

Alternate Optical Coherence Tomography Technologies in Use for Corneal Diseases Diagnosis in Dogs and Cats

Authors : U. E. Mochalova, A. V. Demeneva, Shilkin A. G., J. Yu. Artiushina

Abstract : Objective. In medical ophthalmology OCT has been actively used in the last decade. It is a modern non-invasive method of high-precision hardware examination, which gives a detailed cross-sectional image of eye tissues structure with a high level of resolution, which provides in vivo morphological information at the microscopic level about corneal tissue, structures of the anterior segment, retina and optic nerve. The purpose of this study was to explore the possibility of using the OCT technology in complex ophthalmological examination in dogs and cats, to characterize the revealed pathological structural changes in corneal tissue in cats and dogs with some of the most common corneal diseases. Procedures. Optical coherence tomography of the cornea was performed in 112 animals: 68 dogs and 44 cats. In total, 224 eyes were examined. Pathologies of the organ of vision included: dystrophy and degeneration of the cornea, endothelial corneal dystrophy, dry eye syndrome, chronic superficial vascular keratitis, pigmented keratitis, corneal erosion, ulcerative stromal keratitis, corneal sequestration, chronic glaucoma and also postoperative period after performed keratoplasty. When performing OCT, we used certified medical devices: "Huvitz HOCT-1/1F», «Optovue iVue 80» and "SOCT Copernicus Revo (60)". Results. The results of a clinical study on the use of optical coherence tomography (OCT) of the cornea in cats and dogs, performed by the authors of the article in the complex diagnosis of keratopathies of various origins: endothelial corneal dystrophy, pigmented keratitis, chronic keratoconjunctivitis, chronic herpetic keratitis, ulcerative keratitis, traumatic corneal damage, sequestration of the cornea of cats, chronic keratitis, complicating the course of glaucoma. The characteristics of the OCT scans are given for corneas of cats and dogs that do not have corneal pathologies. OCT scans of various corneal pathologies in dogs and cats with a description of the revealed pathological changes are presented. Of great clinical interest are the data obtained during OCT of the cornea of animals undergoing keratoplasty operations using various forms of grafts. Conclusions. OCT makes it possible to assess the thickness and pathological structural changes of the corneal surface epithelium, corneal stroma and descemet membrane. We can measure them, determine the exact localization, and record pathological changes. Clinical observation of the dynamics of the pathological process in the cornea using OCT makes it possible to evaluate the effectiveness of drug treatment. In case of negative dynamics of corneal disease, it is necessary to determine the indications for surgical treatment (to assess the thickness of the cornea, the localization of its thinning zones, to characterize the depth and area of pathological changes). According to the OCT of the cornea, it is possible to choose the optimal surgical treatment for the patient, the technique and depth of optically constructive surgery (penetrating or anterior lamellar keratoplasty).; determine the depth and diameter of the planned microsurgical trepanation of corneal tissue, which will ensure good adaptation of the edges of the donor material.

Keywords : optical coherence tomography, corneal sequestration, optical coherence tomography of the cornea, corneal transplantation, cat, dog

Conference Title : ICVOAED 2024 : International Conference on Veterinary Ophthalmology and Animal Eye Diseases

Conference Location : Riga, Latvia

Conference Dates : June 20-21, 2024