

# Protozoan eye infections: the challenges of human-animal-ecosystem interactions

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## Introduction

Parasitic infections are significant causes of ophthalmic diseases worldwide. *Acanthamoeba* species and *Toxoplasma gondii* are the most common protozoal parasites that infect the ocular structure and if not treated timely, they could lead to visual impairment and blindness.

*Acanthamoeba keratitis* is caused by *Acanthamoeba* spp., a free-living protist parasite that is present ubiquitously in the environment and exists in two forms, trophozoite and cyst forms. There are various risk factors as wearing of contact lenses for long time, poor personal hygiene, cleaning of lenses with contaminated water and formation of biofilm on contact lenses.

Toxoplasmosis is caused by intracellular protozoan parasite *Toxoplasma gondii*. The mode of infection is either by the ingestion of oocysts shed in feces of the cats or other Felidae (definitive host) or by the consumption of tissue cyst present in the raw or uncooked meat.

Prevention methods differ for each pathogen, but several practices are recognized as effective in reducing the risk at the community and personal levels.

Education campaigns to promote handwashing after contact with animals and other behavioural adjustments can reduce community spread of the disease.

The aim of this study is to increase awareness of protozoal parasites infections by describing two clinical cases that were diagnosed early and were effectively treated.

## Methodology

Two cases were studied through a complete ophthalmologic examination including best-corrected visual acuity (BCVA) slit lamp biomicroscopy dilated biomicroscopic and ocular imaging were performed at the diagnostic assessment and during the follow-up:

**Patient 1:** A 52-years-old Portuguese man was diagnosed with *Acanthamoeba keratitis* in both eyes after abusive use of contact lenses.

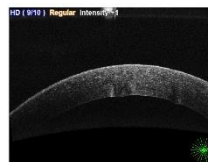


Figure 1: damaged corneal structure with an endothelial scar - Anterior Segment OCT Image.

**Patient 2:** A 41-years-old Brazilian man with Toxoplasmosis in right eye.

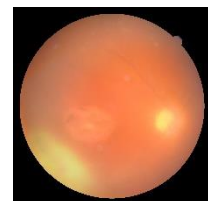


Figure 2: chorioretinal lesions and severe macular lesion - ocular fundus image.

The therapeutic protocol was a combination of classic therapy, anti-parasitic, supplementation (vitamin C, D, zinc, copper and selenium) with immune modulate response and health care recommendations:

**Patient 1:** anti-fungal, anti-septic, anti-parasitic, artificial tear eye drops; non-use of contact lenses was indicated until total infection control.

**Patient 2:** antibiotic, anti-inflammatory, corticosteroids, bacterial folic acid inhibitor; dietary care.

## Results

**Patient 1:** initially, he had light perception, photophobia and hyperaemia; after a six weeks of treatment the patient presented BCVA 1.0 in both eyes.

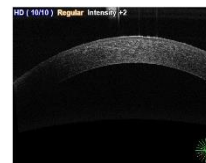


Figure 3: a structural recovery of corneal layers.

**Patient 2:** initially, he was only able to see hand movements; after a four weeks of treatment the patient presented BCVA 0.3 in right eye.



Figure 4: resorptive chorioretinal lesion.

## Conclusion

Our results support that early detection by ocular imaging and pharmacological therapy (that supports the immune system) lead to recovery of visual function and improvement in quality of life.

## Recommendations

Health promotion activities and community engagement may be critical to promote habits and attitudes that reduce the risk of infections, supporting early detection and containment of disease threats. Eye health professionals may be key players to support The One Health approach regarding protozoan eye infections.

## References

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