



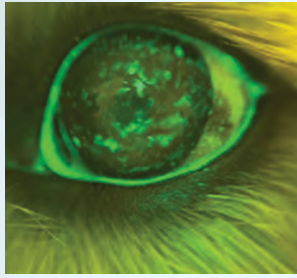
The Latest on Corneal Ulcers

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 the 2022 American College of Veterinary Ophthalmology Conference, several presentations discussed topical serum, which is commonly used to treat and heal ulcers. Of particular interest was a study¹ that found that serum does not improve healing in infected corneal ulcers treated medically or surgically in dogs. Another study² led by Dr. Kubai 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 another study, crosslinked Hyaluronic acid (HA) matrix in a hydrogel drop has shown to support corneal healing. A separate study also compared the ocular residence time of the 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 dualphase 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.

1st Phase: Coverage Phase (Up To 40 Minutes)



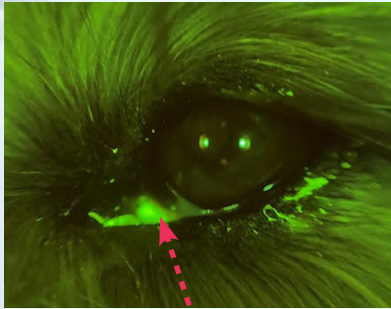
0 minutes

Cross-linked Hyaluronic Acid (0.75%)

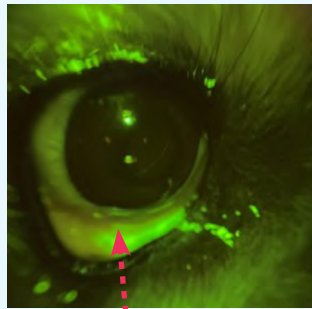
Cross-linked Hyaluronic Acid (0.5%)
5 Minutes



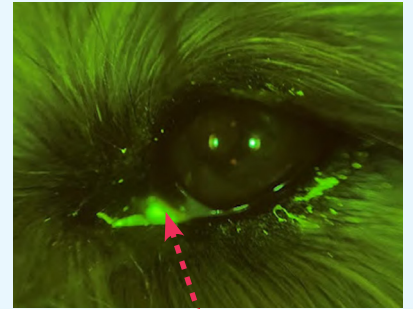
2nd Phase: Medial Canthus Deposit Phase (Slow Release)



Cross-linked Hyaluronic Acid (0.75%)
180 Minutes

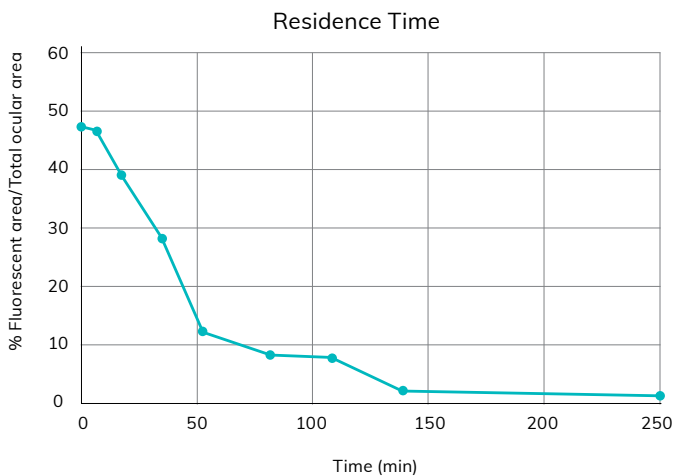


Cross-linked Hyaluronic Acid (0.75%)
180 minutes

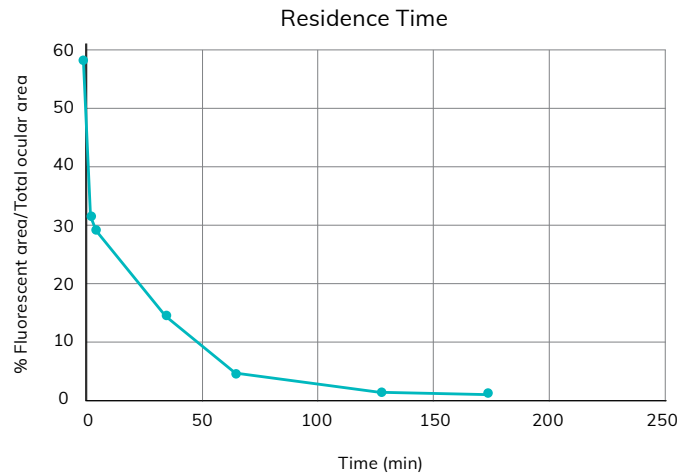


Cross-linked Hyaluronic Acid (0.5%)
127 minutes

Cross-linked Hyaluronic Acid (0.75%) 180 MINUTES



Cross-linked Hyaluronic Acid (0.5%)



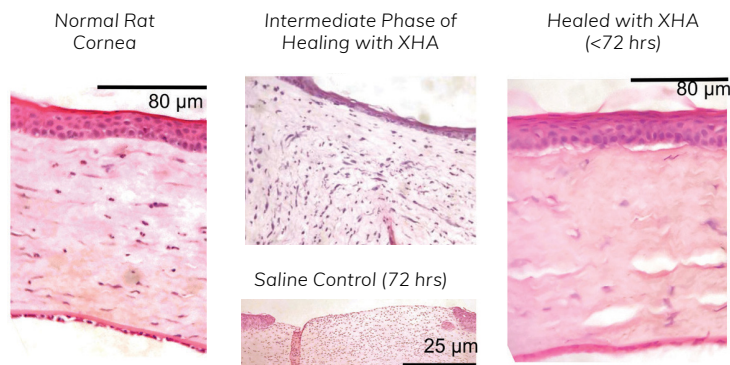
This proof of concept target species test successfully replicated the residence data previously reported.

Next we will expand on the number of test subjects and complete a comparative evaluation with other commercially available lubricants.

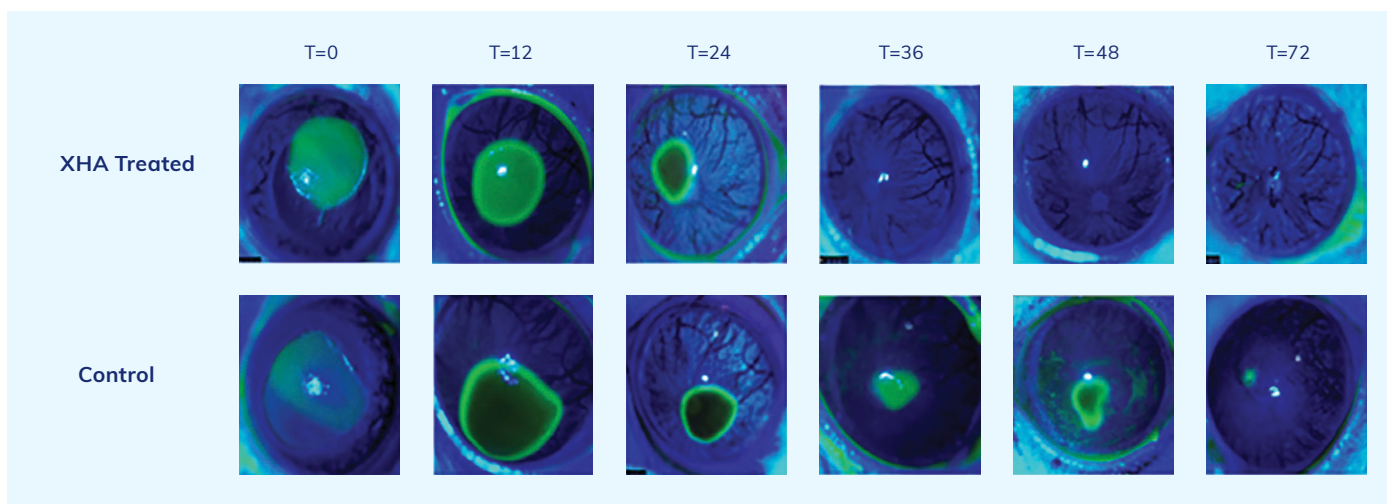
What's new in ocular research?

How does the increased residence time of crosslinked HA on the ocular surface impact healing? 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 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 reepithelisation. 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 neutralise 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.

To learn more about the studies please visit <https://sentrxanimalcare.com/resources/clinical-studies/>

Article written and supplied by Sentrx Animal Care, Manufacturer of Bi oHAnce(TM)

References

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.

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>