

***Encephalitozoon cuniculi* Infection in a Kidney Transplant Recipient**

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Microsporidia, including *Encephalitozoon cuniculi*, are obligate intracellular parasites in the kingdom Fungi. Although microsporidian infections are common among animals such as invertebrates and fish, there were very few human cases reported before 1985 [1]. Since then, many cases have been described in AIDS patients and in patients on immunosuppressive drugs and travelers. Recently, there have been reports of infection in recipients of solid organs from a common donor who are receiving immunosuppressive therapy [2].

In September 2011, two kidneys and the lungs were transplanted from an organ donor who had died of a stroke. Within 7-10 weeks, all organ recipients became ill. The transplanted left kidney was removed from the recipient patient on February 18, 2012, and small, intracellular organisms were noted with a presumed diagnosis of brucellosis. Fixed tissue was sent to the Infectious Disease Pathology Branch at CDC, where immunohistochemical (IHC) staining was negative for *Brucella*, *Toxoplasma*, and *Histoplasma*. Gram stains showed organisms consistent with microsporidia, and EM confirmed this finding. By using immunofluorescent antibody testing from patient's serum, *Encephalitozoon spp.* was diagnosed, and PCR identified the organism as *E. cuniculi*. IHC testing on the autopsy tissues from this patient using antibodies rabbit against *E. cuniculi* was positive.

Electron microscopic examination found abundant microsporidia in the kidney. Spores measured approximately 1.7 x 0.8 um and contained up to 7 cross-sections of the coiled polar filament, consistent with an *Encephalitozoon* species (Figure 1). Immature merogonic forms were seen in some cells with spores (Figure 2), and binucleate meronts were also present (Figure 3). There were also many collapsed spores found within a matrix in the cytoplasm of infected cells (Figure 4).

Unfortunately, the left kidney recipient died. However, once microsporidia was diagnosed as the cause of infection, the right kidney and lung recipients were treated with albendazole and survived. Microsporidiosis may be an under-diagnosed disease due to the lack of experience of clinicians and pathology laboratories. Histopathology along with Gram and immunohistologic stains are useful adjuncts for diagnosis of microsporidia. However, EM and PCR allow definitive identification.

References

- [1] A Curry in "Topley & Wilson's Parasitology", eds. FEG Cox, D Wakelin, SH Gillespie, and DD Despommier. (Hodder Arnold, London) p. 529.
- [2] T Gumbo *et al*, Transplantation **67** (1999) p. 482.

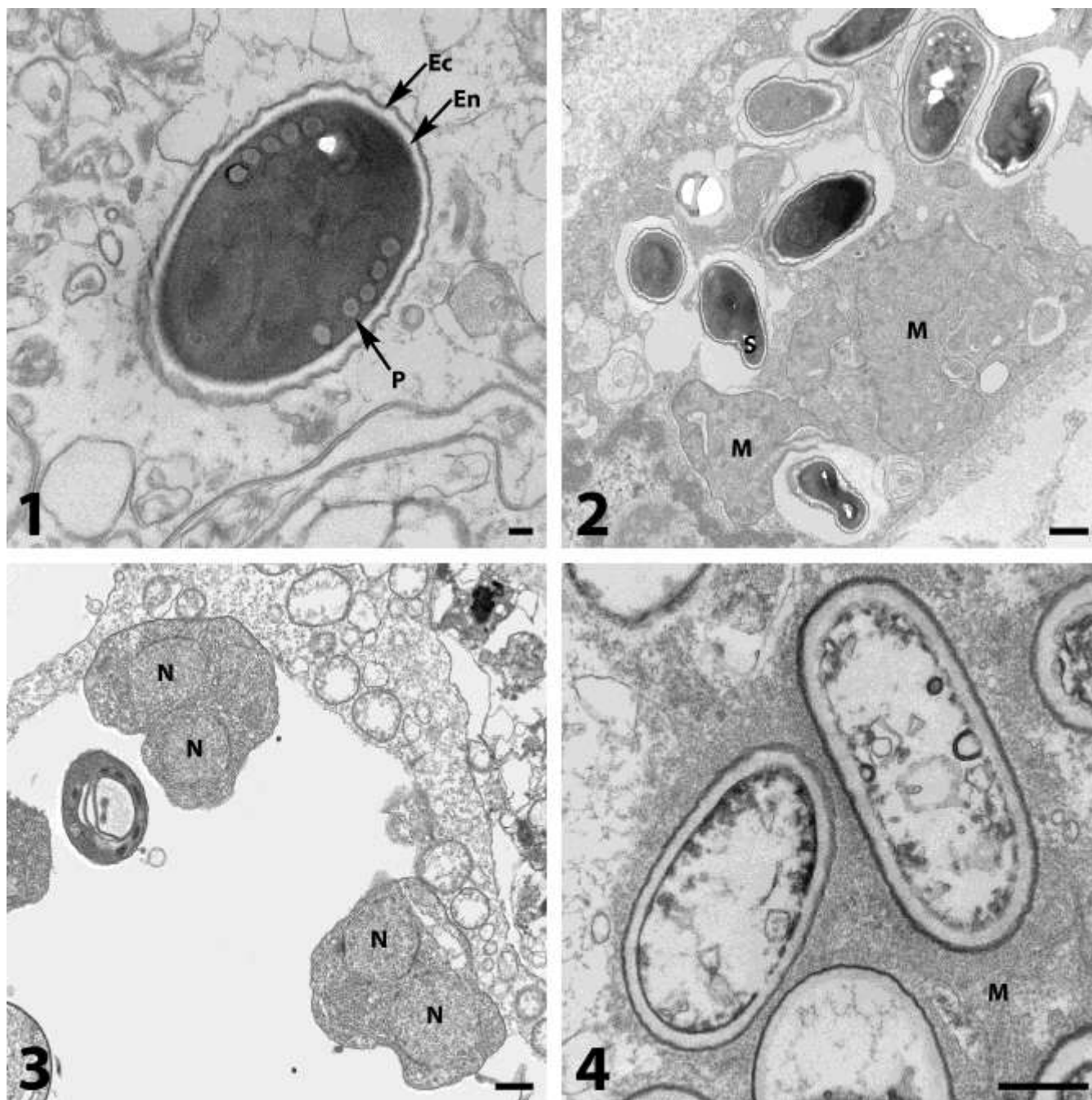


Figure 1. Spore of *Encephalitozoon cuniculi*, surrounded by a dense exospore (Ex) and electron-lucent endospore (EN), and containing 5 cross-sections through the coils of the polar filament (P). Bar, 100 nm. Figure 2. Pleomorphic merogonic forms (M) are seen the cytoplasm of an infected cell which also contains spores (S) within vesicles. Bar, 500 nm. Figure 3. Meronts containing 2 nuclei (N) are seen within a parasitophorous vesicle. Bar, 500 nm. Figure 4. Oval, empty forms of the microsporidia are found within a granular matrix (M) in the cytoplasm of an infected cell. Bar, 500 nm.