

# Treatment of a recurring corneal hemangiosarcoma in a horse with a combined photodynamic diode laser therapy and a dendritic cell therapy

ESVO Meeting  
October 3 - 6 2019  
Dun Laoghaire,  
Dublin, Ireland

Authors: Dr. Birgit Müller | Tierarztpraxis für Augenheilkunde, Weinheim, Germany | info@tieraugen-bergstrasse.de  
Marina Grammel | Tiergesundheitszentrum Südharz GmbH, Osterode am Harz, Germany | m.grammel@tgz-suedharz.de  
Dr. Thomas Grammel | Tiergesundheitszentrum Südharz GmbH, Osterode am Harz, Germany | tgrammel@dr-grammel.de

## Purpose

A hemangiosarcoma located at the **temporal limbus** of the right eye, in a 9 year old male castrated warm blood horse was **removed by keratectomy** in a standing procedure, followed by an immediate **photodynamic diode laser therapy**. No clean margins were achieved and a recurrence occurred after 16 days.

## Material/method

After a recurrence occurred, the dendritic cell (dc) therapy was added to the treatment scheme in order to prevent the enucleation:

1. Autologous Dendritic Cell Therapy: 3 cycles of DCs which were derived from **autologous monocytes** and differentiated by **GM-CSF** and **IL-4**. The DCs were administered into the conjunctiva palpebralis (1ml) and intradermal into the neck (4ml).
2. Continuing photodynamic therapy with diode laser: intratumoral injection of Emundo®, coagulation in 6 cycles between 1,5 and 2 Watt for 30 seconds each, together with the first application of DCs. Subsequently, a renewed laser treatment was omitted and only DCs were injected.

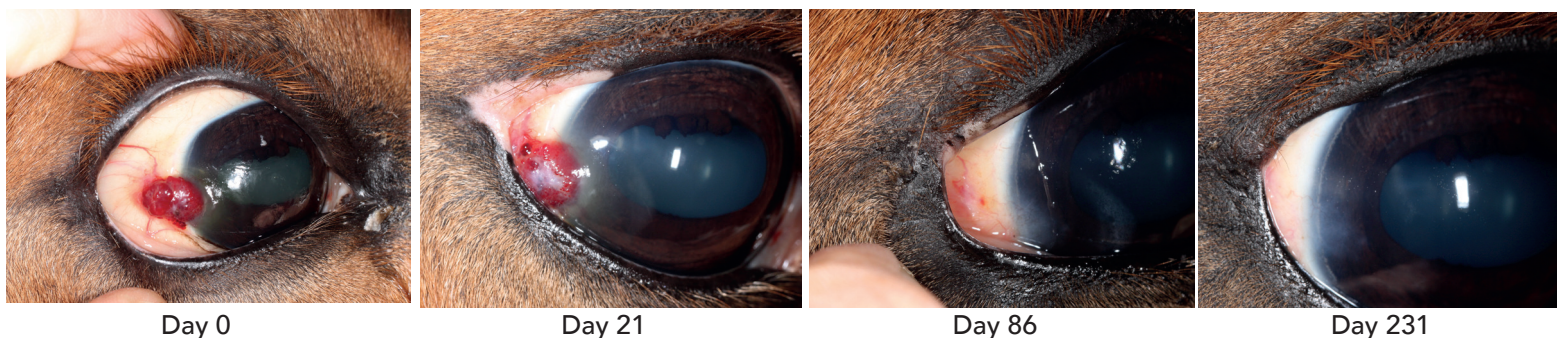
## Results

47 days after initiating this treatment scheme, the **recurrence vanished except for a 1x1 mm small red dot in the episclera**, 2 mm behind the limbus. A mild corneal lipid degeneration was still visible. At a follow-up examination **200 days after initiating the treatment**, the eye showed no pathological changes anymore, the small red dot was gone.

## Discussion

Corneal hemangiosarcomas are difficult to treat (no clean margins, recurrence frequently), new treatment approaches are necessary.

This case demonstrates that the effect of the photodynamic laser therapy can be enhanced by the dendritic cell therapy in order to avoid recurrence (15 months up to date) in corneal hemangiosarcoma.



Day 0 Keratectomy Photodynamic diode laser therapy	Day 16 Recurrence	Day 30 1st Application with DCs 2nd Application of laser therapy	Day 58 2nd Application with DCs	Day 86 3rd Application with DCs	Day 231 Follow-up
--	----------------------	--	------------------------------------	------------------------------------	----------------------

> 200 Days recurrence-free

## Literature

- Buchholz J, Walt H. (2013), Veterinary photodynamic therapy: A review. Photodiagnosis and Photodynamic Therapy, 10(4): 342-347  
Giuliano EA, Johnson PJ, Delgado C, Pearce JW, Moore CP. (2014), Local photodynamic therapy delays recurrence of equine periocular squamous cell carcinoma compared to cryotherapy. Vet Ophthalmol. 17 Suppl 1:37-45.  
McMullen Jr, R., Fischer B. (2016). Intrastromal indocyanine green photodynamic therapy for the treatment of immune-mediated keratitis in the horse.  
Peters JH et al (1996): Dendritic Cells: From ontogenic orphans to myelomonocytic descendants, Immunol. Today 17:273-278.  
Reschke, C. (2012), Erfolgreiche Behandlung eines rezidivierenden equinen Sarkoids Fallbericht einer kombinierten chirurgischen und photodynamischen Therapie. Tierarztl Prax, 40(05): 309-313.  
Scherrer, N. M., Lassaline, M. and Engiles, J. (2018), Ocular and periocular hemangiosarcoma in six horses. Vet Ophthalmol, 21: 432-437.  
Steinman R.M., Cohn Z. (1973). Identification of a novel cell type in peripheral lymphoid organs of mice. I. Morphology, quantitation and tissue distribution. J. Exp. Med. 137: 1142-1162