


“ARE YOU FRUSTRATED, HAVING A MELTDOWN, OR BOTH? HELP WITH CORNEAL ULCERS”

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- *Dr. Jenn Wardlaw (Program Chair)*
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 - ✦ My present and former MU residents: Drs. D'Agostino, Sieve, Routh, Dowler, Fuchs, Banks, Schaefer, Overton, Marlo, Gronkiewicz, Donnelly, Bosiack, Buss, Barnes, Ota-Kuroki, Pearce, Klauss
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- + ACVO and ECVO Colleagues
 - ✦ Wonderful friends and colleagues - Thank you for the collaborations and shared experiences!

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CORNEAL ULCERS
WHAT DO I NEED TO KNOW?

- + Basic diagnostic approach
- + Fluorescein staining patterns
- + The 3 reasons an ulcer doesn't heal
- + Treatment principles for:
 - ✦ Superficial ulcers
 - ✦ Complicated ulcers
 - ◆ Indolent ulcers (SCCEDs)
 - ◆ Deep stromal ulcers
 - ◆ Melting/infected ulcers
 - ◆ Descemetocoele



THE LONDON CAT CLINIC
FOR THE WALL LIVES ARE COUNTING

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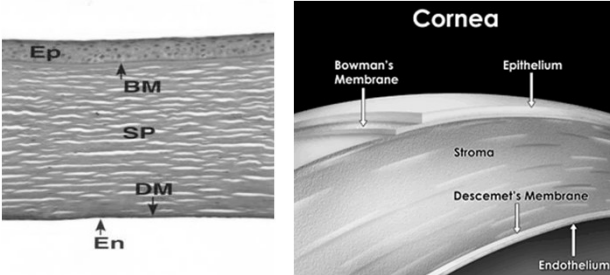
LOOK FOR THE PEARLS



Lasker
 JEWELERS & DIAMONDS

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CORNEAL ANATOMY




The diagrams illustrate the layers of the cornea. The left diagram is a histological section with labels: Ep (epithelium), BM (Bowman's Membrane), SP (stroma), DM (Descemet's Membrane), and En (endothelium). The right diagram is a schematic cross-section of the cornea with labels: Bowman's Membrane, Epithelium, Stroma, Descemet's Membrane, and Endothelium.

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TRUE OPHTHALMIC EMERGENCIES

- ✦ Keratitis
 - ✦ Corneal ulcers
- ✦ Glaucoma
 - ✦ Acute primary
 - ✦ Secondary
- ✦ Uveitis
 - ✦ Hyphema
- ✦ Orbital disease
 - ✦ Proptosis
 - ✦ Foreign body
- ✦ Adnexae
 - ✦ Eyelid laceration



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OPHTHALMOLOGY: MINIMUM DATA BASE

A word or two about "proper restraint/positioning"




8




9

An ocular examination with the slit lamp consists of serially viewing the components of the eye with as many forms of illumination as possible

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WHO HAS LOOPS? WHAT KIND?

Optivisor® 3-1/2 X Binocular Magnifier. 3-1/2 Times At 4" with Adjustable Padded Headband



YOU GET WHAT YOU PAY FOR



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I AM NOT A FAN.... WHY?




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HERE'S WHY:

Clinical Management of Binocular Vision
Heterophoric, Accommodative, and Eye Movement Disorders
7th Edition
Mitchell Scheiman
Bruce Wick
Wolters Kluwer

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REQUIRED DIAGNOSTICS

- + Direct examination
- + +/- Globe retropulsion
- + Menace response
- + PLR (d&c)
- + Palpebral reflex
 - ◇ (CN-V and CN-VII)
- + Schirmer tear test
- + Fluorescein stain
- + Tonometry

Rules Out:

- + Orbital disease
- + Neurologic deficits
- + Tear deficiency
- + Corneal disease
- + Intraocular disease

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EXAM PL

- + Magnification
- + Illumination: Use different forms!
 - ◇ Direct, diffuse
 - ◇ Retro-illumination
 - ◇ Tangential

Tangential illumination
24x

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IS IT DEEP OR SUPERFICIAL?

- + Easiest to see with slit lamp or slit beam
- + Should see divet-stromal loss
- + Ridge of epithelium may be confusing
- + Superficial-rough stromal surface, "peeled grape"

Images courtesy Dr. Bentley

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CORNEAL ULCERATION

- + Uncomplicated ulcers heal fast
 - ◇ 7-10 days

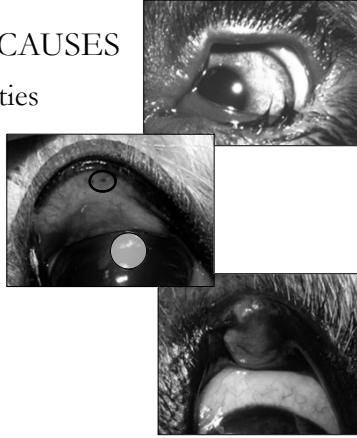
Three Reasons for a Persistent Ulcer

1. Underlying cause is still present
2. Ulcer is indolent
3. Ulcer is infected

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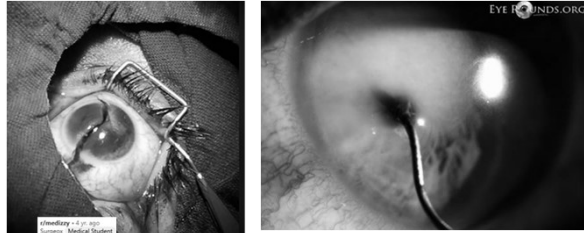
UNDERLYING CAUSES

- + Eyelid abnormalities
 - ◊ Lagophthalmos
 - ◊ Entropion
 - ◊ Trichiasis
 - ◊ Distichia
 - ◊ Ectopic cilia
 - ◊ Eyelid tumors
 - ◊ Blepharitis




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UNDERLYING CAUSES



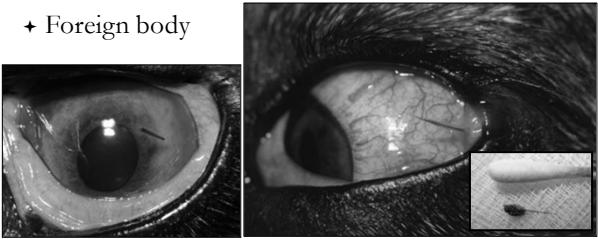
- + IMHO – should be a diagnosis of EXCLUSION
 - ◊ Or you will MISS so much...



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UNDERLYING CAUSES


- + Foreign body



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INFECTIOUS CAUSES

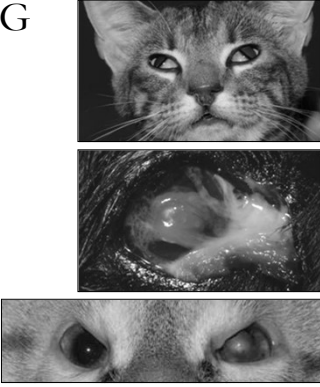
<p><u>Feline</u></p> <ul style="list-style-type: none"> + Primary infection common <ul style="list-style-type: none"> ◊ Feline herpesvirus-1 + Secondary infection rare 	<p><u>Canine</u></p> <ul style="list-style-type: none"> + Primary infectious keratitis rare + Secondary bacterial or fungal infections more common
---	--



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UNDERLYING CAUSES


- + Neurologic deficits
 - ◊ Trigeminal (CN-V)
 - ◆ Sensory
 - ◆ Neurotrophic keratitis
 - ◊ Facial (CN-VII)
 - ◆ Lagophthalmos
- + Keratoconjunctivitis sicca **
- + Congenital abnormalities



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UNDERLYING CAUSE #1 IMHO

- + In case you missed it...
 - ◊ Keratoconjunctivitis sicca **
 - ◆ Quantitative but also Qualitative


AMERICAN KENNEL CLUB
FOUNDED 1884

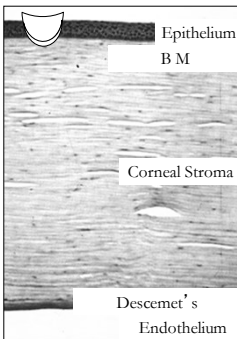
AMERICAN KENNEL CLUB

The Bon Vivant: How the French Bulldog Became the Most Popular Dog in the U.S.

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SUPERFICIAL CORNEAL ULCERATION

- + Acute ocular pain
- + Distinct border epithelial loss
- + Absence of cellular infiltrate
- + Treatment
 - ◇ ID primary cause
 - ◇ Prevent infection
 - ◆ Topical antibiotic QID +/- mydriatic to effect
 - ◇ Recheck 1 week



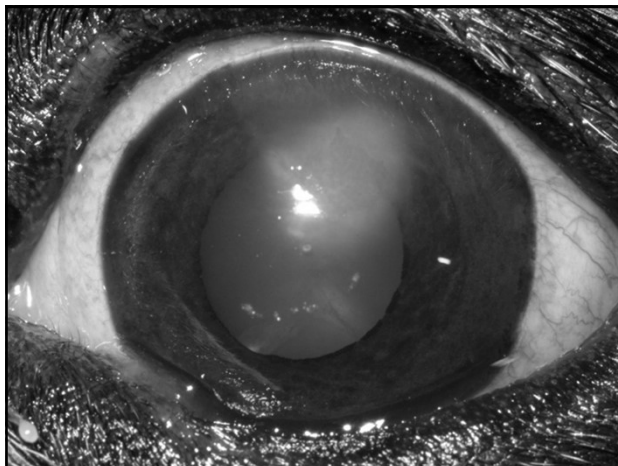
E-collar!

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FRUSTRATING ULCERS



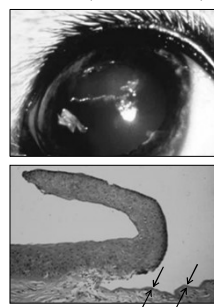
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SPONTANEOUS CHRONIC CORNEAL EPITHELIAL DEFECT (SCCED)

- + Indolent ulcer
- + Boxer ulcer
- + Chronic, superficial ulcer
- + Redundant epithelium
- + Stromal problem



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Veterinary Ophthalmology (2017) 20, 1, 11–15 DOI:10.1111/vop.12337

Immediate effects of diamond burr debridement in patients with spontaneous chronic corneal epithelial defects, light and electron microscopic evaluation

Charlotte Dawson,* Carolina Naranjo,†‡ Belen Sanchez-Maldonado,† Georgina V. Fricker,§ Rose N. Limn-Pearl,§ Natalia Escanilla,* Christiane Kafarnik,§ David J. Gould,§ Rick F. Sanchez* and Marian Matas-Riera*

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- + The acellular hyaline membrane is on average 4.4 μm thick, and it has been shown that a diamond burr debridement removes approximately 3 μm of it with reported success rates between 73.9% and 92.5%.

Conclusion DBD significantly reduces the superficial stromal HAZ in SCCEDs. A reduction of its thickness may be responsible for the healing rates reported with DBD.

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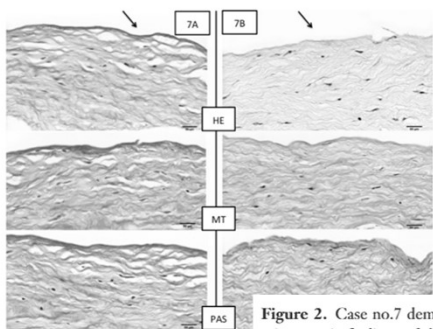



Figure 2. Case no.7 demonstrating the light microscopic findings of the (A) non-burred and (B) burred samples of the same sample in HE, MT and PAS. The burred samples show a decreased HAZ (black arrow). All pictures shown at 20× and the bar is 50 μm.

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DR. ELLISON BENTLEY

Spontaneous Chronic Corneal Epithelial Defects in Dogs: A Review

Spontaneous chronic corneal epithelial defects (SCCEDs) in dogs are typically found in middle-aged dogs of all breeds. These epithelial defects may be present for weeks to months, particularly if left untreated or if treated inappropriately. Typical histopathological findings include loss of the corneal epithelial basement membrane and formation of a superficial, acellular, hyalinized zone in the stroma. Together, these histological abnormalities lead to delayed wound healing and poor epithelial adhesion. Epithelial debridement, anterior stromal puncture, grid keratotomy, and superficial keratectomy are the most common treatment options applied to the defects. Procedures that address the stromal changes present generally have a higher success rate than epithelial debridement alone. [J Am Anim Hosp Assoc 2005;41:158-165.](#)



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BMC Veterinary Research

RESEARCH Open Access

A defect in the *NOG* gene increases susceptibility to spontaneous superficial chronic corneal epithelial defects (SCCED) in boxer dogs


Kathryn M. Meurs^{1,2}, Keith Montgomery^{1,2}, Steven G. Friedenberg¹, Brian Williams^{1,2} and Brian C. Gilger^{1,2*}

Abstract
Background: Superficial chronic corneal epithelial defects (SCCEDs) are spontaneous corneal defects in dogs that share many clinical and pathologic characteristics to recurrent corneal erosions (RCE) in humans. Boxer dogs are predisposed to SCCEDs, therefore a search for a genetic defect was performed to explain this susceptibility. DNA was extracted from blood collected from Boxer dogs with and without SCCEDs followed by whole genome sequencing (WGS). RNA sequencing of corneal tissue and immunostaining of corneal sections from affected SCCED Boxer dogs with a deletion in the *NOG* gene and affected non-Boxer dogs without the deletion were performed.
Results: A 30 base pair deletion at a splice site in *Noggin* (*NOG*) (Chr 9:31453999) was identified by WGS and was significantly associated ($P < 0.0001$) with Boxer SCCEDs compared to unaffected non-Boxer dogs. *NOG*, *BMP4*, *MMP13*, and *NCAM1* all had significant fold reductions in expression and *SHH* was significantly increased in Boxers with the *NOG* deletion as identified by RNA-Seq. Corneal IHC from *NOG* deletion dogs with SCCEDs had lower *NOG* and significantly higher scores of *BMP2*.
Conclusions: Many Boxer dogs with SCCED have a genetic defect in *NOG*. *NOG* is a constitutive protein in the cornea which is a potent inhibitor of *BMP*, which likely regulate limbal epithelial progenitor cells (LEPC). Dysregulation of LEPC may play a role in the pathogenesis of RCE.
Keywords: Corneal ulcer, Chronic, Superficial, Recurrent erosion, *NOG*, Boxer

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SCCED TREATMENTS

- + Q-tip debridement
- + Grid or punctate keratotomy
- + Burr debridement



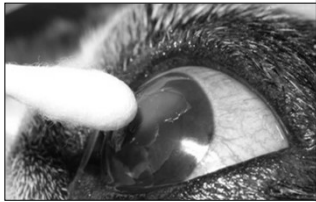
- + Thermal cautery
- + Scalpel blade debridement
- + Keratectomy
- + Combination therapies
 - ✦ With 3rd eyelid flap or contact lens

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SCCED TREATMENT

- + Q-tip debridement
 - ✦ Topical anesthesia
 - ✦ Remove epithelial lip
 - ✦ 50% heal in 2 weeks
 - ✦ How many sterile Q-tips?
 - ✦ Topical atropine +/- phenylephrine

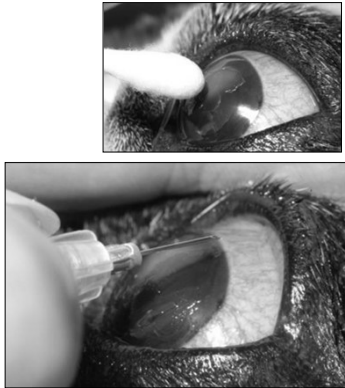
BEFORE you begin**



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SCCED TREATMENT

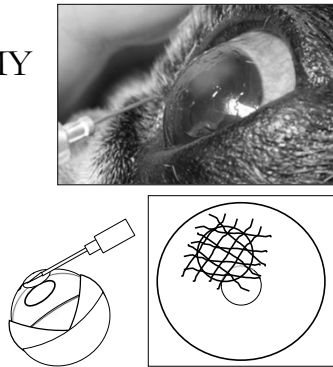
- + Grid keratotomy
 - ✦ Topical anesthesia, dilation, & Q-tip debridement as per usual
 - ✦ Good restraint
 - ✦ +/- sedation
 - ✦ 85% heal in 2 weeks



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GRID KERATOTOMY

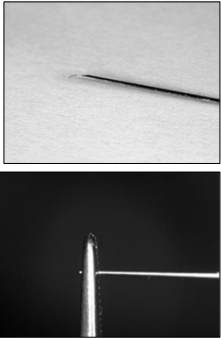
- + 25-27g needle
- + Bevel up
- + Drag, don't push
- + Clear cornea-clear cornea
- + Do not perform in cats, horses



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ANTERIOR STROMAL PUNCTURE

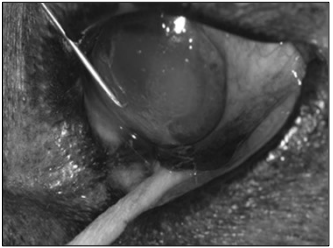
- + Easily done in awake dogs; topical anesthetic
- + ASP vs grid keratotomy
- + 25 g needle in hemostat or Sharpoint needle
 - ◇ Depth of penetration is shallower and more uniform using Sharpoint needles



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ANTERIOR STROMAL PUNCTURE

- + Contact lens
- + Third eyelid flaps
- + Topical antibiotic solution
- + ~80-85% heal within 14-21 days



ASP with Sharpoint needle courtesy Dr. Bentley

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Veterinary Ophthalmology (2011) 16, 2, 81–88 DOI:10.1111/j.1463-5224.2012.01928.x

Management of spontaneous chronic corneal epithelial defects (SCCEDs) in dogs with diamond burr debridement and placement of a bandage contact lens

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Objective: To describe the outcome of canine spontaneous chronic corneal epithelial defects (SCCED) treated with diamond burr debridement (DBD) and bandage contact lens placement (BCL).

Animal studied: Forty eyes of 36 dogs presenting to a single private practice.

Procedure: A retrospective review of medical records was performed. Cases were eligible for inclusion if they were newly diagnosed with SCCED by a veterinary ophthalmologist and treated with DBD/BCL. All patients received a complete ocular examination followed by DBD using a battery-powered, handheld motorized burr (Algerbrush®, Alger Equipment Company, Lago Vista, TX, USA). A BCL was placed post-debridement in all patients. Data were analyzed for sex, age, breed, duration of clinical signs prior to DBD, number of debridements required before healing was achieved, contact lens retention, complications attributed to DBD, and additional surgical interventions were required to achieve healing.

Results: The median time to first recheck examination was 7 days (IQR 7–9 days) with 28/40 (70%) of cases healed at this examination. The mean time to second recheck examination was 15.5 ± 5.5 days with 37/40 (92.5%) healed by this examination. The median time to final recheck examination was 19 days (IQR 18–35.5 days) with a range of 18–52 days. All cases resolved by the third and final recheck examination. A second DBD/BCL was performed in 5/40 (12.5%) of cases. The BCL retention rate was 95% over all examination time points. No case required a keratectomy or other surgical intervention to achieve healing. The only complication observed was one case of suspected bacterial keratitis post-DBD/BCL.

Conclusions: Results suggest that DBD/BCL is safe and effective for treatment of canine SCCED.


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DIAMOND BURR SUPERFICIAL KERATECTOMY/DEBRIDEMENT (DBSK/DBD)

- + Topical anesthesia
- + Debride with Q-tip first
- + 90% heal in 2 weeks
 - ◇ With bandage contact lens
- + Algerbrush
 - ◇ Battery powered motorized burr (buy the medium grit pterygium burr, not the rust ring head)
 - ◇ Use gently on exposed stroma
 - ◇ YOU TUBE!! ... my strong advice is to SLOW DOWN



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<https://bethepro.com/ultimate-guide-for-how-to-stain-a-deck/>

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SCCED MEDICAL TREATMENT

- + E-collar!
- + Medications:
 - ❖ Oxytetracycline
 - ◆ Terramycin TID
 - ❖ Atropine up to EFFECT
 - ◆ Phenylepi + Atropine** prior to starting my Grids +/- DBD
 - ❖ Oral NSAID
 - ❖ Oral analgesic (Gabapentin +/- Trazodone)



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Effects of topically applied heterologous serum on reepithelialization rate of superficial chronic corneal epithelial defects in dogs

Journal of the American Veterinary Medical Association 250, 9; 10.2460/jama.250.9.1014

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Address correspondence to Dr. Maggs (dmaggs@ucdavis.edu).

OBJECTIVE
To assess the effects of topical application of unfiltered heterologous serum on time to corneal reepithelialization in dogs with superficial chronic corneal epithelial defects (SCCEDs).

DESIGN
Multicenter, randomized, double-masked, controlled clinical trial.

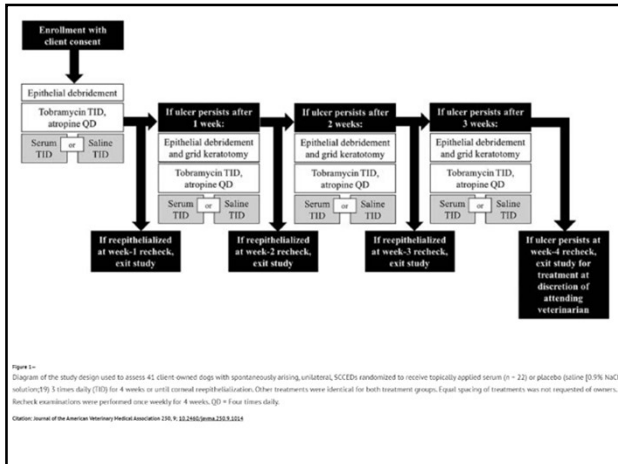
ANIMALS
41 client-owned dogs.

PROCEDURES
After collection of baseline clinical and historical data, dogs were randomly assigned to receive topically applied unfiltered heterologous serum (n = 22) or isotonic saline (0.9% NaCl) solution (19) along with tobramycin and atropine. Epithelial debridement (at all visits) and grid keratotomy (at visits 2, 3, and 4) of SCCEDs were performed. Ophthalmic examination including fluorescein application was performed once weekly for 4 weeks or until corneal reepithelialization. Clinicians and owners were masked to treatment group.

RESULTS
No differences in baseline data were detected between treatment groups. No difficulties with medication administration, noncompliance, or adverse reactions were noted. All SCCEDs in both groups healed by 4 weeks after treatment began. Median time to reepithelialization (2 weeks) was not significantly different between serum-treated and placebo-treated eyes. Irrespective of treatment group, median time to reepithelialization was not significantly different for Boxers versus non-Boxer breeds. Direct correlations were detected between time to reepithelialization and vascularization score at study entry, vascularization score at time of reepithelialization, and ulcer area at study entry in both groups. Time to reepithelialization was not correlated with age, sex, or duration of signs in either group.

CONCLUSIONS AND CLINICAL RELEVANCE
Topical application of unfiltered heterologous serum was well tolerated by dogs with SCCEDs but, as an adjunct to standard treatment, did not reduce time to corneal reepithelialization. (*J Am Vet Med Assoc* 2017;250:1014-1022)

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SCCEDs CAN BE FRUSTRATING!

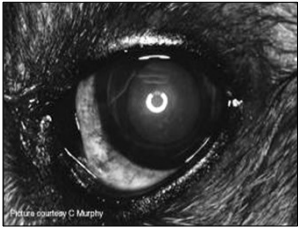
- + Warn owners!
 - ❖ May be in % that does not heal
- + Veterinary ophthalmologist can help
 - ◆ Second or third procedure MAY be needed
 - ◆ Sometimes there MAY be a microscopic underlying cause
 - ◆ Contact lens placement MAY help
 - ◆ Superficial keratectomy in refractory cases (99-100% successful)



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SCCED-SUPERFICIAL KERATECTOMY


- + Contact lens; topical antibiotics
- + Get thinnest layer possible to minimize scarring and astigmatism
- + Requires general anesthesia; microsurgery (referral)
- + 99% success rate in 14-21 days



2 weeks post-operative superficial Keratectomy (courtesy Dr. Bentley)

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“HOT OF THE PRESS”



Veterinary Ophthalmology
Volume 28, Issue 2
Special Issue: Ocular Surgery
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Pages 275-280

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 DOI: 10.1111/vop.13203

ORIGINAL REPORT WILEY

Superficial keratectomy for the treatment of spontaneous chronic corneal epithelial defects in dogs

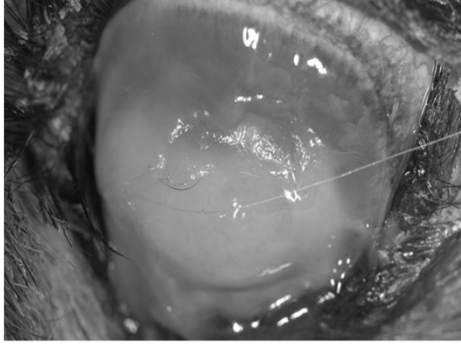
William Irving | Paul McCarthy | Benjamin Reynolds | Cameron Whittaker | Kelly Caruso | Jeff Smith | Matthew Annear

Results: One hundred and seven dogs met the inclusion criteria with 121 SCCEDs. The mean age of patients was 8.34 ± 2.89 years (1–15). Ninety-nine percent (120/121) of SCCEDs healed with no additional treatment within 21 days of surgery. One eye had a diamond burr debridement performed on Day 14 post-operatively and healed 2 weeks following the additional procedure. No post-operative complications were noted.

Conclusions: This study found superficial keratectomy with bandage lens placement to be an effective treatment for SCCEDs.

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WHEN NOT TO PERFORM AN ASP/GRID



Courtesy Dr. Bentley

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When NOT to perform an ASP/Grid? Cats (and Horses)




4 yr persian, pre LK

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End of Part 1 Q & A

- + WHAT ARE THE THREE REASONS AN UNCOMPLICATED ULCER DOESN'T HEAL IN A WEEK'S TIME?
- + ANY OTHER QUESTIONS?




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COMPLEX CORNEAL ULCERATION

1. Descemetocelae
2. Melting or deep stromal ulcers

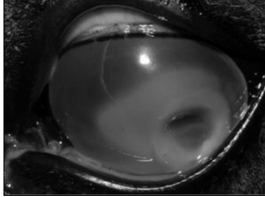
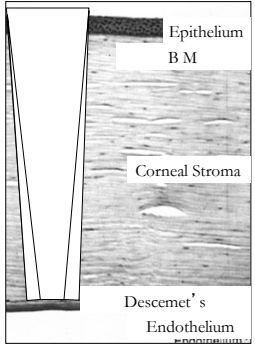
- + Require aggressive treatment
- + Make good referrals



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DESCEMETOCELE

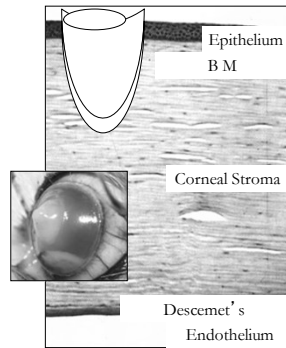
- + Acute or chronic
- + Complete stromal loss
- + Fluorescein stains walls

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MELTING OR DEEP STROMAL ULCERATION

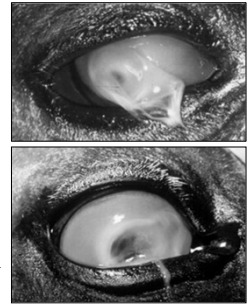
- + Acute or chronic
- + Epithelial and stromal loss
- + Fluorescein stains walls and floor of ulcer
- + Stroma frequently unhealthy



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MELTING OR DEEP STROMAL ULCERATION

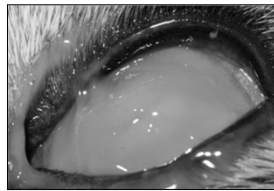
- + Appearance
 - ✦ Severe corneal edema
 - ✦ Variable depth of stromal loss
 - ✦ Soft, melting corneal stroma
 - ✦ White-yellow color
 - ✦ Corneal neovascularization
 - ✦ Anterior uveitis



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MELTING OR DEEP STROMAL ULCERATION CAUSES

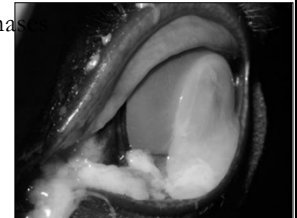
- + Endogenous proteinases
 - ✦ Leukocytes
 - ✦ Corneal epithelial cells
 - ✦ Stromal fibroblasts
- + Infection
 - ✦ Collagenase production
 - ◆ *Pseudomonas*
 - ◆ β -hemolytic *Streptococcus* sp.



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MELTING OR DEEP STROMAL ULCERATION CAUSES

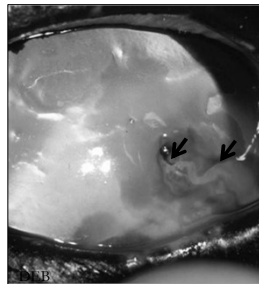
- + Topical corticosteroids
 - ✦ Local immune suppression
 - ✦ Potentiation of collagenase



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INITIAL ASSESSMENT

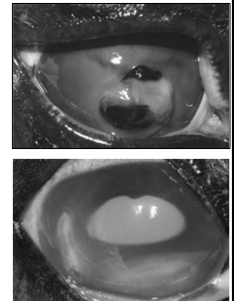
- + Neurologic exam
 - ✦ Palpebral reflex
- + Fluorescein staining
 - ✦ Assess area of ulceration
 - ✦ Seidel test to rule out perforation
 - ◆ Concentrated fluorescein
 - ◆ Fluorescein positive rivulets



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INITIAL ASSESSMENT

- + Ophthalmic examination
 - ✦ Assess extraocular structures
 - ✦ Assess cornea
 - ◆ Integrity of cornea
 - ◆ Depth of stromal involvement
 - ◆ Extent of neovascularization
 - ◆ Pigmented tissue indicates perforation
 - ✦ Assess anterior chamber
 - ◆ Signs of anterior uveitis
 - ◆ Anterior synechia





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MELTING OR DEEP STROMAL ULCERATION

✦ **Diagnostics**

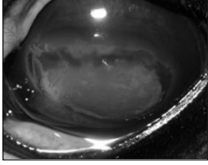
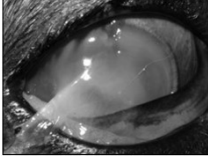
- ✦ **Corneal cytology**
 - ◆ Gently scrape margin of ulcer
 - ◆ Nature of inflammatory infiltrate?
 - ◆ Organism presence?
- ✦ **Corneal culture**
 - ◆ Bacterial
 - ◆ Fungal
 - ◆ Swab margin of ulcer
 - ◆ DO NOT touch eyelids

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MEDICAL VS. SURGICAL TREATMENT

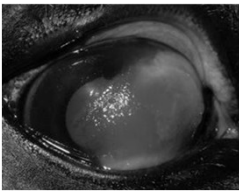
- ✦ Careful monitoring
- ✦ Recommend Referral
 - ◆ Greater than 1/2 stromal depth
 - ◆ Rapidly progressive or melting
 - ◆ No neovascular response
 - ◆ Perforated and actively leaking
- ✦ Medical Management
 - ◆ Until surgery can be performed
 - ◆ If owner cannot afford surgery


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MEDICAL MANAGEMENT TOPICAL ANTIBIOTICS

- ✦ Every 1-6 hours
- ✦ Fluoroquinolone
 - ◆ First line therapy
 - ◆ Ofloxacin, Ciprofloxacin etc.
- ✦ Change if culture results indicate
- ✦ Can select based on cytology



IMPORTANT:
DO NOT use ointments in an eye that has a present or impending perforation, USE SOLUTIONS!




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MEDICAL MANAGEMENT PROTEINASE INHIBITORS

- ✦ Inhibit collagenases
- ✦ Prevent stromal melting
- ✦ Every 1-4 hours
- ✦ Alternate hourly with antibiotics
- ✦ Ideally separate from antibiotics
 - ◆ Serum
 - ◆ Potassium EDTA
 - ◆ N-Acetyl-L-cysteine

Recipe for Serum

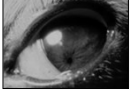
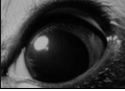


- + 10-20cc blood
- + Animal of same species
- + Allow to clot
- + Spin for 15 mins
- + Aseptically place in sterile eye dropper or red top tube
- + Refrigerate (good 1 week)
- + Freeze (good >1year)



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MEDICAL MANAGEMENT MYDRIATIC-CYCLOPLEGICS

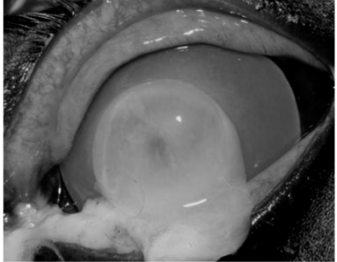
- ✦ Atropine 1%
 - ◆ Every 6 hours initially
 - ◆ Reduce once dilated to effect
- ✦ Pupillary dilation
 - ◆ Prevent synechia at central visual axis
- ✦ Cycloplegia
 - ◆ Ciliary muscle spasm from uveitis
- ✦ Stabilize blood-ocular barrier
 - ◆ Vascular permeability

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CORNEAL UCLERATION IMPORTANT!!

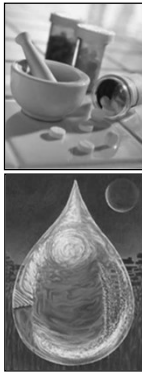
- ✦ Avoid topical corticosteroids!
- ✦ Systemic corticosteroids less of an issue



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SYSTEMIC THERAPY

- + Analgesic
 - ✦ Tramadol/Gaba/Trazodone
 - ◆ Pain relief / takes “edge off”
- + Systemic anti-inflammatory
 - ✦ NSAID x 7-14 days for anterior uveitis and pain relief
- + Systemic antibiotic
 - ✦ If perforation possible
 - ✦ Prevent ascending infection



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Q & A

- + QUESTIONS ON THE MEDICAL MANAGEMENT OF DEEP/COMPLICATED ULCERS?
- + ALL of these cases make excellent referrals....

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SURGICAL MANAGEMENT

- + Conjunctival graft
 - ✦ Brings immediate tectonic support and vascular supply
 - ✦ Frequency of topical antibiotics decreased to q4-6 hours
 - ✦ Serum can be discontinued



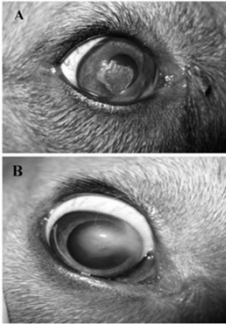
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PHOTO'S COURTESY OF DR. TARYN OVERTON, AEG - 4 Y.O. M/C PUG



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- Tissue glue: sometimes works GREAT, sometimes not...
- Can be a nice addition to aggressive medical therapy
- Similar results in our topical anti-fibrotic studies (Dr. Mohan *et al*)



Comp Clin Pathol (2010) 19:357-362
DOI 10.1007/s00580-009-0877-9

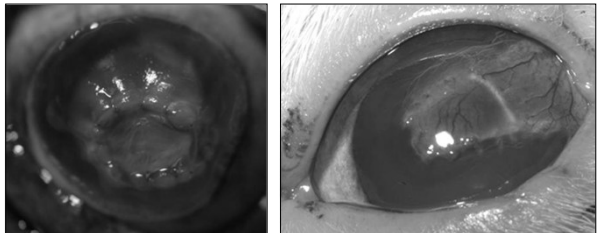
Fig. 4 a Day17 AM+glue eye (AM fell off on day6), some glue remaining on corneal surface; no corneal opacity or vascularisation observed. b Day17 control eye; opacity, vascularisation, and granulation tissue on central cornea

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SURGICAL MANAGEMENT

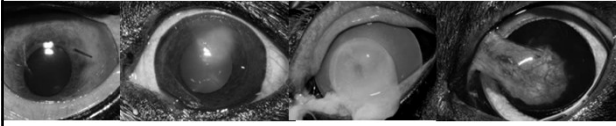
CORNEAL TRANSPLANTATION

CORNEOCONJUNCTIVAL TRANSPOSITION



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“ARE YOU FRUSTRATED, HAVING A MELTDOWN OR BOTH? HELP WITH CORNEAL ULCERS”



Elizabeth A. Giuliano, DVM, MS, DACVO



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STUDENT’S 6 Y.O. DOG

Maya

French Bulldog
Canine
Brindle
Female Spayed

PRESENTS FOR A ROUTINE SCCED....

SO WE DID “ALL THE THINGS”

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Veterinary Ophthalmology



Original Article | Full Access

Diamond burr debridement vs. grid keratotomy in canine SCCED with scanning electron microscopy diamond burr tip analysis

Chloe B. Spertus, Josef M. Brown, Elizabeth A. Giuliano

First published: 09 February 2017 | <https://doi.org/10.1111/vop.12460> | Citations: 4

Veterinary Ophthalmology



ORIGINAL ARTICLE

Comparison of two cleaning and sterilization protocols of diamond burr tips used in debridement for canine superficial chronic corneal epithelial defects

Kayla C. Banks, David E. Stalla, Filiz E. Buryak, Tommi A. White, Loren G. Schultz, Elizabeth A. Giuliano

First published: 04 February 2019 | <https://doi.org/10.1111/vop.12632> | Citations: 2

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FOR THOSE OF YOU USING DBD....HOW MANY USES PER BURR TIP AND WHEN TO REPLACE?

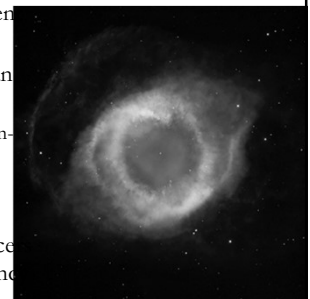
1) Must use U/S cleaning and autoclave between each use to adequately remove particulate matter (ophthalmologists nationally have seen corneal infections post DBD)

2) Properly cared for DBD Tip:
Good for ~100 uses

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ULCERS - SUMMARY POINTS

- + Don't panic!
- + Prompt, accurate assessment critical
- + Remember the 3 reasons an ulcer doesn't heal
 - ✦ Underlying problem mis/undiagnosed
 - ✦ Infection
 - ✦ SCCED
- + Deep, melting, infected ulcers are an ophthalmic emergency



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