (34 eyes). All animals underwent routine ophthalmic examination and were free of ocular abnormalities. Eyes with ophthalmological changes were excluded from the study. The analyses included central corneal thickness, central corneal epithelial thickness, and iridocorneal angle opening. Images were obtained via the Optovue iVue SD-OCT device, with an additional module for the cornea and anterior segment (CAM), and the image quality was classified as "good" or "poor." For corneal scanning, image quality classification on the basis of SQI slices is considered to have an SQI < 27.
Results: Two eyes were excluded from the study because of corneal melanosis. The OCT results revealed a mean CCT of 561.97 ± 45.26 µm and a mean CET of 78.88 ± 8.77 µm. The iridocorneal angle opening had a mean of 55.68 ± 9.88 µm.
Conclusions: The values can be used as a reference to assess the integrity of the ocular surface and glaucoma in French Bulldogs.
Keywords: cornea, iridocorneal angle, parameters, optical coherence tomography, French bulldog.
Approval of the Ethics Committee (CEUA): Protocol number 028/2024/UFPR.

Characterization and quantification of collagen in rat corneas 30 days after intralamellar grafting with tilapia skin

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Purpose: Ulcerative keratitis is one of the most common conditions in veterinary ophthalmology, so studies and innovations have been carried out to promote corneal healing with maximum transparency. This study aimed to propose an alternative treatment for corneal ulcers using a tilapia skin (TS) corneal graft and assess the induction of collagen production in the cornea.
Methods: During stromal interlamellar tunneling surgery, a 5-mm long tilapia skin membrane was implanted in 20 male rats (one eye as a control and the other with the membrane). The eyes were enucleated 5 days (M5), 10 days (M10), 20 days (M20), and 30 days (M30) after the procedure and subjected to histopathological evaluation via picrosirius staining, which, when evaluated via polarized light microscopy, is specific for collagen, both quantitatively and qualitatively.
Results: In M5, TS induced a more significant number of immature fibers (62.75%) than mature fibers (37.25%) in the eyes treated (TE). After 30 days (M30), the percentage of mature fibers was 67.29%, and 32.71% corresponded to immature collagen fibers.
Conclusions: After 30 days, young fibers were replaced by mature fibers, showing that TS is capable of helping to repair coronal lesions with resistant collagen in late periods.
Keywords: picrosirius, ulcerative keratitis; biological membrane, corneal repair.
Approval of the Ethics Committee (CEUA): Protocol number 724/2023.

Comparison of the efficacy of therapeutic protocols for qualitative tear deficit in dogs

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Purpose: This study assesses the efficacy of three therapeutic protocols for managing qualitative tear film deficiency in dogs, a condition characterized by abnormal lipid or mucin components that disrupt ocular surface homeostasis.
Methods: Fifty-four dogs underwent evaluations including the Schirmer tear test (STT-1), tear film break-up time (TFBUT), punctate fluorescein staining (PFS), and assessments of ocular secretion and conjunctival hyperemia, each rated on a scale from 0 to 3. Inclusion criteria were an STT > 15 and a TFBUT < 20 s. Dogs were randomly assigned to three treatment groups: G1 (sodium hyaluronate 0.30% BID - I-drop Vet Gel®, Canada + tacrolimus 0.03% BID - DrogaVet®, Brazil), G2 (sodium hyaluronate

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0.30% QID), and G3 (sodium hyaluronate 0.30% BID). Follow-ups on Days 15 and 45 involved re-evaluations, with statistical analysis conducted using one-way ANOVA and the Holm-Sidak post-hoc method.

Results: STT-1 showed no significant differences across all groups during the study period. TFBUT demonstrated significant improvements in groups G1 ($p<0.001$) and G2 ($p=0.025$); however, G3 did not show significant changes. Significant improvement in PFS was only seen in G1 by Day 45 ($p=0.040$). Additionally, G1 exhibited significant reductions in ocular secretion ($p=0.005$) and conjunctival hyperemia ($p=0.002$). Group G2 showed improvement solely in conjunctival hyperemia ($p=0.004$).

Conclusions: The combination of sodium hyaluronate 0.30% BID and tacrolimus 0.03% BID emerged as the most effective protocol, showing promise for managing qualitative dry eye in dogs.

Keywords: tear film quality, ocular surface, tear film dysfunction, evaporative dry eye, therapeutic protocols.

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Approval by the Ethics Committee (CEUA): Protocol number 12/2022.

Influence of different treatments for evaporative dry eye on canine tear crystallization patterns

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Purpose: This study investigates the effects of three treatment protocols for evaporative dry eye disease in dogs on tear crystallization patterns, utilizing the Rolando and Masmali scales for evaluation.

Methods: Fifty-four dogs diagnosed with qualitative tear deficiency were randomly assigned to one of three treatment groups: G1 (sodium hyaluronate 0.30% BID + tacrolimus 0.03%), G2 (sodium hyaluronate 0.30% QID), and G3 (sodium hyaluronate 0.30% BID). Tears were collected using Schirmer strips and centrifuged at 10,000 rpm for 10 min. Two microliter aliquots were placed on glass slides to air dry and examined under a polarized light microscope at 10× magnification. The slides were evaluated using the Rolando and Masmali scales by three evaluators at three time points: Days 0, 15, and 45. Statistical analysis included one-way ANOVA and Holm-Sidak post-hoc testing.

Results: Tear ferning scores decreased across all treatment groups and both grading scales from Day 0 to Day 45. However, no significant differences in tear crystallization patterns were noted between groups G1 and G3 on either the Rolando (G1: $p=0.223$; G3: $p=0.057$) or Masmali (G1: $p=0.234$; G3: $p=0.104$) scales. Conversely, group G2 showed significant improvements in crystallization patterns from Day 0 to Day 45 on both scales (Rolando: $p=0.004$; Masmali: $p=0.008$).

Conclusions: Treatment with sodium hyaluronate 0.3% QID notably improved tear crystallization patterns over 45 days, indicating a greater efficacy in enhancing tear film quality compared to the other protocols evaluated.

Keywords: tear ferning test, evaporative dry eye, tear analysis.

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Iridociliary melanoma in a 7-month-old Newfoundland puppy: A case report

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Purpose: Melanocytic neoplasms are common in dogs and cats, affecting areas such as the conjunctiva, limbus, anterior uvea, choroid, and adnexa. This report details a case of iridociliary melanoma in a Newfoundland puppy.

Case Reports: A 7-month-old Newfoundland was referred to the Ophthalmology Service due to iris pigmentation. During a slit-lamp biomicroscopic examination, a mass was observed in the left eye's iris. Ultrasonic biomicroscopy (UBM) revealed a thickened iris, measuring 1.32 mm. The dog underwent an iridectomy, and the excised tissue was sent for histopathological analysis. Macroscopic appearance: The specimen was an irregular fragment measuring 0.5 × 0.5 × 0.3 cm, with a blackish-brown, soft, fibroelastic, and irregular internal surface. Microscopic appearance: Histopathology revealed malignant neoplasia in the iris, characterized by epithelioid cells arranged in organoid and spindle cell patterns, with moderate nuclear pleomorphism, round nuclei, prominent central nucleoli, sparse mitotic figures, and a voluminous cytoplasm containing variable amounts of brownish pigment.

Results: The diagnosis was iridociliary melanoma.

Conclusions: This report documents an iridociliary melanoma in a 7-month-old Newfoundland, a condition more commonly seen in older dogs. Early diagnosis through UBM and histopathological confirmation, combined with prompt iridectomy, successfully resolved the condition, with no recurrence observed 2 years post-surgery. The patient remains well and stable. This case is the first documented instance of iridociliary melanoma in a Newfoundland puppy.

Keywords: iridociliary melanoma, Newfoundland, puppy, UBM, iridectomy.

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Quantification of mature and immature collagen in the cornea of rabbits implanted with the PBAT polymer

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Purpose: Through histopathological evaluation of rabbit corneas with the polymer poly(butylene adipate-co-terephthalate) membrane (PBATm) via picrosirius red (PSR) staining, we aimed to quantify mature and immature collagen to evaluate whether collagen formation is induced by PBATm in the cornea.
Methods: Twelve rabbits underwent interlamellar stromal tunneling in both eyes, with one eye implanted with PBATm (treated eye = TE). The contralateral eye served as the control eye (CE), undergoing the procedure but without PBATm implantation. Histopathological evaluation with PSR under polarized light microscopy was performed at 30 (M30) and 60 days post-surgery (M60). The QWin program was used (400× magnification, Leica QWin V3®, Leica Microsystems®) for automatic area calculation after selecting colors corresponding to each type of collagen fiber. Yellowish-green fibers represent immature and thin collagen, whereas red–orange fibers represent mature and thick collagen.
Results: An average of 60.02% immature collagen fibers were observed in the TE at M30, while an average of 28.05% immature collagen fibers were observed in the CE at M30 ($p = 0.002$).
Conclusions: Given the higher proportion of immature collagen fibers in the TE at M30 than in the CE at M30, we conclude that PBATm demonstrates bioactive characteristics at 30 days post-surgery and bioinert characteristics at 60 days post-surgery, as observed with PSR. Therefore, PBATm shows promise as a material for treating corneal ulcers.
Keywords: Polyester, biocompatible material, biomaterial, keratoplasty.
Approval of the Ethics Committee (CEUA): Protocol number FOA-1103-2015.

Corneal squamous cell carcinoma in a dog: the use of topical chemotherapy with 1% 5-fluorouracil eye drops as an adjuvant to surgical excision

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Purpose: To describe the use of 1% 5-fluorouracil (5-FU) as an adjuvant treatment for squamous cell carcinoma (SCC).
Case Report: An 11-year-old female Shih Tzu was presented with sudden corneal bleeding in the left eye, 3 months after undergoing a conjunctival pedicle graft. Ophthalmic examination revealed a red, bleeding mass on the central cornea, while the anterior chamber and fundoscopy results were normal. An incisional biopsy confirmed the diagnosis of SCC. Ultrasound biomicroscopy (UBM) was used to assess the lesion's depth. Surgical keratectomy with the application of an acellular membrane was performed. Histopathological examination of the mass revealed acanthosis of the corneal epithelium with cellular atypia, pleomorphism and stromal invasion. Two months post-surgery, following complete corneal healing, topical chemotherapy with 1% 5-FU eye drops was initiated.
Results: The first protocol involved 5-FU four times a day (QID) for four consecutive days, but side effects, including blepharospasm, keratitis, and severe blepharitis appeared on Day 10. Chloramphenicol ointment (Regencel®) and Dexpanthenol gel (Epitegel®) were prescribed QID, along with intensive lubrication using 0.2% hyaluronic acid (HYLO-GEL®), until symptoms completely resolved. Due to the side effects, the next cycle was adjusted to 5-FU 1% eye drops three times daily (TID) for three consecutive days, combined with intensive lubrication from Day 0 to Day 20 of each cycle. The patient tolerated the modified treatment well, completing a total of four cycles. After chemotherapy, 0.2% ciclosporine ointment was prescribed BID OU long term.
Conclusions: Six years post-surgery, there has been no sign of tumor recurrence. The patient remains visual and comfortable, despite ongoing management of KCS.
Keywords: corneal neoplasia, topical chemotherapy, 5-fluorouracil, UBM.

Bilateral rhegmatogenous retinal detachment in a Shih Tzu—Case report

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Purpose: Retinal detachment (RD) is classified as rhegmatogenic (RDR) or nonrhegmatogenic. RDR can be primary or secondary. Primary RDRs are spontaneous and preceded by vitreous degeneration (VD), which is unrelated to trauma, inflammation, or surgery. The most common type of primary RDR is extensive retinal dialysis, which is often performed in middle-aged to elderly Shih Tzu dogs with VD. The vigorous movement of the head favors the turbulence of the liquefied vitreous, culminating in large retinal ruptures.
Case Report: The present study aimed to report the case of a 2-year-old Shih Tzu with a history of sudden bilateral blindness shortly after tug-of-war play with vigorous head movements. Ophthalmic examination revealed responsive bilateral mydriasis and the presence of a mobile structure in the vitreous chamber. Retinography revealed the presence of a detached retina at the 9-3:00 position that was folded over the optic papilla in the right eye and total dialysis of the retina of the left eye.
Results: Ocular ultrasonography revealed bilateral RDR and the presence of mobile hyperechogenic landmarks in the vitreous cavity of both eyes, indicating vitreous syneresis. VD usually occurs in middle-aged to elderly patients, unlike in this case. The consequences of VD are severe, leading to RDR and permanent blindness.
Conclusions: Shih Tzu dogs are predisposed to the development of vitreoretinopathy, and studies for the early detection of

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this disease should be encouraged so that prophylactic measures can be carried out regarding RDR.

Keywords: retinal detachment, Shih Tzu, vitreous.

Orbital squamous cell carcinoma with invasion into the brain cavity in a dog: Case report

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Purpose: Squamous cell carcinoma (SCC) within the orbital region is rare. This report aimed to describe a case of SCC extending into the orbital and intracranial cavities in a dog.

Case Report: A 5-year-old, male, neutered mixed-breed dog with a history of cranial trauma presented with left-sided head deformity and exophthalmos. Initially, no neuro-ophthalmic or clinical abnormalities were noted. Diagnostic evaluations included radiography (XR), computed tomography (CT) of the skull, and a biopsy of a frontal mass.

Results: XR revealed increased soft tissue volume with an osteolytic defect in the left frontal bone and the caudal part of the nasal sinus cortices. Histopathology confirmed SCC. CT showed a mass with soft tissue attenuation, filling the left orbital cavity and partially extending into the ipsilateral frontal sinus and caudally to the left side of the cranial vault. The mass measured 5.3 cm × 4 cm × 5 cm with extensive regional periosteal reaction, predominantly lytic, involving the medial orbital plate, left frontal bone, and dorsal frontal sinus wall. Osteolysis was also noted in the left portion of the cribriform plate. The neoplasm displaced the ocular globe rostral laterally and invaded the cranial cavity, causing mass effect on the brain parenchyma and slight displacement of the falx cerebri to the right. The dog was referred for chemotherapy. Four months post-diagnosis, it developed sudden bilateral blindness without other visible neurological alterations.

Conclusions: Squamous cell carcinoma is a malignant tumor with rapid local and metastatic infiltration and devastating effects to vision and to be included in the differential diagnosis of orbital neoplasms.

Keywords: squamous cell carcinoma, orbit, imaging diagnosis, canine.

Retrobulbar abscess and endophthalmitis in an mixed-breed dog after tooth extraction: A case report

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Purpose: Complications, such as retrobulbar abscess formation and orbital cellulitis, can occur in patients following oral procedures. We report a case of retrobulbar abscess and endophthalmitis following a dental extraction procedure.

Case Report: A 14-year-old, mixed-breed dog with a history of caudal maxillary block and tooth extraction presented with exophthalmos, conjunctival chemosis, mucopurulent ocular discharge, ulcerative keratitis, periocular swelling, protrusion of the nictitating membrane, blindness to the right eye (OD), and marked orbital pain. Systemic treatment was initiated with prednisolone (1 mg/kg, BID), spiramycin and metronidazole (75,000 IU/25 mg SID), amoxicillin and clavulanic acid (500/125 mg, BID), and pain management. Topical tobramycin (3 mg/mL), hyaluronic acid (0.5%), and dexpanthenol (5% QID) were also used. Ultrasound revealed an indentation of the globe and retrobulbar abscess, from which 20 mL of purulent fluid was drained. A computed tomography scan also revealed a fistula in the region of the right maxillary bone but no signs of tooth root infection.

Results: Culture and antibiogram tests revealed the growth of *Streptococcus spp.* (aerobic) and *Staphylococcus hominis*. (anaerobic), both of which are present in dog dental plaques. The latter is associated with rare cases of endophthalmitis in humans. The OD developed endophthalmitis with a recurrence of a retrobulbar abscess, followed by enucleation. Post surgery care included ceftriaxone injections (50 mg/kg, SID) and chloramphenicol eye ointment TID.

Conclusions: Oral procedures can lead to orbital and intraocular infection due to inoculation of microorganisms. Imaging tests associated with culture and antibiogram analysis represent valuable diagnostic tools, increasing treatment success.

Keywords: retrobulbar abscess, endophthalmitis, Staphylococcus hominis, enucleation.

Corneal conjunctival impression cytology in jaguars and cougars

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Purpose: To describe the corneal and conjunctival cell morphology using an impression cytology technique in healthy jaguars and cougars.

Methods: The evaluation was performed on six jaguars (12 eyes) and six cougars (12 eyes) in captivity. None of the animals included were specifically selected for research purposes. Data were collected simultaneously with examinations, following established restraint protocols. The corneal-conjunctival impression cytology was conducted using cellulose ester membrane with pore size of 0.45 µm and 13 mm diameter. This membrane was cut in half and positioned for 5 s, with one half in contact with dorsal bulbar conjunctiva and the other in contact with cornea. After removal, samples were stained with periodic acid–Schiff (PAS) and hematoxylin–eosin (HE).

Results: The corneal superficial epithelial cells exhibited a polyhedral morphology with tendency to flatten, low nucleus-to-cytoplasm ratio, rounded and centrally located nuclei, and slightly basophilic cytoplasm. Conjunctival intermediate epithelial cells displayed a polyhedral to oval morphology, moderate to marked

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nucleus-to-cytoplasm ratios, eccentric nuclei, condensed nuclear chromatin, and slightly basophilic cytoplasm. Conjunctival basal epithelial cells presented circular to oval morphology, marked nucleus-to-cytoplasm ratio, central nuclei, condensed nuclear chromatin, and scant, moderately basophilic cytoplasm. Goblet cells were identified in small quantities, showing oval morphology, low nucleus-to-cytoplasm ratio, eccentric and flattened nuclei, and mucous eosinophilic contents that filled almost the entire cytoplasm.
Conclusions: Impression cytology is simple and fast method for evaluating ocular surface cells. The characterization of cellularity described will aid in the broader diagnosis and treatment of diseases affecting the cornea and conjunctiva in jaguars and cougars.
Keywords: felidae, *Panthera onca*, *Puma concolor*, ophthalmological examination, wild animals.
Acknowledgment: Support: CAPES- cod. 001/2023, Park Zoo Municipal de Bauru-SP; Park Zoo Municipal Quinzinho de Barros – Sorocaba-SP.
Approval of the Ethics Committee (CEUA): Protocol number: 0373/2023 UNESP.

Dry eye in dogs: A cross-sectional study in different Brazilian states

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Purpose: Keratoconjunctivitis sicca (KCS), or dry eye, is a common worldwide tear film dysfunction in dogs. This study aimed to determine the prevalence of quantitative dry eye among dogs treated by veterinarians certified by the Brazilian College of Veterinary Ophthalmology (CBOV) in four Brazilian states.
Methods: The study included 1940 dogs diagnosed with dry eye (Schirmer tear test results below 15 mm/min) from 2016 to 2023. These dogs were treated in private clinics or hospitals under the care of CBOV-certified veterinarians across different Brazilian states. Data on breed, sex, age, and prescribed treatments were collected for descriptive and cross-sectional statistical analysis.
Results: Incomplete data slightly affected the results' precision. Nonetheless, the epidemiological characteristics were consistent across treatment centers. KCS was identified in 49 breeds, with the highest prevalence found in Shih Tzus (35.46%), followed by mixed-breed dogs (SRD) (11.08%), and Poodles (6.13%). Binomial analysis indicated no significant sex predisposition ($p = 0.3702$), with affected males at 49.32% and females at 48.09%. Affected dogs averaged 7.89 ± 4.07 years old. The most prescribed treatments were cyclosporine (51.13%), followed by tacrolimus (36.6%), and lubricants (6.13%; $p < 0.0001$).
Conclusions: The study revealed a high prevalence of KCS in Shih Tzu dogs, with no significant sex predisposition. Older dogs were more likely to develop this condition. Cyclosporine was the predominant treatment choice.

Keywords: ocular surface, keratoconjunctivitis sicca, dog, retrospective, multicenter study, prevalence.
Acknowledgment: The authors thank the Brazilian Coordination for the Improvement of Higher Education Personnel (CAPES) for the scholarship provided (Finance code no 88887.907313/2023-00). Arianne P. Oriá is a research fellow from the National Council for Scientific and Technological Development (CNPq).
Approval by the Ethics Committee (CEUA): Protocol number: 07/2024 UFBA.

Topical use of aloe vera for ocular surface protection during bathing in dogs

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Purpose: Dryness and instability of the tear film can result from excessive wind exposure. To assess ocular health under such conditions, the use of lubricating eye drops is essential. Given the beneficial properties of aloe vera, we evaluated the effectiveness of 5% aloe vera lubricating eye drops for corneal protection in dogs exposed to drying conditions in pet store dryers.
Methods: Thirteen Shih Tzu dogs were assessed before and after routine bathing. The right eye received 5% aloe vera eye drops, while the contralateral eye was treated with 0.15% sodium hyaluronate (GC) prior to drying. We measured tear film break-up time (TBUT, measured in seconds) and fluorescein dye adherence using cobalt blue light (FLU, considering: 0 absent, 1 slight, 2 moderate, and 3 intense). Results: The mean TBUT values before and after the procedure were as follows: GT, 7 ± 4.39 to 11 ± 4.79; GC, 6.17 ± 3.04 to 8.5 ± 2.84. For FLU, the values were 1.92 ± 0.79 to 1.83 ± 0.72 for GT, and 2.17 ± 0.60 for GC. The *p*-values for TBUT and FLU were 0.061 and 0.75, respectively.
Conclusions: Lubricating eye drops are essential in animal bathing protocols. Although no significant differences were found, the aloe vera-based lubricant demonstrated potential benefits based on the results.
Keywords: aloe vera, lubricating eye drops, dog.

Management of severe keratoconjunctivitis sicca with liposomal sirolimus formulation and minor salivary glands transplantation in a dog—Case report

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Purpose: Quantitative tear deficiency or keratoconjunctivitis sicca (KCS) results from hyposecretion of the lacrimal gland. Ophthalmic solutions thath are commercially available are

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immunomodulators such as cyclosporine, tacrolimus, and pimecrolimus and, currently, subconjunctival administration of a liposomal sirolimus formulation (Excentera LS®). A case of minor salivary gland transposition in a dog for medically refractory severe KCS is reported.
Case Report: A 7-year-old female West Highland White Terrier presented with a recurrent ulcerative keratitis, marked blepharospasm, na STT of 0 mm/min in both eyes (OU), and previous treatment with 1% cyclosporine eye drops and 0.5% pimecrolimus. Five subconjunctival administrations of the liposomal sirolimus formulation (Excentera LS®) were scheduled every 15 days, associated with 0.40% hyaluronate eye drops every 8 h. After three applications with no clinical improvement—STT 0 mm/min OU, bilateral stromal ulcers, and severe blepharospasm—sirolimus was discontinued in favor of transposition of minor salivary glands by autograft.
Results: At 7 days after surgery there was an improvement in blepharospasm, no ulcerative keratitis and clearing of the corneal surface. After 15 days, moderate corneal transparency was noted, allowing fundoscopic examination. Four months later, the patient's owners reported no pain, pruritus, or ulcers. The STT remained at 0 mm/min OU throughout the evaluation period.
Conclusions: Sirolimus treatment did not yield significant results in this case of severe KCS, highlighting the correlation between the degree of immune-mediated KCS and the response to medical therapy. The qualitative improvement of the condition occurred following minor salivary gland transposition surgery as described in the literature.
Keywords: severe keratoconjunctivitis sicca, liposomes, sirolimus, transposition of minor salivary glands.

Use of topical dexmedetomidine combined with dorzolamide for the treatment of glaucoma in dogs

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Purpose: To evaluate the efficacy of topical dexmedetomidine combined with dorzolamide in reducing intraocular pressure (IOP) in dogs with glaucoma.
Methods: Twenty-two dogs with an IOP greater than 25 mmHg were divided into two groups of 11 animals each: Group 1 (DORZO), which received 2% dorzolamide three times a day (TID), and Group 2 (DEX DORZO), which received 2% TID dorzolamide combined with topical dexmedetomidine at a dose of 100 µg/mL twice a day (BID). IOP was measured at the beginning of the evaluation and again after 7 and 30 days of treatment.
Results: Statistical analysis was performed using the Friedman test, with significance set at $p < 0.05$. A significant reduction in IOP was observed in both groups ($p < 0.01$). In the DORZO group, the median IOP was 39 mmHg (31.5–48 mmHg), which decreased to 33 mmHg (28–37 mmHg) after 30 days of treatment, resulting in an average reduction of 9 mmHg (15%). In the DEX DORZO group, the median IOP was 38 mmHg (34–39.5 mmHg), which decreased to 24 mmHg (21–26 mmHg) after 30 days of treatment, yielding an average reduction of 15 mmHg (34%). Neither group exhibited significant adverse effects, such as blepharospasm or hyperemia.
Conclusions: Dexmedetomidine can be considered an adjunctive therapeutic option for the treatment of glaucoma in dogs due to its synergistic effect when combined with dorzolamide.
Keywords: dexmedetomidine, alpha-2 agonist, eye drops, hypotensive, glaucoma.
Approval by the Ethics Committee (CEUA): Protocolo número: 022/2023/UFPR.

Effectiveness of facial paralysis treatment in dogs using direct electrical current, with Vicen Vet: An innovative approach

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Purpose: Facial paralysis in dogs, often of traumatic origin (preferably involving the peripheral portion of the nerve), presents a challenge in clinical management, particularly in cases that do not respond to conventional medical treatments. In this presentation, we discuss the use of the Vicen Vet Veterinary Medical Device, which employs the emission of a direct flow of electrical current through different silver heads, acting directly on the skin of the affected area while using a conductive gel.
Methods: We treated six dogs with traumatic facial paralysis who had shown unsatisfactory outcomes with standard medical treatments. We administered one or two sessions of continuous electric current flow, each lasting 10 min, applying 3 W of energy through the silver heads of Vicen Vet, which operates at 5000 volts.
Results: The outcomes were remarkable; we successfully reversed facial paralysis in all cases within a short period after treatment, highlighting the high anti-inflammatory and regenerative potential of this therapy. The procedure can be performed without sedation and employs a minimally invasive technique.
Conclusions: Most of the dogs were treated without the need for sedation, underscoring the safety and comfort of the procedure. These findings suggest that Vicen Vet therapy represents an innovative and effective option for managing facial paralysis in veterinary practice, offering a new horizon in the treatment of conditions that affect the quality of life of our patients due to rapid recovery.
Keywords: minimally invasive, dogs and cats, direct electric current.
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Histopathological findings of corneal sequestration in a Shih Tzu with chronic ulcerative keratitis

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Purpose: Corneal sequestration is common in cats and has also been less commonly reported in horses and dogs. The etiology is uncertain, but chronic inflammatory processes and eyelash and eyelid abnormalities are believed to be predisposing factors in dogs. This case report describes histopathological findings of a corneal sequestration case in a dog with deep ulcerative keratitis.
Case Report: A 10-year-old male Shih-Tzu was presented with blepharospasm, ocular discharge, severe superficial vascularization, a central and perilesional deep corneal ulcer with a brownish plaque in the right eye and an enucleated left eye. The right eye had previously undergone blepharoplasty to correct macroblepharon and medial canthal entropion. Keratectomy, keratoplasty, and sample collection for histopathology were performed. No bacterial growth was detected in the microbiological test.
Results: Histology revealed an area of epithelial discontinuity with stromal exposure (ulceration). The collagen lamellae were present but compacted, brownish, and devoid of keratocytes (compatible with sequestration). No melanin granules or infectious agents were observed. Adjacent to the sequestration, there was moderate edema and mild neutrophilic inflammation.
Conclusions: Brown/black plaques related to melanin, as observed in pigmentary keratitis; infectious keratitis (i.e., *Streptococcus agalactiae* and fungi), should be included as a differential diagnosis of corneal sequestration in dogs. In the present case, the clinical and histological characteristics of the corneal stroma, along with the absence of infectious agents on microscopy and bacterial culture, are consistent with corneal sequestration in a Shih Tzu dog, presumably due to chronic ulcerative keratitis.
Keywords: corneal stromal sequestration, deep corneal ulcer, superficial keratectomy, canine.

Iridectomy for nodular iris melanoma excision in a cat—Case report

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Purpose: Diffuse iris melanoma is a common intraocular tumor in cats. It can present as a localized solid mass or diffuse nodules, often leading to secondary uveitis and glaucoma. The aim of this report was to describe a case of iris melanoma in a cat without secondary changes, which was removed via iridectomy.
Case Report: A 12-year-old domestic cat presented with pigmented changes in the iris of the right eye, including a nodular lesion between 1 and 3 o'clock. Ultrasound biomicroscopy (UBM) revealed a 1.8-mm nodule in the iris, with other areas showing only melanosis. There were no signs of uveitis or secondary glaucoma. Although enucleation is the most common treatment, in this case, iridectomy was chosen due to the presence of a single nodule, with no signs of uveitis or other systemic changes. The tumor apparently was completely excised, and bleeding was controlled with an epinephrine solution diluted in balanced salt solution (BSS). Postoperative medication included gatifloxacin and prednisolone eye drops (Zypred®, Allergan).
Results: Histopathological analysis revealed proliferation of cells with hyperchromatic round nuclei occupying the entire iris stroma, confirming the diagnosis of melanoma with clear surgical margins. The animal achieved good surgical recovery, with preserved visual function, and was monitored for 120 days postoperatively. No systemic changes compatible with metastasis were observed during this period.
Conclusions: Iridectomy can be an alternative to enucleation when iris melanoma presents as a single nodule without other ocular alterations or signs of metastasis.
Keywords: iridectomy, feline diffuse iris melanoma, intraocular tumor, uveitis.

Iridectomy in a cat with iris melanoma

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Purpose: Describe the surgical approach for the removal of a focal melanoma of the iris using iridectomy in a cat.
Case Report: A 1-year-old male mixed-breed cat was presented with progressive pigmentation in the right eye. Slit-lamp examination revealed an oval-shaped, brown-pigmented area in the temporal region of the iris, with slight thickening and surface irregularities. Ultrasound biomicroscopy confirmed thickening and irregularity in the pigmented region. The contralateral eye and other ophthalmologic examinations were within normal limits. Internal medicine evaluation revealed no systemic abnormalities. A presumptive diagnosis of melanoma was made. Due to the focal nature of the lesion, iridectomy was chosen to excise the suspicious tissue while preserving ocular anatomy. Iridectomy was performed in two stages, the first removing the affected area for histopathological analysis and the second to increase the safety margin.
Results: The surgery was performed without complications, and the initial recovery was smooth. Postoperative care included topical and systemic antibiotics and anti-inflammatories. The cat retained functional vision, with only minor pupillary irregularity. Histopathological analysis confirmed the diagnosis of iris

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melanoma. Although neoplastic cells were found at the surgical margin, no local recurrence or systemic manifestations were observed during the 6-month follow-up. Oncological and ophthalmological follow-up was advised.

Conclusions: This case emphasizes the importance of early diagnosis and treatment of focal iris melanomas in cats. Iridectomy proved to be an effective method to manage the neoplasm, preserving both ocular function and preventing systemic complications.

Keywords: cat, eye, melanoma, therapy.

Ocular spindle-cell sarcoma in a goldfish (*Carassius auratus*): Case report

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Purpose: To describe a surgical case of ocular spindle cell sarcoma in the goldfish *Carassius auratus*, a popular pet species.

Case Report: A 1-year-old *Carassius auratus* weighing 100 g presented with a 2-month history of a progressive periocular mass in the left eye, with no prior health issues affecting navigation or feeding. Ophthalmic examination showed superficial corneal invasion by the tumor. Initial surgery involved excising the periocular tumor and performing a deep keratectomy between the 12 and 2 o'clock positions, closing the cornea with a 9–0 nylon suture in a simple continuous pattern. Anesthesia included intramuscular 0.1 mg/kg butorphanol and 5 mg/kg propofol topically applied to the gills. Postoperative recovery involved moderate corneal edema lasting 10 days, granulation tissue for 20 days, and suture removal after 40 days. Histopathology confirmed ocular spindle cell sarcoma. After 10 months, an extensive mass recurred, invading the anterior chamber, necessitating exenteration. Histopathology confirmed spindle-cell sarcoma recurrence. Post-exenteration, enrofloxacin (5 mg/kg) and dexamethasone (1 mg/kg) were administered intramuscularly, with recovery in a hospital aquarium containing 1% Melaleuca alternifolia solution (Melafix®).

Results: No macroscopic evidence of tumor recurrence was observed up to 60 days post-surgery.

Conclusions: Surgical intervention is the primary treatment for ocular neoplasia in goldfish, with histopathology essential for prognosis and treatment planning.

Keywords: ocular neoplasia, ocular pathology, teleosts, fish surgery, fish ophthalmology.

Enophthalmos, ocular xanthogranuloma and posterior synechia in a dog with chronic kidney disease—Case report

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Purpose: Intraocular xanthogranuloma is a rare condition, previously described in Schnauzers with diabetes mellitus and hyperlipidemia. It consists of lesions characterized by abundant lipid-laden macrophages, likely associated with metabolic derangements, blood–ocular barrier breakdown, excessive intraocular lipid deposition, and foam cell accumulation.

Case Report: An obese, 8-year-old female Blue Heeler dog with severe azotemia was admitted. On physical examination, the dog was overhydrated, and the right eye showed enophthalmos with severe corneal edema and a solid, granulomatous appearance in the anterior chamber, previously diagnosed as phthisis bulbi by another veterinarian. According to the owners, the dog had experienced sudden uveitis months prior. Measurements of systolic blood pressure (300 mmHg), urinalysis (showing marked proteinuria and lipids), blood gas analysis, serum albumin, and cholesterol were performed to assess nephropathy. The dog was diagnosed with nephrotic syndrome secondary to glomerulopathy; due to the severity, the owners opted for euthanasia, and the dog was sent for autopsy at the Veterinary Pathology Service of São Paulo State University.

Results: Macroscopic evaluation of the right eye revealed intense enophthalmos and posterior synechia due to a yellowish-white mass. Histopathological analysis confirmed a granuloma composed of cholesterol clefts and foamy macrophages. The ciliary body, iris, cornea, and lens had collapsed, and the lens was thin and fragmented. Additionally, the retina and ciliary body were atrophied. Microscopically, the kidneys showed glomerulosclerosis, proteinuria, and severe tubular atrophy with interstitial fibrosis.

Conclusions: Although rarely reported, xanthogranuloma should be included in the differential diagnoses for ocular disease in animals with chronic nephropathy.

Keywords: nephrotic syndrome, hypercholesterolemia, foamy cells.

Retrobulbar xanthogranuloma in a dog: Case report

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Purpose: Xanthogranulomas are inflamatory lesions that arise from macrophage accumulation. These lesions are associated with intracellular lipid deposits, giant cells, and cholesterol. This is a rare condition in dogs and, in most cases, occurs due to dyslipidemic events. They are usually characterized by nodular skin lesions but have also been reported in other locations, such as ocular and periocular tissues. The objective of this report is to present a case of retrobulbar xanthogranuloma in a dog.

Case Report: A 10-year-old female Lhasa Apso dog was presented for an ophthalmological examination. The dog's owner reported an enlarged left eye (OS), mucopurulent discharge, corneal opacity and loss of corneal luster. During the ophthalmic examination the left eye showed no pupillary light reflex or consensual pupillary light reflex, a negative menace response, a negative dazzle reflex, and an intraocular pressure of 30 mmHg. Blood tests revealed elevated serum cholesterol and triglyceride levels. Ocular ultrasound identified a nonspecific retrobulbar mass. The patient underwent enucleation followed by histopathological examination of the left eye.

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Results: Histopathological examination revealed round cells that formed lobulations. They had mild pleomorphism, a large and slightly acidophilic cytoplasm that was engorged by numerous lipidic vacuoles, and there were few mitotic figures. These features were compatible with xanthogranuloma.
Conclusions: Xanthogranulomas are a rare condition in dogs and must be considered in the list of differential diagnosis of retrobubar masses. Enucleation should be considered in some cases, and histopathological examination is crucial for diagnosis.
Keywords: xanthogranuloma, dyslipidemias, retrobulbar, canine.

Corneal epithelial inclusion cyst in a dog: Case report

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Purpose: Epithelial inclusion cysts of the cornea are rare lesions in dogs, characterized by the proliferation of epithelial cells trapped within the cornea. The aim of this study was to report a case of an epithelial inclusion cyst in the cornea of a 6-year-old male Yorkshire Terrier.
Case Report: The patient presented with a 3-mm white mass on the cornea of the left eye that had progressed over 45 days, without any recent history of trauma or signs of ocular discomfort. Hematological tests were normal, and the Schirmer test indicated values within normal limits. Ophthalmic examination revealed a neoplasm affecting one-third of the corneal stroma, with neovascularization surrounding it. Surgical intervention included excision of the cyst through a superficial lamellar keratectomy under inhalation anesthesia.
Results: Histopathological analysis confirmed an epithelial inclusion cyst. Postoperatively, recovery was positive, with neovascularization around the treated area. Three months after surgery, the cornea was fully transparent, with no signs of recurrence or scarring.
Conclusions: This report underscores the importance of differential diagnosis for corneal lesions in dogs and demonstrates the effectiveness of superficial lamellar keratectomy in treating epithelial inclusion cysts, enabling corneal transparency recovery without recurrence. Ongoing evaluation is recommended to monitor for possible recurrences, though such cases are rarely reported in the literature. This case contributes to the clinical and therapeutic understanding of these lesions, emphasizing the need for precise and effective treatment approaches.
Keywords: dog, corneal epithelial inclusion cyst, keratectomy.

Pigmented iridociliary adenocarcinoma in a Lhasa Apso

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Purpose: Canine iridociliary epithelial tumors (ICETs) are highly invasive, with a greater predisposition observed in retriever breeds. This case report describes a pigmented iridociliary adenocarcinoma in a Lhasa Apso dog.
Case Report: An 8-year-old intact female presented with conjunctival hyperemia, epiphora, neovascularization, corneal edema, buphthalmia, increased volume in the medial sclera, and third eyelid gland protrusion. Topical medications prescribed included prednisolone acetate (1.0% QID), dorzolamide hydrochloride (2%) with timolol maleate (0.5% TID), sodium hyaluronate (0.15% TID), and oral prednisolone (1 mg/kg SID). An ocular ultrasound was requested due to suspected intraocular neoplasia. Exenteration was performed, and the material was sent for histopathology and immunohistochemistry.
Results: The patient's ophthalmic signs worsened after starting treatment, and imaging suggested neoplastic formation due to an anechoic anterior chamber with reduced depth and diffuse thickening of the iris. Following exenteration, immunohistochemical analysis confirmed a diagnosis of pigmented iridociliary adenocarcinoma, with the sample testing positive for cytokeratin (CK Pan), vimentin, and neuron-specific enolase (NSE) antibodies.
Conclusions: Iridociliary epithelial tumors are previously unreported in Lhasa Apso dogs and rarely metastasize; however, given the high vascularization of the uvea, the prognosis is guarded.
Keywords: glaucoma, exenteration, neoplasia

Eyelid neoplasms in dogs: Case analysis from a University Veterinary Hospital in São Luís, Maranhão

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Purpose: Our goal was to analyze the profile of patients, tumor location, diagnosis, and surgical treatments used for eyelid neoplasms in dogs treated at a Veterinary Teaching Hospital in São Luís, MA, Brazil.
Methods: Dogs of different breeds, sexes, and ages presenting with eyelid neoplasms were evaluated. Patients underwent ophthalmologic examinations and were managed according to histopathological diagnosis and individual needs.
Results: A total of 29 dogs with eyelid neoplasms were treated, of which 15 (51.7%) were female and 14 (48.3%) were male. The

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predominant age range was between 6 and 10 years, accounting for 48.3% of the patients. The most affected breeds were Shih Tzu (37.9%), mixed-breed dogs (20.6%), and Poodles (17.2%). In terms of location, 17 cases (58.6%) occurred in the right eye, 11 (37.9%) in the left eye, and 1 (3.5%) in both eyes. The upper eyelid was the most affected (62%). The predominant surgical technique was V-plasty, used in 24 cases (82.7%), followed by H-plasty and labial commissure transposition, each used in two cases (6.9%). Histopathological diagnoses revealed sebaceous epitheliomas 12 (41.3%), meibomian gland adenomas 11 (37.9%), melanomas 2 (6.8%), mast cell tumors, fibro-adnexal hamartomas, melanocytomas, and sebaceous epitheliomatous carcinoma, each accounting for one case (3.5%).

Conclusions: The most frequent eyelid neoplasms were sebaceous epitheliomas and Meibomian gland adenomas, affecting Shih Tzus and mixed-breed dogs aged 6–10 years. The right eye and upper eyelid were the most affected areas. Surgical treatment with the V-plasty technique proved to be effective.

Keywords: blepharoplasty, ocular neoplasms, canine, veterinary ophthalmology.

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Evaluation of the efficiency of continuous wave or micropulse transscleral cyclophotocoagulation in controlling intraocular pressure in dogs with refractory glaucoma

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Purpose: To retrospectively evaluate the efficacy of continuous (CWC) and micropulse (MPC) transscleral cyclophotocoagulation in controlling intraocular pressure (IOP) in dogs with refractory glaucoma from 2020 to 2024.

Methods: Thirty dogs (42 eyes) received cyclophotocoagulation with a FastPulseXRange laser in either CWC or MPC mode, alongside with antiglaucoma eye drops. IOP was measured pre-treatment and at 1 (T1), 6 (T6), and 12 (T12) months post-treatment. Success was defined as IOP remaining below 25 mmHg. CWC was performed in 31 eyes with an average power of 188 ± 57 J/1602 ± 215 mW and 20 ± 6 sites, and MPC in 15 eyes at 102 ± 33 J/1740 ± 450 mW. A chi-square test was performed to evaluate data. *Phthisis bulbi* was considered a therapeutic success, as the goal of controlling both pain and IOP was achieved.

Results: Baseline IOP was 49.1 ± 19.3 mmHg in CWC-treated eyes and 48.8 ± 20.6 mmHg in MPC-treated eyes. In the CWC group, IOP decreased to 16.6 ± 8.0 mmHg at T1 14.6 ± 11.2 mmHg at T6, and 13.1 ± 11.6 mmHg at T12 In the MPC group, IOP was 28.0 ± 15.6 mmHg at T1, 20.9 ± 17.7 mmHg at T6, and 15.8 ± 13.3 mmHg at T12. Chi-square test to compare efficacy of treatments indicated difference only at T1 ($p = 0.01$). The number of eye drops in CWC-eyes decreased from 2.9 ± 0.8 pre-treatment to 2.0 ± 1.0 at T1, 1.6 ± 1.0 at T6, and 1.7 ± 1.2 T12. In the MPC-eyes, the eye drops decreased from 2.8 ± 0.8 pre-treatment to 2.5 ± 1.0 at T1, 2.1 ± 1.1 at T6, and 1.6 ± 1.4 at T12.

Conclusions: Both CWC and MPC, when combined with antiglaucoma drops, effectively control IOP in dogs with refractory glaucoma, enhancing quality of life. Long-term follow-up is essential for sustained success.

Keywords: ocular disease, canine, glaucoma treatment, laser, eye.

Use of transscleral cyclophotocoagulation with micropulsed laser to reduce intraocular pressure in 18 dogs with glaucoma

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Purpose: Glaucoma is one of the main causes of visual loss in dogs. Cyclodestructive procedures are performed in cases refractory to drug treatment, with the aim of better long-term IOP control. The objective of this study was to report the use of transscleral cyclophotocoagulation with a micropulsed laser to reduce IOP in 18 dogs with glaucoma.

Methods: Eighteen dogs (24 eyes) with IOP between 15 and 90 mmHg were submitted to treatment. IOP was evaluated before the procedure and 7, 14, 30, and 60 days after the procedure with the Tono-Pen AVIA Vet. For the procedure, the FOX 810 device was used, at 2800 W of power, with 33% of time on. Two markings were made in 3–9 h, and the eye was divided into two hemispheres. Next, the projector pen was slid into the upper hemisphere of the eye, 3 mm from the limbus, in a semicircular pattern for 180 s, and the same process was repeated in the lower hemisphere.

Results: IOP stabilization with the use of medication in reduced doses or without medication in 19 (79.16%) of the 24 (100%) eyes submitted to cyclophotocoagulation was observed. There was a significant reduction in IOP in the first days (Days 7–14), followed by a slight increase and stabilization (Days 30–60). The pressure in these eyes, after 60 days of the procedure, remained between 8 and 25 mmHg.

Conclusions: Transscleral cyclophotocoagulation with a micropulsed laser is an effective and simple procedure for reducing IOP in dogs with glaucoma.

Keywords: glaucoma, cyclophotocoagulation, laser.

Feline conjunctival sequestrum combined with corneal sequestrum: A case report

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Purpose: Corneal sequestrum, or corneal necrosis, is a condition frequently observed in cats, though the etiology is not yet

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fully understood. However, the occurrence of sequestrum in the palpebral conjunctiva has not yet been documented in the literature. This report aimed to describe a case of corneal sequestrum concurrently associated with a sequestrum in the palpebral conjunctiva in a cat.

Case Report: A 3-year-old male Persian cat was diagnosed with corneal sequestrum in the right eye. During the ophthalmological examination, another amorphous black plaque was observed on the right upper palpebral conjunctiva, measuring approximately 2 mm in diameter. After lamellar keratectomy, the blackened plaque on the upper palpebral conjunctiva also was excised and both tissues underwent histopathological examination.

Results: Histological analysis of the blackened conjunctival plaque revealed degenerative coagulation necrosis of conjunctival epithelial cells, surrounded by a discrete zone of inflammatory cells, including lymphocytes and plasma cells, in addition to the presence of dark brown pigment. This confirmed the occurrence of a conjunctival sequestration associated with corneal sequestration.

Conclusions: This is the first reported case of feline conjunctival sequestrum. A through ophthalmological examination, complemented by histopathological examination, allowed for the identification of conjunctival sequestrum associated with corneal sequestrum.

Keywords: cat, eye, histopathology, necrosis, Persian.

Anatomic and ultrasonographic description of the collared anteater (*Tamandua tetradactyla*) eye

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Purpose: This study aimed to detail the anatomical and ultrasonographic characteristics of the collared anteater's eye (*Tamandua tetradactyla*).

Methods: Sixteen collared anteater cadavers, provided by INEMA-BA post-mortem, were utilized for this research, which received approval from the SISBIO-IBAMA under permit no 82780-1. The specimens underwent topographic dissection, exenteration, and ocular ultrasonography.

Results: The collared anteater's eyeball is small and spherical. Identified among the ocular adnexa were the rectus muscles (paired dorsal, lateral, medial, and ventral), the ventral oblique muscle, and the bulbar retractor. The dorsal oblique muscle was absent. The lacrimal gland was small and lobulated; a medioventrolateral gland akin to Harder's gland was also noted. Eyelashes appeared on the upper eyelid, but the opening of the tarsal gland openings were not visible macroscopically. The retina could not be differentiated from the choroid, and no lucid tapetum was present. Ultrasonography revealed two convex lines in the cornea separated by hypo/anechoic tissue averaging 0.05 cm in thickness. The eyeball contained echogenic material of coarse echotexture, measuring an average rostro-caudal and medio-lateral axis of 0.87 cm and 0.81 cm, respectively. The biconvex lens measured an average of 0.48 cm in width and 0.30 cm in thickness.

Conclusions: The collared anteater's eye exhibits several anatomical distinctions from domestic animals, including the absence of the dorsal oblique muscle, the presence of a structure resembling Harder's gland, and two dorsal rectus muscles. Ultrasonographic examination provided comprehensive visualization of the entire eye and retrobulbar tissues, except for the uvea.

Keywords: anatomy, eye, ultrasound.

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Cataract secondary to hypocalcemia in the dog—A case report

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Purpose: Mineral deficiency is caused by secondary renal/nutritional hyperparathyroidism or, more rarely, primary hypoparathyroidism. The present study aimed to describe a case of cataract due to hypocalcemia secondary to primary hypoparathyroidism.

Case Report: A 13-year-old neutered dog previously diagnosed with lens nuclear sclerosis presented, according to the owner, a "stellar characteristic" in both eyes after a period of hospitalization for tremors, fever, and cardiorespiratory arrest secondary to hypocalcemia of 2.8 mg/dL (8.6–11.2 mg/dL). Slit-lamp biomicroscopy revealed the presence of multifocal punctiform opacities only in the lens cortex, bilateral, symmetrical, and pathognomonic of cataracts due to hypocalcemia. As there were no renal or nutritional disorders that could justify hypocalcemia, parathyroid hormone levels of 0.43 pmol/L (2.0–13.0 pmol/L) were measured, and primary hypoparathyroidism was diagnosed.

Results: The animal was followed up for 6 months, with no complications or progression of cataracts after calcium supplementation, as described in the literature.

Conclusions: Despite uncommon and rarely described, cataract secundary to hypocalemia should be taken as differential diagnosis of all cataracts causes. Finally, the eyes can act as a sentinel of systemic diseases and it is crucial that general practitioners pay attention to changes in ocular morphology, even if they are discrete.

Keywords: hypoparathyroidism, lens, metabolism.

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Intraocular pressure response after phacoemulsification lens extraction in dogs with the use of polyacrylamide 1.5% as the viscoelastic agent

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Purpose: Cataracts and loss or compromise of vision following disease are the major causes of referral to professionals specializing in ophthalmology. Several agents have been suggested for preventing or delaying the progression of cataracts; however, none have proven effective, making surgery the treatment of choice. Postoperative ocular hypertension (POH) plays a significant role in the success of canine cataract removal. POH is attributed to several factors, including the retention of viscoelastic material in aqueous humor outflow pathways. Sudden, large increases in intraocular pressure with few clinical signs have become important because very few patients are kept hospitalized and monitored in the hours following surgery. This study aimed to document the incidence of POH after phacoemulsification cataract surgery in dogs using polyacrylamide 1.5% as the viscoelastic agent.
Methods: Intraocular pressure was measured immediately before the surgical procedure and at 1, 2, 3, 4, 5, 6, 7, 8, 12, 15, 18, 24, 48, and 72 after surgery in both eyes (operated and not operated on) of each dog.
Results: Statistical analysis revealed no significant differences between the groups.
Conclusions: The results indicate that viscoelastic material and its retention in the anterior chamber do not play a significant role in POH development.
Keywords: cataract, surgery, hypertension.

Cataract surgery by phacoemulsification in a puma (*Puma concolor*): Case report

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Purpose: Cataract is defined as any opacity of the lens or its capsule. Phacoemulsification is a routine surgical treatment for cataracts in dogs, but a few reports have described the treatment of cataracts in exotic animals including pumas (*Puma concolor*). The objective of this report was to describe, for the first time, bilateral phacoemulsification in a puma (*Puma concolor*).
Case Report: A 3-month-old, 5.4 kg intact male puma (*Puma concolor*) with a history of visual dysfunction was submitted. During the ophthalmologic exam both eyes had different degrees of cataract. Blood tests, ocular ultrasound and electroretinography were performed before surgery. Two corneal incisions were performed 1mm from the limbus, the main incision was 2.75 mm long and the second incision 2.5 mm long. Trypan blue was used to color the anterior capsule, viscoelastic (methylcellulose 2%) was applied at the anterior chamber, and the continuous curvilinear capsulorhexis was performed. Phacoemulsification lasted 80 and 67 s for the left and the right eyes respectively, using the divide-and-conquer technique. The cortical material was removed, intraocular lenses were not inserted, and simple separated sutures were applied to the cornea with nylon 10-0.
Results: The patient underwent another ophthalmological examination at 9 and 20 months after surgery. The patient recovered vision and had no severe complications after surgery.
Conclusions: There are a few reports of phacoemulsification in exotic animals. To the authors' knowledge, this is the first case report of bilateral phacoemulsification in a Puma concolor. A good clinical outcome is reported up to 20 months post-surgery.
Keywords: cataract, phacoemulsification, *puma-concolor.*

Optic nerve coloboma in a middle age Shih Tzu—Case report

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Purpose: Optic nerve colobomas (ONC) are congenital malformations that result in deformation of the optic nerve head caused by the absence of papillary tissue and/or peripapillary sclera, large optic disc with deep cavitation, or slightly enlarged and irregular discs containing deep pits within the boundaries of the optic nerve head. This condition usually appears in patients with Collie's eye anomaly syndrome.
Case Report: The present study aimed to report a case of ONC in a 4-year-old Shih Tzu dog with a history of visual deficit and ocular discharge 1 month prior.
Results: Ophthalmic examination revealed bilateral mucopurulent secretion and anisocoria. OD: mydriasis, menace response (−), photomotor papillary reflex (PPR) (−), Schirmer tear test (STT): 13 mm/min, intraocular pressure (IOP): 16 mmHg. OS: menace response (+), PPR (+), STT: 11 mm/min, IOP: 17 mmHg, neovascularization and corneal pigmentation in the dorsal half of the cornea. Fundoscopy revealed an optic nerve head of the OD with a diameter 75% larger than that of the OS and marked cavitation allowing the diagnosis of ONC. An ocular ultrasound was performed to illustrate the scleralectasia measuring 0.53 × 0.30 cm in a 6-h cross-section. Eyes with this condition are blinded, and the diagnosis can be an ophthalmologic examination finding when the involvement is unilateral. In the present case, the visual deficit was significant because of vascularization and pigmentation of the contralateral cornea resulting from tear film disease.
Conclusions: Ophthalmoscopy should be performed in all patients, because some may have fundus changes without apparent blindness.
Keywords: coloboma, congenital malformations, optic nerve head.

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Ultrasound diagnosis of persistent hyperplastic primary vitreous in a Shih Tzu dog: Case report

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Purpose: Persistent hyperplastic primary vitreous (PHPV) is considered a congenital anomaly and is often unilateral because the hyaloid vascular system fails to regress after hatching. The aim of this study was to report a case of PVPH, emphasizing the importance of ocular ultrasound (OUS) as a definitive diagnostic method.
Case Report: A 7-year-old male Shih Tzu dog with a history of progressive right eye opacification was referred for treatment. Ophthalmic examination revealed leukocoria and high intraocular pressure (40 mmHg). An ocular ultrasound scan was carried out with the Esaote®Mylab70VETXV device via a linear multifrequency transducer with a range of 4–13 MHz.
Results: In the ultrasound scan of the right eye, punctate echoes were observed in the anterior and vitreous chambers, which were correlated with an inflammatory process. In the lens, capsular echo thickening and increased echogenicity in the nuclear area were observed, which is consistent with cataracts. In the vitreous chamber, a triangular-shaped echogenic structure adhered to the posterior capsule of the lens and extended to the optic disc, with no vascularization on color Doppler, which is compatible with PHPV. No alterations were detected in the left eye.
Conclusions: Ultrasonography made it possible to treat a case of nuclear cataract and an inflammatory vitreous process associated with PHPV, excluding the persistence of the hyaloid artery, which is not possible by ophthalmological examination. This underlines the need for imaging tests when there is opacification of transparent media in the bulb of the eye.
Keywords: dog, ocular ultrasound, PHPV.

Uveal intravascular lymphoma in a dog: A case report

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Purpose: Intravascular lymphoma, also known as malignant angioendotheliomatosis, is extremely rare and characterized by the proliferation of neoplastic lymphocytes within the lumen of blood vessels, without a primary extravascular tumor. It poses diagnostic challenges, has a rapid progression, and a poor prognosis.
Case Report: A 12-year-old intact female Yorkshire Terrier presented with a 3-day history of conjunctival hyperemia and blepharospasm in the right eye (OD). Ophthalmic examination of the OD revealed signs of uveitis, iris thickening, and corectopia, with the left eye (OS) showing no abnormalities. Physical examination was unremarkable. A diagnosis of uveitis in the OD was established, and further tests were ordered to rule out multicentric lymphoma.
Results: Ocular ultrasound showed iris thickening suggestive of neoplasia, while other tests were normal. Despite treatment with 1% prednisolone eye drops and slight clinical improvement, the condition rapidly worsened. Given the suspicion of neoplasia, despite the patient's normal visual acuity and intraocular pressure, enucleation of the OD was performed. Histopathological examination revealed neoplastic cell proliferation within the lumen of the iris and ciliary body vessels, diagnosing uveal intravascular lymphoma. Immunohistochemistry was positive for CD79a and negative for CD3. Four months post-initial treatment, the patient developed changes in the OS and progressive neurological signs, eventually leading to death.
Conclusions: Intravascular lymphoma is a rare malignant neoplasm that can affect the uvea before systemic signs are evident. This case involved intravascular B-cell lymphoma.
Keywords: lymphoma, intravascular, uveitis, histopathological, dog.

Tomographic and ultrasonographic evaluation of bilateral retinal and optic nerve aplasia in a domestic cat: Case report

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Purpose: To report a case of retinal and optic nerve aplasia in a domestic cat evaluated through ocular ultrasonography and optical coherence tomography.
Case Report: A 3-month-old female cat was presented with visual difficulties. The physical examination showed both eyes had a normal appearance, with mydriatic pupils that were unresponsive to stimuli. The ophthalmological exam revealed calm eyes, absence of menace response, dazzle reflex, pupillary light reflex, and bilateral photopic reflex. Biomicroscopy evaluation showed no alterations, with intraocular pressure of 14 mmHg in the left eye (OS) and 15 mmHg in the right eye (OD). Indirect ophthalmoscopy and retinography documented the absence of posterior segment structures such as retinal vessels and the optic disc, along with diffuse hyperreflectivity. Due to the cat's age, a follow-up was scheduled for 90 days to monitor the condition's progression.
Results: The follow-up occurred when the patient was 10 months old, and the development of the tapetum was observed, but the posterior eye structures remained absent. Ocular ultrasound and optical coherence tomography (SD-OCT) of the posterior segment were performed, revealing the absence of an ultrasonographic image compatible with the optic nerve and the absence of retinal layers on OCT in both eyes.
Conclusions: Optic nerve and retinal aplasia are considered rare conditions in small animals, with few cases described in veterinary literature.
Keywords: ocular tomography, retina, optic nerve, cats.

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Orbital cellulitis in a dog due to *Prevotella denticola*

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Purpose: Orbital cellulitis is an infection and inflammation of the orbital tissues and mainly caused by an external infectious focus on the nasal sinuses or teeth. *Prevotella denticola* is a gram-negative anaerobic bacterium from the genus Bacteroides, which is commonly associated with the oral and gastrointestinal tract microbiomes. *P. denticola* is rarely associated with this location in dogs.
Case Report: A 1-year- and-2-month-old female French Bulldog was admitted to a veterinary hospital with increased volume in the left orbital region that appeared two days after facial trauma. Ophthalmic examination revealed intense swelling of the left orbital region, positive bilateral pupillary reflexes (direct and consensual), Schirmer's tear test at 18 and 20 mm/min and intraocular pressure measured by Tonovet Plus at 20 and 22 mmHg, in the right and left eyes, respectively, and negative fluorescein test in both eyes.
Results: After performing ocular ultrasonography, radiography and computed tomography of the skull, aspiration cytology, culture and an antibiogram, the patient was diagnosed with bacterial orbital cellulitis. Empirically combined antibiotics was administered until the culture and antibiogram results were obtained, opting for enrofloxacin bolus IV associated with metronidazole in IV infusion in addition to the use of meloxicam and tramadol. Seventeen days after sending the culture sample, *P. denticola* bacteria grew, and the antibiogram showed sensitivity to the antibiotics that was successfully adopted empirically.
Conclusions: This is the first report of orbital cellulitis caused by *P. denticola* in a canine species, highlighting the need for imaging and microbiological examinations for adequate diagnosis and treatment.
Keywords: orbital cellulitis, *Prevotella denticola*, dog.

Ophthalmic evaluation, corneal suture and blepharorrhaphy in three-toed sloth (*Bradypus variegatus*): Case report

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Purpose: To report an ophthalmic evaluation, eyelid and corneal sutures in three-toed sloth (*Bradypus variegatus*).
Case Report: A free-living adult male, 5 kg, was sent by a wildlife rescue center for ophthalmic services. OS, it was possible to perform Schirmer Tear Test (3 mm/min), rebound tonometry (16 mmHg), slit-lamp, biomicroscopy (without alterations), and fundoscopy, where pseudoanagiotic retina, papilla, and poorly differentiated tapetum, characteristics of the species, were visible. OD with intense blepharospasm and epiphora, caused by lacerations in palpebral fissure and in cornea, which affected its entire thickness. The sloth was anesthetized and positioned under a surgical microscope. After antisepsis, a maneuver was performed to undo any synechiae using an iris spatula through the pre-existing corneal laceration, that was sutured in simple interrupted pattern with PGLA8-0 thread. Subsequently, to restore the anterior chamber and to avoid post surgical synechiaes, air was injected with a cannula through the incision. Blepharorrhaphy in two plans: subcutaneous with PDO6-0 thread in simple continuous suture and the skin with PDO5-0 thread in simple interrupted suture. After the procedure, topical treatment with moxifloxacin eye drops 5% QID and retinyl acetate (10,000 UI/g), amino acids (25 mg/g), methionine (5 mg/g), and chloramphenicol (5 mg/g) ointment BID, in eyelid surgical wound.
Results: Within 1 week, the skin had healed completely and corneal cicatrization was satisfactory. However, after 13 days, the patient died because of gastrointestinal complications. Thus, it was impossible to monitor the results further.
Conclusions: Reports on surgical procedures and ophthalmic parameters are scarce for this species, reinforcing the importance of their publication.
Keywords: microsurgery, suture, sloth, wild animals.

Marsupialization of the third eyelid gland for correction of a lacrimal cyst in a canine: Case report

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Purpose: To report the surgical approach used to treat prolapse of the third eyelid gland in a Beagle dog.
Case Report: A 1-year- and 8-month-old Beagle presented with prolapse of the third eyelid gland, with a Schirmer test of 17 mm/min OD and 19 mm/min OS. A surgical procedure was performed to reposition the gland using the modified Morgan technique. Ten days post-surgery, the dog accidentally disrupted the sutures, leading to gland exposure. A second surgery was performed, revealing significant glandular edema, with suspicion of suture material rejection. The sutures were removed 15 days later, but the edema persisted. An ocular ultrasound revealed an anechoic structure measuring 7.27 mm in length and 7.18 mm in width, suggestive of a lacrimal cyst. Cytology was performed, indicating chronic inflammatory filtrate, drainage was performed which showed serous content with 0.7 mL. After the cyst diagnosis, marsupialization was performed with an incision over the cyst, dissection of the conjunctiva and fixation of the edges of the cavity to the conjunctival epithelium of the third eyelid with simple interrupted stitches to maintain the opening and facilitate the drainage of tears and fluids. After the procedure, the Schirmer test indicated 23 mm/min OD and 21 mm/min OS.
Results: Marsupialization significantly improved the patient's condition. The edema decreased considerably, and anatomy

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was restored, demonstrating the effectiveness of this surgical technique.
Conclusions: Marsupialization proved to be an effective treatment for the lacrimal cyst, highlighting the importance of adapting surgical techniques to the specific conditions of each patient.
Keywords: marsupialization, gland, eye, surgery.

Use of vitamin D3 supplementation for the treatment of corneal dystrophy in dog

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Purpose: Corneal dystrophy is any primary, usually bilateral, hereditary disease of the cornea that is not accompanied by inflammation or systemic disease. Vitamin D is an essential fat-soluble steroid hormone for dogs, which are usually deficient due to their inability to synthesize it through UVB rays. The purpose of this report is to describe the importance of vitamin D in the maintenance of eye health, providing possible reabsorption of deposits and neovascularization.
Case Report: An 8-year-old Dachshund, female, presented bright whitish deposits in both corneas in perilimbal regions that were heterogeneous, with discrete vascularization. He showed no clinical alterations or routine hematologic or imaging tests and was deficient in blood vitamin D3. Refractory to dietary treatments and ocular surface calcium chelators, the patient was subjected to oral vitamin D3 supplementation at a dose of 100 IU/kg/SID.
Results: A deficient value of 23.9 ng/mL was found, and supplementation was performed for 90 days, with almost complete reabsorption of the deposits and all vascularization, without maintenance of any other type of therapy. A study carried out in humans with dry eye revealed that vitamin D decreases osmolarity and increases tear stability, stimulating the synthesis of phospholipids and the release of surfactant and contributing to the defense and regulation of immunity and inflammation of the ocular surface, thus justifying the reabsorption of deposits.
Conclusions: Vitamin D3 has been shown to play an important role in reabsorbing calcium in the cornea and controlling associated inflammation, and its deficiency in most dogs makes it necessary to investigate and supplement it as an adjuvant therapy for corneal dystrophy.
Keywords: corneal dystrophy, vitamin D3, dog.

Spectral domain optical coherence tomography assessment of penetrating keratoplasty using acellular porcine corneal matrix in dogs: Pilot study

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Purpose: To evaluate the outcome through optical coherence tomography (OCT) of penetrating keratoplasthy (PK) in dogs affected with deep stromal ulcers and descemetocele using acellular porcine corneal matrix (APCM) grafts.
Methods: We report a case series of five dogs (three deep stromal ulcers and two decemetoceles) submitted to unilateral PK. Initially, the corneas underwent a process of decellularization and removal of the genetic material for a period of 72 h (Bioenxerto corneano®). Subsequently, the APCM was treated with a buffer solution containing bacterial and fungal growth modulators. Before surgical application, the corneas were evaluated by OCT for their thickness and the organization of the collagen fibers. For each patient, a preserved cornea was used. All the animals underwent routine ophthalmic examination with a slit-lamp biomicroscope and OCT before and after keratoplasty, every 7 days. For corneal scanning by OCT, the image quality classification based on the SQI slices is considered to be SQI < 27. Ease of keratoprosthetic tissue handling, graft survival, anterior chamber stability, corneal opacity, neovascularization and re-epithelialization were noted.
Results: OCT evaluation showed an average thickness of the APCM of 379.5 ± 101.32 µm. The collagen fibers were well compacted and hyperreflective. Ophthalmic evaluation after PK showed that vascularization of the APCM occurred between 13 and 18 days. Re-epithelialization occurred between 20 and 30 days. OCT showed hyperreflectivity in the graft area due to collagen compaction, which gradually remodeled and decreased reflectivity.
Conclusions: APCM proved to be an excellent biomaterial for use in PK of deep ulcers and descemetocele in dogs.
Keywords: grafts, OCT, corneal ulcer, keratoprosthetics, dogs.

Pseudobuphthalmos due to nasolacrimal punctal atresia in a young *Crotalus durissus*

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Purpose: Nasolacrimal punctal atresia is a rare congenital disorder in animals. The aim of this report was to describe a case of nasolacrimal punctal atresia in a rattlesnake.
Case Report: A young free-living rattlesnake, rescued by the Brasília Zoo, was diagnosed with pseudobuphthalmos in the left eye.

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Results: Paracentesis and fistula were performed on the affected spectacle. Systemic treatment consisted of enrofloxacin (10 mg/kg), IM, and SID for 10 days; meloxicam (0.2 mg/kg), PO/SC, and SID for 5 days; and topical treatment with neomycin, polymyxin B, and dexamethasone (Maxitrol®) eye drops (TID) for 15 days, followed by ciplofloxacin and dexamethasone (Cilodex®) eye drops (TID) for 15 days. This was combined with management correction, overfeeding, warm water baths, and supportive care. The same procedure was performed for two more ecdyses due to pseudobuphthalmos recurrence. Imaging exams, including radiography and cranial tomography, were performed, revealing no abnormalities. After the third ecdysis, surgical enucleation was chosen. After spectacle removal, a membrane was observed in the lacrimal punctum. After rupture of this membrane, flushing was performed, followed by the Jones test, with fluid observed in Jacobson's organ. The congenital unilateral absence of the punctum prevents the physiological drainage of lacrimal secretions to the oral cavity, leading to fluid accumulation in the subspectacular space and causing pseudobuphthalmos.
Conclusions: Pseudobuphthalmos is a condition commonly observed in snakes and reptiles and is typically associated with nasolacrimal duct obstruction secondary to infections. Nasolacrimal punctal atresia should be included in the differential diagnosis of pseudobuphthalmos.
Keywords: congenital disease, rattlesnake, subspectacular space, imperforate punctum, bullous spectaculopathy.

Chorioretinitis associated with toxoplasmosis in a dog—Case report

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Purpose: To report a case of chorioretinitis associated with toxoplasmosis in a dog. In dogs, toxoplasmosis is rarely a primary disease and is often associated with immunosuppression.
Case Report: A 7-year-old Rottweiler was examined and presented with panuveitis and visual loss in both eyes, along with a history of epileptic seizures with no preexisting cause; cutaneous and respiratory changes were not observed. Ophthalmologic examination revealed keratic precipitates in both eyes, ocular hypotension (08 mmHg), aqueous humor turbidity, reduced pupillary reflexes, and a decreased response to the menace reflex. Fundoscopy revealed chorioretinitis with intraretinal exudate formation and several pigmented retinal scars. Although PCR testing was positive for toxoplasmosis, PCR tests for ehrlichiosis, anaplasmosis, babesiosis, and distemper were negative. Laboratory tests showed no abnormalities according to reference values. The proposed clinical treatment for toxoplasmosis was initiated following the literature guidelines, with prednisolone (10 mg/mL), ketorolac tromethamine (5 mg/mL), and sodium hyaluronate (0.15%) applied topically to the eyes every 8 h, prednisolone 0.5 mg/kg/SID for 7 days, and clindamycin 10 mg/kg/TID orally for 30 days, leading to normalization of both the patient's general and ocular conditions.
Results: The patient has been periodically monitored and has shown no ocular or neurological recurrence to date.
Conclusions: Although uncommon in dogs, toxoplasmosis should be included in the differential diagnosis for uveitis. In addition to being a zoonosis, it can lead to significant visual and neurological impairments.
Keywords: toxoplasmosis, chorioretinitis, dog.

Topical bevacizumab in combination with treatment for corneoconjunctival hemangiosarcoma: A case report in a dog

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Purpose: The monoclonal antibody bevacizumab acts as an angiogenesis inhibitor that is widely used in some types of cancer in human medicine. This case describes the topical use of bevacizumab to control corneoconjunctival hemangiosarcoma in a dog.
Case Report: A 14-year-old male mongrel dog presented with a hyperemic mass with progressive growth in the corneoconjunctival lateral region of the left eye. After surgical excision, histopathological analysis revealed hemangiosarcoma. Topical treatment was instituted with 0.5% bevacizumab twice daily for two months following excision. After 50 days of treatment, discrete corneal neovascularization was observed, and the eye drop frequency was adjusted to three times daily.
Results: The patient was followed for 11 months and presented with slight corneal neovascularization and no signs of pain or disconfort during treatment.
Conclusions: Topical bevacizumab 0.05% can be used to slow the progression of ocular superficial hemangiosarcoma.
Keywords: tumor, corneoconjunctival hemangiosarcoma, anti-VGF, topical bevacizumab, dog.

Eye disorders in free-ranging fur seals (*Arctocephalus australis* and *Arctocephalus tropicalis*) rescued on the Northern Coast of Sao Paulo: Two case reports

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Purpose: To report ocular disorders in two free-ranging pinnipeds rescued on the northern coast of São Paulo by the Argonauta Institute as part of the Santos basin beach monitoring program (PMP-BS).
Case Reports: A female South American Fur seal (SAFS-*Arctocephalus australis*) with upper eyelid laceration and left-corneal perforation with abscess and frontonasal laceration, most likely bite related. Ocular treatment included moxifloxacin, 10% acetylcysteine and ciprofloxacin ointment, TID, until ulcer healing and oral amoxicillin and clavulanate during 7 days. The SAFS small size allowed adequate treatment. A male Subantarctic fur seal (SFS-*Arctocephalus tropicalis*) with anterior lens luxation associated with cataract, normal intraocular

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pressure, and superficial corneal ulceration in the right eye. The SFS presented with neutrophilic leukocytosis and pneumonia. The SFS aggressive behavior and large size made handling difficult. Treatment included enrofloxacin, ocular moxifloxacin and 0.35% EDTA, TID, until ulcer healing in 9 days. After 5 days, the SFS developed uveitis (treated with 1% prednisolone, TID) and parasitic diarrhea but died within 3 days.
Results: In the SAFS, healing occurred after 49 days, with corneal transparency but *phitisis bulbi*. The individual was released at sea after 4 months of rehabilitation. In the SFS, intracapsular lens extraction was not performed as the patient died. Necropsy revealed pneumonia and necrohemorrhagic enterocolitis.
Conclusions: Pinnipeds' large eyes can be easily affected by fights over territory and food competition, or by fishing gear interactions, increasing the risk of blindness and death. Additionally, cataracts are prevalent in these species. Pinnipeds' aggressive behavior makes examination and management difficult.
Keywords: fur seals, cataract, lens luxation, corneal perforation.
Acknowledgment: The authors are thankful for Argonauta Institute as part of the Santos Basin Beach Monitoring program - PMP-BS.

Innovative treatment of entropion in dogs and cats by controlled eyelid retraction with plasma discharge generated with direct electric current

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Purpose: To present a minimally invasive technique for treating mild and moderate entropion using a device that controls eyelid retraction through plasma flow discharge from direct electric current.
Method: The treatment was performed under sedation using butorphanol 0.4 mg/kg + medetomidine 0.15 mg/kg (IM) and local anesthesia with 2% lidocaine. Total 20 animals: 4 cats: Persian: male (3), female (1): age: 0–3 (1), 4–7 (3), +8 (0). Dogs (16): Pug (5), French Bulldog (4), Pomeranian Lulu (2), Maltese Bichon (2), others (3): male (12), female (4): age: 0–3 (4), 4–7 (8), + 8 (4) Vicen Vet® device uses "dot by dot technique," combining reversible electroporation with air ionization plasma, to treat mild and moderate entropion. This approach minimizes pain, postoperative complications and recovery from 3 to 5 days. Postoperative medications aloe vera on demand and no pre-operative medicines needed.
Results: Evaluation in lower eyelids in medial canthus in 4 cats and 11 dogs. Four old dogs had lateral canthus lower eyelid including 2 Pugs, 1 French bulldog, and 1 Mountain Dog. Dogs aged 8–13 had entropion due to periocular fat reabsorption and secondary enophthalmia. Other dogs and cats nasal canthus entropion resolved but English bulldog aged 2, with medial entropion, needed a second session. The treatment significantly improved eyelid position and quality of life in treated animals, increased comfort, and demonstrated long-term effects for almost a year.
Conclusions: Plasma discharge technology offers a safe and effective alternative for entropion. This innovative and long-term treatment opens new possibilities in veterinary practice.
Keywords: minimally invasive, entropion, dogs and cats, direct electric current.
Acknowledgment: Supported by NESCLAPA S.L.

Corneolimbal squamous cell carcinoma with intraocular invasion in a dog: Case report

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Purpose: To report an atypical case of corneolimbal squamous cell carcinoma (SCC) with intraocular invasion in a dog.
Case Report: A 10-year-old male Shih Tzu was presented with neoformation on the ocular surface of the left eye, which started in the medial limbus and grew progressively toward the cornea over 5 months. The lesion was previously diagnosed as well-differentiated SCC by corneal biopsy (30 days earlier). Tacrolimus 0.03% eye drops had been used in both eyes, for a year, to treat keratoconjunctivitis sicca. The ophthalmic examination revealed an exophytic pink mass occupying the entire corneal surface. Ocular and abdominal ultrasound, chest x-ray, blood count, and serum biochemistry were normal. Ultrasound biomicroscopy (UBM) showed intense corneal thickening (3mm) with high reflectivity, homogeneous echogenicity in the stroma (suggestive of neoformation), athalamia, extensive anterior synechiae with absence of a 360-degree ciliary cleft. Enucleation and histopathological examination were performed.
Results: SCC was confirmed by histopathological examination, which revealed a plaque diffusely infiltrating the entire corneal thickness, with extensive areas of infiltration of the sclera, choroid, ciliary body and iris, thus causing anterior synechia and obstruction of iridocorneal angle. It was poorly demarcated and unencapsulated with nests and cell islands embedded in desmoplastic stroma. Keratin pearls were also visualized.
Conclusions: Intraocular invasion should be investigated in cases of corneal mass. Early diagnosis and treatment are important to prevent tumor growth and infiltration, allowing for more conservative therapies. To date, in the specialized literature, there are no reports of corneolimbal SCC with intraocular invasion in dogs.
Keywords: neoplasm, ocular surface, UBM, enucleation.

Tear production and intraocular pressure in jaguars (*Panthera onca*) and cougars (*Puma concolor*)

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Purpose: To describe reference values for tear production and intraocular pressure in healthy jaguars and cougars.
Methods: Involving six jaguars (12 eyes) and six cougars (12 eyes), from the Sorocaba Zoo, Bauru Zoo, CEMPAS at UNESP Botucatu and Ampara Silvestre (ethics committee approval: 0373/2023). All animals were adults, two males and four females for the species group. Chemical restraint was performed on all animals, considering the institution of origin. Among the

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protocols used were ketamine 10 mg/kg, midazolam 0.2 mg/kg, xylazine 0.5 mg/kg, induction with propofol 2.5 mg/kg, and maintenance with isofluorane, ketamine 5 mg/kg and medetomidine 0.06 mg/kg IM or with midazolam 0.2 mg/kg, dexmedetomidine 0.02 mg/kg, and butorphanol 0.15 mg/kg IM. Notably, no animals were used solely for research purposes. Data collection was executed concurrently with the restraint protocols for routine examinations. Tear production was measured using the Schirmer I tear test (Ophthalmos®) for 60 s. Intraocular pressure was assessed using a rebound tonometer (Tonovet Plus, Icare®) with a feline calibration function, and four measurements was obtained. Statistical analysis was performed using ANOVA for repeated measures in independent groups, complemented by the Bonferroni.

Results: Jaguars presented a mean tear rate of 13.7 ± 7.1 mm/min and mean intraocular pressure of 24.4 ± 3 mmHg, whereas in cougars of 14.5 ± 5.4 mm/min and 23.7 ± 3.9 mmHg, respectively. There were no statistical differences between species and eye laterality.

Conclusions: Tear production and intraocular pressure values in jaguars and cougars are similar between the two species. Thorough documentation of ophthalmic assessments is essential for the clinical management of wild animals, facilitating accurate diagnosis and treatment of ocular conditions.

Keywords: Felidae, ophthalmological examination, *Panthera onca, Puma concolor*, wild animals.

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Approval of the Ethics Committee (CEUA): Protocol number: 0373/2023.

Conjunctival dacryops in a maine coon cat

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Purpose: Dacryops is rarely reported in cats. Periocular cysts in cats are most commonly associated with primary or secondary neoplasia, scleral staphylomas, foreign body granulomas, nodular episclerokeratitis, orbital fat prolapse, congenital dermoid, larval migration, and parasitic infection. In this report, we present a case of conjunctival dacryops, detailing the clinical and surgical management and also the histopathological findings in a cat.

Case Report: A 1-year-old male Maine Coon cat was presented with a 4-month of a conjunctival mass over the dorsolateral quadrant of the right eye. The mass demonstrated intermittent growth and resistance to anti-inflammatory and antibiotic therapy.

Results: Ophthalmic examination revealed a hyperemic, smooth, nonpainful, and fluctuant subconjunctival mass, whereas intraocular parameters were normal. Ultrasound biomicroscopy was performed and revealing a cavitated structure filled with fluid and anechoic content. The cytology exam revealed a yielding transparent fluid consistent with an inflammatory process. Based on these findings, surgical excision with histopathological analysis was recommended, resulting in a diagnosis of dacryops, characterized by cystic dilation of the lacrimal sac, lined with ciliated pseudostratified columnar epithelium and filled with eosinophilic material. There were no complications post-excision, and no recurrence was reported during a 5-month follow-up period.

Conclusions: Currently, only two cases of conjunctival dacryops have been reported in cats. Consequently, distinguishing this condition from other cystic structures with similar clinical presentations is essential. Histopathological assessment remains the gold standard for confirming the diagnosis, and surgical excision has proven to be the most effective treatment for this condition.

Keywords: dacryops, cysts, cat.

Morphological analysis of tear glands and eyelids of a jaguarundi cat (*Herpailurus yagouaroundi*)

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Purpose: This study aimed to describe the morphological characteristics of the lacrimal glands and eyelids of a jaguarundi cat.

Methods: Five specimens of both sexes, donated by animal health and conservation institutions post-mortem, were utilized in this research. The specimens were fixed in 10% formaldehyde, followed by topographic dissection and exenteration of the eyeball and adnexa, which were then subjected to histological analysis.

Results: Macroscopically, the upper eyelid, of the jaguarundi cat, featured eyelashes and visible openings of the tarsal glands along its margin. Histologically, the eyelid's epidermis included multiple layers of epithelial cells and melanocytes, while the dermis housed hair follicles, sebaceous glands, muscle fibers, blood vessels, and collagenous tissue. The tarsal glands were situated near the posterior surface. The palpebral conjunctiva of the third eyelid displayed a dense distribution of goblet cells, focal areas of multilayered epithelium, melanocytes, and was supported by dense connective tissue and cartilage. The lacrimal glands have an oval-shaped in cross-section, displayed a glandular parenchyma consisting of serous glands of the tubuloalveolar type. These glands were divided into lobes by connective tissue, with each lobe containing numerous serous acini. The cells of these acini had round nuclei positioned at their base, with blood vessels interspersed between the lobes and a modest presence of mononuclear cells.

Conclusions: The lacrimal glands and eyelids of the jaguarundi cat (*Herpailurus yagouaroundi*) morphologically resemble those of domestic cats but have unique features, including eyelashes on the upper eyelid.

Keywords: anatomy, comparative ophthalmology, eye.

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Approval by the Ethics Committee (CEUA): Protocol number: 06/2024.

Malignant eyelid trichoblastoma in a rabbit (*Oryctolagus cuniculus*)

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Purpose: Trichoblastoma is a slow-growing skin tumor derived from follicular germ cells. This case report describes a case of malignant eyelid trichoblastoma in a rabbit.
Case Report: A 7-year-old male New Zealand rabbit (*Oryctolagus cuniculus*) presented with two nodules measuring 0.8 and 2 cm located on the lower eyelid and conjunctiva of the left eye, one of which was ulcerated and had evolved over the course of 1 year. The patient had previously undergone clinical treatment with ciprofloxacin and dexamethasone ointment to reduce inflammation, and then to blepharoplasty. V-plasty and conjunctivectomy aimed at excising the tumor area with a safety margin were performed. Postoperative topical treatment with ketorolac tromethamine and ciprofloxacin ointment three times a day for 10 days was given until complete healing was achieved.
Results: Histopathological examination revealed a malignant trichoblastoma characterized by the proliferation of neoplastic cells with round to oval nuclei, evident nucleoli and eosinophilic cytoplasm. The neoplastic cells formed islands separated by fibrovascular tissue, and an extensive area formed a solid cellular arrangement, with a high degree of pleomorphism and atypia and free surgical margins. Blepharoplasty resulted in proper eyelid juxtaposition, and there was no tumor recurrence after 18 months of follow-up.
Conclusions: Trichoblastoma is a common skin neoplasm in rabbits that has not yet been reported in the eye. This case is an unprecedented report in the palpebral conjunctiva, where blepharoplasty promoted a definitive cure.
Keywords: neoplasm, trichoblastoma, ocular, lagomorph.

Glaucoma secondary to a primitive neuroectodermal tumor

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Purpose: Report a case of glaucoma secondary to a primitive neuroectodermal tumor in the anterior chamber (AC) of a dog, an uncommon intraocular condition in this species.
Case Report: An 8-year-old female Shih Tzu presented with an enlarged right eye (OD). The dog had been previously treated with antibiotics and anti-inflammatory eye drops, but there were no signs of improvement.
Results: Ophthalmic examination revealed neoformation in the AC, positive menace response, negative pupillary light reflexes, and elevated intraocular pressure (30 mmHg; FA800®) in the OD, and other ocular examinations of both the OD and OS revealed no alterations. Brinzolamide and latanoprost 0.005% were prescribed. Ocular ultrasound revealed a hyperechogenic, homogeneous image with poorly delimited borders and a vascular signal in Doppler mode (venous pattern), measuring approximately 0.35 cm × 0.73 cm in the anterior chamber. The OD was enucleated, and histopathology was performed. Histological analysis revealed a mass that replaced the ciliary body and iris, extending into the AC and occluding the drainage angle. The neoplasm was composed of cuboidal cells organized into clusters with a central lumen (Flexner Wintersteiner rosettes) and sporadically occluded lumens (Homer Wright rosettes), exhibiting a low mitotic index. Mineralization and discrete inflammation were observed within the tumors. Edema of the optic nerve was also noted.
Conclusions: The histological pattern allows the diagnostic conclusion of a primitive neuroectodermal tumor, a rare tumor in dogs, with occlusion of the drainage angle, therefore leading to secondary glaucoma.
Keywords: neoplasm, intraocular, anterior chamber.

Zygomatic sialoadenitis as a cause of exophthalmos in a mixed-breed dog: A case report

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Purpose. To describe a case of sudden exophthalmos in a dog caused by zygomatic sialoadenitis.
Case report. A 10-year-old mixed-breed female spayed dog with diabetes presented with left third eyelid protrusion, exotropia, and chemosis. An ocular examination was performed.
Results: Retropulsion was negative, but menace response, pupillary light reflexes, and dazzle reflexes were intact. Intraocular pressure (IOP) was measured at 9 mmHg in the left eye and 22 mmHg in the right eye. No signs of corneal edema or uveitis were observed. The dog exhibited normal fundoscopy. Imaging exams were performed. Ocular ultrasonography revealed an undefined expansive orbital formation associated with inflammation. Magnetic resonance imaging (MRI) showed enlargement of the left zygomatic salivary gland, with focal dilation of the salivary ducts, causing dorsal displacement of the eye and third eyelid. No signs of neoplasia or expansive masses surrounding the gland were observed, leading to a diagnosis of left zygomatic sialoadenitis. The patient was treated with carprofen (2.2 mg/kg BID for 10 days), enrofloxacin (5 mg/kg BID), and metronidazole (15 mg/kg BID) orally for 10 days. Analgesia was provided with dipyrone (25 mg/kg TID) for 5 days. Corneal lubrication was maintained with 0.2% hyaluronate eyedrops (QID) to prevent band keratitis. All clinical signs resolved within 5 days, and treatment was completed after 10 days. The patient was then discharged.
Conclusions. While orbital tumors and cellulitis are common causes of exophthalmos, other conditions such as sialoadenitis

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should be considered. MRI was crucial in reaching a definitive diagnosis and guiding appropriate treatment.
Keywords: exotropia, salivary gland, magnetic resonance.

Ciliar body cystic adenoma in a dog: Case report

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Purpose: To report a case of cystic adenoma in the ciliary body of a dog's eye highlighting diagnostic challenges, treatment approach, and outcomes.
Case Report: An 8-year-old spayed female mixed-breed dog presented with pigmented cysts in the posterior chamber of the left eye, leading to mild anterior displacement of the iris. Ocular ultrasound revealed increased echogenicity in the ciliary body, forming a poorly defined mass. Ultrasound biomicroscopy (UBM) showed multiple cystic structures with anechoic content in the inferior ciliary body, surrounded by hyperechoic tissue, raising suspicion of a cystic neoplasm. Intraocular pressure (IOP) was normal, with no evidence of intraocular inflammation. To preserve vision, local excision of the mass and cysts was performed.
Results: Histopathological examination revealed neoplastic epithelial cells forming a glandular pattern, with large cystic structures having thin walls, confirming a diagnosis of cystic adenoma. Two months after surgery, there was no recurrence, and the eye remained visual without signs of intraocular inflammation.
Conclusions: Cystic adenoma should be considered as a differential diagnosis in cases of cysts in the posterior chamber. Diagnostic imaging such as UBM and ocular ultrasound is crucial for evaluating the nature of intraocular cysts and also studies suggest the potencial for ocular cyst to mimic neoplasia. Complete surgical excision of the cystic mass proved curative in this case, with no recurrence observed during the follow-up period. This case emphasizes the importance of early detection and intervention in preserving ocular function and highlights the successful management of cystic adenomas in veterinary ophthalmology.
Keywords: neoplasm, ciliary body, ocular ultrasound.

Limbal rupture associated with optic nerve coloboma in a dog—Case report

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Purpose: Report a case of limbal rupture associated with optic nerve coloboma in a dog. Congenital malformations can be linked to genetic or teratogenic factors or a combination of both, although the origin is not always clearly defined. Other anomalies, such as urogenital defects and microphthalmia, may be associated with coloboma in affected individuals.
Case Report: A 3-year-old Shih Tzu dog, which presented temporal conjunctivalization and cystic formation on the cornea of the right eye within twelve hours, was treated. Limbic rupture was confirmed in the cystic region in addition to a slight decrease in ocular diameter compared with that of the adelphic eye. Fundoscopy confirmed optic nerve coloboma. The limbal rupture was repaired by suturing followed by coverage with a conjunctival flap.
Results: The patient was monitored periodically, and no complications were revealed.
Conclusions: The presence of a coloboma of the optic nerve associated with corneal conjunctivalization and microphthalmia, a complex of congenital malformations, gave rise to limbic/scleral fragility followed by rupture.
Keywords: congenital malformations, coloboma, limbic rupture, dog.

Ophthalmia in a turkey infected with *Pasteurella multocida*: case report

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Purpose: The aim of this work was to report a case of ophthalmia caused by *Pasteurella multocida in a turkey.*
Case Report: A female adult turkey was admitted with an increased volume in the left infraorbital region, measuring approximately 5 cm × 3 cm, that extended to the conjunctiva next to the third eyelid associated with nasal and ocular discharge for 8 days. A sample was collected for cytopathology, culture and an antibiogram.
Results: The culture exam was positive for *Pasteurella multocida*, and the cytopathology revealed a bacterial process. The abscess was drained and debrided; gentamicin (10 mg/kg IM every 12 h × 10 days) was prescribed according to the antibiogram exam. It was recommended that the wound be cleansed twice daily with iodized physiological solution, and subconjunctival application of 1 mL of gentamicin was performed and repeated after 7 days; nebulization (1 mL of gentamicin and 9 mL of physiological solution every 24 h) was also recommended. After 13 days, the abscess was drained again, and meloxicam (0.2 mg/kg IM q24 h × 4 days) was prescribed, after which the abscess was cleansed once daily with an iodized physiological solution. After 5 days, the animal showed good improvement and was discharged.
Conclusions: *Pasteurella* is an important etiological agent for many diseases, including ophthalmic presentations in rabbits, rats, ducks, turkeys and humans. There are few works reporting ocular involvement and treatment used in animals, so this case report describes an infection of *Pasteurella multocida* causing

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facial and ocular implications in a turkey and the treatment chosen.

Keywords: facial abscess, caseous plug, caseum, avian, turkey, *Meleagris spp.*

Comparative study in dogs between three diagnostic strips for Schirmer tear test

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Purpose: The Schirmer tear test (STT) is widely used to diagnose keratoconjunctivitis sicca in dogs. This study aimed to evaluate the discrepancies in the absorptive capacity of diagnostic strips from different manufacturers used in STT.

Methods: Thirty dogs (60 eyes), 11 females (36.66%) and 19 males (63.33%), aged between 6 months and 14 years (mean: 6.5 ± 5.0 years), of different breeds, including healthy dogs and dogs with ophthalmological alterations, were used. Three strips from different manufacturers were used and divided into Group 1—DrogaVet (G1), Group 2—Formula Animal (G2), and Group 3—Optitech (G3). Measurements between tests were performed with a minimum interval of 1 hour. The tests were performed standardized, placing the end of the paper, on the edge of the lower eyelid margin, near the lateral cantus, as described by the literature, kept for 1 minute. The interpretation of the tests was realized immediately after this period. The temperature and humidity were measured before each test throughout the experiment. All strips in the experiment were analyzed by the same evaluator.

Results: The results revealed statistically significant differences ($p < 0.001$) in all comparisons between the three groups tested. Only one animal in each of the three groups was diagnosed with bilateral keratoconjunctivitis sicca.

Conclusions: Equity between different tests is of paramount importance since a lack of uniformity may lead to no detection of the disease in many animals. This study emphasized the need for standardization to ensure a more effective diagnosis of keratoconjunctivitis sicca in dogs.

Keywords: Dogs, keratoconjunctivitis sicca, Schirmer tear test, ophthalmology.

Diagnosis of zygomatic sialocele in a jaguar (*Panthera onca*)

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Purpose: To report the diagnostic methods utilized in a case of zygomatic sialocele in a jaguar (*Panthera onca*).

Case Report: A 2-year-old, male, intact jaguar kept in a zoo presented with right eye strabismus, globe conjunctiva chemosis and ventral periorbital swelling. The patient underwent an ophthalmic exam and ultrasonography under anesthesia. On ultrasonography, a retrobulbar anecoic cystic structure can be visualized. Centesis was performed, which revealed a clear, lightly viscous fluid, raising suspicion of a sialocele. The fluid was sent for cytopathological examination, and the patient was subjected to a contrasted computed tomography (CT) exam.

Results: In addition to the aforementioned clinical signs, no other ocular abnormalities were observed. The cytopathological examination revealed proteinaceous material with cellular debris. CT images revealed the presence of an oval, well-delimitated neoformation, measuring 4.97 cm × 4.37 cm × 4.01 cm, located in the right retrobulbar space, in intimate contact with the zygomatic salivary gland and the eye.

Conclusions: This is an unprecedented report of the occurrence of zygomatic sialocele in a jaguar.

Keywords: computed tomography, diagnostic imaging, ultrasonography.

Description of corneal epithelium and endothelium via scanning electron microscopy for three avian species

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Purpose: To describe the morphology of the epithelial and endothelial cells of the cornea using scanning electron microscopy (SEM) for three avian species: blue-and-white swallow (*Pygochelidon cyanoleuca*), common pigeon (*Columba livia*), and rufous-bellied thrush (*Turdus rufiventris*).

Methods: Corneal samples were collected from healthy individuals, without ocular changes. The samples were fixed for 24 hours in Karnovsky solution (Glutaraldehyde/ Paraformaldehyde) and processed for SEM evaluation.

Results: The epithelium was comprised of diversely shaped cells, with a surface densely populated by microvilli. The endothelial cells of all three species were predominantly hexagonal, and interdigitating cell processes were observed in the cell borders. Particularly for the rufous-bellied thrush, the endothelial cell surface was covered in microvilli.

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Conclusions: This is an unprecedented report on the use of SEM for description of corneal epithelium and endothelium for these species.

Keywords: Cerrado, corneal cells, ocular surface.

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Cataract surgery in avians using small incision utrata capsulorhexis: Case reports

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Purpose: To describe the surgical technique for cataract extraction using a small incision utrata capsulorhexis in various species of birds referred from the São Paulo Zoo and attended at Pet Vision Veterinary Ophthalmology Clinic.

Case Report: A barn owl (*Tyto furcata*) and a blue macaw (*Anodorhynchus hyacinthinus*), forwarded by the Zoo; a blue-fronted parrot (*Amazona aestiva*); a rufous-bellied thrush (*Turdus rufiventris*) and a green-winged saltator (*Saltator similis*), treated at the clinic. Under general inhalation anesthesia, and prior pupillary dilation with topical rocuronium, a 1.2-mm incision was made in the clear cornea. Trypan blue dye and a viscoelastic agent (4% methylcellulose or 3% polyacrylamide) were then infused. Access to the cataractous lens was achieved through a continuous capsulorhexis, facilitated using small incision utrata capsulorhexis forceps. The technique for cataract removal was chosen based on eye size. For larger eyes, such as those of the owl and macaw, a second 1.2-mm incision was made and phacoemulsification followed by irrigation and aspiration handpiece was used to perform lens removal. Conversely, the irrigation and aspiration technique with a two-way cannula system (Simcoe cannula) was performed in cases where the eyes were relatively smaller. The incisions were closed with 9-0 polyglactin sutures.

Results: Small incision utrata capsulorhexis effectively facilitated intraocular manipulation and aspiration of the lens contents, while also reducing surgical time.

Conclusions: Small incision utrata forceps offer significant advantages for cataract extraction in bird species with smaller eyes, providing better intraocular control and efficiency in the surgical process.

Keywords: cataract, lens, birds, microsurgery, small incision utrata.

Optical coherence tomography of the cornea of healthy and with dry eye disease dogs

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Purpose: To evaluate the central corneal thickness (CCT) and corneal epithelial thickness (CET) in dogs with dry eye disease using optical coherence tomography (OCT).

Methods: Sixty eyes of dogs divided into two groups of 30 eyes each were evaluated: group without dry eye disease (NDED) with STT-1 > 15 mm/min, of age 1–15 years (5.82 ± 3.73) and group with dry eye disease (DED) with STT-1 < 15 mm/min, of age 1–15 years (4.22 ± 4.25). To evaluate the corneal scan, the pupil was centered on the alignment reticule within the guidelines of the scan window. The pachymetry map with the average thickness in each of the 17 sections (including the center) determined at a diameter of 6 mm was generated automatically by the software. The thickness of the corneal epithelium was measured manually. All the images were analyzed by the same operator. Only scans with a quality score of 27 or greater and shown to be free of motion artifacts were accepted for data collection. Student's *t* test and Spearman's correlation were used to analyze the data.

Results: A mean CCT score of 573.30 ± 46.37 was obtained in the NDED group, and a score of 647.33 ± 152.10 was obtained in the DED group; these differences were statistically significant ($p < 0.001$). The CET averages were 75.46 ± 11.27 for NDED and 122.24 ± 53.96 for DED, differing statistically ($p < 0.001$). A strong correlation was observed between STT-1 and CET ($r = -0.581$).

Conclusions: Dogs with DED have severe corneal thickening characterized mainly by thickening of the epithelium.

Keywords: OCT, corneal thickness, keratoconjunctivitis sicca, corneal epithelium.

Intraocular pressure and corneal paquimetry in a population of gold-headed lion tamarin (*Leontopithecus chrysomelas* - Khul, 1820)

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Purpose: This study aimed to evaluate measurements of intraocular pressure (IOP) and corneal pachymetry in 12 eyes of golden-headed lion tamarin (*Leontopithecus chrysomelas*—Khul,1820).

Methods: The IOP and corneal pachymetry of each eye were measured in five males and one female aged 3–8 years and weighing between 430 and 740 g. The animals were anesthetized with mask anesthesia—isophlorane—immediately after their neutering/spaying procedures, standardized ophthalmic instruments—TonopenVet Reichert® and I PachPen Reichert® were used, with all animals in the same anesthetic plane.

Results: IOP readings from 12 eyes, varying from 12 to 36 mmHg were recorded and analyzed (mean 16.44 mmHg, median 14.25 mmHg, and standard deviation, 4.99 mmHg). Additionally, corneal pachymetry measurements were taken from each eye and varied from 316 to 372 µm (mean 353.3 µm, median 353.75 µm, and standard deviation 14.0518 µm). Significant differences between gender could not be noticed.

Conclusions: This study successfully established reference IOP and corneal pachymetry values in *Leontopithecus chrysomelas*. The data will aid in better understanding the ocular health of these animals and contribute to improved veterinary care practices. Further research in a larger number of animals is recommended to explore the underlying causes of any observed

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variations and to expand the dataset for broader applicability. The findings suggest that there may be variability in these ocular parameters among individuals, potentially influenced by physiological factors. This information is crucial for researchers in the diagnosis and treatment of ocular conditions, as well as for comparative studies with primate species.

Keywords: gold-headed lion tamarin, eye, IOP, CCT.

Approval of the Ethics Committee (CEUA): Protocol number 566/23 - UNIFESO.

Evaluation of the cornea in persian cats through optical coherence tomography

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Purpose: To record the corneal layer values in Persian cats using optical coherence tomography.

Methods: Optical coherence tomography (SD-OCT/IVue-OptoVue) of the cornea with an anterior segment lens was performed on 12 Persian cats ($N=24$), both males and females, aged 10 months–12 years, obtained through routine care at a specialized veterinary ophthalmology center (Zoovet Ophthalmology—Juiz de Fora/MG). All cats underwent an ophthalmic evaluation to exclude any ocular pathology. Afterward, they were manually restrained and subjected to three OCT scans on each eye, obtaining images from the central corneal area of both eyes. The data were analyzed using descriptive statistics and the *Kruskal–Wallis* test to compare the samples.

Results: The mean total corneal thickness was 575.00 ± 32.66 μm in the right eye (OD) and 590.50 ± 25.45 μm in the left eye (OS). The epithelial thickness was 64.16±8.24μm in OD and 62.16±6.43μm in OS. The stromal thickness was 470.41 ± 32.79 μm in OD and 480.75 ± 32.70 μm in OS. The Descemet's membrane/endothelial thickness was 43.58 ± 5.68 μm in OD and 44.25 ± 6.79 μm in OS. No statistically significant variations were identified either between patients or between the eyes of the same patient in all analyses.

Conclusions: It was concluded that there were no statistical differences between the patients, and no significant differences were observed between the eyes of the same patient. Reference data for corneal ocular tomography in Persian cats were successfully established.

Keywords: ocular tomography, corneal pachymetry, feline.

Optical coherence tomography of *ex vivo* frozen porcine cornea

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Purpose: To evaluate the morphology of frozen porcine corneas preserved in different forms through optical coherence tomography (OCT).

Methods: Ten porcine corneas from enucleated eyes within 6 hours post-slaughter were obtained. The corneas were washed in a 0.9% saline solution and subsequently stored. For freezing, the corneas were divided into two distinct groups with five samples each: Group A (GA): corneas in a tobramycin vial at a concentration of 3 mg/mL; Group B (GB): corneas in a 5% sodium chloride vial. The samples were frozen at −20°C for 30 days. After this period, they were thawed at room temperature for 10 min and subjected to OCT. Central corneal morphology and thickness was measured via pachymetry performed by the equipment, with a mapping quality index > 27. The nonparametric Mann–Whitney test was used.

Results: Corneas in the GA had an average thickness of 681 ± 27 μm, whereas those in the GB had an average thickness of 785 ± 19.93 μm, indicating a significant difference ($p=0.0317$). The morphological assessment of images from the GA demonstrated severe irregularity of the corneal surface, with the presence of ice crystals. Furthermore, disorganization of collagen fibers in the stroma was observed, with vacuoles measuring 135 μm in width. In contrast, GB showed organized and parallel collagen fibers, an absence of vacuoles, and a regular corneal surface.

Conclusions: Despite being thicker, the corneas in the GB maintained tissue architecture, which may result in less postoperative scarring.

Keywords: OCT, corneal graft, keratoplasty, preservation.

Diamond burr corneal debridement and stem cell in the treatment of spontaneous epithelial defects in dogs

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Purpose: To report the results of corneal debridement with a diamond drill associated with subconjunctival and topical application of mesenchymal stem cells for the treatment of chronic spontaneous corneal epithelial defects (CSECDs) in dogs.

Methods: Patients undergoing a combination of diamond drill debridement and stem cell application between January 2023 and June 2024 were included in the study. The affected eyes, clinical therapy and other procedures were recorded. After debridement (Almed—Low Rotation Pen, 5 mm Drill), under anesthetic sedation and ophthalmic application of proxymetacaine 5 mg eye drops, a single dose of mesenchymal stem cells was applied subconjunctivally and one drop every hour for the first 24 h, associated with one drop of Gatifloxacin eye drops every 6 h for 14 days. The corneas were considered healed when fluorescein staining was negative.

Results: Five dogs (6 eyes) were included: 1 Golden Retriever (2 eyes), 1 Shih Tzu (1 eye), and 3 French Bulldogs (1 eye each). The age of the patients ranged from 6 to 14 years. All eyes healed within 14 days, without any additional surgical treatment. No postoperative complications or recurrences were observed.

Conclusions: This study demonstrated that diamond drill debridement associated with subconjunctival and topical application of stem cells may be a viable option for the treatment of SCCEDs.

Keywords: indolent ulcer, keratoplasty, therapy.

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Ultrasonic pachymetry in coatis (*Nasua nasua*)

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Purpose: Corneal thickness is a significant clinical parameter in ophthalmological evaluations, serving as an indicator of tissue health and endothelial pump function. This study aimed to assess corneal thickness in healthy coatis using ultrasonic pachymetry.
Methods: Twelve coatis, aged between 2 and 5 years, from two distinct captive facilities in the central region of Rio Grande do Sul, were evaluated. The animals underwent chemical restraint for clinical and hematological examination. None of the animals were included solely for research purposes. Following the confirmation of their health status, central corneal thickness was measured using ultrasonic pachymetry (Reichert iPac®) under topical ocular anesthesia. Data were analyzed using the Student *t*-test ($p < 0.05$), with comparisons made according to (right or left), sex, age, and weight.
Results: The central corneal thickness values ranged from a minimum of 295 µm to a maximum of 364 µm, with a mean thickness of 324.29 ± 18 µm (mean ± SD). No statistically significant differences were observed between the right and left eyes ($p = 0.26$), nor across sex ($p = 0.08$), age ($p = 0.9$), or weight ($p = 0.06$). The findings revealed significant differences in corneal thickness between coatis and other species reported in the literature, underscoring the need for species-specific studies.
Conclusions: The central corneal thickness values obtained through ultrasonic pachymetry provide physiological reference data for coatis and contribute to the ophthalmological evaluations previously described for this species.
Keywords: wild animals, central corneal thickness, ophthalmological examination, iPac.
Approval of the Ethics Committee (CEUA): Protocol number 8976130722 and SISBIO no 84109.

Mesenchymal stem cell-conditioned medium for the treatment of keratoconjunctivitis sicca in dogs

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Purpose: The use of conditioned medium derived from mesenchymal stem cells (MSC-CMs) is an innovative approach for treating keratoconjunctivitis sicca (KCS) in dogs. We aimed to evaluate ocular therapy via MSC-CM with eye drops in dogs diagnosed with KCS via the Schirmer tear test (STT), lacrimal interferometry, meniscometry, and osmometry.
Methods: Eighteen eyes from 10 dogs with STT results below 15 mm/min and treatment washout period of more than 2 months were evaluated. They were divided into two groups: one group received eye drops containing 50% MSC-CM with 0.15% sodium hyaluronate and 0.3% carboxymethylcellulose (MG), while other group received eye drops containing only 0.15% sodium hyaluronate and 0.3% carboxymethylcellulose (CG).
Results: In the STT, CG remained stable, whereas initial value of MG doubled, although it still did not reach normal STT levels. Tear film interferometry remained low (< 15 nm) in both groups, even after treatment. Meniscometry increased in the MG (from 0.29 to 0.39 mm) and decreased in CG (from 0.50 to 0.32 mm). Tear osmolarity decreased in MG (from 302.56 to 288.89 mOsm/L) and increased in CG (from 294.11 to 297.44 mOsm/L).
Conclusions: Despite the MG showing a trend toward improvement in these aspects of the ocular surface after treatment, it was still insufficient to generate a statistically significant difference compared with the CG. These findings suggest the potential use of CM as an adjunctive treatment for KCS in dogs and suggest the need to increase the concentration of MSC-CM in the formulation.
Keywords: secretome, dry eye syndrome, canine, growth factor.
Acknowledgment: Supported by grant 140812/2021-0, National Council for Scientific and Technological Development (CNPq).
Approval of the Ethics Committee (CEUA): Protocol number: 0233/2021, UNESP.

Keratitis due to *Histoplasma* spp. in a cat

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Purpose: The present report describes a case of Histoplasma spp affecting the eyelid and cornea of a cat in Cachoeiras de Macacu, Rio de Janeiro, Brazil.
Case Report: A 9-year-old, neutered female domestic shorthaired cat was presented with a progressive thickening of the upper eyelid and a raised pink tissue occupying almost the entire cornea of the right eye for months. There was no intraocular involvement, and the left eye had no alterations at any time. Treatment with topical corticosteroids and antibiotics worsened the condition. Due to suspicion of neoplasia, a biopsy of the cornea and eyelid was performed.
Results: Histopathology exam revealed a granulomatous inflammatory response and numerous intracellular small round structures 3–4 µm in size with a well-defined wall and a clear halo inside compatible with Histoplasma spp. Treatment with topic 0.5% amphotericin B, six times per day, and oral itraconazole 10 mg/kg every 12 h was successful in resolving the ocular signs in 3 weeks. Treatment was maintained for 4 months.
Conclusions: A biopsy should be performed in similar lesions to avoid using drugs which can potentially worse the eye condition. To the authors' knowledge, this is the first report of *Histoplasma* spp. affecting the cornea of a cat.
Keywords: keratitis, blepharitis, histoplasmosis, cat.

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Photodynamic therapy-induced oxidative stress in ocular melanoma cells

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Purpose: To assess the oxidative stress induced by photodynamic therapy (PDT) using new photosensitizers the dihydroxymethyl ring-fused chlorin (PS1) and dihydroxymethyl-Pt(II) ring-fused chlorin (PS2), in ocular melanoma cells.
Methods: Ocular melanoma cell line MP-41 was cultured and incubated with 100 and 500 nM concentrations of the photosensitizers for 24 h. After renewing the culture medium, the cells were irradiated with visible light ($\lambda > 570$ nm, 10 J). To study the role of singlet oxygen and hydroxyl radicals, the cells were treated with PDT in the presence of sodium azide (5 mM) and D-mannitol (40 mM). Intracellular superoxide and peroxide levels were measured using DHE (5 μM) and DCF-HA (5 μM), respectively, followed by spectrophotometric and fluorimetric analyses.
Results: Inhibition of singlet oxygen increased metabolic activity in cells treated with 100 nM PS1 and PS2 from 48.4 ± 13.6 to 118.8 ± 4.7 and from 56.4 ± 16.8 to 102.0 ± 3.6, respectively. With 500 nM PS1 and PS2 from 0.77 ± 0.2 to 8.3 ± 3.29 and from 2.3 ± 1.7 to 12.2 ± 1.6, respectively. The presence of a superoxide radical scavenger led to metabolic activities with 100 nM PS1 and PS2 from 48.4 ± 13.6 to 67.3 ± 19.5 and from 56.4 ± 15.6 to 75.5 ± 13.2, respectively. With 500 nM PS1 and PS2 from 0.77 ± 0.2 to 6.3±4.5 and from 2.3±1.7 to 17.4±8.3, respectively.
Conclusions: Reactive oxygen species (ROS) generation is key in PDT-induced cell death, with singlet oxygen playing a predominant role in the Type II photodynamic process, as demonstrated by the chlorins' efficacy in ocular melanoma cells. The reduced peroxide and superoxide levels suggest singlet oxygen's significant generation, though Type I reactions may also be involved.
Keywords: ocular melanoma, PDT, photosensitizers, ROS.
Acknowledgment: Support: Foundation for Science and Technology (FCT), Portugal (SFRH/BD/139319/2018, COVID/BD/152962/2023). CIBB is funded by National Funds via FCT (Foundation for Science and Technology) through the Strategic Projects UID/NEU/04539/2019, UIDB/04539/2020, UIDP/04539/2020, and by COMPETE-FEDER (POCI-01-0145-FEDER-007440).

Frozen porcine corneoscleral graft after excision of limbal melanocytoma in a dog—Case report

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Purpose: Limbal melanocytoma is a relatively common benign neoplasm in dogs that often invades the adjacent corneal stroma and sclera. Although it is benign, its location can compromise ocular function, leading to ocular impairment due to uveitis and secondary glaucoma. The objective was to remove the tumor, combined with the use of a frozen porcine corneoscleral graft, preserving the ocular structure and vision.
Case Report: A 2-year-old mixed-breed dog presented with a blackened mass in the limbus region, involving the cornea and adjacent sclera, measuring 2.8 mm, with no invasion of the iris or ciliary body as assessed by ultrasonography. A biopsy was performed, and the patient was diagnosed with melanocytoma. Deep sclerectomy and penetrating keratectomy were performed, followed by corneoscleral grafting. The cornea was sutured with 10–0 nylon, and the sclera was sutured with 5–0 polyglecaprone. Postoperative treatment included prednisolone and gatifloxacin eye drops. Histopathological analysis confirmed the diagnosis of melanocytoma with tumor-free margins.
Results: The graft healed properly, without signs of necrosis or excessive inflammation, preserving fibrous tunic and visual function throughout the follow-up period.
Conclusions: Total tumor excision, even when extensive, followed by corneoscleral grafting allows preservation of ocular structure and visual function. The frozen porcine graft effectively reconstructed the ocular fibrous tunic, providing adequate strength with a controlled inflammatory response managed by topical anti-inflammatory medication.
Keywords: limbal melanocytoma, corneoscleral graft, dog.

Gastrointestinal protothecosis with ocular manifestations in a cocker spaniel: A case report

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Purpose: The prototheca is an opportunistic unicellular *algae* found in organic matter. Infections have been reported in multiple species, including humans and companion animals, leading to severe clinical manifestations and often poor prognosis. This report describes a case of gastrointestinal protothecosis with ocular manifestations.
Case Report: A 5-year-old female cocker spaniel presented with chronic hemorrhagic diarrhea unresponsive to medical therapy, followed by visual deficits and disorientation. Direct ophthalmoscopy examination via a panoptic technique revealed whitish areas in the tapetal region, tortuous retinal vessels, hemorrhagic areas, and partial retinal detachment, leading to

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a clinical diagnosis of exudative chorioretinitis. Treatment with topical prednisolone (1%) was initiated. Histopathological analysis carried out postcolonoscopy revealed a diffuse pyogranulomatous necroulcerative colitis, presence of spherical structures measuring 12–20 µm, and microabscesses in the crypts, suggesting protothecosis. Systemic treatment with itraconazole (150 mg SID) and oral prednisolone (10 mg SID) was initiated. A rectal swab and fecal culture in Sabouraud's medium confirmed the growth of the *Prototheca sp.*

Results: The results revealed that partial retinal detachment progressed to total bilateral detachment, as confirmed through biomicroscopy and ocular ultrasonography. Hemorrhagic diarrhea persisted throughout the evaluation period, with no signs of remission.

Conclusions: Although protothecosis is an uncommon disease, visual impairment in dogs with refractory colitis is relevant for differential diagnosis. Ophthalmological examination, scrapings, or biopsies of the affected tissues for histopathological assessments and/or culture of the microorganism should be included whenever possible for establishing an etiological diagnosis.

Keywords: prototheca, exudative chorioretinitis, retinal detachment, necroulcerative colitis.

Prototheca spp granulomatous chorioretinitis in a dog: A case report

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Purpose: describe a case of an infectious granulomatous chorioretinitis in a dog with the involvement of *Prototheca spp.*

Methods: A 2-year-old male intact mixed breed was hospitalized with a history of hematochezia, left vestibular syndrome, head tilt, and severe visual deficit. MRI images confirmed multifocal neurological disease. Liquor PCR was negative for all most frequent agents: Distemper virus, *Ehrlichia canis*, *Toxoplasma gondii, and Neospora caninum*. Serous panels for Distemper virus, *Ehrlichia canis*, *Toxoplasma gondii, and Neospora caninum* also returned negative. Ophthalmic examination showed bilateral serous retinal detachment with several foci of chorioretinal hemorrhages. A vitreous aspiration was made at "*ora serrata*" in the 9-h position in the right eye, and 0.5 mL of grayish/green material was obtained for cytology, and slides were stained with methylene blue.

Results: Cytopathological examination showed the presence of polymorphonuclear exudate, degenerated macrophages, and frequent morula-like elements with a content of granular basophilic material, supposedly sporangians, algae compatible with the genus *Prototheca spp.*

Conclusions: Although not common, algae from different genera, including *Prototheca*, should be considered in animals with multiorgan involvement, including ophthalmic signs. As there is a lack of tests available to confirm cases of algae infections, cytology should be used more frequently in such cases.

Keywords: canine, eye, uveitis, algae.

Importance of ultrasound biomicroscopic (ubm) in a glaucomatous dog: Case report

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Purpose: Due to the diversity of disorders associated with glaucoma, as well as the lack of an assertive early diagnosis of the underlying cause, it is not always possible to diagnose it. The aim of this study was to report an imaging diagnostic approach in a glaucomatous dog, via ultrasound biomicroscopy (UBM).

Case Report: A 16-year-old Yorkshire dog with a history of corneal ulcers, hypopyon and increased IOP (32 mmHg) in the left eye underwent ocular ultrasound examination via a Quantel Aviso® device at a frequency of 50 MHz for biomicroscopic scanning.

Results: Corneal thickness was evident, with central and paracentral corneal thickening of 620 microns and 860 microns, respectively. There was also irregularity of the corneal epithelium in the central area, suggesting corneal edema. In the anterior chamber, there were multiple free punctate echoes associated with the presence of a cluster of partially defined echoes adjacent to the pupillary space, which are compatible with an inflammatory/hemorrhagic process and a blood clot and/or hypopyon. There was also a decrease in the iridocorneal angle in the meridians evaluated. In the right eye, signs of cataracts were noted.

Conclusions: For the diagnosis and management of canine glaucoma, imaging methods should be considered, with UBM being essential for assessing the anterior chamber and iridocorneal angle components. In this case, the use of UBM was fundamental to the diagnosis of glaucoma, which was determined to be secondary to severe reflex uveitis, emphasizing the importance of obtaining detailed information on the iridocorneal angle.

Keywords: dog, glaucoma, UBM.

Unilateral exophthalmos secondary to nasal osteosarcoma: Case report

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Purpose: To report a unilateral exophthalmos secondary to nasal osteosarcoma in a Lhasa Apso dog.

Case Report: A 12 year old female, Lhasa Apso breed, with a history of unilateral nasal discharge, exophthalmos, and third eyelid protrusion in the right eye, was referred to the Veterinary Ophthalmology Service. The patient underwent complete ophthalmic examination, ocular ultrasound, hematological and biochemical tests, rhinoscopy with sampling for histopathology and immunohistochemistry, culture of nasal secretions, and cranial tomography.

Results: Severe leukocytosis and lymphocytosis were detected, ocular ultrasound revealed the presence of a mass with poorly defined limits, nasal discharge culture revealed *Klebsiella spp.*, immunohistochemistry revealed cells compatible with

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osteosarcoma and tomography revealed bilateral nasal tumor with bone involvement and obstructive frontal sinusitis, revealing the cause of exophthalmos secondarily. The patient was referred for oncological treatment.
Conclusions: Osteosarcoma is the most common primary bone tumor in dogs, with a median age of 7–8 years. It affects mainly large and giant breeds, but less frequently small breeds and presents rapid and progressive growth, with low survival rates. Neoformations when located in the nasal sinuses can trigger signs such as exophthalmos and should be included in the differential diagnosis for orbital pathologies.
Keywords: canine cancer, bone tumor, sinusitis, dog.

Optical coherence tomography of the iridocorneal angle and ocular tonometry in persian cats

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Purpose: To record intraocular pressure values through applanation tonometry and the iridocorneal angle through optical coherence tomography in Persian cats, and to analyze the correlation of these parameters.
Methods: Optical coherence tomography (SD-OCT/IVue®-OptoVue) of the cornea with an anterior segment lens was performed in 12 Persian cats ($N = 24$), both males and females, aged between 10 months and 12 years, obtained from a veterinary ophthalmology center (Zoovet Ophthalmology—Juiz de Fora/MG). All patients had previously undergone an ophthalmological evaluation to rule out any ocular pathology. An anesthetic eye drop was then applied, followed by three intraocular pressure (IOP) (Tono-Pen Vet®/Reichert) measurements and optical coherence tomography of the iridocorneal angle in the temporal corner of both eyes. Descriptive statistics of the obtained values were conducted, ANOVA was used to compare sides, and Spearman's correlation was used to analyze angle/pressure.
Results: The mean intraocular pressure and standard deviation (SD) was 20.74 ± 2.86 mmHg in the right eye (OD) and 20.58 ± 2.69 mmHg in the left eye (OS). The iridocorneal angle values were $70.30° \pm 15.78°$ in the OD and $66.71° \pm 11.13°$ in the OS, with no differences detected between samples ($p > 0.05$). No correlation was found between the iridocorneal angle and IOP.
Conclusions: It was possible to conclude that there were no statistical differences in the studied age groups, and reference values for the studied species/breed were established. Additionally, no correlation was observed between the angle and IOP in normal patients.
Keywords: ocular tomography, ocular tonometry, iridocorneal angle, cats.

Fungal keratitis caused by *Malassezia pachydermatis* in a Shih Tzu dog

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Purpose: To report a rare case of keratomycosis in dogs, which can pose a diagnostic and therapeutic challenge in this species.
Case Report: A 3-year-old female Shih Tzu was presented with a 1-week history of blepharospasm in the left eye. Upon examination, reflex uveitis, ulcerative keratitis, and bilateral distichiasis were observed. The dog also had concurrent otitis caused by *Malassezia pachydermatis*. Treatment included oral anti-inflammatory medication, analgesics, moxifloxacin, tobramycin eye drops, 0.35% EDTA, and hyaluronate-based ocular lubricant. After 24 h, the condition worsened, progressing to corneal melting. Conjunctival pedicle graft surgery was performed, and treatment continued with the addition of oral antibiotics. A bacterial culture yielded negative results. One week post-surgery, the corneal epithelium deteriorated, and inflammation spread to previously unaffected areas of the cornea. Amikacin eye drops were prescribed, but no improvement was observed. Ten days after surgery, cytological examination revealed fungal keratitis caused by *Malassezia pachydermatis*. Oral itraconazole, 1% voriconazole eye drops with crosslinked hyaluronate, and compounded eye drops with neomycin and polymyxin B were prescribed.
Results: Following the initiation of antifungal treatment, the lesion showed rapid improvement, with epithelialization and vision recovery within 12 days.
Conclusions: Although fungal keratitis is rare in dogs, a differential diagnosis should be considered in difficult ulcers to resolve, with cytology being a valuable tool for diagnosis.
Keywords: keratomycosis, ulcer, fungus.

Tubular meningothelial meningioma confined to the intraorbital portion of the optic nerve in a dog: A case report

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Purpose: Meningiomas are primary neoplasms commonly reported in veterinary medicine, predominantly originating in the spinal cord and central nervous system, with rare occurrences involving the optic nerve, particularly in its intraorbital portion. This study aimed to report a case of tubular meningothelial meningioma affecting the optic nerve in a dog.
Case Report: A 12-year-old male poodle was referred to a specialized veterinary ophthalmology service with controlled glaucoma in the right eye (RE), treated with dorzolamide-timolol eye drops (Drusolol®) three times a day (TID). Examination revealed exophthalmos in the RE, with the eye displaced dorsotemporally,

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absence of threat response, and lack of glare and retropulsion. The left eye showed no abnormalities. Systemic prednisolone (1 mg/kg) once a day (SID) for 7 days, Prednisolone eye drops (Pred-Fort®) TID, and Nepafenac (Nevanac®) TID for 14 days were prescribed, and a computed tomography (CT) scan was scheduled. After 14 days, a cranial x-ray showed no bone involvement, but a retrobulbar mass was detected. Enucleation was performed without complications, and the tissue was sent for histopathological examination, followed by magnetic resonance imaging (MRI).
Result: Histopathological examination revealed a bulbiform mass concentrically involving the optic nerve, diagnosed as tubular meningothelial meningioma. MRI confirmed no changes in the remaining portion of the right optic nerve, highlighting the atypical involvement restricted to its intraorbital portion.
Conclusions: Tubular meningothelial meningioma, limited to the intraorbital portion of the optic nerve, should be considered in cases of exophthalmos and blindness.
Keywords: blindness, dog, optic nerve, meningioma.

Outcome of a third eyelid hemangiosarcoma in a dog treated with radiofrequency excision and perilesional bevacizumab injection

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Purpose: This study aimed to report a third eyelid hemangiosarcoma in a dog, that was completely excised with radiofrequency and, after biopsy result, treated with perilesional injection of a dilution of bevacizumab, with no remission after 8 months.
Methods: An 11-year-old female spayed mixed-breed dog presented to the Ophthalmology service with a huge brown red mass in the palpebral surface of the third eyelid in her left eye. After an unconcluded cytology, it was decided to proceed with an excisional lesion biopsy. Surgery was done using a regular blade followed by radiofrequency energy application in the lesion root. After biopsy results, it was decided to inject a solution of bevacizumab.
Results: Histopathological examination revealed an irregular piece of third eyelid, presenting a nodular, dark-colored formation, exophytic, and friable upon cutting. Microscopy: The epithelium shows hyperplastic areas with spongiosis. Conjunctiva showed expansive, infiltrative but well-demarcated neoplastic proliferation composed of pleomorphic endothelial cells forming vascular spaces containing blood. There is marked anisocytosis and anisokaryosis, with cells displaying prominent nucleoli. The mitotic index found was four per field/10 fields at 40× magnification. Surrounding the neoplastic area, there are large spaces containing blood and coagulative necrosis. Diagnostic impression of a hemangiosarcoma of the third eyelid conjunctiva with clear margins.
Conclusions: The present report describes a case of a large hemangiosarcoma of the nictitating membrane, which showed complete remission following excision by radiofrequency and perilesional application of bevacizumab solution, with no recurrence observed 8 months after the procedure.

Keywords: dog, eye, third eyelid tumor, hemangiosarcoma, bevacizumab.

Penetrating keratoplasty in a cat with a homologous corneal graft preserved in Eusol

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Purpose: To describe a case of total penetrating keratoplasty in a cat using a feline cornea preserved in Eusol medium to treat deep corneal sequestration.
Case Report: A 6-year-old spayed female mixed-breed cat was presented with an extensive blackened plaque on the central cornea of the left eye. Biomicroscopy revealed deep lamellar involvement. The cat underwent penetrating keratoplasty and corneal reconstruction using a homologous corneal graft. The donor was a 7-year-old male mixed-breed cat euthanized due to complications from chronic kidney disease. The corneal disk was harvested 24 h before surgery and preserved in Eusol medium at 4°C. The patient was followed up throughout the postoperative period. Histopathology confirmed the diagnosis of corneal sequestrum.
Results: Graft viability and transparency were satisfactory during the entire postoperative follow-up. After 60 days, the patient showed visual acuity, complete corneal healing, a nebula at the surgical bed, no synechiae, and excellent graft transparency.
Conclusions: In this case, penetrating keratoplasty with homologous corneal tissue preserved in Eusol medium provided optimal patient visual acuity maintenance.
Keywords: feline, corneal sequestrum, corneal transplant.

Microbiological evaluation of frozen porcine cornea

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Purpose: To investigate the efficacy of tobramycin in the microbiological control of frozen porcine corneas.
Methods: Twelve samples of porcine corneas were equally divided into three groups: Group 1 (tobramycin eye drop bottle), Group 2 (moist chamber with tobramycin), and Group 3 (moist chamber with 0.9% saline solution). Cultures of the corneas were taken before being immersed in the solutions and after 30 days of freezing in the bottles with tobramycin or 0.9% saline solution.
Results: Pre-freezing culture revealed bacterial growth in all the samples: five coagulase-negative Staphylococcus

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strains, seven Staphylococcus strains from the SIG group, four Morganella strains, and eight Citrobacter strains. According to the antibiogram, tobramycin initially showed efficacy in 10 of the 12 samples (83%). After 30 days of freezing, a second culture and antibiogram revealed bacterial growth in 50% of the samples from Group 1, 75% in Group 2, and 25% in Group 3. Tobramycin was resistant in all cases of bacterial growth. Three of the bacteria that remained active after freezing belonged to the SIG group, and three were coagulase-negative Staphylococcus. Group 3 presented the lowest bacterial growth rate after freezing.
Conclusions: The use of tobramycin in frozen corneas was not adequate for microbiological control.
Keywords: cornea, microbiota, graft, culture and antibiogram, tobramycin.

Physiological variation of the mean intraocular pressure throughout the day observed in adult Shih Tzu dogs

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Purpose: Measurement of intraocular pressure (IOP) is crucial for the diagnosis, treatment, and monitoring of many ocular diseases. Given the impact of various factors, tonometry performed over 24 h reveals IOP peaks and fluctuations, providing the daily physiological ocular tension curve (DTC) and the mini-curve for each individual. This study aimed to evaluate IOP in adult Shih Tzu dogs, hourly over a 24-h period, to establish the DTC and mini-curve.
Methods: IOP was measured in 24 eyes of 12 healthy adult Shih Tzu dogs, male and female, using a rebound tonometer (TonoVet®). Triple measurements were taken every hour for 24 h. The dogs were kept under natural photoperiod conditions, with minimal restraint applied during the measurements.
Results: The mean IOP value over the 24-h period was 15.61 ± 1.29 mmHg, with no statistically significant difference between the two eyes ($p = 0.480$). The DTC showed that the highest peaks occurred at 8:00 AM and 6:00 PM, while the lowest values were recorded at 4:00 AM and 6:00 AM. This indicates that IOP measured at the end of the darkness period (scotophase) tended to be lower than those measured at sunrise and at the onset of darkness (photophase).
Conclusions: In the studied population, the DTC proved to be a valuable tool for identifying key measurement times and supporting the treatment of conditions influenced by IOP.
Keywords: dogs, ocular tension curve, tonometry.
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Approval of the Ethics Committee (CEUA): Protocol number 6598121222 (CEUA-UFSM).

Conjunctival papilloma in a dog: Report of two cases

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Purpose: Considered uncommonly in dogs, conjunctival papillomas are confirmed by histopathology, and squamous cell carcinoma should be considered a differential diagnosis given the clinical presentation. The objective of this study was to report the formation of papillomas in the bulbar conjunctiva of two dogs.
Case Report: Two female Shih Tzu dogs were admitted for ophthalmological examination at different times; however, both had a history of blepharospasm and conjunctival neoformation, with one affecting the left eye (OS) and the other showing alterations in the right eye (OD). The ophthalmological examination of both dogs revealed moderate conjunctival hyperemia and a small formation in the bulbar conjunctiva, with a "cauliflower" appearance, reddish-brown coloration and irregular edges, suggestive of neoplasia. Excision of the neoformations was recommended.
Results: Histopathological findings revealed neoplasia caused by papilloma virus, which was benign.
Conclusions: Therapeutic and surgical measures adopted for these patients promoted the resolution of all alterations, since 3 years (patient with affected OS) and two years (patient with affected OD) after excision, they remained without recurrence.
Keywords: dog, conjunctiva, neoplasia, surgery.

Criteria for evaluating and interpreting the tear ferning test in Shih Tzu dogs

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Purpose: Dry eye disease (DED) is a multifactorial condition characterized by poor precorneal tear film (PCTF) quality and various ocular clinical signs. The tear ferning test (TFT) aids in the early diagnosis of DED by indirectly measuring PCTF osmolarity. The aim of this study was to evaluate the TFT; investigate changes in PCTF related to age, sex, reproductive status, temperature, and humidity; and integrate this technique into clinical practice.
Methods: A tear drop from 92 eyes of 46 Shih Tzu dogs (23 males and 23 females) aged one to 13 years was deposited on

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a glass slide, allowed to dry under controlled temperature and humidity, and observed using optical microscopy at 40x magnification. Statistical analyses included Cramér's V correlation for age, sex, and reproductive status, and Pearson's correlation for humidity and temperature.

Results: TFT results were classified according to Rolando's system as Type I (28.26%), Type II (22.82%), Type III (29.35%), and Type IV (19.57%). Ambient temperature ranged from 22°C to 35°C, humidity ranged from 41% to 71%, and ferning time ranged from 10 to 120 min. Moderate correlations were observed for age, reproductive status, temperature, and humidity.

Conclusions: Shih Tzus may exhibit qualitative DED regardless of age or reproductive status. Temperature and humidity affect the duration and degree of ferning. This technique is easy to implement in clinical practice.

Keywords: humidity, keraconjunctivitis sicca, precorneal tear film, prevention, temperature.

Approval of the Ethics Committee (CEUA): Protocol number 033.2023/UEL.

Corneal melting caused by *Serratia marcescens* in a dog

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Purpose: To report a case of melting caused by *Serratia marcescens tha*t was resistant to the main antibiotics used in routine ophthalmic treatment with vision maintenance. *S. marcescens* may demonstrate resistance to initial antibiotic therapy. It is a bacterium that produces several proteases and is rarely involved in ocular infections.

Case Report: Shih Tzu, a male, eight years old, had a history of being treated for superficial ulcers with good evolution. After 10 days, the lesion evolved acutely to melt with neovascularization, corneal edema, and hypopyon. The material was collected with a swab for culture and antibiogram.

Results: *S. marcescens*, sensitive to amikacin and cotrimoxazole grew, and the sensitivity increased with increasing exposure to ceftazidime and marbofloxacin. Topical treatment included amikacin 2% every 4 h, EDTA 0.35% every 4 h and heterologous serum every 4 h for 45 days and oral cotrimoxazole 20 mg/kg every 12 h for 17 days. Two subconjunctival applications of ceftazidime were performed 15 days apart. The patient presented healing of the ulcer with maintenance of vision.

Conclusions: *S. marcescens* is rarely found in normal conjunctival flora and is a nosocomial pathogen. However, the bacterium has been reported as a source of purulent conjunctivitis, keratitis, and corneal ulcers. The corneal lesion was the likely entry point for the bacteria, which, owing to its potential to produce several proteases, led to the acute onset of melting. Culture and antibiogram are essential for choosing the correct antibiotic to control melting and maintain vision.

Keywords: keratitis, keratomalacia, enterobacteriaceae.

Use of the Vicen Vet device in the treatment of qualitative dry eye and blepharitis in dogs: Report of two cases

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Purpose: To report two cases of dogs with qualitative dry eye disease (DED) and blepharitis treated with VicenVet.

Case Report: Two brachycephalic dogs (four eyes) qualitative DED and blepharitis underwent two sessions with VicenVet, 15 days apart. The protocol set the device to ophthalmic mode, energy level 6, with 2-min cycles applying direct electrical current to the skin, conjunctiva, eyelid margins, and accessory lacrimal glands. Efficacy was assessed using OSAVET parameters pre- and post-treatment (30 days): NIBUT (non-invasive breakup time), interferometry, meibography, and inflammatory scores for meibomitis (MB) and blepharitis (B).

Results: All evaluated parameters were improved when comparing pre- and post-treatment results. NIBUT: patient I—from 5.6 to 13.8 s (OD) and 4.9–15.7 s (OS); patient II—from 14.4 to 21.2 s (OD) and 19.8–20.5 s (OS). Interferometry: Patient I improved from ~15nm to ~80nm (both eyes), and Patient II from ~30 to ~80 nm. Meibography: Patient I—from 55% to 6% (OD) and 21%–11% (OS); Patient II—from 34% to 18% (OD) and 25% to 15% (OS). Meibomitis scores decreased from 3 to 0 (both eyes) for Patient I; and from 3 to 0 (OD) and 2 to 0 (OS) for Patient II. For blepharitis, scores in both patients improved from 2 to 0 bilaterally.

Conclusions: The device used may be a valuable tool in the management of qualitative dry eye and eyelid inflammations.

Keywords: dry eye, meibomian glands, tear film, ocular surface.

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