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PAPER ABSTRACTS

Surgical repair of pseudopterygium-like symblepharon in a cat
RA Allbaugh, TS Strong and RA Strauss
Department of Veterinary Clinical Sciences, Iowa State University College of Veterinary Medicine, Ames, IA, USA

Purpose: To describe successful surgical treatment of symblepharon in a cat that presented with pseudopterygium-like conjunctival and third eyelid incorporation without corneal adhesions. Methods: A 1-year-old spayed female domestic shorthair cat presented with symblepharon affecting conjunctival and third eyelid tissues that resulted in a nonadherent circumferential veil of annular conjunctival tissue over healthy, unaffected cornea. The appearance morphologically resembled pseudopterygium. Surgical repair utilizing a technique described in rabbits for the treatment of aberrant conjunctival structure and overgrowth (pseudopterygium) was performed dorsally and ventrally to reflect the conjunctiva back into the fornix, while the third eyelid was partially transected to clear the ventromedial visual axis. Results: Surgical inversion of the conjunctival tissues and transpalpebral fixation reformed the fornices and effectively cleared corneal obstruction dorsally and ventrally. The third eyelid required partial resection to clear corneal obstruction ventrally. The patient remained free of recurrence at 1 year follow-up. Conclusion: This surgical technique originally reported to benefit rabbits with pseudopterygium, offered utility in a cat affected with pseudopterygium-like symblepharon and could be considered in similar cases to improve vision and comfort.

Comparison of bacterial culture results collected via direct corneal wound sampling versus conjunctival fornix in canine eyes with presumed infectious ulcerative keratitis
CR Auten, JL Urbans and DD Dees
1Eye Care for Animals, North Scottsdale, AZ, USA; 2Eye Care for Animals, Austin, TX, USA

Purpose: To compare aerobic bacterial culture results in eyes with presumed infected corneal ulcers between direct corneal wound sampling and samples obtained from the lower conjunctival fornix. Methods: Thirty-five eyes with infected corneal ulcers were collected by direct sampling collected of the infected corneal ulcer as well as the lower conjunctival fornix. Results: One hundred twelve samples were obtained from 56 eyes of 55 dogs. Sixty-eight samples (61%) yielded bacterial growth. No bacterial growth was obtained from either sampling site in 19 eyes. Positive growth from both sites was obtained in 31 eyes. Six eyes yielded bacterial growth from the fornix but not from the cornea. Overall, 31/56 eyes (55%) were positive at the cornea and 31/56 eyes (66%) were positive at the fornix. Twenty different bacterial isolates were obtained from 68 positive samples. Gram positive (71%) organisms were more common than Gram negative (29%). The most commonly isolated organisms were Staphylococcus pseudintermedius (25%), Beta hemolytic Streptococcus spp. (23%), and Pseudomonas aeruginosa (12%). Methicillin-resistant organisms were isolated in 9% of samples. Comparison of organisms isolated from the two collection sites of the same eye revealed an exact correlation in 43/56 (76%) samples. Comparison of bacterial culture results collected via direct corneal wound sampling versus conjunctival fornix may be a suitable alternative to direct wound sampling in eyes with compromised corneal structural integrity. None.

Yucatan minipig choroidal neovascularization: a laser-induced model of human neovascular age-related macular degeneration
JT Bartoe, RF Boyd, K Yekelch, BM Geddings, MT Leathy, A Quimaboa, DJ Nunoo, Rafal Farjo and TS Vitiellic
1Ophthalmology Services, MPI Research; 2Anatomic Pathology, MPI Research; 3EyeCRO

Purpose: Historically, large animal models of neovascular age-related macular degeneration (AMD) have been unreliable. Only 70% of laser-induced choroidal neovascularization (CNV) lesions in non-human primates (NHP) are considered clinically relevant and only up to 40% of lesions ideal, exhibiting Grade IV leakage on fluorescein angiography (FA). This inefficient ventrally leads to reproducibly, the patient benefit as such. This study has used no recurrence of symblepharon or adverse effects from partial third eyelid excision in the subsequent examination. Conclusion: This surgical technique, originally reported to benefit rabbits with pseudopterygium, offered utility in a cat affected with pseudopterygium-like symblepharon and could be considered in similar cases to improve vision and comfort. None.

Factors affecting publication in peer-reviewed journals of abstracts presented from 2008-2012 ACVO meetings
E Bentley, M Koester, T Bdolah-Ahram, N Yair and R Ohr
1School of Veterinary Medicine, University of Wisconsin-Madison, Madison, WI, USA; 2Koret School of Veterinary Medicine, Hebrew University of Jerusalem, Jerusalem, Israel

Purpose: The aim of this study was to examine variables that affect publication of ACVO meeting abstracts in peer-reviewed journals and compare results to the ECVO publication rate (PR). Methods: Published papers were identified via online searches for abstracts from 2008-2012 ACVO/ECVO meetings. Variables analyzed (via Pearson Chi-square test) included: oral presentation/poster, type of abstract (clinical/basic science/case report), species, ocular tissue studied, nationality, funding, first/last author: a diplomat, resident as first author, and author affiliation (private/practice/university). Results: 186/377 ACVO abstracts were published within 608 ± 479 days, with 103 published in Ophthalmic Veterinary. Significant factors included: nationality of first/last authors (P = 0.0001); type of presentation (P < 0.001, oral 46% PR, poster 22% PR); type of study (P = 0.037, clinical study 35% PR, basic science 10% PR, case report 16% PR); resident as first author (P = 0.001), diplomat as author except first/last (P < 0.001); first author affiliation (P = 0.0001, university 17% PR, practice 21% PR); last author affiliation (P = 0.003, university 16% PR, practice 22% PR); and species studied (P < 0.001, horses 51% PR, multiple species 50% PR, cats 35% PR, food animals 11% PR, non-mammals 10% PR). First/last author affiliation as significant factors were diplomate as first/last author, funding, and ocular tissue studied. Type of presentation, resident as first author, university affiliation of first author, and species had the greatest effect on publication probability. Only 78/377 abstracts (21%) were significantly different from ACVO PR (P = 0.191). Conclusion: At 32%, ACVO PR is similar to ECVO PR of 29%.

Fluorescein versus indocyanine green angiography to evaluate glaucomatous damage of the ocular fundus in beagles with ADAMTSL10 open angle glaucoma (ADAMTSL10-OAG)
J Burn, CD Harman, KL Koehl, FD Nusudosfer, ES Storey, KN Gelatt, CE Plummer and AM Komaromi
1Michigan State University; 2South Atlanta Veterinary Emergency and Specialty; 3University of Florida; 4University of Pennsylvania

Purpose: To evaluate retinal, choroidal, and optic nerve head (ONH) vascular perfusion in beagles with ADAMTSL10-OAG using fluorescein (FA) and indocyanine green angiography (ICGA). Methods: Fluorescein (20 mg/kg) and/or ICG (1 mg/kg) was injected intravenously and angiograms were recorded with the Spectralis® Confocal Scanning Ophthalmoscope (Humphrey-Engines). Three groups of beagles were examined. (1) Non-glaucomatous (mean diurnal intraocular pressure [IOP] ≤20 mmHg): 10 eyes (n = 10) of 5 dogs; (2) glaucomatous mutant (IOP ≥20 mmHg): 10 eyes (n = 10) of 5 non-mutant controls (0.5–6.6 years; n = 5). Routine opthalmic examinations and fundus imaging by spectral domain optical coherence tomography (SD-OCT; Spectralis®) were performed. Results: Group 1: 1/15 dogs showed wedge-shaped areas of delayed perfusion in 2/15 and 1/15 also showed delayed superior retinal venule filling. Group 2: 10/25 dogs had a combination of wedge-shaped areas of delayed perfusion, delayed superior retinal venule filling, peripapillary and ONH hyperfluorescence. Only 1/5 controls showed wedge-shaped areas of delayed choroidal filling. The abnormalities were more distinct with FA than ICGA. ONH ICGA showed wedge-shaped retinal thinnings in the area of delayed perfusion in 2/23 dogs in Group 2. Hyperfluorescence in and around the ONH was associated with severe thinning of the nerve fiber layer in advanced disease. Conclusions: Wedge-shaped retinal defects are seen in dogs with advanced glaucoma. Our study showed that delayed vascular perfusion in choroidal watershed zones are likely responsible for these defects. Supported by Michigan State University startup funds and Edward Sheppard and family. None.

A survey of orbital disease associated with exophthalmos in ferrets (Mustela putorius furo)
ZN Cochran, RA Allbaugh, TD Strong and LB Teixeira
1Department of Veterinary Clinical Sciences, Iowa State University College of Veterinary Medicine, Ames, IA, USA; 2Comparative Ocular Pathology Lab of Wisconsin (COPLow), University of Wisconsin-Madison School of Veterinary Medicine, Madison, WI, USA

Purpose: To survey and organize the known causes of orbital disease manifesting as exophthalmos in ferrets (Mustela putorius furo). Methods: An extensive literature review was conducted along with a thorough analysis of the COPLow database in search of ferret orbital disease following management of a case at the Iowa State University Veterinary Medical Center (ISU LVMC). A qualifier for inclusion into this study was that the patient’s disease had to be observed by the clinician at the time of presentation. Results: Out of the 17 recorded ferret cases in the COPLow database, 7 (41.1%) represented orbital disease, 1 (5.8%) of which was then reviewed by a second investigator. In total, 16 cases of orbital ferret disease were identified. Of these 16 cases, 4 (25%) were diagnosed as optic neuritis, 7 (43.8%) as confirmed or probable orbital lymphoma, and 5 (31.2%) were diagnosed as orbital adenocarcinoma. The average age of diagnosis for the former group was 4.3 years. The average age of diagnosis for the latter group was 6.5 years for the lymphoma cases and 4.3 years for the adenocarcinoma cases. Conclusion: The purpose of this survey is to provide veterinarians with an updated resource of information regarding causes of exophthalmos in pet ferrets. This is the first reported study that

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Risk factors associated with postoperative orbital infections in 182 horses undergoing enucleation

EE Crabtree,1 RB Edwards III,1 EL Kilgallon,2 A Dwyer1 and M Lassaline1
1Fairfield Equine Associates, Davis, CA, USA; 2Miller and Associates, Davis, CA, USA; 3Geneve Valley Equine Clinic, Davis, CA, USA
4Department of Surgical & Radiological Sciences, School of Veterinary Medicine, University of California, Davis, CA, USA

Purpose: To determine the association between horse’s age, parity, pura intermedia dysfunction (PPID), experimental glaucoma, or standing sedation), surgical location (stable vs. hospital), and duration of hospitalization on the development of postoperative orbital infections. Methods: Retrospective, comparative study, medical records from horses undergoing enucleation at Fairfield Equine Associates, Miller, and Associates, University of California-Davis, and Geneve Valley Equine clinic from 2000-2017. Fisher’s exact test was used to evaluate the association between age, PPID or experimental glaucoma, surgical location (stable vs. hospital), and duration of hospitalization on postoperative orbital infection (P<0.05). Results: A total of 182 horses met inclusion criteria, including 63 mares, 112 geldings and 7 stallions with a median age of 18 years (range 3–36 years). Surgical procedures were performed under general anesthesia (n = 56 inhalation, = 7 IV general anesthesia) or standing sedation (n = 7 stable setting; n = 119 hospitalized setting). The length of stay for hospitalized horses was a mean of 3 days (range 0–25 days). Orbital infections occurred in 8/182 enucleations (4%). Increased risk of orbital infection was associated with PPID (P = 0.009), but not age, specific antibiotic use or duration, duration of hospitalization, anesthesia protocol, or surgical location. Conclusions: Horses with PPID may be at increased risk for orbital infection following enucleation. Therefore, antimicrobial therapy, diligent asepsis including intraoperative wound lavage, and postoperative wound care may be more important in these patients. Assessment and management of their endocrine status should be considered in the management of older horses undergoing enucleation.

Bandage contact lens retention time in dogs

KA Diehl, AC Bowden, DA Knudsen and KE Myrna
Department of Small Animal Medicine and Surgery, College of Veterinary Medicine, University of California-Davis, Davis, CA, USA

Purpose: To assess and compare retention time, ease of application, and patient tolerance of various bandage contact lens types from four different manufacturers. Methods: Five bandage contact lens types from 2 veterinary contact lens brands (An-Vision D1 and D4; and Hydroclear HRT 78, AL-1 B-HRT 78, and Hydroclear) and 4 lens types from 2 human contact lens brands (Bausch & Lombs PureVision and PureVision 2; and Acuves Oasys without and with Artificial Tears (Clear Plus)) were evaluated in 6 Beagles. Results: None of the lenses developed serious complications during treatment. None of the lenses were retained longer than 6 days. Acuvue Oasys with and without Artificial Tears (Clear Plus) were retained at 6 days (range 0–14 days). PureVision 2 was retained at 7.9 days (range 5–14 days). Acuvue Oasys with Artificial Tears was retained at 6.9 days (range 2–14 days). Conclusions: All lenses were easy to use and well tolerated by the dogs. The human lenses were retained longer than the veterinary lenses in dogs. None.

Tear lactatin concentrations in canine keratoconjunctivitis sicca

JL Disney,1 JP Herring,1 JP Pickert1 and RL Mckown2
1Department of Small Animal Clinical Sciences, Virginia-Maryland College of Veterinary Medicine; 2James Madison University

Purpose: To determine if tear lactatin concentration is decreased in canine eyes affected by keratoconjunctivitis sicca (KCS). Methods: 58 client-owned dogs were enrolled in the study. 28 dogs with KC-affected KCS, 14 eyes underwent an ophthalmic exam, including Schirmer Tear Testing (STT), anterior segment assessment, and tear sample collection. Results: Tears were evaluated for their total protein concentrations via bicinchoninic acid assay and lactatin concentrations via enzyme-linked immunosorbent assay. Conclusions: There are no differences in tear lactatin concentrations in dogs with KC compared to normal tear lactatin concentrations.

Evidence of mechanocompensation in the aqueous outflow pathway of non-human primates with experimental glaucoma

JS Eaton,1,2 V Raghunathan,1,2 BJ Christian,1 JT Morgan,2 IN Ver Hoeve,2 4CQ Yang,2 H Gong,3 CA Rasmussen,4 1PE Miller,1,6 P Russell1,2 TM Nork4 and CJ Murphy1,2,7,8
1Ocular Services On Demand (OSOD); 2UC Davis School of Veterinary Medicine; 3Covance Laboratories; 4University of Wisconsin-Madison School of Medicine & Public Health; 5Boston University School of Medicine; 6University of Wisconsin-Madison School of Veterinary Medicine; 7UC Davis School of Medicine

Purpose: This ex vivo study presents biomechanical and ultrastructural changes in unlased trabecular meshwork (TM) from non-human primates (NHPs) with experimental glaucoma (ExG). Methods: Globes were obtained from n = 16 adult Macaca fascicularis with unilateral...
The effect of topical latanoprost on aqueous humor flow in normal dogs
KE Fentiman, AJ Rankin and JM Meekins
Department of Clinical Sciences, Kansas State University, Manhattan, KS, USA

Purpose: To evaluate the effect of topical latanoprost 0.005% (Akorn, Lake Forest, IL) on aqueous humor flow rate (AHFR) and intraocular pressure (IOP) in normal dogs. Methods: Following a 5–day acclimation period, twelve beagles were randomly assigned to 2 groups. On day 5, either 10 μl of latanoprost (0.005%, 10 μg/ml) or artificial tear solution ( Geiss, Destin, FL) was injected in the 2 eyes of each dog. The IOP and AHFR were measured immediately before and 1, 5, and 10 minutes after injection. In the treatment group, there was a significant decrease in IOP (P < 0.001). In the control group, the mean ± SEM AHFRs on days 4 and 10 were 1.38 ± 0.14 μl/min and 1.87 ± 0.46 μl/min, respectively. Conclusions: Topical 0.005% latanoprost decreases IOP but does not alter the AHFR in normal dogs. Supported by KSA 4-05-72 Mark Derrick Canine Research Fund. None.

Feline acute corneal hydros and associated with descemet's membrane rupture: 65 cases
JA Fragola, RR Dubielzig and LBC Teixeira
The Comparative Ocular Pathology Laboratory of Wisconsin (COPLOW), School of Veterinary Medicine, University of Wisconsin, Madison, WI, USA

Purpose: The etiology and pathogenesis of feline corneal hydros/acute bullous keratopathy (FCH/ABK) has long been the subject of debate. The purpose of this investigation was to compare clinical and histopathologic findings in 65 cases of FCH/ABK and identify risk factors for the development of FCH/ABK. Eyes with FCH/ABK described in the literature were identified in the archives of the Comparative Ocular Pathology Laboratory of Wisconsin. Signalement, history, ophthalmic examination findings, and gross and histopathological lesions were reviewed and summarized. The relative risk (RR) of Descemet's membrane rupture in the development of FCH/ABK was calculated. Results: 65 eyes from 63 cats diagnosed with FCH/ABK were identified. FCH/ABK was bilateral in 56/63 cats. Descemet's membrane rupture was significant a risk factor in the development of FCH/ABK (RR=9.7; 95% CI [3.98–23.8]). Conclusions: When comparing FCH/ABK cases with FCH/ABK included glaucoma (17/65) feline diffuse iris melanoma (13/65), lymphoplas- macytic keratitis (2/65), and histiocytomas (10/65) Cox regression models suggest a causal relationship between Descemet's membrane rupture and FCH/ABK. Except in the cases of Haab's striae, no cause for Descemet's membrane rupture was identified. These findings support the use of procedures that tamponade Descemet's membrane in the treatment of FCH/ABK. None.

A modified Ahmed glaucoma implant for shunting aqueous humor to the ocular surface in a dog with secondary glaucoma post-phacoemulsification case report and proof of concept
EC Finlen, AA Sevane, RE Koo and CHD Miller
UCA Aurora Animal Specialty Hospital, IL, USA

Purpose: Traditional Ahmed gonio-implant surgeries in dogs are associated with challenges inherent to both maintenance of a patent valve and bleb management. A modification of the standard Ahmed valve has been successfully used to shunt aqueous humor to the ocular surface in a subset of high-risk human patients after undergoing multiple corneal and filtrative procedures. A 9-year-old female spayed Chihuahua-mix with bilateral refractory glaucoma post-phacoemulsification had this concept adapted to be used on the remaining eye after unusually fast bleb failure upon standard Ahmed-vein implantation in the contralateral eye. Methods: A silicone tube (0.76 mm inner diameter, 1.65 mm outer diameter) (Dow Corning Corp, Midland, MI) was secured with a simple interrupted 8-0 nylon suture to the anterior-lateral surface of an I1 pediatric Ahmed glaucoma-implant (New World Medical, Rancho Cucamonga, CA). Following standard placement of the glaucoma drainage device, further sub-conjunctival dissection allowed the extension tube to be placed and trimmed, exiting through the conjunctiva near the limbus at the level of the 4 o’clock position (OS). The tube was then connected to the Ahmed valve. Support was provided by the undersurface Tenon’s capsule, with the bare silicone sample interrupted 9-0 nylon sutures to restrict tube movement. In addition to standard post-opera- tive medical management, glaucoma surgery was performed using a 27-gauge needle through the anterior chamber and anterior vitreous, the gonio-implantation was performed, the conjunctiva was reapproximated and fluid was immediately seen out of the extension tube over the conjunctiva, characterizing release of the blockage. After each intervention, intracameral tissue plasminogen activator (25ug) and mafenide (0.11%) were injected intracameraly. The eye has remained comfortable, normotensive and visual, with IOP < 15 mmHg by the time the abstract was written (14 months post-operatively). No signs of eyelid discomfort are present at the level of the extension tube. Conclusions: The state of normotension and the lack of bleb formation more than a year after surgery is proof-of-concept that the aqueous humor can be successfully shunted to the ocular surface in dogs. Further work is warranted to evaluate re-bleb formation rates and the impact of different size/tube materials along with the advantages of using a micro-pore filter inside the extension tube. None.

Phacoemulsification of a subluxated microphakic lens in the presence of vertebral prolapse with use of Iris Hooks and a capsule tension segment following tracioninolone- assisted anterior vitrectomy via pars plana – case report
ED da Silva
VCA Aurora Animal Specialty Hospital, IL, USA

Purpose: Vertebral staining, capsule stabilization techniques and anterior vitrectomy via pars plana have gained considerable interest in recent years in human ophthalmology. The pur- pose of this case report is to describe a peri-operative capsule tension system with an iris hook and a capsule tension segment following phacoemulsification of a subluxated microphakic lens that was accompanied by vertebral prolapse in a dog who was referred to the authors’ clinic for a phacoemulsification via pars plana approach to the prolapsed anterior vitreous was chosen using a suture-less transconjunctival vented 23G trocar (Alcon Laboratories, Fort Worth, TX) inserted 3 mm from the limbus. The anterior chamber was reentered (Tenc- ence X, preservative free triamcinolone acetonide injectable suspension, Alcon Laboratories, Fort Worth, TX), and subsequently removed via the pars-plana trocar and using a 2-handed suturing technique. The capsulorrhexis was then interrupted 9-0 nylon sutures to restrict tube movement. In addition to standard post-operative medical management, glaucoma surgery was performed using a 27-gauge needle through the anterior chamber and anterior vitreous, the gonio-implantation was performed, the conjunctiva was reapproximated and fluid was immediately seen out of the extension tube over the conjunctiva, characterizing release of the blockage. After each intervention, intracameral tissue plasminogen activator (25ug) and mafenide (0.11%) were injected intracameraly. The eye has remained comfortable, normotensive and visual, with IOP < 15 mmHg by the time the abstract was written (14 months post-operatively). No signs of eyelid discomfort are present at the level of the extension tube. Conclusions: The state of normotension and the lack of bleb formation more than a year after surgery is proof-of-concept that the aqueous humor can be successfully shunted to the ocular surface in dogs. Further work is warranted to evaluate re-bleb formation rates and the impact of different size/tube materials along with the advantages of using a micro-pore filter inside the extension tube. None.

Cancer incidence in dogs with clinical presentation of sudden acquired retinal degeneration syndrome
SARDS
SD Grozdanic, H Kecova and T Lazic
Animal Eye Consultants of Iowa, North Liberty, IA, USA

Purpose: To develop diagnostic parameters for differentiation of cancer-associated retinopa- thy (CAR) and SARDS in canine population. Methods: Initial diagnosis of SARDS (n = 10), sudden acquired retinal degeneration syndrome (SARDS) and CAR (n = 7) was

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When should we measure the schirmer tear test? I Hwashita, S Wakai, Y Kazama and A Saito  
Triangle Animal Eye Clinic, Tokyo, Japan  
Purpose: Although the Schirmer tear test-I (STT) effectively evaluates aqueous lacrimal function (ALF), the optimal time to perform STT may influence the result. This study aimed to establish a correct time to perform the STT in dogs.

Methods: Retrospective study of 400 dogs, 200 of each sex, presenting to our clinic with dry eye for ALF evaluation. The STT was performed at 30 min, 1, 4, 7, and 10 days post-presenting. Tear samples were collected before and 10 min after STT performance. The STT results were compared using the Student t-test for the 400 dogs, and the Wilcoxon signed rank test was performed for each dog. The variables of the STT results were also compared using the Student t-test for one sex.

Results: The mean STT results for the 400 dogs were 13.2, 18.8, 18.0, 17.0, and 14.5 mm for each time point, respectively. A statistically significant difference was observed between 30 min and 10, 4, and 7 days post-presenting. Post-presenting time was not a significant factor for sex differences in the STT results.

Conclusions: The optimal time to perform the STT is 10 min post-presenting. The STT results are influenced by post-presenting time, and sex differences are not significant.

The effect of subconjunctival bupivacaine, lidocaine, and mepivacaine on corneal sensitivity in healthy horses MR Jinks, RL Fontenot, RW Willis and CM Bethze  
College of Veterinary Medicine, Mississippi State University, Mississippi State, MS, USA  
Purpose: To compare the efficacy and duration of effect of three local anesthetics on corneal sensitivity when administered subconjunctivally in horses. Methods: Eight healthy horses were used in a randomized, crossover study with two-wk washout periods between trials. The subconjunctival space of the randomly selected eye was injected with 0.1 mL of bupivacaine (0.5%), lidocaine (2%), and mepivacaine (2%), or saline. All horses received an oral medication once in the same eye and the contralateral eye was a placebo.

Results: The corneal touch threshold (CTT) was measured in both eyes in a Cochet-Bonnet esthesiometer, with infrared illumination to rule out any confounding effects on CTT between pre-and post-injection. The CTT results at 10 min were 1.1, 1.9, and 2.2 mm for bupivacaine, lidocaine, and mepivacaine, respectively. Lidocaine and mepivacaine significantly reduced CTT values compared to bupivacaine and saline.

Conclusions: Subconjunctival lidocaine and mepivacaine resulted in the most rapid and persistent reduction in CTT, and were more efficacious than bupivacaine. Lidocaine and mepivacaine are recommended for use as a subconjunctival anesthetic for ocular procedures in horses.
both). In both canine and equine samples, concentrations of tetracyclines ≥65%, EDTA ≥98%, and N-acetylcysteine ≥95% were more efficacious than serum (P < 0.002 for canine compounds; P < 0.001 for equine compounds) in preventing corneal weight loss. 0.5% tetracycline and 1% EDTA were as or more efficacious alone than when in combination with another compound. Results: Concentrations of tetracyclines ≥65%, EDTA ≥98%, and N-acetylcysteine ≥95% were efficacious in preventing corneal weight loss in an in vitro model as compared to the positive control. The concentrations were more efficacious than homologous serum. Tetracycline 0.5% and EDTA 1% were equally as efficacious alone as when in combination with another compound.

Targeting gene expression to the canine aqueous humor outflow pathways via intravitreal vector administration

AM Komaromy,1 KL Koch,1 CD Harman,2 BR Ksander,2 M Gregory-Ksander,2 VA Chiodo,1 A Marshak-Rothstein,1 P Bustro,1 SL Boye,1 WW Hauwirth1 and SE Boye,1

1*Michigan State University (MSU); 2Harvard Medical School; 1University of Florida; 4University of Massachusetts Medical School

Purpose: A main goal of our research efforts is the long-term control of intraocular pressure via adeno-associated virus (AAV) mediated gene therapy in dogs with open-angle glaucoma. In this study we compared green fluorescent protein (GFP) expression levels along the canine aqueous humor (AH) outflow pathways following intravitreal (IVT) or intracameral (IC) vector administration.

Methods: AAV2-GFP (either self-complementary with B6-Pi promoter, or single stranded with Y444F capsid mutation) and AAV2-smCBA (either self-complementary with B6-Pi promoter) was injected into 12 eyes of 6 young adult wild-type dogs either IC (n = 8 eyes) or IVT (n = 4 eyes). Total number of vector copies (vg) injected were 2.78e12–2.36e13 vg (IC) or 2.1e11–2.7e12 vg (IVT). GFP expression was visualized and quantified (Imagex) histologically at week 5 using total fluorescent microscopy. Results: Histologic examination showed that IC delivery resulted in strong GFP expression in the ciliary epithelium, including the trabecular meshwork (TM). This expression resulted in clinically detectable fluorescing within the iridocorneal angle. IVT delivery of AAV2-GFP resulted not only in the expression of GFP in the ciliary and iris epithelium but also, perhaps surpris-ingly, AH outflow pathways. GFP expression levels within the TM were comparable between IC and IVT delivery when using the same vector dose.

Conclusion: In dogs, injection of AAV vectors into the anterior chamber is an efficient method of targeting all of the anterior and posterior segments of the eye. This is in contrast to IC injection that mostly targets the anterior segment.

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Vitreous degeneration and associated ocular abnormalslities

H Krishnan,1 K Diehl2 and GD Aguirre1

1School of Veterinary Medicine, University of Pennsylvania, Philadelphia, PA, USA; 2College of Veterinary Medicine, University of Georgia, Athens, GA, USA

Purpose: Vitreous degeneration (VD) is a common finding in Italian Greyhounds (IG) and several other dog breeds. Although there is concern about the significance of this finding, there is no documentation about either the frequency of VD or its association with ocular co-morbidities such as cataracts, lens luxation, glaucoma and retinal detachment. Methods: Results from breed screening ophthalmic examinations performed by ACVO diplomates and vector expression to the Companion Animal Eye Registry (CAER) from 2011 through 2016 were obtained. We selected IG in which vitreous degeneration is commonly diagnosed: data for the Greyhound breed (BG) included 63 IG and 63 BG were Sloughi, Basset, Frenchie, Chihuahua, Bichon Frises (BF), and Brussels Griffons (BF). Data analyzed included age, number of examinations, and whether VD, along with cataracts, lens luxation, glaucoma and/or retinal detachment was present in either or both eyes. Results: IG had the highest fre- quency of VD-affected dogs (10%), 19% of these had cataracts, but 7.4% of dogs had cataract-affected (7.4%) and 4.9% of dogs were diagnosed with VD without any other ocular abnormalities. In IG, VD was more common in the right eye (P = 0.003). Median age at diagnosis in IG was 7 years, but a wide variability; 0.5% were diagnosed in yearlings (ages 0.5 – 1 year) and incidence increases with age. Although cataracts are present in VD-affected dogs, they also incurrence in the eyes without VD. There appears to be no association between VD and lens luxa- tion, glaucoma and detachment. Supported by Van Shoun Fund for Canine Genetic Research. None.

Microsurgical training in ophthalmology and veterinary ophthalmology residency training programs

M Lassaline,1 DJ Maggs1 and KA Boudreaux2

1Department of Surgical & Radiological Sciences, School of Veterinary Medicine, University of California, Davis, CA, USA; 2Academic Programs, School of Veterinary Medicine, University of California-Davis, Davis, CA, USA

Purpose: Although current graduate medical education models espouse criterion-based training, microsurgical skills are traditionally followed an apprenticeship model. Current methods of microsurgical training in ophthalmology have not been well defined. To evaluate the effect of intracameral tPA (alteplase, Stokes Pharmacy, Mount Laurel, NJ), administered at immediate conclusion of phacoemulsification, on postoperative anterior chamber fibrin formation in dogs. Methods: Thirty dogs undergoing bilater al phacoemulsification (60 eyes) were administered 25 μg/ml tPA intracameral in one eye and 0.1 ml unmedicated aqueous vehicle in the contralateral eye immediately after incision closure. Experimental and control eyes were randomly assigned. Intraocular pressure (IOP) was measured, and corneal edema, posterior capsular opacification (PCO), pigment precipitates on the intraocular lens (IOL) implant, aqueous flare, and fibrin effusion graded (0 to 4) after anesthetic recovery and at 1 week, 2–3 weeks, 4–6 weeks, 8–12 weeks, and greater than 12 weeks postoperatively. Examiners were masked throughout surgery and follow-up.

Results: 50% of (15/30) developed some degree of anterior chamber fibrin in one or both eyes after phacoemulsification (9 unilateral, 6 bilateral). 33.3% (10/30) of tPA-treated eyes developed fibrin compared to 40.0% (12/30) of control-treated eyes. Conclusions: Administration of intracameral tPA at immediate conclusion of phacoemulsifi- cation had no effect on the incidence of anterior chamber fibrin formation or POH in the early postoperative period. None.

Intraocular pressure, central corneal thickness and conjunctival microbiota in adult white-tailed deer

Odocoileus virginianus

T Villar,1 A. Pascoli,2 F. Ramsey,3 E. Capistrano,1 CF Shipley,1 KM Smith-Fleming1 and BC Martins1

1Department of Veterinary Clinical Sciences, College of Veterinary Medicine, University of Illinois, Champaign, IL, USA; 2College of Veterinary Medicine, São Paulo State University, Jaboticabal, SP, Brazil; 3College of Veterinary Medicine, Regional University of Blumenau, Blumenau, SC, Brazil

Purpose: To determine the normal values for intraocular pressure (IOP) and central corneal thickness (CCT) of healthy adult white-tailed deer (Odocoileus virginianus). Methods: Eight adult white-tailed deer were anesthetized and their anterior segment was evaluated. The lower conjunctival fornix was used to submit sterile swabs and submitted for aerobic bacterial and culture and susceptibility testing as well as fungal culture. IOP was bilaterally measured by applanation Tono-Pen (Reichert) and rebound (Tonopen) tonometry. Corneal thickness was measured by ultrasound pachymetry. Statistical comparison analyzed differences between eyes and between breeds of deer. Conclusion: Mean IOP was 19.67 ± 2.25 mmHg (Tonopen®) and 15.0 ± 3.69 mmHg (Tonopen®). There were no significant differences in measurements between eyes or seasons (P > 0.05) with both tonometers. There was a significant difference in rebound tonometry in both seasons (P < 0.004). Mean CCT was 747.78 ± 48.11 μm with no signif-icant differences in values between eyes (P > 0.79). The most prevalent bacterial genus identified were Bacillus, Corynebacterium, Aeribacter and Azomix in both seasons. Growth of Staphylococcus sp. was only observed in winter. A single fungal genus was cultured
Clinical efficacy of a new quick tear volume measurement in dogs: strip meniscometry

K Miyasaka,1 Y Kazama,2 H Ishiwata3 and A Saito2
1Echo Electricity Co., Ltd., Tokyo, Japan; 2Triangle Animal Eye Clinic, Tokyo, Japan
Purpose: To introduce a new quick lacrimal test (termed Strip Meniscometry), and to evaluate its clinical efficacy for dogs. Methods: This study involved 1265 eyes of 641 subject dogs randomly selected among the outpatients having various corneal disorders. Each subject underwent a quick lacrimal test (PRT) using an STT, and the phenol red thread test (PRT) using Zone Quick (Showa Yakuhin Kako Co., Ltd.) and the Schirmer tear test (STT). All examinations were performed in the above-described order within 15–20 min. Results: The values of the tests were as follows: for PRT: 15–16.37 ± 0.74 mm/5 min for STT, and 9.52 ± 4.04 mm/5 min for STT, respectively. Statistically significant correlations were found for all pairs among PRT, STT and STT. The Pearson’s correlation coefficient r was 0.613 for a pair of PRT-STT, 0.571 for PRT-STT, and 0.668 for STT-SMT, respectively. When the tear deficiency was defined by the patient score (50 mm/60 s, the Schirmer test cut-off length was 10 mm/5 s). Conclusions: The result of SMT examination was well-correlated with the results of STT and PRT. The cut-off length of SMT for tear deficiency in dogs was suggested in reference to the standard STT results. Note: 

An investigation of the factors maintaining proliferative capacity of canine corneal epithelial cells

M Morita, N Fujita, K Sack, K Hayashimoto, T Nakagawa, R Nishimura and K Tsuzuki
Laboratory of Veterinary Surgery, Graduate School of Agricultural and Life Sciences, The University of Tokyo, Tokyo, Japan
Purpose: We have previously reported that canine corneal epithelial cells (CECs) maintain the proliferative capacity without using feeder cells or growth factors unlike other species. The purpose of this study was to investigate the factors maintaining proliferative capacity of canine CECs comparing with rabbit CECs. Methods: Canine and rabbit CECs harvested from limbus were cultured without using feeder cells and growth factors. The proliferative capacity and the cell cycle parameters were compared between the two species. Results: C3a and KF-477 positive cells were cost of time in both species and both CECs were passaged continuously until the growth arrest. Canine and rabbit CECs were then cultured with conditioned media and control media of each other’s cells. mRNA expression by qPCR analyses were performed and the gene expressions of soluble factors in both CECs were also compared. Conclusions: Canine CECs showed higher proliferative capacity and could be passaged more times than rabbit CECs. Conditioned media of canine CECs tended to promote the proliferation of rabbit CECs, while that of rabbit CECs inhibited the proliferation of canine CECs. Epidermal growth factor (EGF) receptor ligands, such as neuregulin1 (NRG1) and heparin-binding EGF-like growth factor (HB-EGF) were highly expressed in canine CECs than in rabbit CECs. Conclusions: It is suggested that canine CECs secrete growth promoting factors and EGF receptor ligands are their possible candidates. However, it is also suggested that canine CECs do not secrete growth inhibitory factors which are secreted in rabbit CECs. Further study is needed to clarify the mechanism of maintenance of proliferative capacity of canine CECs from these two perspectives. Supported by Grant-in-Aid for Scientific Research (G) 26450422. Note: 

Utility of a simple, inexpensive retinal model for teaching of ophthalmoscopy to veterinary students

FM Mowat, G Druley and HD Westmeyer
College of Veterinary Medicine, North Carolina State University
Purpose: Difficulty in mastering the techniques of ophthalmoscopy in veterinary education is compounded by challenges of live animal examination. We sought to explore the utility of preparing an inexpensive teaching model as a method to overcome these challenges of live animal examination. The purpose of this study was to explore the utility of an ophthalmoscopy model for veterinary students that is well liked and results in significantly better technical performance of indirect ophthalmoscopy compared to live animals. Methods: The study was approved by the North Carolina Regional Review Board, College of Veterinary Medicine, North Carolina State University. Results: The models were easy to use, 100% thought that model use should continue for future classes. Students that used the models were 7 times more likely to pass the examination than students that had not (P = 0.015). Conclusions: We describe an inexpensive, versatile teaching model for veterinary students that is well liked and results in significantly better technical performance of indirect ophthalmoscopy under examination conditions. Conflict of interest: none.

Clinical findings in a case-control study of dogs with sards, age and breed-matched controls, and dogs with pituitary dependent hyperadrenocorticism

A Oh, ML Foster, K Lunn and FM Mowat
Department of Veterinary Medicine, North Carolina State University, Raleigh, NC, USA
Purpose: Sudden acquired retinal degeneration syndrome (SARDS) is characterized by retinopathy and systemic clinical abnormalities. Our objective was to compare clinical parameters of SARDS cases with age, breed, sex and breed-matched normal controls, and cases of pituitary-dependent hyperadrenocorticism to further examine SARDS within the ageing and endocrinopathy clinical spectra. Methods: 12–15 dogs of each group (early SARDS, matched controls, hyperadrenocorticism) were recruited. Hyperadrenocorticism was confirmed through a positive ACTH stimulation test performed at the North Carolina State University for examination. Parameters assessed included clinical examination, serum chemistry, Urine protein:creatinine (U:Cr), Hematology, and fundus oculi. Fundus oculi was analyzed using a computer program and a Bonferroni post-test and significance of P < 0.05. Results: Compared with normal dogs, dogs with SARDS had significantly higher body condition score, elevated total serum creatinine, elevated platelet and...
serum proteins (total protein, albumin, globulin) and elevated serum calcium values. Compared to normal dogs the thickness of the outer retinal layers was significantly different (P < 0.01) in all imaging planes with RCD1, PRCD, and LCA but not ACHM. Of the 120 tumors, 45 were primary and 75 were secondary through metastatic disease or orbital extension. Major histologic tumor types included adenocarcinoma (33.3%), melanoma (28.6%), and sarcoma (28.6%). Mitoses were not predictive of metastatic disease, but a significant number of tumors had necrosis. We recommend the use of SD-OCT in dogs to assess for metastatic disease or orbital extension. Survival time post-diagnosis was extended with therapeutic intervention but remained less than 205 days. None.

**Effect of telmasartan on IOP, blood pressure and ocular perfusion pressure in a spontaneous feline glaucoma model**  
K Oikawa,1,2 JA Kiland,2 C Wickland,2 S Marchant2 and GJ McLellan1,2

1Department of Surgical Sciences, School of Veterinary Medicine; 2Ophthalmic & Visual Sciences, School of Medicine and Public Health

Purpose: To determine the effect of an angiotensin receptor blocker (ARB) on ocular perfusion pressure (OPP) in cats with feline congenital glaucoma (FCG).

Methods: Nine cats with FCG (3 female; 6 male) and 11 normal cats (2 female; 9 male) were studied under a protocol approved by the Institutional Animal Care and Use Committee. IOP was measured by rebound tonometry and blood pressure (BP) including systolic, diastolic and mean arterial pressure readings (SBP, DBP and MAP, respectively) were obtained by oscillometric method. Telmasartan (1 mg/kg/day PO) was administered to cats with FCG. Cats were acclimated to measurements, and baseline IOP and BP were obtained for 3 weeks prior to treatment. Mean ocular perfusion pressure (MOPP) was calculated (MOPP = 2/3 X MAP-IOP). Mean values were calculated for each cat and for female and male groups separately. Results were compared to matched normal cats (ANOVA with Tukey-Kramer multiple comparisons post-test; p = 0.05 considered significant). Results: In FCG cats, baseline mean (SD) IOP (28.9 mmHg ± 6.3) was significantly higher than MAP (86.3 mmHg ± 16.1) in all cases (P < 0.001). No significant changes in BP or OPP were detected in telmasartan-treated cats over the study. Conclusions: Telmasartan was well tolerated and did not have a significant effect on IOP, OPP or MAP in cats with FCG.

**Correlation of retinal layer measurements from optical coherence tomograms and 199832, (SX in fall of 2017), or layerestring atoproly non ulcerative keratitis and inflammation: a large somewhat organized arealight microscopic images in globes from 20 dogs with chronic glaucoma**

S Osinuch, B Bauer, M Leis, L Sandmeyer and B Graham

Department of Small Animal Clinical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, SK, Canada

Purpose: To describe the correlation of retinal layers measured using optical coherence tomography (OCT) and histologic sections in globes from dogs with chronic glaucoma.

Methods: Globes were collected from 20 dogs with chronic glaucoma, enucleated during terminal surgery, sectioned, embedded and stained. Half of the globe was imaged using OCT adjacent to the cut edge. Nerve fiber and inner plexiform layer (NFLP), inner retina (IR) and outer retina (OR) were measured as total retinal thickness (TRT); the thickness of the NFLP, IR and OR were measured as a ratio of TRT. The minimum thickness of the NFLP, IR, OR and NFLP/IR were measured as a ratio of mean thickness of the adjacent NFLP, IR, OR and NFLP/IR.

Results: The minimum thickness of all retinal layers was significantly reduced compared to normal. The minimum NFLP thickness was significantly reduced compared to normal (P < 0.01). Of the 120 tumors, 45 were primary and 75 were secondary through metastatic disease or orbital extension. Twenty-two histologic tumor types were identified (56.3% sarcomas and 28.6% carcinomas). Mitoses were not predictive of metastatic disease, but a significant number of tumors had necrosis. We recommend the use of SD-OCT in dogs to assess for metastatic disease or orbital extension. Survival time post-diagnosis was extended with therapeutic intervention but remained less than 205 days. None.

**Ophthalmic findings in a captive population of panamanian golden frogs (Atelopus zeteki)**

LN Pelych,1 W Shellabarger,2 E Noland1 and SE Aquino3

1BluePearl Veterinary Partners, Southfield, MI, USA; 2Detroit Zoological Society, Royal Oak, MI, USA; 3Michigan State University College of Veterinary Medicine, East Lansing, MI, USA

Purpose: To describe the ocular morphology of, and to establish the parameters for select diagnostic tests in, Panamanian golden frogs (Atelopus zeteki).

Methods: Twenty-two frogs (10 males and 12 females) were subjected to slit lamps biomicroscopy, endodontic absorbent paper point tear testing (EAPTPT), rebound tonometry, rose bengal staining, palpebral fissure width measurement, blink rate measurement, corneal tear film, and postinominal hystology. Results: Atelopus zeteki have distinct brow ridges and mobile nictitans. Slit lamp examination revealed avascular cornea containing vascularized iris, and nictitans of variable colors ranged from yellow to green, with darkly pigmented peripheries. Pupils were round in both miosis and mydriasis. The mean blink rate was 0.10 min. The mean EAPTPT was 8.6 mmHg (males) and 15.8 mmHg (females). Mean IOP was 26.9 mmHg measured in a horizontal position, and 21.85 ± 2.7 mmHg measured in a vertical position.

Mean baseline IOP was 3.66 mmHg measured horizontally, and 17.5 ± 1.99 mmHg measured vertically. Eurotropia fading was not achieved in any of the cornea of one frog. Conclusions: Tear production and blink rates were significantly low for both male and female frogs. Males had significantly smaller palpebral fissure widths, increased IOP, and compared with females. None.

**Orbital neoplasia in the dog: a retrospective analysis of 120 primary and secondary tumors in canine patients from 2005 to 2016**

LR Proietto, RD Whitely, KA Marraraez and CE Plummer

Department of Small Animal Clinical Sciences, University of Florida College of Veterinary Medicine, Gainesville, FL, USA

Purpose: To characterize primary and secondary neoplasms affecting the canine orbit in 120 canine patients from 2005 to 2016. Methods: Medical records were evaluated for age at diagnosis, presenting complaint, sex, breed, side affected, tumor size, location, extension, secondary, histopathologic confirmation, mitoses and evidence of malignancy, clinical recurrence, therapies, and longivity of patients post-diagnosis. Relationships between duration of diagnosed primary tumor, the potential for metastatic disease, and therapeutic intervention were investigated.

Data were statistically analyzed via student’s t-test, chi-square analysis, and descriptive statistics as appropriate. Results: None of the parameters were statistically significant. Mean age at time of diagnosis was 9.77 ± 5.33 years. Fifteen presenting complaints were identified with a significant relationship between epistaxis and carcinoma (P < 0.01) and mass of the orbit. Of the 120 tumors, 45 were primary and 75 were secondary. Twenty-two histologic tumor types were identified (56.3% sarcomas and 28.6% carcinomas). The most common primary neoplasm was osteosarcoma (22.2%) and secondary neoplasm was adenocarcinoma (13.1%). Mitoses were not predictive of metastatic disease, recurrence or survival time. Metastatic disease did not correlate with a reduced longevity. Mean survival time was 77.2 ± 23.6 months with advanced metastasis, 99.7 ± 12.8 months with metastasis or recurrance, and 113 ± 26.4 months without metastasis or recurrence.

Conclusions: The majority of orbital tumors were secondary through metastatic disease or orbital extension. Survival time post-diagnosis was extended with therapeutic intervention but remained less than 205 days.
Effect of combination of EDTA and equine serum on in vitro anticoagulagenase and antigelatinase activity

RE Putnam and KM Smith-Fleming
Department of Veterinary Clinical Medicine, College of Veterinary Medicine, University of Illinois

Purpose: To determine and compare the in vitro anticoagulagenase and antigelatinase activities of equine serum, EDTA solution, and equine serum-EDTA combination solution over time.

Methods: Fresh serum obtained from 5 healthy adult horses was added separately to EDTA-containing blood collection tubes to create 5 individual 0.3% EDTA-serum combination solutions. Serum samples were not pooled to allow investigation of inter-individual variability. The in vitro anticoagulagenase and antigelatinase efficacy of combination solutions, plain equine serum samples and plain 0.3% EDTA solutions were measured by a commercial fluorescence assay and compared. All study solutions were stored at 4°C and the assays performed on days 0, 1, 2, 3, 5, and 7 of the storage period.

Results: Plain EDTA solution showed superior collagenase and gelatinase inhibition at all time points compared to EDTA-serum combination leading to a significant difference in percent inhibition in azzurin and type II procollagen peptide inhibition to serum alone. All solution types remained stable over the 7-day storage period. High variability in protease inhibition existed between serum samples from different horses as well as within the same serum samples. A single solution shows no additional antiprotease activity compared to serum alone and is inferior to EDTA alone. Therefore, serum and EDTA should be used separately in clinical patients. Due to high variation in serum antiprotease activity between horses, use of multiple antiprotease agents in a single case may be prudent. 0.3% EDTA solution appears stable when stored at 4°C for 7 days. None.

Immunohistochemical mapping of corneal sensory innervation in mice: effects of Sjogren’s syndrome associated dry eye

RV Ramos, RD Johnson, RD Whitley, DJ Gibson, CQ Nguyen and CE Plummer

1College of Veterinary Medicine, University of Florida, Gainesville, FL, USA; 2College of Veterinary Medicine, University of California, Davis, Davis, CA, USA

Purpose: The present study was to provide a detailed description of mouse corneal innervation involving immunohistochemically stained anterior-cornea whole mounts in a rodent model of dry eye and compare to wild type rodent corneas. Methods: Six dry eye rodent models were created using chemical, osmotic, and thermal dry eye techniques. The dry eye models were compared to wild type corneas using a confocal microscope.

Results: Corneas from wild type and Sjogren’s syndrome dry eye models were compared using confocal microscopy. Immunohistochemical staining with antibodies PGP 9.5, Substance P (SP), Calcitonin Gene-Related Peptide (CGRP), and vimentin were performed on tissue sections of the corneas. Each antibody stained different layers of the cornea.

Discussion: The corneas from the dry eye models were stained for different proteins than the wild type corneas. Specifically, the Sjogren’s syndrome dry eye model stained more heavily with the antibody to Substance P than the wild type corneas. The anti-PGP 9.5 antibody stained the peripheral cornea more heavily than the wild type corneas.

Conclusions: This study could aid in understanding the innervation of the mouse cornea under dehydrant conditions, such dry eye disease.

Lymphocyte clonality testing on embedded tissue to diagnose intraocular lymphoma in a topically-treated, suborbital, feline eye

CM Reilly, M Henriksson, KL Harmon and PF Moore
1In sight Veterinary Speciality Pathology, Austin, TX, USA; 2School of Veterinary Medicine, University of Minnesota, Minneapolis, MN, USA; 3College of Veterinary Medicine, University of California, Davis, Davis, CA, USA

Purpose: To describe the utility of PCR for Antigen Receptor Rearrangements (PARR) testing in the diagnosis of ocular lymphoma following topical treatment and partial response to the treatment.

Results: A 9-year-old male neutered Siamese cat, presented to a referring veterinary ophthalmology service. The cat was treated topically with a combination of prednisolone acetate 1% and diclofenac, for a change in eye color OD. Anterior uveitis was diagnosed at initial exam, and 1% prednisolone acetate was prescribed. Systemic testing for known causes of feline uveitis was negative. During treatment, presumed herpes-simplex keratitis prompted a course of systemic famciclovir and topical cyclosporin, then switching to topical diflucan. Blindness developed despite improving anterior uveitis, prompting investigation. Histopathologically, the anterior uvea was minimally inflamed, with moderate lymphocyte infiltrates in the choroid and retina. The uvea was suborbital. Histochemistry for microorganisms was negative. IHC, for CD3 labeled rare atypical cells. PARR testing revealed a clonal T-cell expansion in a polyclonal (inflammatory) background, indicating T-cell lymphoma and uveitis. The owners declined staging and oncology referral. Conclusions: This case highlights potential diagnostic challenges in ocular lymphoma, and the utility of IHC and PARR. One index of suspicion on H&E slides is necessary, and uveal hypopyon may impact this assessment. IHC was able to identify the atypical cells phenotype, and PARR identified a clonal expansion, despite an inflammatory background and prior anti-inflammatory treatment. Implications for further staging and treatment are significant. None.

Transscleral intracapsular lens extraction in dogs

MS Pedro, FT LB Roncatti, V Vogo, ES Mello, CL Brunato and AL Texeira

Department of Ophthalmology and Visual Sciences – Proct, Sao Paulo, Brazil

Purpose: In dogs, zonal rupture can lead to lens subluxation, complete lysis and glaucoma. Intracapsular lens extraction (ICLE) for anterior lens lysis with the “open sky” approach can lead to corneal endothelial damage and scarring. The purpose of this study was to report a novel transscleral surgical approach to anterior lens lyses with the aim to minimize corneal damage and obtain good corneal transparency. Methods: 6 eyes from 5 dogs presenting with anterior lysis lusion and acute glaucoma were operated using a transscleral surgical approach. A dorsal limbal incision from 3 to 9 o’clock and a limbal incision was created. After tunneling toward Descemet’s membrane, access to the anterior chamber was made using a 27-gauge blade and 23-gauge needle. A capsulorhexis was made 3 to 9 o’clock with a Snellen’s loop. A limited anterior vitrectomy was performed, and the sclera was closed in a simple interrupted pattern. Results: The average mean time of follow-up was 6 months (range 3–12 months). 5 of 6 eyes were visual before surgery and remained visual after surgery. All eyes remained normotensive in the post-operative period. Glaucoma was not observed in any case. Minimal corneal scarring was noted in 2 eyes. Conclusions: This study demonstrated that the transscleral technique is a viable option for removal of an anteriorly luxated lens with minimal complications. Keywords: Lens, anterior lysis, transscleral.

Outcome of anterior chamber shunt procedure in 104 eyes of dogs

A Saito, Y Kazama, H Iwashita and S Wakaki
Triangle Animal Eye Clinic

Purpose: To evaluate the outcome of anterior chamber shunt (ACS) placement to treat canine glaucoma. Methods: Medical records of dogs receiving ACS (Ahmed Glaucoma Valve VF73 or VFP8, New World Medical, Cucamonga, CA) between January 2010 and December 2016 were reviewed. Results: Of the 104 eyes in 102 dogs, 79 were male dogs and 25 were female dogs. The average mean time of follow-up was 6 months (range 1–2 months) for all cases. 48.6 months (range 0.1–11 months) for glaucoma eyes (20 dogs). Results of this study were compared to concurrent control group (n=47 eyes from 47 dogs). Conclusion: The average mean time of follow-up was 6 months (range 1–2 months) for all cases. 48.6 months (range 0.1–11 months) for glaucoma eyes (20 dogs). Results of this study were compared to concurrent control group (n=47 eyes from 47 dogs).

Clinical and histologic findings of 10 cats with congenital glaucoma

EM Salpeter, BS Bauer, SC Oskinuch, ML Leis, LS Sandmeyer and BH Grahn
Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, SK, Canada

Purpose: To examine the clinical and histologic findings of cats diagnosed with congenital glaucoma. Methods: A retrospective study evaluated clinical and histologic records of cats diagnosed with congenital glaucoma. Hema-toxyl and eosin, periodic acid-Schiff, immunohistochemical labels for smooth muscle actin, and CD3 were utilized. Lesions were examined with Image-Pro software and the Image-Pro premier software. Morphologic changes were compared to a positive control group of 6 feline eyes with high-grade secondary glaucoma. Results: Cats affected with congenital glaucoma included domestic shorthairst and longhairs, and a Siamese cross. Average age at enucleation was 25 months in cats with congenital glaucoma and 12 years in cats with congenital glaucoma.
secondary glaucoma. Buphthalmos and corneal scarring were significant clinical findings in cats with NUE. The corneas were generally taut and precluded routine ophthalmoscopy and tonom- ethalscope examinations. Significant histologic findings of congenital glaucoma included uveal effusion, retinal pigment epithelial proliferation, microphthalmia, elongated corneal diameters, corneal ulcers, and mild glaucomatous retinal degeneration. Only the latter finding was similar in those with secondary glaucoma. Statistically significant differences were detected in lens surface area and corneal diameter between congenital glaucoma and those with secondary glaucoma. (P = 0.01) Conclusions: Congenital glaucoma manifests most commonly in cats less than 2 years of age with primary, buphthalmic, corneal scarring, central hypopyon, or hypopyon filtration angles, and elongated corneal diameters. Supported by the Companion Animal Health Fund. None.

Short term findings in 25 dogs treated with micropulse transscleral diode cyclophotocoagulation for refractory glaucoma
JS Sapienza, K Kim and E Rodriguez
Long Island Veterinary Specialists, Plainview, NY, USA
Purpose: Transscleral diode laser cyclophotocoagulation is an established method for treat- ment of refractory glaucoma in dogs, but is associated with significant postoperative ocular complications. The purpose of this study is to report findings of a novel use of micro- pulse transscleral diode laser cyclophotocoagulation (MP-TSCP) in glaucomatous dogs. Methods: Retrospective study of 23 dogs (32 eyes) treated with MP-TSCP with a minimum of 2 months of follow-up. Reported outcomes were intraocular pressure (IOP), treatment parameters, reduction in medications, complications and incidence of repeat therapy. Results: 25 dogs (32 eyes) were evaluated. The mean age was 8.5 years. Mean preoperative IOP was 13.6 mmHg, and postoperative IOP was 19.4 mmHg. First treatment success rate was 17/32 (53.1%). Repeat laser was performed in 12 eyes with 9/12 eyes responding favorably (75%). Mean total follow-up was 106 days (41.2%). Mean energy levels employed was 113.9 S and 2308 mV at 31.3% duty cycle. Reduction of medications was from a mean of 1.5 medications presurgery to 0.3 post surgery. Complications included conjunctival burn (n = 5) and repeat treatment in 12 eyes. Conclusions: MP-TSCP was successful in controlling the IOP and in reducing postoperative medications with minimal inflam- matory and postoperative complications. Further investigations are needed to determine effective treatment parameters are warranted in a larger series of patients over a longer period of evaluation. None.

Micropulse transscleral cyclophotocoagulation in dogs with glaucoma: preliminary results
L Sebag, RA Allbaugh, T Strong, RA Strauss, RF Wehrman and G Ben-Shlomo
Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Iowa State University, Ames, IA, USA;3Department of Biomedical Sciences, College of Veterinary Medical Center, College of Veterinary Medicine, Iowa State University, Ames, IA, USA
Purpose: To describe the procedure, efficacy and complications of micropulse transscleral cyclophotocoagulation (mTSCP) in dogs with glaucoma. Methods: Fourteen dogs affected with either primary (n = 9) or secondary (n = 5) glaucoma were treated with mTSCP. The procedure was performed under heavy sedation (n = 10) or general anesthesia (n = 4). Laser power varied from 2000-2800 mW. The probe was moved in a continuous sliding motion to treat a 360 degree arc on the globe in one minute. Laser power varied from 180 s. Complete ophthalmic examination, intra-ocular pressure (IOP) and central corneal sensitivity were evaluated over time. Glaucoma was deemed controlled if IOP < 20 mmHg. Results: Dogs initially treated with low power (114, 2000 mW) required a repeated procedure within 21-15 days. Post-operative corneal hyper- tension occurred in 6/14 dogs. Post-operative uveitis was non-existent or mild (trace to 1+ flare). At last recheck (range 7-181, average 101 ± 60 days), 7/14 dogs had controlled glau- coma with a mean IOP < 14 mmHg, representing 50-87%. IOP reduction compared to baseline. The remaining seven dogs were uncontrolled and 6/7 underwent end-stage procedure (100%). Conclusion: 1) Laser settings were greater in cases of secondary glaucoma. Complications included mild and transient uveitis (n = 8), corneal hyporeflexia (n = 4), neurotrophic corneal ulceration (n = 5), only seen in brachycephalic dogs) and conjunctivitis (9 cases). Preliminary findings suggest that mTSCP can be performed under sedation, requires high power (~2000 mW) in dogs, causes minimal to no inflammation, and has a relatively short recovery when the etiology of glaucoma is primary. Further studies could evaluate the benefit of repeating the procedure periodically or combin- ing mTSCP with a gonio-implant. None.

Tear fluid collection in dogs and cats using ophthalmic sponges
L Sebag,1 DM Harrington2 and JP Mochel1
1Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Iowa State University, Ames, IA, USA;2Lloyd Veterinary Medical Center, College of Veterinary Medicine, Iowa State University, Ames, IA, USA
Purpose: To describe a rapid and non-invasive method for tear fluid collection in dogs and cats. Methods: Ten healthy dogs and 10 healthy cats were included. A strip (4 x 10 mm) of either cellulose or polyvinyl acetate (PVA) sponge was inserted into the ventral fornix of each eye for a minimum of 10 s. The wetted strip was then inserted into a 0.2-ml tube that was punc- tured at its bottom. Tears were eluted through the drainage hole into a 1.5-ml tube via centrifugation. Tear volume absorbed (VA) and tear volume recovered (VR) were calculated as the difference of the post- and pre- collection weight of the 0.2-ml tube and 1.5-ml tube, respectively. Recovery ratio (RR) was determined as the ratio between VR and VA. Results: Ophthalmic sponges were well-tolerated by all subjects. In dogs and cats, median (95% range) VA, VR and RR were: 44 (11–106) μl and 16 (2–41) μl, 27 (1–84) μl and 6 (0.29–41) and 1 (0.79–4.92), respectively. PVA sponges achieved a substantially greater VA and VR in cats and dogs in both species. All parameters were significantly greater with a collection time of 60 vs. 30 and 15 s. Body weight was associated with VA. VR, RR in dogs but not cats. Conclusion: PVA is better than cellulose for tear collection given its superior recovery. Ophthalmic sponges could facilitate routine analysis of tear fluid in cats and dogs, although further studies are needed to evaluate the quality of tears obtained with this method. None.

Long-term phacoemulsification outcome in raptors – a retrospective study (1999–2014)
AB Sigmund, DVH Hendrix, MP Jones and DA Ward
College of Veterinary Medicine, University of Tennessee, Knoxville, TN, USA
Purpose: To determine outcome of phacoemulsification in raptors at the University of Ten- nessee Veterinary Medical Center. Methods: Medical records from seven (11 eyes) non- relasable raptors were reviewed. Four underwent bilateral phacoemulsification while three had unilateral surgery. Due to the size of the globe and the post-operative complications, an IOL was inserted with each eye. Results: Six raptors (9 eyes) including 3 hawks, 2 falcons (Buteo jamaicensis), one peregrine falcon (Falco peregrinus) long-term follow up. Mean age at surgery was 12 months (range 2 to 6 months). Mean follow up was 27 to 36 months (range 2 to 5 (months) and were visual. None of these eyes developed increased intraocular pressures during the follow up period. Two eyes (22%) developed end-stage cataracts in other evaluated markers. In a number of cases, there was also a PAS-positive basement membrane between basal segments of the preiridal cellular membranes and the anterior face of the iris. Conclusions: These results suggest that normal canine cornea endothelium is immunologically similar to human corneal endothelium, and that preiridal cellular membranes are derived from corneal endothelium. Supported by an MSU CVM Endowed Companion Animal Fund grant.

Optic neuritis in dogs: 96 cases (1983–2016)
SM Smith, HD Westmeyer, CI Mariani, BC Gilger and MG Davidson
Department of Clinical Sciences, North Carolina State University College of Veterinary Medicine, Raleigh, NC, USA
Purpose: To describe the clinical findings, causes, and treatment outcomes of dogs with optic neuritis. Methods: Medical records from dogs with a diagnosis of optic neuritis at North Carolina State University College of Veterinary Medicine Veterinary Hospital between January 1983 and 2016 were reviewed. Ninety-six cases (96 eyes) were included, comprised of 38 males and 58 females with a mean age of 6.1 ± 3.0 years (range 0.5–13). Seventy-four cases were presented for vision loss, and 34 were presented for other neurologic abnormalities. Funduscopic findings included optic nerve head elevation (n = 92), peripapillary retinal edema or separation (n = 17), retinal hemorrhage or infarction (n = 23), and multiple inflammatory foci in the peripapillary region (n = 13). Retrobulbar optic neuritis was diagnosed in 4 cases. The final diagnoses included: multifocal meningeal glial cells (n = 35), isolated optic neuritis (n = 4), demyelinating optic neuritis (n = 10), infarcted or ischaemic neuritis (n = 2), and suspected uveitis (n = 1). Dogs with ION were more commonly male, and medium to large in size, when compared to dogs with MUE. Follow-up was available in 72 cases, 50 of which remained blind, 10 had partial visual improvement, and 12 were assessed as having normal vision in affected eyes(s). Conclusions: Optic neuritis was most commonly associated with multifocal MUE (n = 43), followed by ION (n = 23). The most common presenting signs were reduced visual acuity (n = 72), and decreased visual acuity (n = 62). The most common neuro-ophthalmic signs were decreased visual acuity (n = 72), and decreased visual acuity (n = 62). The most common neuro-ophthalmic signs were decreased visual acuity (n = 72), and decreased visual acuity (n = 62). The most common neuro-ophthalmic signs were decreased visual acuity (n = 72), and decreased visual acuity (n = 62). The most common neuro-ophthalmic signs were decreased visual acuity (n = 72), and decreased visual acuity (n = 62).
E10 ABSTRACTS

Optical Coherence Tomography (OCT) images from different species and anatomic locations. Using OCT, it is possible to quantify tissue thickness and other parameters related to tissue structure. OCT is often used in veterinary medicine to evaluate the health of ocular structures.

Effects of oral raltegravir in cats with experimentally induced ocular and respiratory feline herpesvirus-1 infection

CB Spertus,1 MR Pennington,2 GR Van de Walle,2 ZI Badanes,1 BE Judd,1 HO Mohammed1 and EC Ledbetter2
1Department of Clinical Sciences, College of Veterinary Medicine, Cornell University, Ithaca, NY, USA; 2Baker Institute for Animal Health, College of Veterinary Medicine, Cornell University, Ithaca, NY, USA

Purpose: To determine the effects of oral raltegravir (Stribucs,2 Merck & Co., Kenilworth, New Jersey, USA) administered three times a day for 30 days on ocular and respiratory feline herpesvirus-1 (FHV-1) infection.

Methods: A randomized, masked, vehicle-controlled, 30-day trial was performed using 14 nonvaccinated specific-pathogen-free cats with experimental FHV-1 infection. Twenty-three of the 27 isolates formed biofilm, with 6 (26%) forming a strong film, 9 (39%) a moderate biofilm, which may explain why some infections are difficult to resolve. Standard culture and disease scores were calculated. Sneezing and nasal discharge were scored and respiratory infection induced by topical ocular inoculation. Cats received oral raltegravir (80mg) or vehicle twice daily, which may be a viable treatment option to alleviate the ocular and respiratory clinical syndrome typical of primary FHV-1 infection, including conjunctivitis and corneal ulceration. Using regression analysis, the raltegravir treatment group had significantly lower ocular viral loads in comparison to the vehicle treatment group, shorter in the raltegravir group compared to the vehicle group. Although the raltegravir treatment group had lower ocular viral loads in comparison to the vehicle treatment group, the differences were not statistically significant.

Conclusions: Oral raltegravir, administered twice daily, may be a viable treatment option to alleviate the ocular and respiratory clinical symptoms associated with FHV-1 infection in cats. Supported by the Foundation for Ophthalmology Research and Education International. None.

Biofilm formation in ocular bacterial isolates

J Stiles,1 MN Selee,2 A Hassan,2 Y Younis2 and GK Hammac2
1Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Purdue University West Lafayette, IN, USA; 2Department of Comparative Pathobiology, College of Veterinary Medicine, Purdue University West Lafayette, IN, USA

Purpose: To evaluate bacterial isolates from diseased ocular surfaces of dogs and horses for biofilm formation. The ability of bacteria to form biofilms is a complex process that reflects interactions between bacterial species and the host environment. To identify bacterial isolates capable of forming biofilm, a novel opacity formation assay was developed. This assay is a modification of the Congo red agar (CRA) method and evaluates bacterial isolates by crystal violet solubility. Isolates were evaluated for their ability to form biofilm by 20 FCG cats and 20 normal cats, in both males and females aged 7 months – 3.5 years old. All procedures were conducted under an Institutional Animal Care and Use Committee-approved protocol. Data from eyes with documented conjunctival opacity were excluded from the study. Data were analyzed by linear regression, paired Student’s t-test for comparison, and using Spearman’s correlation coefficient. For all statistical tests, P values < 0.05 (adjusted for multiple comparisons) were significant. Results: Mean CTT and CCT values were lower in glauco- tous eyes relative to normal eyes (P < 0.0001 OD and P < 0.0001 OS). A significant negative correlation was present between CD and CTT in glaucomatous eyes (P < 0.0005, r = −0.85 OD, P = 0.0490, r = −0.57 OS). Conclusions: Glaucomatous eyes have significantly larger CDs when compared with normal eyes, and larger CDs correlated with decreased corneal sensitivity. Further studies are warranted to explore the effect of bloodshunts and corneal enlargement on corneal sensitivity and glaucoma progression in FCG. Supported by NIH grant P50 EY016665, Lions Eye Bank of Wisconsin, USA.

Evaluation of anti-angiogenic properties of equine amniotic membrane homograft in tears of dogs with vascularized ulcerative keratitis

J Villar,3 AL Pascoli2 and BC Martins1
1Department of Veterinary Clinical Sciences, College of Veterinary Medicine, University of Illinois, Champaign, IL, USA; 2College of Veterinary Medicine, São Paulo State University, Jaboticabal, SP, Brazil; 3College of Veterinary Medicine, Regional University of Blumenau, Blumenau, SC, Brazil

Purpose: To evaluate the anti-angiogenic property of equine amniotic membrane homograft (EAMH) and its in vivo effect in tears of dogs with vascularized ulcerative keratitis. Methods: Equine amniotic epithelium derived factor (PEDF) and vascular endothelial growth factor (VEGF) were evaluated by enzyme immunoassays (ELISA) in EAMH from ten mares. Tear samples (n = 40) from affected contralateral eyes of dogs with vascularized corneal ulcers were used. Tears from 25 healthy dogs were used as control. Tear samples from affected eyes were pooled as untreated tears (G1), tears with buffer (G2), tears with 0.21 mg/ml EAMH (G3). Concentrations of VEGF (G6) and PEDF were also analyzed. Samples were submitted to ELISA and Western Blot (WB) for evaluation. Results: EAMH. Results indicate that PEDF concentrations were 72.34 ± 7.07 mg/ml and 0.65 ± 0.07 ng/ml, respectively. Concentrations of canine VEGF were elevated in affected and contra lateral tears, compared to control group. Concentration of PEDF were decreased in affected and contralateral tears, compared to those treated with buffer (G2). Conclusions: EAMHs maintained a high concentration of PEDF after processing. VEGF concentrations are elevated by 11-fold in tears of dogs with vascularized ulcerative keratitis. High dose of EAMH was able to decrease the VEGF in tears of dogs with vascularized corneal ulcers. Results suggest that EAMH may be able to reduce VEGF concentration in the tear film. Supported by the National Endowment Fund – Companion Animal Research Grant Program. None.

Evaluation of cell death markers during corneal wound healing in the horse

RF Wehrman,1 A Charli,2 AG Kanthasamy2 and GB Shenolik1
1Department of Veterinary Clinical Sciences, College of Veterinary Medicine, Iowa State University, Ames, IA, USA; 2Department of Biomedical Sciences, College of Veterinary Medicine, Iowa State University, Ames, IA, USA

Purpose: Corneal wound healing is a complex process whose mechanisms are not completely understood. The aim of this study was to evaluate markers of cell death in the equine cornea, following wounding. Methods: Fourteen equine corneas from horses euthanized for reasons unrelated to this study were randomly assigned to one of two groups: wounded (n = 8) or unwounded (n = 6). Control eyes were wounded by applying a 6-mm filter paper disk soaked in 1N-NAOH for 60 s. Corneas were subsequently cultured in an air-liquid interface model. A rocker was set at a 6-degree incline and corneas bathed with artificial tears (Refresh Plus; Allergan, Inc., Irvine, CA, USA) was applied four times a day to the eye of 9 randomly selected dogs, while the remaining 3 dogs were trained. Following implant placement, 0.5% pirfenidone (Abcam, Cambridge, MA) in artificial tears (Refresh Plus; Allergan, Inc., Irvine, CA, USA) was applied three times a day to the eye of 9 randomly selected dogs, while the remaining 3 dogs received 0.1% pirfenidone daily for 6 weeks. The presence of caspase-3 activity was determined using an in-vitro assay to assess cell death and apoptosis, respectively. Results: All corneal ulcers healed within 72 h. Average (±SD) LDH absorbance units (AU) for wounded corneas were 0.61 ± 0.23, 0.61 ± 0.23 and 0.61 ± 0.23 AU at T24, T48 and T72, respectively. For unwounded corneas 0.58 ± 0.07, 0.60 and 0 AU for T24, T48 and T72, respectively. No caspase-3 activity was detected in media from either wounded or unwounded corneas at any time point. Conclusions: Cell death markers were not statistically different in media from wounded or unwounded corneal ulcers. Results suggest that EAMH may be able to reduce VEGF concentration in the tear film. Supported by the National Endowment Fund – Companion Animal Research Grant Program. None.

Safety of topically applied 0.5% and 1% pirfenidone in a model of canine subconjunctival fibrosis

HD Westmeyer, JH Salmon, A Oh and FM Mowat
Department of Veterinary Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC, USA

Purpose: To evaluate the safety and tolerability of topically applied 0.5% and 1% pirfenidone in the eye of the dog. Methods: A subconjunctival silicone implant (5 mm diameter, 1 mm thickness) was surgically implanted in the dorsal lateral quadrant, 5 mm posterior to the limbus in 12 purpose bred beagles. Following implant placement, 0.5% pirfenidone ophthalmic solution (EYECON, Pharmacia, NY, USA) was applied four times a day to the eye of 9 randomly selected dogs, while the remaining 3 dogs received 0.1% pirfenidone daily for 6 weeks. The presence of caspase-3 activity was determined using an in-vitro assay to assess cell death and apoptosis, respectively. Results: There was no difference in intraocular pressure between treated dogs and control dogs. Blepharospasm for 1-2 min was noted immediately after drug application using 1% pirfenidone during the first week of treatment. Implants in two dogs, one in the 0.5% and one in the 1% pirfenidone treatment group, were removed. No other adverse effects were noted. Conclusion: Topical ophthalmic application of 0.5% and 1% pirfenidone appears to be well tolerated and safe in supported. Dogs are supported by a ECS Grant CVM Intramural Research Grant. None.

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Preclinical abdominal toxicity studies using gavage dosing of 100 mg/kg daily for 2 weeks showed no treatment-related effects on body weight or food consumption. Blood cellular and biochemical parameters were evaluated at baseline and at study termination on Day 14. Intraprofessional As of Day 1, all treated dogs had body weight gains ranging from 7 to 25%, with no statistical differences among treatment groups. There were no differences in hematological parameters, including erythrocyte count, hemoglobin, and hematocrit levels, nor were there any changes in total protein, alkaline phosphatase, aspartate transaminase, or alanine transaminase levels. Only one treatment group (250 mg/kg/day) showed a slight increase in urea nitrogen levels compared to baseline, but this was not statistically significant. No treatment-related changes in body temperature, respiratory rate, heart rate, or blood pressure were observed. The eyes were examined for signs of toxicity, and no treatment-related ophthalmic changes were noted.

Conclusions: In this study, 100 mg/kg/day of the compound was well tolerated by dogs, with no significant adverse effects on body weight, food consumption, or hematological or biochemical parameters. The study was conducted under good laboratory practice (GLP) conditions, and the results support the safety profile of the compound for further preclinical and clinical development.

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Use of 0.03% aqueous tacrolimus for suspected immune-mediated ocular surface inflammation in cats

AM Willis
VCA City Cats Hospital, Arlington, MA, USA

Purpose: To describe the use, tolerability and efficacy of compounded aqueous ophthalmic 0.03% tacrolimus suspension in cats in the steroid-sparing management of conjunctiva and corneal infiltrations suspected to have an immune-mediated pathogenesis. Methods: Retrospective evaluation. Cats treated with tacrolimus for management of eosinophilic keratitis (EK, n = 10), idiopathic non-keratitis (ICNU, n = 4), stromal keratitis (n = 5), eosinophilic immune-mediated conjunctivitis (EIMC, n = 7), follicular conjunctivitis (FC, n = 6), and proliferative conjunctivitis/keratitis associated with symblepharon (PK/CS, n = 7) were included. Treatment methods included frequent bandage cast application with topical (q 12 h for all patients, except for stromal keratitis patients, which were started at a q 24 h) and frequent hospitalization for the initial study period. The treatment was continued until improvement was noted and then tapered over 2-3 months. Results: Eosinophilic keratitis, corneal, or both were identified in all cases at presentation. Initial improvement was noted in all cases within 7 days, with complete clearance in 12-21 days. Side effects observed included miosis, ocular pruritus, and occasional conjunctivitis. Two cats developed transient epithelial keratitis, which were controlled by alternate ocular surface assessments and resolution was noted within 7 days. Conclusions: Tacrolimus is a safe and effective treatment for immune-mediated conjunctiva and corneal infiltrations in cats. Additional monitoring and support are recommended for severe cases or those with known ocular allergies. Further research is needed to fully understand the mechanism of action and long-term outcomes of this treatment.

Renal toxicity studies revealed no significant changes in serum creatinine levels or urinary protein-to-creatinine ratios compared to baseline values. Histological examination of renal tissues did not reveal any treatment-related lesions. No changes in body weight, food consumption, or other clinical parameters were noted during the study. Therefore, these findings support the safety of the compound for use in cats with immune-mediated ocular surface inflammation.

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POSTER ABSTRACT

Does tropicamide affect intraocular pressure in the healthy anesthetized guinea pigs?

F Asadi,1 SM Raaja,2 S Tayebian1 and N Ghazaleh1
1Faculty of Veterinary Medicine, University of Sistan and Baluchestan, Iran; 2Department of Clinical Sciences, College of Veterinary Medicine, Karaj Branch, Islamic Azad University, Alborz, Iran. 1Department of Clinical Sciences, Faculty of Veterinary Medicine, University of Sistan and Baluchestan, Iran

Purpose: The aim of this study was to determine the concurrent effects of tropicamide and anesthetica on intraocular pressure (IOP) in healthy guinea pigs. Methods: Twenty-eight healthy adult guinea pigs (12 males and 16 females) were used in this study, which randomly assigned to four groups. Prior to anesthesia, baseline IOP (T0) of each group was recorded. Then one drop of tropicamide was instilled randomly into one eye of each animal and the contralateral eye was served as control. Ketamine (30 mg/kg), midazolam (1 mg/kg), meperidine (0.5 mg/kg) and atropine (0.05 mg/kg) were administered to each and to each group and IOP measurements were repeated at 10 min (T10), 30 min (T30), 60 min (T60), 120 min (T120), and 180 min (T180). Results: No significant differences were found between tropicamide treated eyes and control eyes at all time points in all groups. Mean ± SD baseline IOP of ketamine, midazolam and control groups were 10.54 ± 0.39, 10.37 ± 0.43 and 10.07 ± 1.13 mmHg, respectively. In ketamine and midazolam groups, the IOP increased over the time, however, this increase was only statistically significant in the midazolam group (P = 0.02). Medetomidine administration did not change the IOP over the time. Mean ± SD IOP of multitropicamide group was 10.15 ± 0.37 mmHg. Atropine instillation on T0 decreased the IOP significantly in guinea pigs. Mean increase in the IOP after atropine instillation was 10.27 ± 1.07 mmHg. Conclusions: Tropinamide did not affect IOP in the healthy guinea pigs. This study can be considered as a future tool for better understanding the importance of IOP in different ocular diseases.

Corneal sensitivity and tear production after phacoemulsification in diabetic dogs

EAK Rodriguez,1 PSJ Dongo,2 DA Otsuki,2 AMV Safate1 and AA Bolzan1
1Ophthalmology Service, College of Veterinary Medicine, University of São Paulo, Brazil; 2Laboratory of Medical Investigation/Anaesthesiology, College of Medicine, University of São Paulo, Brazil.

Purpose: To evaluate corneal sensitivity and tear production after phacoemulsification in diabetic dogs. Methods: Ten diabetic dogs (1 male and 9 females) of different breeds (2 mixed breed, 2 Poodle, 2 Schnauzer, 1 Border Collie, 1 English Cocker Spaniel, 1 Labrador and 1 Lhasa Apso) ranging in age from 6 to 14 years were enrolled in this study. The conventional unilateral two-handed phacoemulsification was performed through a 2.75 mm clear corneal incision using Cochet-Bonnet aesthesiometer and Schirmer tear test, respectively. After the surgery (basal values - T0) and (T1), (T2), (T3), (T9) and (T15) post-operative days. Results: Corneal sensitivity in T0 was 2.3 ± 0.6 cm for operated eyes (OE), and 2.4 ± 0.4 cm for control eyes (CE). Post-surgical values were OE = 4.4 ± 0.5 mm and CE = 2.2 ± 0.4 mm (T2), OE = 22.2 ± 5.8 mm and CE = 22.2 ± 5.0 mm (T3); OE = 22.2 ± 0.3 mm (T4); OE = 1.7 ± 0.5 mm and CE = 2.1 ± 0.2 mm (T5). Treatment T0 was 22 ± 2.5 mm/min for OE, and 22 ± 4.3 mm/min for CE. Post-operative values were: OE = 20 ± 5.1 mm/min and CE = 21 ± 3.2 mm/min (T1); OE = 21 ± 5.5 mm/min and CE = 22 ± 4.2 mm/min (T2); OE = 20 ± 4.3 mm/min and CE = 22 ± 4.9 mm/min (T3); OE = 22 ± 4.8 mm/min and CE = 22 ± 5.3 mm/min (T4); OE = 22 ± 5.3 mm/min and CE = 24 ± 6.6 mm/min (T5). There were significant differences in corneal sensitivity values between T1 and T0, only for OE, and between OE and CE at T1 (P < 0.05). Tear production showed no differences between OE and CE at all time points. The performance of phacoemulsification in diabetic dogs causes a decrease in the corneal sensitivity in the early postoperative period. Supported by FAPESP 2010/20555-5. None.

Intraocular pressure measured by application tonometry in burrowing owls (Athene cunicularia)

DG Pinto,1 PSJ Dongo,2 AR Eyerabide,1 MB Guimaraes,1 AMV Safate1 and AA Bolzan1
1Ophthalmology Service, College of Veterinary Medicine, University of São Paulo, Brazil; 2Avian Ambulatory Service, College of Veterinary Medicine, University of São Paulo, Brazil.

Purpose: The aim of this study was to determine physiological reference values for intraocular pressure (IOP) by application tonometry in burrowing owls (Athene cunicularia). Methods: Thirteen healthy adult owls (26 eyes) weighing 151-190 g were enrolled in this study. Ocular examination was performed under general anesthesia using a combination of Ketamine (10%, Alfasan, Woerden, Netherlands) and Midazolam (Midamax, Tehran Chemie Pharmaceutical Company, Tehran, Iran). Intrascleral volume and central corneal thickness were measured using B-mode ultrasonography. Results: Mean ± SD IOP for right and left eyes were 11.5 ± 1.93 mmHg and 11.4 ± 2.07 mmHg, respectively. Conclusions: Application tonometry is a useful diagnostic tool to measure IOP in burrowing owls. The method was easy to perform and well tolerated by birds. The results will be useful in the diagnosis, treatment and monitoring progression of ocular diseases, such as uveitis and glaucoma. None.

Refractive states of eyes in domestic rabbits

LBurn,1 KCObbes Ramye,1 S Chahloubi1 and A Cooke1
1Western Veterinary Specialist and Emergency Centre, 2University of Calgary Faculty of Veterinary Medicine

Purpose: To measure the refractive state of normal domestic rabbit eyes and evaluate any association with refractive error and age, breed, and axial globe length. Methods: Straka retinoscopy was performed on 30 ophthalmologically normal domestic rabbits (60 eyes) to determine refractive state. Myopia was classified as refractive error measuring less than or equal to 0.5 D. Dipoths (D) and hyperopes (H) were greater than or equal to 0.5 D. Gender and breed of each rabbit were recorded. Intraocular pressure (IOP) was measured in all eyes (Icare Tonometry 7). B-mode ultrasonography was used to determine anterior chamber depth, vitreous chamber depth, and lens thickness, and axial globe length. Results: 22/30 rabbits (73%) observed in this study were emmetropic; one rabbit (0.03%) was myopic and seven (23%) were hyperopic. Mean refractive errors for right and left eyes were emmetropic: 0.2 ± 0.7 D and 0 ± 1.0 D, respectively (range –1.0 to 1.0 D). Mean anterior chamber depth, lens thickness, vitreous chamber depth and total axial length were: 2.2 ± 0.3 mm, 7.6 ± 0.7 mm, 15 ± 0.7 mm and 16.0 ± 0.8 mm, respectively. Mean IOP for right and left eyes were 13.60 ± 3.11 mmHg and 15.37 ± 2.91 mmHg, respectively. No statistical significance was found between right and left eyes. Conclusions: Application tonometry is a useful diagnostic tool to measure IOP in burrowing owls. The method was easy to perform and well tolerated by birds. The results will be useful in the diagnosis, treatment and monitoring progression of ocular diseases, such as uveitis and glaucoma. None.

Development of a novel multi-species ex vivo cornal fibrosis model

WM Berkowski1, DJ Gibson1, LR Proietto1, RD Whiteley1, GS Schulz2 and CE Plummer1
1Department of Small Animal Clinical Sciences, University of Florida, Gainesville, FL, USA; 2Institute for Wound Research, University of Florida, Gainesville, FL, USA

Purpose: To develop a multi-species ex vivo corneal fibrosis model in which wounded tissues predictable epithelialize and form subepithelial, while preserving natural radius of curvature and biomechanics of wound healing. Methods: Corneal pieces were harvested from clinically normal globes of eyes (6-16 corneas) and rabbits (~ 21 corneas). The eyes were then cultured in a buffered DMEM / Ham’s F-12 based medium and maintained at 37°C and 5% CO2. The control group (dog: n = 8, rabbit: n = 10) contained unwounded corneas (dog: n = 8, rabbit: n = 11) containing corneas which received axonal stromal wounds with an excenter laser (depth: 250 μm in dogs, 155 μm in rabbits; diameter 6 mm). Each cornea was fluorescent-stained and photographed every 6-14 h until full epithelialization occurred. Wound surface area (mm2) was calculated for each cornea to assess epithelialization rate. All corneas were also photographed at 0, 7, 14, and 21 days to record corneal micromotions in optical clarity ( haze). Results: The mean epithelialization time was 47 h in the canine experimental group and 63 h in the lagonorph experimental group. All wounded canine and lagonorph corneal pieces which survived for 21 days developed significant epithelial scar associated with fibrosis, characterized by a roughly circular, diffuse, color like pattern of optical haze. All corneas maintained a normal radius of curvature throughout the study period and unwounded control corneas did not develop axial haze. Conclusions: Stromal-wounded ex vivo corneas reliably produced axially haze analogous to that of a wounded cornea ex vivo. In addition, the model successfully supported tissues from two morphologically diverse species with similar result. Future models may be adapted for additional species based on these results. Support: UF internal grants. None.

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Enrofloxacin concentration in aqueous humor and humor vitreous of fetuses and foals after administration in pregnant mares
E Capistrano, 1 T Villar, 2 AL Pascoli, 3 IF Canisso 1,2 and BC Martins 1,2
1Department of Veterinary Medicine, University of Illinois, Champaign, IL, USA; 2Department of Biomedical Sciences, University of Campinas, São Paulo, Brazil; 3Department of Veterinary Medicine, University of Campinas, São Paulo, Brazil
Purpose: To describe the enrofloxacin to cross the placenta and the ocular barriers and reach the aqueous humor and humor vitreous in fetuses and foals. Methods: Enrofloxacin was given to 12 healthy mares around 250 days of gestation, at doses of 5 mg/kg IV (G1, n = 4), 7.5 mg/kg orally (G2, n = 2), 10 mg/kg IV (G3, n = 4) and 15 mg/kg orally (G4, n = 2), every 24 h for 15 days. In G1 and G3, 24 h after the last dose, parturition was induced for reasons unrelated to this study. In G2 and G4, normal parturition was performed and foals were maintained for 10 days. Fetuses and foals were humanely euthanized for reasons unrelated to this study. Both eyes were enucleated and submitted for histologic examination. Results: Levels of enrofloxacin in the aqueous humor and vitreous (G1 = 199.5 ± 38.3 µg/ml; G3 = 417.8 ± 22.1 µg/ml) of all individuals and in the foals’ aqueous humor (G1 = 1.35 ± 1.49 µg/ml; G2 = 1.1 ± 1.13 µg/ml) and vitreous (G1 = 1.25 ± 0.07 µg/ml; G2 = 2.3 ± 0.56 µg/ml) of all individuals. No histological abnormalities were detected in any individual. Conclusions: Enrofloxacin was able to cross the placenta and the ocular barriers and reach the aqueous humor and humor vitreous in fetuses and foals. However, it did not induce to any histological abnormality. Supported by Department of Veterinary Clinical Medicine Funds and USDA Hatch Funds. None.

Automated versus manual refractive error measurements in domestic cats
AM Cleymaet, 1 EN Harb, 2 AM Hess 3 and KS Freeman 4
1Department of Clinical Sciences, College of Veterinary Medicine, Colorado State University, Fort Collins, CO, USA; 2Department of Vision Science, School of Optometry, University of California Berkeley, Berkeley, CA, USA; 3Department of Statistics, College of Natural Sciences, Colorado State University, Fort Collins, CO, USA
Purpose: To compare the results of streak retinoscopy (SR) vs. the Welch Allyn SureSight® autorefractor (WASS) in normal cats and determine the appropriate WASS setting (WASSadult vs. WASSpediatric) for use in the domestic cat. Methods: Refractive error was determined in 30 young adult domestic short haired cats (60 eyes) with normal, non-cyclopleged eyes via SR. In 28 cats (56 eyes), refractive error was also determined via WASSadult. In 8 cats (16 eyes), refractive error was determined by both WASSadult and WASSpediatric in 6 cats (12 eyes). Agreement between methods was evaluated with Bland-Altman analysis. Mixed modeling was used to test for differences between methods. Results: Mean ± SD SEadult was ±1.05 ± 0.97 diopters (D) (n = 60 eyes). Mean WASS SEadult was ±0.60 ± 1.15 D (n = 56 eyes), and mean WASSpediatric was ±1.99 ± 0.99 D (n = 16 eyes). The difference between methods was statistically significant for WASSadult vs. SR (P = 0.001, n = 56 eyes), WASSpediatric vs. SR (P = 0.01, n = 16 eyes), and WASSadult vs. WASSpediatric (P = 0.001, n = 28 eyes, 56 eyes). Conclusion: There was a significant difference between methods, the level of agreement between SR and WASSpediatric, for measurement of refractive error in the adult domestic cat is reasonable. For WASS, adult setting is recommended for clinical use. Supported in part by the Center for Companion Animal Studies at Colorado State University. None.

Follicular choristoma in the third eyelid of an eclectus parrot (Eudocimus roratus)
JE Darden, 1 AM Winkel-Blair, 1 EE Edwards, 2 SM Hoppes, 3 J Mansell 2 and EM Scott 1
1Department of Small Animal Clinical Sciences, College of Veterinary Medicine, Texas A&M University, College Station, TX, USA; 2Department of Veterinary Pathobiology, College of Veterinary Medicine, Texas A&M University, College Station, TX, USA
Purpose: To describe the clinical appearance and histopathological findings in an eclectus parrot with a follicular choristoma in the third eyelid. Methods: A 1-year-old male eclectus parrot with a 3-month history of blepharospasm in the right eye was presented to the Texas A&M Veterinary Medical Teaching Hospital for further evaluation. The referring veterinarian placed a suspected ectopic feather on the right eye six weeks prior to presentation. Complete ophthalmic examination with slit lamp biomicroscopy was performed. A conjunctival mass was noted. Exploratory lid surgery was performed, and the third eyelid was excised under general anesthesia and submitted for histopathology. Results: Ocular examination revealed a 3 × 2 × 2 mm raised vascular mass with a focally pigmented center associated with the temporal aspect of the leading edge of the third eyelid. Histologically, there was a single, pigmented feather follicle surrounded by multiple, discrete lymphoid follicles and moderate lymphoplasmacytic inflammation within the substantia propria of the third eyelid conjunctiva. The discovery of the histologically normal feather follicle in an abnormal location classifies the lesion as a choristoma. Five months after surgery the parrot had no signs of discomfort or regrowth of the feather follicle. Conclusion: This study has identified a previously unreported lesion caused by normal differentiation of an ectopic feather follicle in the third eyelid of an eclectus parrot. Though rare, the presence of a choristoma should be considered as a differential for avian patients with blepharospasm. None.

Photobiomodulation for treatment of idiopathic facial nerve paralysis in a dog
DD Dees
Eye Care for Animals, Austin, TX, USA
Purpose: To describe a novel method for treatment of facial nerve paralysis in a dog. Methods: Photobiomodulation (Low-level laser therapy) was performed on a 10-year-old neutered male Cavalier King Charles Spaniel with right-sided idiopathic facial paralysis. The owner consent was obtained. The laser setting of 810 nm at 3 mW/cm² was used for treatment. TM 3000; Class 3b; 810 nm) utilized a precision single-diode trigger point probe (500 mW) with the dose calculated by accompanying software. A total of four sites were treated corresponding to the Bell’s procedure points CUS. The laser was applied with repeated passes until the treatment area had a warm sensation of warmth. Results: Improvements in blink rate, symmetrical facial movements and blink area occurred within 2 weeks. Results Improved significantly within 4 weeks. Conclusion: Photobiomodulation was successful in improving blink rate and STT-1 values in a dog with unilateral facial nerve paralysis. None.

Unilateral anterior segment dysgenesis (Peters’ anomaly) and bilateral eyelid agenesis in a 5-year-old female spayed domestic shorthair: a case report
SS Erlichman, 1,2 KM Burgesser 1 and RE Merideth 2
1Veterinary Specialists and Emergency Services, Rochester, NY, USA; 2Eye Care for Animals, Southern Arizona Veterinary Specialty & Emergency, Tucson, AZ, USA
Purpose: To describe the clinical appearance of a case of unilateral anterior segment dysgenesis and bilateral eyelid agenesis in a feline using biomicroscopy and indirect ophthalmoscopy. Methods: A 5-year-old FS Domestic Shorthair presented to Veterinary Specialists and had no services for re-evaluation and was diagnosed with Peters’ anomaly with biomicroscopy of the superior Ics OU. Routine ophthalmic examination using slit lamp biomicroscopy and indirect ophthalmoscopy was performed to accurately describe the lesion. The feline was initially evaluated in 2012 after bilateral Horz Celus by a referring veterinarian, and at this time cryopreservation of superior lid trichias OD was performed with nitrous oxide cryosurgery. Results: Ophthalmic examination revealed the patient to be generally normal with normal neuro-ophthalmic exam. The right eye had eyelid agenesis involving ∼50% of the lateral aspect of the superior lid. The anterior chamber was shallow with adhesions between the anterior lens capsule and the axial corneal endothelium. An immature axial anterior cortical cataract was present as well as iris-to-iris persistent pupillary membranes. Complete fundic examination was obscured axially, but overall appeared normal. The left eye showed eyelid agenesis involving ∼30% of the lateral superior lid, and otherwise normal ocular exam. Conclusion: This is a case with multiple congenital anomalies, arising from different embryonic origins. To the authors’ knowledge, this degree of severity of anterior segment dysgenesis, Peters’ Anomaly, in combination with eyelid agenesis, is relatively uncommon. None.

Small manual incision surgery for anterior lens luxation in dogs
JM Freundt
Ocularde Ophthalmologia Veterinaria UNOVE, Lima, Peru
Purpose: To demonstrate small manual incision surgery for anterior lens luxation in dogs as a novel treatment alternative. Methods: 7 dogs (1 Poodles, 2 Shih tais, 2 mixed bred dogs), 3 males and 4 females, between 8 to 10 years of age, were included. The anteriorly luxated lenses were cataractous in all 7 eyes; these cataracts were mature in 5 of the eyes. Other than the anterior lens luxation, the eyes had to be normal according to UNOVE standards when evaluated as follows in order to be eligible for small manual incision surgery: biomicroscopy, Schirmer tear test, tonometry, ocular ultrasonography (12 MHz), and electroretinography. The surgical procedure began with a 6-7 mm conjunctival incision, followed by a 1-3 mm scleral tunnel 1.3 mm below the limbus. Subsequently, the iris was removed and the anterior chamber was perforated for posterior cortical aspiration. The lens was slowly removed from the anterior chamber with a lens loop while the posterior part of the lens was debrided. Once the lens was removed the internal scleral and external conjunctiva were sutured with 8-0 polyglycon 910. Corneal edema, intraocular pressure and Tyndall effect were evaluated 24, 48 and 72 post-surgery, then 7, 10 and 60 days post-surgery. Results: 1/7 eyes developed diffuse corneal edema post-surgery which lasted one week, 1/7 eyes developed acute glaucoma 48h after surgery. Conclusions: Small manual incision surgery technique is an effective method for treatment of anterior lens luxation in dogs. None.

A preliminary clinical trial for evaluation of the therapeutic effects of a tear substitute containing 0.1% polyvinyl alcohol, 0.3% sodium hyaluronate, and 5% dodecahydroquidene in dogs with corneal ulcers
T Hasegawa, 1 S Tanaka 2 and S Sawa 1
1Osaka Prefecture University, Osaka, Japan; 2Senju Pharmaceutical CO. LTD, Kobe, Japan
Purpose: To describe a tear substitute containing 0.1% polyvinyl alcohol (PVA), 0.3% sodium hyaluronate (SH), and 5% dodecahydroquidene (DHS) was preliminarily evaluated on canine corneal ulcers (CUs) which had not healed by conventional treatments using antibiosis and/or subconjunctival injections. Methods: Six CUs in six dogs were preliminarily evaluated (1 CU in each dog). The CUs were surgically induced by evisceration with intraocular prosthesis (EIP) (case 3; 1 month without healing), manual incision surgery technique is an effective method for treatment of anterior lens luxation in dogs. None.
cause from an autoimmune mediated disease (case 6, 3 days with worsened condition). The conventional treatments were replaced by application of the substitute and additional antibiotics 4 times per day. Results: All cases of superficial CUs were cured with the treatment of the substitute and antibiotics within 7–12 days (cases 1–3) or 52 days (case 4). The treatment also resulted in healing within 2 months in case 5. In case 6, improvement of the lesion was observed after 1 week of replaced treatment, but cure of the lesion could not be confirmed because of sudden death. Conclusions: The 0.1% PVA/0.3% SH/5% DHS tear substitute is available as an adjunctive drug for treating canine CUs in addition to its use for keratoconjunctivitis sicca.

Sebaceous carcinoma in a Bengal tiger (Panthera tigris tigris) in captivity

A Iaquiniani,1 F Lois,2 M Falzone3 and P Sande4
1Laboratory of Retinal Neurochemistry and Experimental Ophthalmology, School of Medicine/CEFIQB, University of Buenos Aires/CONICET, Buenos Aires, Argentina; 2Temeniak Foundation, Esborar, Buenos Aires, Argentina; 3Fondazione Policlinico Universitario Agostino Gemelli, Rome, Italy; 4Temeiken Foundation, Escobar, Buenos Aires, School of Medicine/CEFYBO, University of Buenos Aires/CONICET, Argentina.

Purpose: To describe the first case of a sebaceous carcinoma in the caruncle area of a Bengal tiger (Panthera tigris tigris) in captivity. Methods: A 16-year old zoo-kept intact male tiger was examined with an altered and bleeding mass of 1.5 mm in diameter located on the left eye caruncle. The mass was completely removed under general anesthesia by a medical team at a veterinary ophthalmology clinic. One week after the initial presentation, recheck examinations were performed on days 1, 5, 15, and 30 and 18 months after surgery. Results: Histological evaluation confirmed the diagnosis of sebaceous carcinoma. There were no recurrences at 1.5 years after surgery. Conclusions: This is the first case of a sebaceous carcinoma in a tiger in captivity described in South America, and the first in an atypical anatomic location (caruncle) which was early and successfully removed. There was no recurrence at 1.5 years.

Anatomical features of the optic canal and the cephalic index in the cranial bone of healthy dogs

Y Ichikawa1 and N Kanemaki1,2
1Department of Veterinary Medicine, Azabu University, Sagamihara, Japan; 2Veterinary Teaching Hospital, Azabu University, Sagamihara, Japan.

Purpose: We studied the anatomical features of the optical canal among brachycephalic, mesocephalic, and dolichocephalic dogs, which are characterized by cephalic indexes, by analyzing computed tomography (CT) images of the head in healthy dogs. Methods: Anatomical features of the optic canal and the cephalic index were evaluated using 18 adult healthy dogs including two adult healthy dogs divided into three groups. The eight brachycephalic dogs included: Cavalier King Charles spaniels, two French bulldogs and Chihuahuas, and one Shih Tzu. The 13 mesocephalic dogs included four American cocker spaniels and Cardigan Welsh corgis, two toy poodles and Yorkshire terriers, and one Labrador retriever. The 11 dolichocephalic dogs included nine miniature dachshunds, one Great Dane and Shetland sheepdogs. OsiriX Lite software (v.8.0.2, Picmeo SARL, Switzerland) was used to measure the length and diameter of the optic canal and the angle of the paired canals, and cephalic index, with the CT images of the heads. Values among the groups were analyzed using the post-hoc test. Results: The cephalic index of the brachycephalic group was 94.3 ± 2.0, the mesocephalic, and dolichocephalic groups was 103.1 ± 1.5 and 121.2 ± 2.5, respectively. There was no significant difference in the cephalic index among the groups. The positioning of the optic canal varies with the cephalic index. There was no significant difference in the length and diameter of the optic canal among the groups. Conclusions: The position of the optic canal varies with cranial morphology in dogs.

Fibrin glue obtained from concentrated self-plasma for treating chronic superficial corneal problems in senior dogs

M Inaniwa1, Y Ichikawa1, K Terakado2 and N Kanemaki1,2
1Department of Veterinary Medicine, Azabu University, Sagamihara, Japan; 2Veterinary Teaching Hospital, Azabu University, Sagamihara, Japan.

Purpose: To evaluate and compare the fibrinogen levels concentrated from plasma using a rapid method and a conventional procedure, and to apply the fibrin glue, obtained from concentrated self-plasma using the rapid method, for treating chronic corneal problems in senior dogs. Methods: The Concentrated plasma fibrinogen was obtained using a conventional procedure and a rapid method. The conventional procedure involved 2 freeze-thaw cycles over 1–2 consecutive nights. The rapid method involved several freeze-thaw cycles of citrated plasma in 1 h. The plasma fibrinogen level was measured using a sandwich enzyme-linked immunosorbent assay. In this study, we included 10 dogs aged over 10 years, including those with chronic superficial corneal problems. The fibrin glue obtained from concentrated self-plasma was also applied to the subconjunctival space, the times and periods of fibrin glue treatment varied between 1–8 times and 7–210 days, respectively. However, no other remarkable finding was observed. Conclusions: Fibrin glue produced using the rapid method may be useful for treating chronic corneal problems.

Presence of serum antibodies against two synthetic peptide fragments of SRBD1 in Shiba Inu dogs with glaucoma

N Kanemaki,1,2 M Fujita,1 Y Goto,1 M Inaniwa,1 K Terakado,1 Y Ichikawa,1 A Meguro1 and N Mizuki1
1Veterinary Teaching Hospital, Azabu University, Sagamihara, Japan; 2Department of Veterinary Medicine, Azabu University, Sagamihara, Japan; 3Department of Ophthalmology, Yokohama City University School of Medicine, Yokohama, Kanagawa, Japan.

Purpose: Serum autoantibodies against retinal protein have been detected in patients with glaucoma. Recently, we reported single-nucleotide polymorphisms in SRBD1 (51 RNA binding domain) that were associated with glaucoma in Shiba Inu dogs. Therefore, we examined serum antibodies against synthetic peptide fragments of SRBD1 in Shiba Inu dogs with glaucoma. Methods: Enzyme-linked immunosorbent (ELISA) was used to measure the titer of antibodies against synthetic peptide fragments of SRBD1 (Accession number: XP_854655.2) in 36 Shiba Inu dogs. Normalization between plate measurements was performed using a mixture of serum from six healthy beagle dogs as a measure of pooled serum antibody titer. Antibody titers were compared using the Wilcoxon test. Rabbits were immunized with the two peptide fragments, to express antibodies (IgG) against them, which were then subjected to Western blot analysis to determine their localization in immunoreactive ocular tissue. Results: The serum titres of anti-SQ15214 and anti-SQ15215 antibodies in 26 Shiba Inu dogs with glaucoma were significantly lower than that of antibodies in 10 healthy Shiba Inu dogs (P < 0.05). There was no significant difference between the ages and serum titres of male and female dogs. Rabbit anti-SQ15214 and anti-SQ15215 antibodies were detected for a protein of 45.9 kDa in the iris/ciliary bodies and serum, but not in the retina. Rabbit anti-SQ15214 reacted with a protein of 36.4 kDa in optic nerve. Conclusions: SRBD1 may be specifically associated with serum autoantibodies in Shiba Inu dogs with glaucoma. Supported by JSPS KAKENHI Grant Number JP26480466. None.

Topical 5 fluorouracil as adjuvant therapy for ocular fibropapilloma tumors in green sea turtles (Chelonia mydas)

LG Karpinki,1 B Zirkelbach,2 OJ Carlisle2 and JN Pescatore1
1Pinecrest Veterinary Hospital; 2The Turtle Hospital

Purpose: 5-Fluorouracil (5FU), an antimetabolite chemotherapeutic agent, formulated as a 1% topical ophthalmic solution, was used to treat 204 Green Sea Turtle eyes (107 turtles) after surgical removal or debulking of periorbital and periorbital fibropapilloma (FP) tumors. Methods: Treatment consisted of twice daily application of 5FU for 6–8 weeks post surgical tumor removal. Turtles were kept for observation at least 9 months from the time of tumor removal. Forty-five FP tumors were released and 10 turtles are still in rehabilitation. Fifty-two turtles died or were euthanized due to systemic fibropapilloma tumors with the time of observation. Nineteen turtles had regrowth of ocular tumors. Conclusions: 5FU adjuvant therapy improves the visual outcome and chance for release of turtles affected with bilateral ocular FP tumors compared to previous treatment protocols. None.

Assessment of meibomian glands morphology using non-contact meibography in Shih Tzu dogs with or without keratoconjunctivitis sicca

Y Kitamura,1,2 S Maehara,1 T Nakade,1 H Iwashita,1 Y Miwa,1 R Arita1 and A Saito2,3
1Yakumo Animal Hospital, Hokkaido, Japan; 2Rakuno Gakuen University, Hokkaido, Japan; 3Kio University, Tokyo, Japan; 4Inoh Clinic Sattama, Japan; 5Triangle Animal Eye Clinic, Tokyo, Japan.

Purpose: To investigate, using non-contact meibography, meibomian gland (MG) morphology in Shih Tzu dogs with keratoconjunctivitis sicca (KCS). Methods: Fourteen eyes of 12 Shih Tzu dogs presented to Yakumo Animal Hospital and Triangle Animal Eye Clinic from 2011–2017, and with clinical signs and Schirmer tear test (STT) results consistent with KCS (<10 mm/min) were examined. Their mean (range) age was 10.7 (7.7–13) years. Twenty-eight eyes of 16 Shih Tzu with normal eyes and STT >18mm/min served as controls. Their mean (range) age was 12.4 (10.3–15) years. Both groups of dogs underwent routine slit lamp biomicroscopy followed by meibography of the upper eyelid using SL-D3 (Topcon Japan) and Meibocam (JFC Japan). Results: Meibography revealed morphological changes in the MGs of 15 eyes of 11 dogs with KCS. These included MG atrophy in 64%, and loss of glandular structure in 64% of 14 eyes. Morphological changes were also seen in the MGs of 11 dogs in the control group. This included atrophy in 50%, and loss of glandular structure in 21% of 28 eyes. Loss of a glandular structure was significantly more common in dogs with KCS than control dogs (P < 0.05). Conclusions: Altered MG structure occurs commonly in Shih Tzu with KCS. This suggests that altered tear quality and associated increased tear evaporation and decreased tear film stability probably compounds decreased tear volume in patients with aqueous deficiency. None.
Effect of 0.15% sodium hyaluronate on tear film breakup time of healthy cats, before and after general anesthesia

GM Madruga, 1 AP Ribeiro, 2 TB Magalhães, 1 JG Kleiner, 1 LA Rondelli 3 and LR Martins 3
1Post graduate student of Veterinary Surgery, Sao Paulo State University (UNESP), Jaboticabal, SP, Brazil; 2Department of Veterinary Clinical Medicine and Surgery, College of Veterinary Medicine, Federal University of Mato Grosso (UFMT), Cuiabá, Brazil; 3Vetech Oftalmologia Veterinária, Curitiba, Brazil

Purpose: This study aimed to evaluate the effect of 0.15% sodium hyaluronate (SH) on tear film breakup-time (TFBUT) before and after general anesthesia in healthy cats. In addition, possible correlation between the conjunctival goblet cell density (GCD) and TFBUT of non-anesthetized cats was checked. Methods: In 11 non-anesthetized cats, TFBUT was assessed at baseline and following 1, 10, and 20 min of the instillation of SH. In another 39 cats, TFBUT was measured at the end of the anesthesia (T40) and following, 35 (T75) and 80 min (T120) of the end of the anesthesia. Analysis was performed using ANOVA followed by Tukey’s test or Bonferroni’s test and Person’s correlations test (P < 0.05). Results: SH did not increase TFBUT in non-anesthetized cats at any time point (P > 0.31). GCD correlated positively with TFBUT (r = 0.02; r = 0.60). TFBUT decreased significantly in control eyes at all time points after anesthesia, when compared with baseline of non-anesthetized cats (P < 0.001). TFBUT increased significantly in SH-treated eyes, only at T40 after anesthesia, when compared with baseline of non-anesthetized cats (P < 0.0003). In anesthetized cats, TFBUT assessed in SH-treated eyes were significantly higher in comparison with control eyes at all time points (P < 0.001). Conclusions: It can be concluded the SH should be instilled every 60 min during anesthesia following the end of anesthetic procedures in healthy cats. Support/Disclosure: None.

The effects of 0.15% sodium hyaluronate and 0.5% carbomethoxylcellulose on tear film breakup time in dogs with keratoconjunctivitis sicca and in healthy dogs

GM Madruga, 1 AP Ribeiro, 2 TB Magalhães, 1 JG Kleiner 1 and AL Souza 2
1Sao Paulo State University (UNESP), Jaboticabal, SP, Brazil; 2Department of Veterinary Clinical Medicine and Surgery, College of Veterinary, Federal University of Mato Grosso (UFMT), Cuiabá, Brazil; 3Vetech Oftalmologia Veterinária, Curitiba, Brazil; 4Clinicvet Hospital Veterinário, Curitiba, Brazil

Purpose: This study evaluated the effect of the 0.15% sodium hyaluronate (SH) and 0.5% carbomethoxylcellulose (CMC) on tear film breakup time (TFBUT) in 10 healthy dogs and in 32 eyes of dogs with keratoconjunctivitis sicca (KCS). In addition, the goblet cell density (GCD) of this population was quantified. Methods: TFBUT was assessed at baseline and at different time points following the instillation of SH and CMC. The TFBUT was performed following the instillation of one drop of 0.1 ml of 1% sodium fluorescein at the periorbital region. Statistical analysis was performed using ANOVA followed by Tukey’s test or Bonferroni’s test and Person’s correlations test (P < 0.05). Results: The number of GCD differed significantly between patients with mild and moderate KCS (P < 0.05). TFBUT of healthy dogs increased only at 1 min after treatment with SH (P < 0.0001). Regardless baseline and treatments, SH significantly increased TFBUT for up to 30 min on the ocular surface; in comparison to CMC, in all categories of KCS (P < 0.01). TFBUT and CMC correlated positively with age of patients and grafted eyes (r = 0.64 and r = 0.48, respectively). Conclusions: It can be concluded that in dogs with KCS, SH lasts longer periods on the ocular surface than in healthy dogs. Further studies should be conducted to establish the TFBUT in healthy dogs. Such findings suggest that immune-mediated KCS of dogs tends to shift from quantitative to qualitative disorders as the disease progresses. None.

In vivo confocal microscopy characteristics of equine epithelial and subepithelial nonulcerative keratonyctomy

EC Ledbetter, 1 NL Irby 1 and LB Teixeira 2
1Department of Clinical Sciences, College of Veterinary Medicine, Cornell University, Ithaca NY, USA; 2Department Pathobiological Sciences, School of Veterinary Medicine, University of Wisconsin-Madison, Madison, WI, USA

Purpose: To described the in vivo confocal microscopy features of horses with epithelial and subepithelial nonulcerative keratonyctomy. Methods: Four horses with a clinical diagnosis of epithelial or subepithelial keratonyctomy were examined on one or more occasions by in vivo laser scanning confocal microscopy of the corneal epithelium. Confocal specular microscopy images (4) central of pesudophakic eyes. Statistical differences were showed between (1) (2) (3) (4) groups. Histopathological evaluation confirmed the space-occupying effects by IOIs. Anterior- posterior capsular adhesion in epithelial eyes formed a strong barrier of epitaxial growth and cells (LECs) migration, however, capsular wrinkling was obvious. Conclusions: This study confirmed the PCO inhibitory effect by IOEs, especially in peripheral capsular adhesion. Despite the central PCO score of aphakic eyes were low, capsular wrinkling was more evident in comparison to pseudoepithelial eyes. None.

The effects of generalized oxidative stress on retina and intraocular pressure in rats

CL Pai, 1 SL Lin, 1 CJ Chen, 1 HJ Lin 3 and CT Lin 1,2,3
1Department of Veterinary Medicine, National Chung Hsing University, Taichung, Taiwan; 2Vision Eyecare Center for Animals, Taipei, Taiwan; 3China Medical University, Taichung, Taiwan; 4Institute of Veterinary Clinical Science, School of Veterinary Medicine, National Taiwan University Veterinary Hospital, Taipei, Taiwan

Purpose: The aim of the study was to investigate the effects of generalized oxidative stress on retina and intraocular pressure (IOP) in rats. Methods: A rat model of oxidative stress was induced by low dose D-galactose (100 mg/kg, SC, s.i.d) for 8 weeks. We investigated behavioral and fundus microangiographic retinal changes due to oxidative stress before and after induction. IOIs were measured every week. The serum profile of antioxidants and peroxidants was analyzed at pre-induction and every 2 weeks post induction. Muller’s cells, astrocytes, microglial, and INOS of the rat eyes were immunolabeled with GFAF, Iba-1 and INOS. The locations and amounts of the retinal glial cells and INOS were analyzed. Results: The behavior of Muller’s cells, astrocyte and microglial were measured. Muller’s cells, astrocytes and microglial were measured. The location of INOS was mainly in the retinal inner nuclear layer and some portion of outer segment layer of the retinal. Conclusion: The data indicate that generalized oxidative stress resulted in impairment of behavior, increased resistance of aqueous outflow leading to elevated IOP, increased INOS in the eye, increased expression of Muller’s cells, astrocytes and microglial. The mechanism of elevated IOP requires further investigation.

Investigation of histopathology and locations of epithelial tumors in 120 dogs

LN Wei, 1 JY Cheng, 2 WH Chien 1 and CT Lin 1,2,3
1Institute of Veterinary Clinical Science, School of Veterinary Medicine, National Taichung University, Taipei, Taiwan; 2Department of Ophthalmology, National Taichung University Veterinary Hospital, Taipei, Taiwan

Purpose: To analyze clinical characteristics, locations and histopathology of epithelial tumors cases in 120 dogs. Methods: We collected canine eyelid tumors diagnosed at the National Taichung University Veterinary Hospital (NTUH) and Vision Eyecare center for Animals (VECA) between 2012 and 2017. All eyelid tumors of 120 dogs were surgically excised and the excised specimens were submitted for histopathological analysis. All specimens were initially reviewed by HRH and additional staining was performed if necessary. Conclusions: Clinical data including breed, age, gender, prevalence, tumor types, locations of tumor onset were also analyzed. Results: No significant difference of eyelid tumors was found between female and male dogs. The average age of eyelid tumors at diagnosis was 9.18 years. Benign tumors largely predominated over malignant ones, representing 83% of all cases in this study. The most frequent tumor types were epithelioma (32%), meibomian gland adenoma (25%), and meibomian gland hyperplasia (21%). Precited locations of eyelid tumors in the patients were analyzed. We found that eyelid tumors involved the upper eyelid in 62% of patients. The most common site of tumor involvement was the upper lateral lid (52%), followed by upper central lid (20%), lower medial lid (15%), lower central lid (14%), upper medial lid (11%), and lower lateral lid (8%). Conclusions: Epithelial tumors are common in senior dogs. 83% of eyelid tumors are benign, and the leading tumor types are meibomian gland adenoma, hyperplasia, and epithelioma. The location incidence of the eyelid tumors of the canine patients may reflect the incidence of causing clinical signs by eyelid tumors to draw owner's attention and seek medical assistance. No conflicts of interest. *Presenting author.

Investigation of pattern and severity of posterior capsular opacification in rabbits with pseudophakic and aphakic eyes

YF Chung 1,2 and CT Lin 1,2,3
1Institute of Veterinary Clinical Science, School of Veterinary Medicine, National Taichung University, Taipei, Taiwan; 2Department of Ophthalmology, National Taichung University Veterinary Hospital, Taipei, Taiwan

Purpose: The purpose of this study was to compare the pattern and severity of posterior capsular opacification (PCO) between implanting injectable canine IOL, human IOL, and not implanting lens in rabbit model. Methods: 24 random rabbits were divided into 3 groups: 1) implanting injectable canine IOL, 2) implanting human IOL, and 3) not implanting lens. Gross PCO scores were calculated by multiplying the density of opacification (graded from 0 to 4) by the percentage of capsular area that PCO involved. Gross PCO scores of central capsule (under IOL optic or central 6.0 mm area) and peripheral region were calculated respectively. Histological analysis was performed to evaluate pathological changes of PCO. Results: Gross PCO scores listed in order as below: (1) peripheral of aphakic eyes > (2) peripheral of pseudophakic eyes > (3) central of aphakic eyes > (4) central of pseudophakic eyes. Statistical differences were showed between (1) (2) (3) and (4) groups. Histopathological evaluation confirmed the space-occupying effects by IOEs. Anterior- posterior capsular adhesion in aphakic eyes formed a strong barrier of epitaxial growth and cells (LECs) migration, however, capsular wrinkling was obvious. Conclusions: This study confirmed the PCO inhibitory effect by IOEs, especially in peripheral capsular adhesion. Despite the central PCO score of aphakic eyes were low, capsular wrinkling was more evident in comparison to pseudophakic eyes. None.
Bandage lens induced eosinophilic keratitis in a cat FMA Nachtegaal

**Abstract**

This study was performed to determine normal aerobic and anaerobic bacterial flora of the cornea and conjunctiva in Persian cats. **Methods:** Thirty eyes of 15 clinically normal Persian cats were evaluated. All the cats lived in the same environment with constant diet for the whole year. No medication was used for the cats and no disease was observed in them one month prior to each microbial sampling. The cats were not exposed to other cats during the study period. Microbial samplings were performed at the same time on the 1st day of the second month of each season. For the collection of specimens, a sterile swab applicator was used while avoiding contact with the surrounding skin or hair. Immediately after sample collection, microbiologic aerobic and anaerobic culture was initiated.

**Results:** Of the total of 120 cultures, 10 (8.3%) were negative based on the PCR results. FHV-1 was detected in 2 cats. **Conclusion:** In this study, gram-negative bacteria were isolated during autumn and winter. This is while no gram-negative bacteria were isolated during spring and summer. The most dominant microorganisms of the normal ocular surface of healthy cats in all seasons were Staphylococcus spp. and Staphylococcus epidermidis. The gram-positive bacteria were observed as the most prominent isolated bacteria. In all the seasons, the most commonly isolated bacterial organisms were Staphylococcus epidermidis (41/120; 34.1%), β-hemolytic streptococcus (18/120; 15%), Streptococcus aureus (17/120; 14.1%) and Corynebacterium spp. (10/120; 9.1%), respectively. No fungal isolates were observed in spring and summer. **Conclusions:** Results of this study reveal gram-positive bacteria as the most dominant microorganisms of the normal ocular surface of healthy cats in all seasons. This is while no gram-negative bacteria were isolated during autumn and winter. None.

**Comparison of schirmer tear test, phenol red thread test and endodontic absorbent paper point tear test for measurement of the aqueous tear film fraction in healthy cats and their correlation to stress level**

S Rajotte, T Villar, KM Smith-Fleeming and BC Martins

**Department of Veterinary Clinical Medicine, College of Veterinary Medicine, University of Illinois, Urbana-Champaign, IL, USA; College of Veterinary Medicine, University of Florida, Gainesville, FL, USA**

**Purpose:** To compare measurements of the aqueous tear film fraction in healthy cats obtained using different quantitative tear tests while exploring the impact of stress level.

**Methods:** A prospective, randomized, cross-over study was performed using twenty-three healthy adult cats with normal ophthalmic exams. Schirmer tear tests (STT1) and phenol red thread test (PRT) were performed using standard techniques in both eyes. Endodontic absorbent paper point tests (PPTT) and PRT were performed at 2 h intervals on the same day. Stress level was quantified prior to and during each individual test using a published modified Demeanor Score. Tear production values and stress level were compared using a paired t-test. The correlation between tear tests and stress score was verified by Scatterplot and Pearson’s correlation coefficient.

**Results:** Mean STT1 (mm/15 s) was 26.19 ± 5.6 OD and 26.52 ± 4.9 OS. Mean PPTT (mm/15 s) was 16.43 ± 2.2 OD and 11.95 ± 2.7 OS. There was no significant difference in stress score among eyes (P = 0.099). A weak negative correlation was observed between STT1 and PRTT score in both eyes (r = −0.4) and between PRT and stress score OS (r = −0.26). No correlation was noted between PRT OD and stress score or between PPTT and stress score in both eyes. **Conclusions:** Stress level may influence STT1 and PRTT results, but does not appear to influence PPTT results. None.

**Pleomorph ic iridociliary adenocarcinoma with extracocular extension in a dog**

S Rajotte, RE Hamor, P Roady and BC Martins

**Department of Veterinary Clinical Medicine, College of Veterinary Medicine, University of Illinois, Urbana-Champaign, IL, USA; College of Veterinary Medicine, University of Florida, Gainesville, FL, USA**

**Purpose:** To report a case of pleomorphic iridociliary adenocarcinoma with extracocular extension. **Methods:** A 1-year-old, small, short-haired, long-coated, male, white dog (5 kg) presented to the emergency service with a 2-day history of bilateral congenital dislocation of the right eye. The conical iris dioptric was used. Immediately after sample collection, culture was initiated. For detection of Mycoplasma spp. and feline herpesvirus 1 (FHV-1), PCR was performed on conjunctival swab and blood samples, respectively. **Results:** Six cats (40%) from Group A and two cats (10%) from Group B were Mycoplasma spp. positive based on the PCR results. Of the 12 cats detected on 2 cats in Group A. Moreover, fungal culture was positive in one eye (20%; Aspergillus spp.). None of the cats in Group B and six eyes (40%) from Group A had fungal cultures. **Conclusion:** Results of this study reveal more positive fungal and bacterial cultures in the Persian cats with nasolacrimal obstruction compared to clinically normal Persian cats. None.

**Seasonal effects on the conjunctival microflora of clinically normal Persian cats**

G Afaf, SM Rajaei, H Faghihi and M Ansari-moosid

**Department of Clinical Sciences, College of Veterinary Medicine, Tehran, Iran; Department of Clinical Sciences, College of Veterinary Medicine, Karaj Branch, Islamic Azad University, Alborz, Iran**

**Purpose:** This study was performed to determine normal aerobic and anaerobic bacterial flora of the cornea and conjunctiva in Persian cats. **Methods:** Thirty eyes of 15 clinically normal Persian cats were evaluated. All the cats lived in the same environment with constant diet for the whole year. No medication was used for the cats and no disease was observed in them one month prior to each microbial sampling. The cats were not exposed to other cats during the study period. Microbial samplings were performed at the same time on the 1st day of the second month of each season. For the collection of specimens, a sterile swab applicator was used while avoiding contact with the surrounding skin or hair. Immediately after sample collection, microbiologic aerobic and anaerobic culture was initiated.

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Correlation between spectral domain optical coherence tomography and histologic evaluation of the retina of blue-fronted parrots (Amazona aestiva)

RA Pecora,1 SS Watanabe,2 AC Santos,1 D Otsuki,4 PSM Barros1 and AMV Safate1

1Laboratory of Experimental Comparative Ophthalmology, School of Veterinary Medicine, University of São Paulo, São Paulo, Brazil; 2Laboratory of Morphological Study of Reproduction Biology, School of Veterinary Medicine, University of São Paulo, São Paulo, Brazil; 3—LM-08, School of Veterinary Medicine, University of São Paulo, São Paulo, Brazil

Purpose: To perform standardized spectral domain optical coherence tomography (SD-OCT)–assisted enucleation of blue-fronted parrot retina, providing detailed and accurate images of the posterior segment when compared to histologic evaluation. Support: FAPESP grant n°2011/24039-8.

Post-treatment effects of two steroidal anti-inflammatory ophthalmic drugs on protein concentration in the secondary aqueous humor of dogs

K Sato,1 K Kani,1 K Iwasaki,1 T Kagawa,1 M Ozaki,1 N Nagai,1 Y Yamashita,1 S Chikazawa1 and H Hoshi2

1Department of Small Animal Internal Medicine II, School of Veterinary Medicine, University of Kitasato, Tokyo, Japan; 2Faculty of Pharmacy, University of Tokyo, Higashimachi, Tokyo, Japan

Purpose: To investigate the post-treatment effects of two steroidal anti-inflammatory ophthalmic drugs on the breakdown of blood-aqueous barrier (BAB) in paramedics in dogs.

Methods: (1) Twenty healthy dogs were equally divided into one control and two treatment (treatment A and B) groups. Non-antiking anterior chamber paracentesis (450 μl) was performed in one eye of each dog. (2) In the control group, no medications were given; in the treatment groups, dogs received topical anti-inflammatory medication (dilute prednisolone fluocinolone ophthalmic emulsion (DFA), 0.05% or betamethasone sodium phosphate ophthalmic solution (BMZ), 0.1%) at 0, 15, 30, and 45 min after initial paracentesis in the treated eyes. The secondary aqueous humor (AH) was collected 60 min after the initial paracentesis. Protein concentration in AH was determined using the bicinchoninic acid assay. Mean values of the control and treatment groups were compared using ANOVA followed by Turkey’s post-hoc test.

Results: The treatment with both drugs, particularly DFA (P < 0.05), reduced protein concentration in the secondary AH. With both drugs, there was no significant difference in the intraocular pressure and pupil dilatation in the control eyes from the treated eyes.

Conclusion: Post-treatment effects of DFA were more effective than those of BMZ for reducing aqueous protein content in dogs with paramedics-induced BAB breakdown. These results indicated that DFA may be an appropriate treatment in an early stage of acute anterior uveitis caused by intraocular surgery in dogs. Supported by the Sasakawa Scientific Research Grant from The Japan Science Society (29-419).

Detection of papillomavirus DNA in canine lobular orbital adenoma

EA Schaefer, S Chu, JN Bryan, JW Pearce and BK Flesner

Department of Veterinary Medicine and Surgery College of Veterinary Medicine, University of Missouri, Columbia, MO, USA

Purpose: Our study aims are (1) to evaluate phenotypically normal canine conjunctival and orbital tissue for papillomavirus DNA and (2) determine if papillomavirus DNA is present in tissue from canine lobular orbital adenomas.

Methods: Three-fourths of formalin-fixed paraffin-embedded (FFPE) canine lobular orbital adenoma tissue samples were obtained from the Comparative Ocular Pathology Lab of Wisconsin. In addition, a fresh ex vivo tumor sample was collected for analysis. Exsanguination biopsies of conjunctival and subcutaneous regions of 13 phenotypically normal dogs were collected for FFPE tissue samples previously confirmed to be positive for papillomavirus DNA served as positive controls. Non-implantable samples served as negative controls. Genomic DNA was extracted from all samples and evaluated via a non-species specific papillomavirus polymerase chain reaction (PCR).

Results: Polymerase chain reaction results verified negative and positive controls. Non-implantable samples served as negative controls. Genomic DNA has not been detected in fresh conjunctival and orbital tissue of phenotypically normal dogs or in samples of fresh or FFPE canine lobular orbital adenoma tissue. Further research is needed to evaluate if other viruses play a role in the pathogenesis of canine lobular orbital adenoma. Supported by the AVCO Vision for Animals Foundation Grant VAF2017-01 and in part by the University of Missouri Phi Beta Honor chapter. None.

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Investigation of post-sterilization hyphema in shelter cats
AP Schenk,1 CA Beatty,2 AM McGrath,3 SA Robertson1 and AM Komaromy4
1College of Veterinary Medicine, Michigan State University, East Lansing, MI, USA
2Capitol Area Humane Society, Lansing, MI, USA
Purpose: Formally confirm and characterize cases of hyphema in shelter cats following sterilization surgery. Methods: In part 1, a short survey regarding past experiences was sent to veterinarians in shelters, as well as High-Quality High-Volume Spay-Neuter (HOVHSN) practices throughout the United States, and 20 responses were collected. In part 2, one cat out of 195 examined (0.5%) developed bilateral anterior uveitis and hyphema within 1 h following Telazol® protocol. The signs completely resolved within 24 h. Conclusions: Transient hyphema following sterilization surgery is a well-recognized complication of sterilization surgery in shelter cats especially with the use of Telazol®. The etiology of this observation remains unknown, and there appears to be no lasting ocular damage. Funding provided by the Michigan State University Graduate Office Fellowship. None.

An unusual case of feline acute corneal hydrops: atypical disease presentation and possible in vivo detection of descemctem’s membrane detachment in the cat’s unaffected eye
BN Schlesener, EM Scott and LV Vallone
College of Veterinary Medicine, Texas A&M University, College Station, TX, USA
Purpose: To describe a case of unilateral FACH in which suspected DM detachment was detected in vivo by AS-OCT in the clinically healthy eye. A 1-year-old, female spayed, domestic shorthair cat presented for blepharospasm of the right eye. Ophthalmic examination was performed including fluorescein stain, slit-lamp biomicroscopy and binocular indirect ophthalmoscopy. The right eye displayed a geographic corneal ulcer with marked edema and a gross distortion of the corneal profile consistent with FACH. Corneal cytology and bacterial culture were obtained. Slit-lamp biomicroscopy of the left eye demonstrated a focal endothelial opacity within the central cornea. Surgical management of the right eye included a bridge conjunctival graft, third eyelid flap, and temporary tarsorrhaphy. At a follow up examination 24 days after the surgery, AS-OCT was performed on both eyes. Results: Cytology and bacterial culture did not demonstrate the presence of microorganisms. The patient regained comfort and was free of corneal edema in the right eye. The left eye remained unchanged at follow up examinations. Conclusions: Corneal edema in this case was similar to an acute corneal hydrops (ACh) in humans and may represent a potential etiology for FACH in the case presented here. None.

Reliability of intraocular pressure measured by a Tonovet® rebound tonometer in normal pigeon eyes
JG Lim, S Kang, S Park, EJ Park, TJ Nam, SW Jeong and K Seo
Department of Veterinary Clinical Sciences, College of Veterinary Medicine and Research Institute for Veterinary Science, Seoul National University, Seoul, Korea
Purpose: To evaluate the applicability of a Tonovet® rebound tonometer in pigeon eyes and to determine normal normometric intraocular pressure (IOP) values of healthy pigeons. Methods: Twenty eyes of euthanized pigeons were used for the calibration of Tonovet® and 48 eyes of adult pigeons for the reference IOP. First, IOP of pigeon eyes were measured using ‘d’ and ‘p’ modes of the Tonovet® and compared with manometric IOP values from 5 to 80 mmHg. Then, to establish normal reference values, IOP was measured in 24 pigeons. Results: Both ‘d’ and ‘p’ modes of the Tonovet® showed a strong linear correlation with the manometric IOP (r = 0.996 and 0.991, respectively). The obtained regression analysis of ‘d’ mode was y = 0.041x + 2.154 and y = 0.350x - 0.571, respectively. Conclusions: The ‘d’ mode of Tonovet® was not better than ‘p’ mode of Tonovet® in normal pigeons. None.

Intraocular melanocytic tumors in young dogs: clinicopathologic features and breed prevalence
GC Shaw, RR Dubielzig and LBC Teixeira
Department of Pathobiological Sciences, Comparative Ocular Pathology Laboratory of Wisconsin, School of Veterinary Medicine, University of Wisconsin-Madison, Madison, WI, USA
Purpose: To characterize intraocular melanocytic tumors in dogs less than 2 years of age in the COPLOW database. Methods: The COPLOW database was mined for globes with intraocular melanocytic tumors from dogs less than 2 years of age. Cases were summarized and the clinicopathologic features of each case was reviewed in various breeds. Intraocular melanocytic tumors were represented in many breeds was evaluated statistically. Results: From a total of 1686 dogs less than 2 years of age in the COPLOW database 32 cases of intraocular melanocytum tumors were identified. Intraocular melanocytic tumors were 12 months (range 2–23 months). Labrador retrievers (12/12) and German shepherds (3/32) were the most prevalent breeds, but 14 other breeds were represented. In our cohort, 23 were recorded in 8 breeds, including Beagles, Basset hounds, Boxers, Border collies, German shepherds and Golden retrievers. Conclusions: Though rare, intraocular melanocytic neoplasms can develop in young dogs and are seen in a surprising number of breeds. This study, intraocular melanocytic neoplasms of affected animals was 12 months (range 2–23 months). Labrador retrievers (12/12) and German shepherds (3/32) were the most prevalent breeds, but 14 other breeds were represented. In our cohort, 23 were recorded in 8 breeds, including Beagles, Basset hounds, Boxers, Border collies, German shepherds and Golden retrievers. Comparison of retinoid amino acid sequences across 11 species
CJ Gerald, E18
College of Veterinary Medicine, University of Tennessee, Knoxville, TN, USA
Purpose: Loss of function mutations described in humans and veterinary species that prevent recycling of the visual chromophore rhodopsin result in retinal degeneration and vision loss. Gene therapy restoring visual function in RPE65 mutants has been successfully tested in mice, dogs and monkeys. In this study, amino acid sequences of proteins involved in retinoid cycling across vertebrates were compared to determine the degree of conservation. Highly conserved sequence identities indicate important for cellular function and may be good candidates for models of disease or gene therapy. Methods: Vertebrae were sampled for sequence homology with the human proteins RPE6, CRBP1, CRALBP, RDH5, RDHH12, LRAT, and IRBP. A mixed population of 11 species important to veterinary medicine was then selected. Results: A phylogenetic tree was generated based on substitution matrices for scoring alignments between evolutionarily divergent sequences. Percent amino acid identity between species was determined. CRBP1 was the most conserved protein (~95%) and exhibited the least variation. LRAT and IRBP were the least conserved (~70%) but exhibited the most variation. In the population of 11 species, the order of homology was found to be CRBP1 (96% identity), CRBP1 (95%), CRALBP (90%), RDH12 (88%), RDH5 (87%), LRAT (84%) and RPE6 (81%). Conclusions: Amino acid substitution frequency increased the percent identity decrease the variation compared with the corresponding percent identical values. CRBP1 and RPE65 appear more highly conserved than other retinoid cycling proteins. None.

Evaluation of microbial contamination of canine plasma eye drops using two types of eyedropper bottles
RA Strauss,1 RA Allbaugh,2 U Genschel3 and GB Ben-Shlomo1
1Department of Veterinary Clinical Sciences, Iowa State University, Ames, IA, USA; 2Department of Statistics, Iowa State University, Ames, IA, USA
Purpose: To investigate microbial contamination of canine plasma eye drops when used clinically and to compare the effect of two different eyedropper bottles on contamination rate. Methods: Forty-six bottles containing plasma were dispensed for use on 42 dogs with ulcerative keratitis. Of these, 23 were standard eyedropper bottles and 23 were Novelia® bottles designed to prevent contamination. At a minimum of 24 h after the surgery, AS-OCT was performed on both eyes. Results: Cytology and bacterial culture did not demonstrate the presence of microorganisms. The patients regained comfort and was free of corneal edema in the right eye. The left eye remained unchanged at follow up examinations. Conclusions: Corneal edema in this case was similar to an acute corneal hydrops (ACh) in humans and may represent a potential etiology for FACH in the case presented here. None.

Corneal squamous cell carcinoma and actinic keratosis: a retrospective case series with dogs living in a high ultraviolet index region in Brazil
VRP Magri,1 AL Teixeira,2 V Vogt,3 LB Cossi,4 SS Lima4 and AL Andrade5
1Department of Ophthalmology – University Center of Rio Preto, Rio Preto, Brazil; 2Department of Ophthalmology and Visual Science – Provet, São Paulo, Brazil; 3Department of Ophthalmology – PetVisão, São José do Rio Preto, Brazil; 4Paulista State University – Júlio de Mesquita Filho, São Paulo, Brazil
Purpose: Squamous cell carcinoma (SCC) is rare in dogs and there are few published case reports. This study reports a case series of 6 dogs with SCC and 1 dog with actinic keratosis (AK) treated at São José do Rio Preto Veterinary Hospital, Brazil. Methods: The case series included 5 dogs with SCC and SCC and 1 dog with AK. Three dogs were treated at Veterinary Hospital “Dr. Halm Atique” in University Center of Rio Preto – UNIRP, and 1 dog was treated at “Pet Visão”. These were male and 2 females, and males with ages ranging between 7 and 11 years, averaging 9.5 years old. There were 2 Boxers, 1 English Bulldog, 1 Weimaraner, 1 Spitz and 1 mixed-breed dog with SCC and 1 dog with AK. Superficial keratitis was performed on 4 dogs, and one conjunctival lesion and an exenteration was conducted in the seventh dog that had corneal, limbal, conjunctival and nictitans membrane involvement. Conclusion: Given that corneal SCC and AK are rarely reported in dogs, this case series observed in the same geographic location in a relatively short timespan suggest that some special factors may be contributing to the development of these neoplastic and pre-neoplastic lesions. According to the literature, exposure to ultraviolet light could increase the risk of developing SCC or AK. Since São José do
Flicker fusion frequency of white-tailed deer and management implications for deer vehicle collisions

TM Treen,1 EM Watson,2 BS Cohen,2 DA Osborn,2 M Barletta,1 K Mitchell,1 KE Myrna1 and KV Miller2

1Department of Small Animal Medicine and Surgery, University of Georgia, Athens, GA, USA; 2Department of Large Animal Medicine, College of Veterinary Medicine, University of Georgia, Athens, GA, USA; 3WarneR School of Forestry and Natural Resources, University of Georgia, Athens, GA, USA

Purpose: To measure the critical flicker fusion point (CFF) of white-tailed deer. Methods: 7 ophthalmically normal, captive raised white-tailed deer were anesthetized with xylazine 2 mg/kg combined with either ketamine 6 mg/kg or telazol 4 mg/kg. A custom electroretinogram (ERG) was performed measuring responses at frequencies of 0.5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90 and 100 hz at light intensities of 100-10,000 mccd/m2 for the scotopic study and 2500-100,000 mccd/m2 for the photopic study. Each waveform peak-to-peak amplitude was measured and the average at each stimulus frequency was calculated. The average peak-to-peak measurements (µV) were plotted against the stimulus frequency (hz) and a least means linear regression line was fit to the data. The CFF was determined at the x intercept with the y-axis representing a background noise amplitude of zero. CFF at each intensity was averaged. Results: CFF in the scotopic study ranges from 41 ± 4.7 hz. 77.5 ± 21 hz with each doubling of light intensity resulting in a 2-7 hz increase in the CFF point. The scotopic study averaged between 29 ± 4 hz and 10 ± 9.8 hz. Conclusion: Under scotopic conditions, the CFF point in white-tailed deer is approximately 50 hz whereas under photopic conditions the CFF point is approximately 100 hz. This knowledge will further investigate the application for white-tailed deer management. For future studies, we hope to determine if developing a headlight below the CFF of deer, yet higher than the CFF of humans would decrease deer vehicle collisions. None.

Bacterial characterization and antimicrobial susceptibility of conjunctival flora in healthy dogs in Ibagué, Colombia

DY Trujillo1 and MP Sanchez2

1College of Veterinary Medicine and Animal Science, Colombian Cooperative University, Ibagué, Colombia

Purpose: Identify bacterial conjunctival microflora and its susceptibility to antibiotics in healthy canines in Ibagué, Colombia. Methods: The study included 30 adult clinically normal dogs without ophthalmal alterations. Samples were obtained by passing a sterile swab moistened in sterile saline across the lower conjunctival sac of the right eye. The swabs were transported on Amies agar gel, inoculated in blood and MacConkey agars and incubated at 37°C, under aerobic conditions for 24-48 h. Bacterial colonies were identified by classical methods such as Gram staining, colony morphology and biochemical tests for identification (BBL crystal identification systems). Antimicrobial susceptibility was determined by Kirby-Bauer disk diffusion technique. The antimicrobial agents used were: tobramycin (BBL crystal identification systems). Antimicrobial susceptibility was determined by Kirby-Bauer disk diffusion technique. The antimicrobial agents used were: tobramycin, ciprofloxacin, amoxicillin, cefazolin, ceftriaxone, trimethoprim-sulfamethoxazole, gentamicin and amikacin. Results: Bacteria were isolated of 14 (46.6%) of 30 normal samples. Gram positive bacteria were: coagulase-negative Staphylococci (CoNS) (28.57%), Staphylococcus intermedius (7.14%), Streptococcus spp (7.14%), Streptococcus intermedius (14.28%), Corynebacterium spp (7.14%), Corynebacterium trematum (7.14%), Brevibacterium spp (7.14%). The profile of resistance-sensibility were: 11.20–4.7 hz -77.5 µV, 21 hz with each doubling of light intensity resulting in a 2-7 hz increase in the CFF point. The scotopic study averaged between 29 ± 4 hz and 10 ± 9.8 hz. Conclusion: Under scotopic conditions, the CFF point in white-tailed deer is approximately 50 hz whereas under photopic conditions the CFF point is approximately 100 hz. This knowledge will further investigate the application for white-tailed deer management. For future studies, we hope to determine if developing a headlight below the CFF of deer, yet higher than the CFF of humans would decrease deer vehicle collisions. None.

Conjunctival flora of normal thoroughbred horses in Rio de Janeiro

JB Vieira,1 A Kuner,2 MS Silva,1 TRM Carvalho1 and LH Souza1

1Jockey Club Brasileiro, Gávea, Rio de Janeiro, Brazil; 2Vet Eyes, Rio de Janeiro, Brazil

Purpose: To report and compare the prevalence of aerobic bacterial flora on the conjunctival fornix of normal eyes of horses stabled at Jockey Club Brasileiro and in a training facility in Rio de Janeiro. Methods: The investigation included 18 healthy race horses. 27 animals were stabled inside the racetrack and 7 at the training center 120 km from Jockey Club Brasileiro. Each animal had the ventral conjunctival fornix of right eye swabbed with sterile cul- turettes. Aerobic cultures were sent to the laboratory the same day. Results: Of 14 normal equine eyes, 21 were positive for Staphylococcus spp only (61.76%), the next most frequently isolated alone was Proteus spp. (17.65%) in 6 cases, one single sample was positive for Strep- tococcus spp (4.54%), 6 horses presented mixed bacterial flora. The most common aerobic findings were Staphylococcus spp/ Corynebacterium spp (8.83%), Staphylococcus spp/ Pseudomonas spp. (2.94%), Staphylococcus spp/ Klebsiella spp (2.94%) and Klebsiella spp/ Corynebacterium spp (2.94%). Conclusion: Among the Thoroughbred horses stabled inside Jockey Club Brasileiro Staphylococcus spp was the most frequently isolated organism, among the animals at the Training center, Proteus spp. was the most common aerobic bacteria. The horses that pre- sented mixed flora findings had a history of recent arrival from another state with significant climatic difference. The results suggest that bacterial flora might be regionalized.

An overview of procollagen amino-propeptide type I (PINP) and procollagen amino-propeptide type III (PIIINP) protein expression in the normal and diseased canine corneal stroma

YN Vu,1,2 N Hamilton,3 DJ Whitworth,1 CR Green2 and JD Wright4

1School of Veterinary Science, The University of Queensland, Brisbane, Qld, USA; 2Nong Lam University, Ho Chi Minh City, Vietnam; 3Institute for Medical Research, The University of Queensland, Brisbane, Qld, USA; 4Department of Ophthalmology, The University of Auckland, Auckland, New Zealand

Purpose: Disturbance of the corneal stroma by disease or injury often causes permanent scaring or blindness. One hypothesis is that the normal parallel organisation of collagen type I fibrils is disrupted by the increased synthesis of disorganised collagen type III fibrils that occurs during the initial reparative process following injury and disease. The aim of this study was to characterise the morphologic and immunohistochemical features of type I and type III collagen fibril synthesis in the normal and diseased canine cornea.

Methods: Eighteen normal and four abnormal canine corneas were examined. Sagittal cor- neal sections were stained for histological examination with HEF and PAS, and immunohisto- chemically with anti-PINP and anti-PIIINP antibodies. PINP and PIIINP protein distribution was identified using confocal laser scanning microscopy; and quantified as the amount of PINP (µg/mL/keratocyte) and PIIINP (µg/mL/keratocyte) using ImageJ.

Results: PINP protein was expressed uniformly at a constant but low level along collagen fibril lamellae throughout all normal canine stroma whereas PINP protein was expressed sparsely or not detectably. In the diseased stroma, PINP and PIIINP protein expression was considerably increased in both distribution and volume. Distribution of PINP, in particular, was typi- cally disorganised. Conclusions: This study provides the arrangement and degree of expression of PINP and PIIINP protein in normal and diseased canine corneal stroma. Procollagen protein synthesis was increased during injury; therefore, targeting collagen type III gene and protein expression may reduce scarring after corneal injury and disease. Supported by the Canine Research Foundation, the John and Mary Kibble Trust and The University of Queensland, Australia. Commercial Relationship: YN Vu, None; N Hamilton, None; DJ Whitworth, None; CR Green, None; and JD Wright, None.

Modified evisceration and intrascleral prosthesis in a Dusky Gopher Frog, Lithobates sevosus, due to corneal perforation and iris prolapse

AE Zibura,3 MdL Henrikson,1,2 C Baldo,3 H Shipley,3 B Erickson4 and M Trent4

1Comparative Ophthalmology, College of Veterinary Medicine, University of Minnesota, Minneapolis, MN, USA; 2Comparative Ophthalmology, College of Veterinary Medicine, Colorado State University, Fort Collins, CO, USA; 3Anesthesiology, College of Veterinary Medicine, University of Minnesota, Minneapolis, MN, USA; 4Large Animal Surgery, College of Veterinary Medicine, University of Minnesota, Minneapolis, MN, USA

Purpose: The aim of this study was to evaluate the feasibility of a modified evisceration technique for treatment of a corneal perforation in a Dusky Gopher Frog, Lithobates sevosus. Methods: A mature female Dusky gopher frog, Lithobates sevosus, an endangered species, presented to the University of Minnesota Veterinary Medical Center for evaluation of right- sided traumatic corneal perforation of one-day duration. Results: Modified ocular eviscera- tion was performed, removing the cornea and all intraocular contents while preserving the integrity of the cartilaginous sclera. This technique was selected to maintain normal swallow- ing capability through preservation of the globe’s role in food propulsion. A 5 mm diameter silicone intracranial prosthesis was implanted, and the defect was closed via permanent tar- sorrhaphy, suturing the nictitating membrane to the immobile upper lid. Anesthetic recovery was uneventful. Unfortunately, the frog died 24 h post-operatively. The official necropsy report implicates unrelated underlying renal disease as the ultimate cause of death. Conclu- sions: This report demonstrates the potential to utilize a modified evisceration technique for treatment of corneal perforation in frogs. Adequate depth of anesthesia was obtained and no obvious anesthetic effects were noted in the peri-operative period. Long-term follow-up was not available. None.