

The Latest on Corneal Ulcers



Veterinarians know that ocular ulcers can be a discouraging problem. It's disturbing for owners to see their dogs in pain and trapped in the "cone of shame." But at the same time, compliance with the prescribed regimen can be a challenge for many pet parents, especially if the dog is uncooperative. The result: Staying on top of the latest research to support management of ulcers that don't heal, and the risks associated with them.

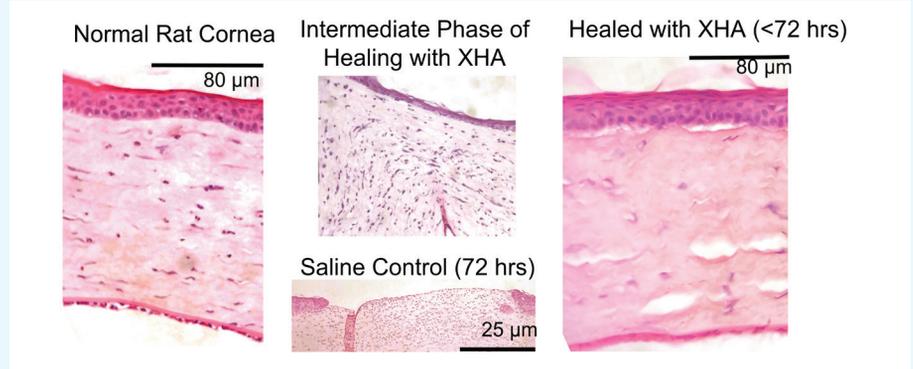
At this year's ACVO Scientific Conference, several presentations discussed topical serum, which is commonly used to treat and heal ulcers. Of particular interest was a study from Purdue University¹ that found that serum does not improve healing in infected corneal ulcers treated medically or surgically in dogs. Another study² from the University of Iowa St. found that serum and plasma can reduce antibiotic efficacy because of antibiotic binding to protein from high levels of albumin; therefore, care should be taken to avoid concomitant administration of serum/plasma and topical antibiotics. The serum/plasma should be administered last and only after appropriate time has elapsed since antibiotic application.

In a study from Sentrax™ Animal Care, a patented crosslinked Hyaluronic acid (HA) matrix in a hydrogel drop has shown to support healing of the damaged cornea. A separate study from Sentrax also compared the ocular residence time of their crosslinked HA to a linear HA drop in normal healthy dogs.³ Linear HA quickly migrated to the tear meniscus and could be quantified up to 36 min. Crosslinked HA exhibited a dual phase behavior: A wide surface coverage first, lasting up to 50 min, then accumulating in tear film meniscus and medial canthus in the second phase, remaining in contact with the ocular surface up to 180 min. Crosslinked HA exhibited a broader ocular surface coverage and a significantly increased ocular surface contact time compared with linear HA. Not only could this indicate extended lubrication but the ability of the crosslinked matrix to adhere to the ocular surface to provide much needed scaffolding support.

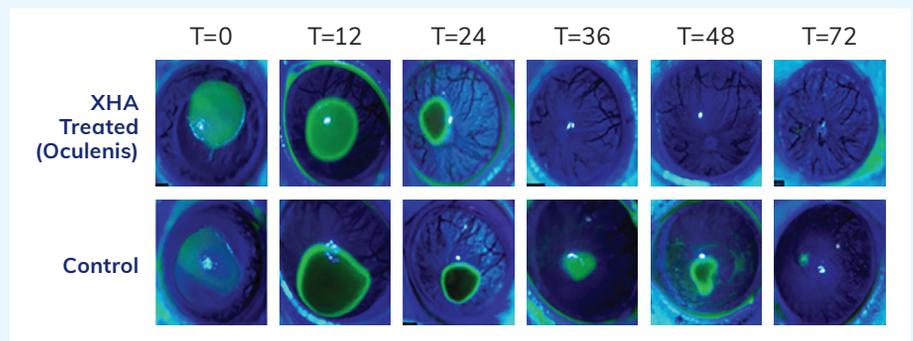


What's new in ocular research?

How does the increased residence time of Oculenis on the ocular surface and its unique crosslinked HA matrix impact healing? Sentrx has completed a proof-of-concept study³ comparing healing rates of hyaluronic acid hydrogel and amniotic drops in rats. This proof-of-concept study was also presented at the 2022 ACVO Scientific Conference.



In this study, the cornea was considered healed when there was no fluorescein staining on the corneal surface. This proof-of-concept study showed a greater than 50% increase in healing rates of corneal injuries treated with crosslinked HA, BioHance, compared to saline controls. It is also worth noting that measurements for the study were formally stopped at 72 hours; in some control groups it took over 100 hours for complete re-epithelization. Thus, if the study was not stopped at 72 hours an even greater difference in healing rates would have been seen. Crosslinked HA also showed reduced healing time in comparison to amniotic eye drops. This result warrants further study into the comparative efficacy of hydrogels in corneal healing time in dogs and will be further investigated. The histopathology reported here indicates that not only is healing faster with the matrix provided by crosslinked HA, but it also appears healthier and closer to normal uninjured morphologies as seen by the images below.



While this research is promising, crosslinked HA is not a one-for-one substitute of serum. Serum contains factors that can neutralize collagenase activity. Collagenases are enzymes that break the peptide bonds in collagen. They assist in destroying extracellular structures in the pathogenesis of bacteria. Thus in complex cases of infected ulcers serum still may be required. In addition antibiotics are required if an infection is present. However, with its unique crosslinked HA matrix that delivers extended residence time and support for accelerated healing, crosslinked HA should be considered to support faster healing of the damaged cornea



To learn more about the studies please visit sentrxanimalcare.com/learnmore

Abstracts: 53rd Annual Meeting of the American College of Veterinary Ophthalmologists, Palm Springs, CA, USA October 26–29, 2022. Vet Ophthalmol, 26: e1-e22. <https://doi.org/10.1111/vop.13045>

1. Davis RL, Latham EA, Townsend WM. Clinical Outcomes of Infected Corneal Ulcers in Dogs Treated with and Without Topical Serum.
2. Kubai MA, Allbaugh RA, Stinman CC, Kenne DE, Moniot JM, Baum DH, Roy MM, Sebbag L. Canine and Equine Serum/Plasma Modulate the Effect of Topical Antibiotics Against Common Bacterial Pathogens in Dogs with Infectious Keratitis.
3. Montiani-Ferreira F, Atzet SK, Fankhauser AD, Behan EK, Haeussler DJ. Fluorometric Evaluation of Crosslinked Vs Linear Hyaluronic Acid Eye Drops.