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Post-Renal Transplant Microsporidosis

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Microsporidia is an intracellular obligated protozoon, which belongs to the Microspora phylum. There are about 140 genera and 1,200 species of microsporidia. 14 species from 8 genera have been reported infecting humans: Encephalitozoon, Enterocytozoon, Pleistophora, Tachipleistophora, Nosema, Vittaforma, Brachiola, and Microsporidium [1]. They are opportunist pathogens which infect immune depressed patients. It is rare in the transplant setting but is an emerging pathogen in AIDS patients [2]. We describe a case of microsporidiosis in a post renal transplant patient.

The patient is a 36 year old male who received a deceased donor renal transplant 9 months prior to the first biopsy. The first biopsy showed marked interstitial inflammation with tubulitis consistent with cellular rejection. After 2 weeks of treatment, renal function did not improve and another biopsy was performed. Histologic features in the second biopsy were similar to the first but had much more pronounced inflammation and semi-translucent cytoplasmic inclusions. Tubulitis was widespread.

Kidney biopsy tissue was collected per UC Davis Medical Center protocol. The portion designated for electron microscopy studies was placed into Karnovsky's fixative. Tissue was rinsed with Sodium phosphate buffer and post-fixed in 1% Osmium fixative buffered with 0.1 M PO4. Dehydration was accomplished with ascending concentrations of acetone. Resin infiltration was completed using the microwave under vacuum for 3 min each step- 1:1, 3:1 and 2 x's pure resin and polymerized in 70^{o} oven overnight. Thick section (480 nm) were collected using a Diatome diamond knife (Diatome, Switzerland, EMS Hatfield, PA., U.S.A. distributor)and stained with Methylene Blue/AzureB to ascertain presence of glomeruli. Thin sections were taken at 60-80 nm, using a Diatome diamond knife, picked up on copper grids and stained with uranyl acetate and lead citrate. The sections were viewed on Philips CM120 TEM (FEI Company, Hillsboro, OR.,U.S.A. made in Eindhoven, The Netherlands) and images were collected using Gatan Megascan camera and Digital Micrograph (Gatan, Pleasanton, CA).

Light microscopy revealed parasitophorous vacuoles in the tubular epitheilial cells and in some luminal spaces (Fig. 1). These vacuoles contain numerous microorganisms (Fig. 2). Electron Microscopy revealed the characteristic morphology of the organisms (Fig. 3). Higher magnification allowed visualization of the coiled polar tubules (Fig. 4) located along the thick cell wall which identified them as microsporidia.

Microsporidia have been detected in many if not all organs and may present symptoms which are related to their specific localization including interstitial nephritis [1]. While rare in the post-transplant setting, microsporidiosis should be considered in this setting where features of rejection are present but do not fit the clinical picture. Transmission Electron Microscopy (TEM) is vital in diagnosing this intracellular organism. TEM is used to confirm the diagnosis based on morphology such as the coiled polar tube within the spores and the posterior vesicles [1].

References:

[1] Hernandez-Rodriquez, O. X., et al, Case Reports in Nephrology, V 2012, Hindawi Publ Corp, p 1-4 [2] Latib, M. A. et al Transpl Int (2001), p. 274.

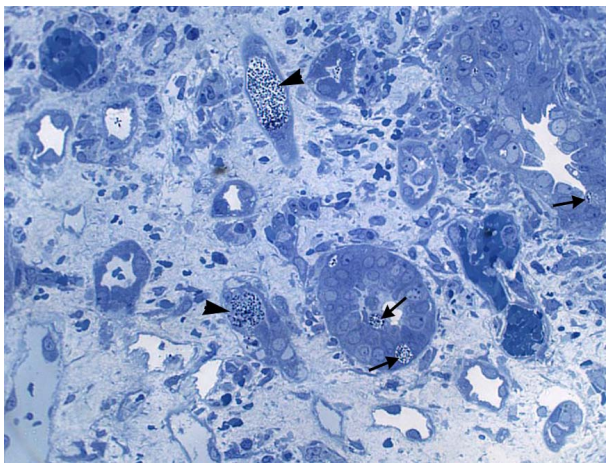

Figure 1. Light microscope image. Note the tubule epithelium (arrows) and the tubular luminal spaces (arrowheads) containing the organisms

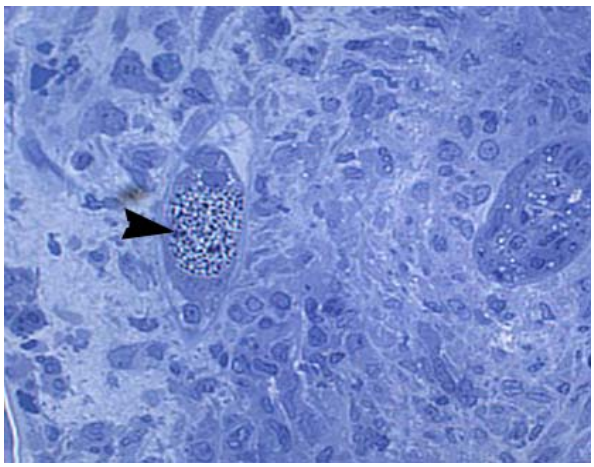

Figure 2. Light microscope image. Some tubular luminal spaces contain the microsporidia spores.

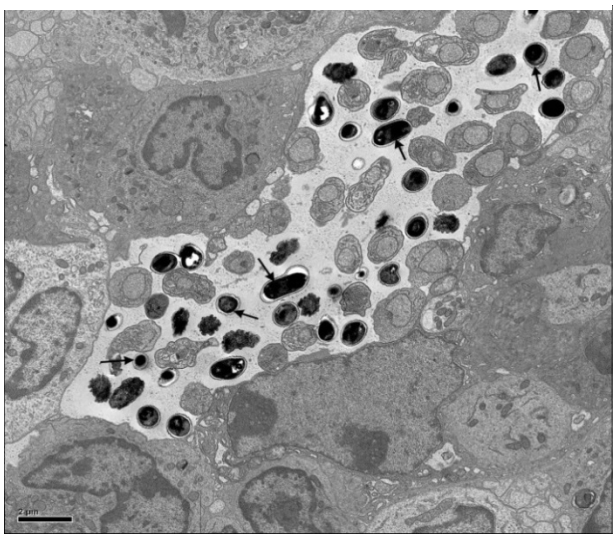

Figure 3. TEM image of organisms contained in the luminal space. Microsporidia is indicated by the arrows.

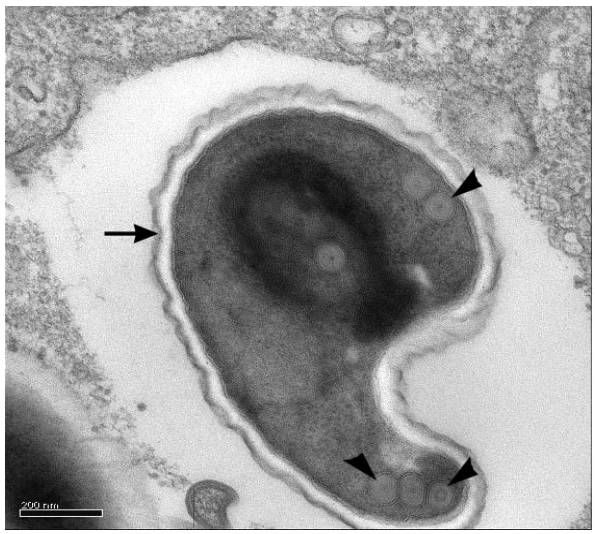

Figure 4. TEM image of microsporidia spore. Note the coiled polar tubes (arrowheads) and thick cell wall (arrow).

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