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Encephalitozoon (Nosema) Infection of the Cornea in a Cat

ENCEPHALITOOZONOSIS (nosematosis) is a disease with variable manifestations caused by protozoa of the genus *Encephalitozoon* (*Nosema*) of the class Microsporidea. Since their 1st description in the rabbit,¹¹ microsporidians have been found in numerous animal species, ranging from protozoa to man.^{3-6,8-10} Although lesions have been found in most organs examined, the eyes have infrequently been studied. Visual disturbance has been reported but appears to be the result of central nervous system inflammation. Ocular involvement has been demonstrated only in a human being,¹ a laboratory rat,⁷ and a rabbit.²

A 3½-year-old male domestic short-haired cat had had blepharospasm of the right eye for 6 months. The right central cornea contained numerous superficial opacities arranged in a stellate pattern; these opacities resembled so-called cholesterol deposits seen in dogs. Inflammation of the cornea, conjunctiva, and anterior uvea was moderate. Topical medication was prescribed and used but without significant improvement. A superficial keratectomy was done. Excised corneal tissue was fixed in neutral buffered 10% formalin, and a portion of the fixed tissue was prepared for light microscopy. Another portion of the tissue was then fixed in 2% osmium tetroxide and

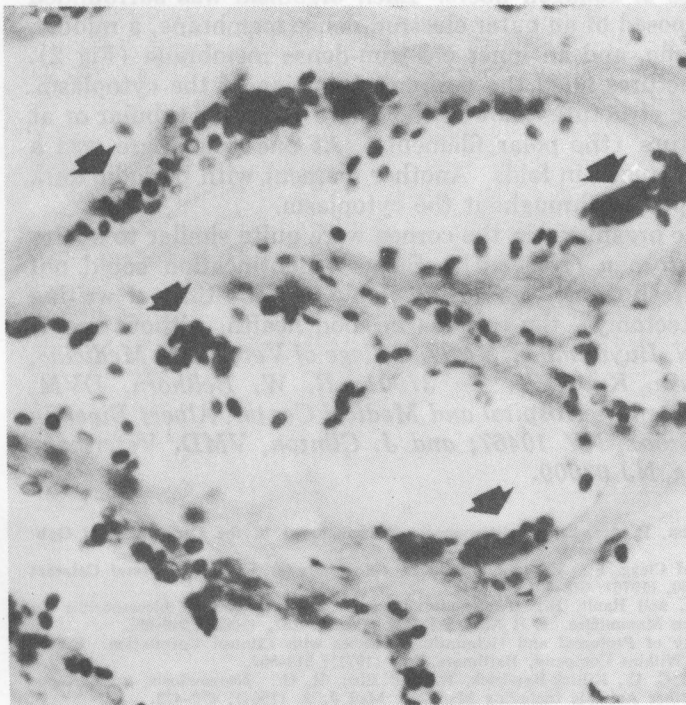


Fig 1—Photomicrograph of corneal specimen, showing numerous organisms within stroma (arrows). Giemsa stain; original magnification; $\times 240$.

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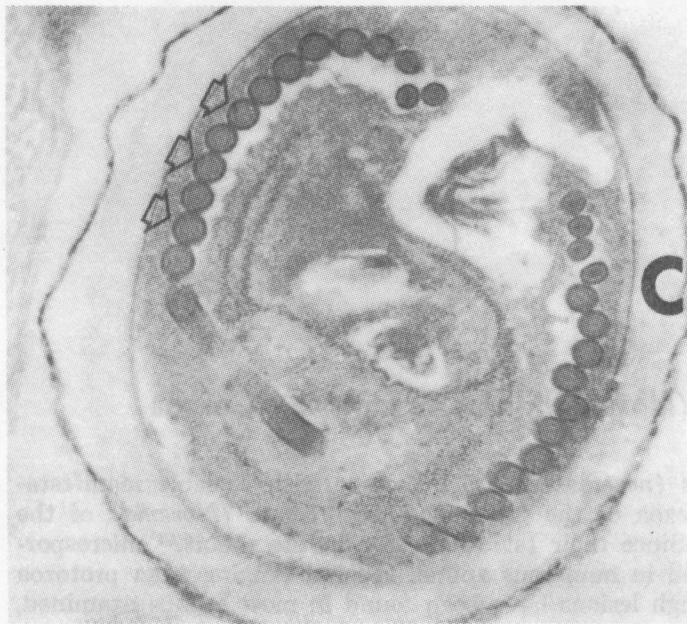


Fig 2—Electronmicrograph of organism in cornea. Notice thick capsule (C) and profiles of polar filament (open arrows). Original magnification; $\times 18,000$.

prepared for electronmicroscopy. Ultrathin sections were stained with uranyl acetate and lead citrate.

The epithelium was degenerated in some areas. A diffuse inflammatory reaction throughout the stroma included polymorphonuclear and mononuclear cells. Within numerous small pockets between stromal fibers and throughout the stromal tissue were numerous refractile oval bodies measuring approximately 1.5 by 4 μm (Fig 1). Some of these bodies had a dense central core surrounded by a clear zone, with the entire body enveloped in a thick hyaline capsule; other bodies did not have internal structure. Evidence of fusion or budding was not seen.

Electronmicroscopic examination of thin sections revealed several oval bodies in various states of preservation, similar in shape and dimensions to those seen by light microscopy, embedded in a somewhat electron-dense matrix between bundles of collagen fibers. Each organism was surrounded by a thick capsule composed of an outer electron-dense membrane, a middle, more electron-lucent zone, and an inner electron-dense membrane (Fig 2). Numerous circular structures filled the peripheral portion of the cytoplasm. Oblique profiles of these structures showed they were probably tubular or at least cylindrical in nature (the polar filament). At one pole there was a filamentous structure arranged in folds. Another filament with periodic dark and light units was dispersed throughout the cytoplasm.

Morphologically, the organisms in the cornea were quite similar to spores of the genus *Encephalitozoon* (*Nosema*).⁵ Species identification could not be done, inasmuch as fresh tissue was not available. At the time of writing (1 year after the keratectomy), the cat was in good health, without recurrence of the disease.—N. Buyukmihci, VMD, College of Veterinary Medicine, University of Tennessee, Knoxville, Tn 37901; R. W. Bellhorn, DVM, J. Hunziker, DVM, Montefiore Hospital and Medical Center, Albert Einstein College of Medicine, Bronx, NY 10467; and J. Clinton, VMD, Veterinary Eye Clinic, Cedar Grove, NJ 07009.

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