Tulane National Primate Research Center
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Tulane University

Case No: FG05

Submitted by: David Liu

History:

A 6-year-old male Indian M. Mulatta was one of animals involved in a HIV vaccine study. This animal was challenged with SIVsm/E660 1 year ago, and had a chronic dehydration and weight loss. The animal was humanely euthanized due to the poor prognosis.

Gross findings:

The animal was severe dehydated with a very thin body condition. The spleen was enlarged 2x with prominent lymphoid follicles. The peripheral lymph nodes are also enlarged. Thymus was severely atrophic.

Lab Results:

Immunochemistry of Simian virus 40 was positive in kidney and brain.

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Histopathologic Description:

Kidney: Multifocally the capsule, the vessel walls and interstitium are moderately to markedly expanded by edema, increased connective tissue, and numerous infiltrates of lymphocytes, plasma cells and eosinophils. Multifocally the renal tubes are variably dilated and often contained with eosinophilic amorphous material (protein cast) or sloughed epithelial debris. The associated tubular epithelial cells are hypertrophic with cytoplasmic vasculization (degeneration), attenuated with hyperchromatic nuclei (regeneration), or shrunken with hypereosinophilic cytoplasm and karyorrhectic and pyknotic nuclei (necrosis). Occasionally, mild glomerular atrophy and lined by hypertrophilic parietal epithelial cells is noted. There are numerous deeply basophilic intranuclear inclusion bodies in the tubular epithelial cells, fibroblasts cells in capsule and vessel walls, parietal cells of Bowman's capsule, and cells sloughed in the tubules.

Morphologic Diagnosis: Nephritis, interstitial and perivascular, lymphoplasmacytic, multifocal, moderate, with many intranuclear inclusion bodies

Cause: Simian virus 40

Discussion:

The inclusion bodies in kidney were SV40 positive by immunochemistry. SV 40 virus is double stranded DNA virus belonging to the Papovaviridae family. It is similar to BK polyoma virus and JC polyoma virus in humans. All polyoma viruses have large T and small T antigen, common sites for primer design in PCR diagnosis. Polyoma viruses can cause latent infections in healthy hosts, but clinical disease occurs in immunocompromised hosts. This animal was experimentally inoculated with SIV with chronic CD4 depletion. This animal had other SIV associated lesions, including giant cell pneumonia, lymphoid hyperplasia and dysplasia in spleen and lymph nodes, and encephalitis. Intronuclear inclusion bodies were also noted in brain, optic nerve and thymus. The differential diagnosis for these inclusions are cytomegalovirus, herpesvirus and adenovirus . These inclusion bodes can be differentiated based on size, using electron microscopy, virus-specific immunohistochemistry and PCR.

References:

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3. Lerche NW: Polyomaviruses – Simian virus 40. *In*: The handbook of experimental animals, the laboratory primate, eds., Wolfe-Coote S, Bullock G, Petrusz P, pp. 84-85. Elsevier Academic Press, San Diego, CA, 2005