

Adenovirus Infection in Guinea Pig - A Case Study

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Although pneumonia is a common cause of death in guinea pigs, the cause is usually bacterial. Common etiologic agents include *Bordetella bronchiseptica*, *Streptococcus pneumoniae*, *Streptococcus zooepidemicus*, *Klebsiella pneumoniae*, and *Pasteurella multocida*. Relatively common causes of viral infections in guinea pigs include cytomegalovirus, lymphocytic choriomeningitis virus and a few enteric viruses. Adenoviral pneumonia was diagnosed and experimentally reproduced in the early 1980's but has been reported rarely. Adenoviruses cause natural respiratory disease in cattle, sheep, horses, quail, nonhuman primates, dogs, and man, and experimental disease in swine and mice.

History: One-year-old, male guinea pig found dead in an animal nursery.

On PM examination consolidation of all pulmonary lobes, marked splenic hyperplasia, moderate lipidosis of the liver, multiple hemorrhages of the mucous membranes of stomach, colon and rectum were observed.

On histopathological examination lung showed diffuse severe interstitial pneumonia, with numerous macrophages within the alveolar lumina and basophilic intranuclear inclusion bodies. Lung vessels showed severe perivascular edema, acute thrombosis of small vessels and basophilic intranuclear inclusion bodies in endothelial cells. In liver moderate lipidosis, basophilic intranuclear inclusion bodies in hepatocytes and endothelial cells and in spleen basophilic intranuclear inclusion bodies were observed. Etiology: consistent with

adenovirus infection.

The diagnosis of adenovirus-infection was established by electron-microscopic investigation. Within the nuclei of hepatic endothelial cells, numerous round virus particles were identified. They measure approximately 90nm in diameter and some have an electron-dense core while others have an electron-lucent core. The size and appearance of the viral particles are characteristic for adenovirus. The first reports on a spontaneous respiratory disease in guinea pigs caused by adenovirus (*Namann, et.al., 1981; Brennecke, et.al., 1983*) gave reason for an experimental proof of the infection (*Kaup, et.al., 1984; Kunsty, et.al., 1984*).

Note multiple electron dense viral particles and other immature membrane bound particles which contain developing central nucleoids.

On electron microscopic examination of lung diffuse interstitial, pneumonia with multifocal fibrin thrombi and intrahistiocytic and endothelial basophilic and eosinophilic intranuclear inclusion bodies were noticed.

Differential diagnosis considered for this case included cytomegalovirus and adenovirus. Both of these viruses produce a similar histologic appearance, with large intranuclear inclusions. Cytomegalovirus causes prominent cytomegaly and by electron microscopy, there are 100-150 nm diameter, hexagonal viral nucleocapsids within nuclei of infected cells. Electron microscopy of adenovirus infected cells demonstrates 70-90 nm virions that are sometimes arranged in paracrystalline arrays.

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