



Abbey Veterinary Services

DIAGNOSTIC HISTOPATHOLOGY AND CYTOLOGY

Clinicopathological Newsletter

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CASE OF INTEREST

Herpesvirosis in Tortoises

By Richard Fox, Veterinary Pathologist

Herpesviruses have been detected in a wide range of vertebrates. In chelonians Herpesvirus infections have been identified in at least seven genera (Gopherus, Chelonia, Geochelone, Testudo, Graptemys, Clemmys, Chrysemys) and in five types of tortoises: Greek (Testudo graeca), Horsfield (Testudo horsfieldii), Hermann's (Testudo hermanni), desert (Gopherus agassizii), and Argentine tortoises (Geochelone chilensis).

Herpesvirosis in chelonians is caused by Chelonid Herpesvirus (ChHV). Common terms include "stomatitis-rhinitis" characterised by necrotizing lesions of the oral mucosa (diphtheritic plaques), with a yellow-white pseudomembrane extending often from the caudal half of the tongue to the caudal pharynx and epiglottal area. These lesions impair food prehension and swallowing. These plaques often have a cyclical appearance and resolution. Rhinitis and conjunctivitis are also common features seen in Herpesvirosis. A clear serous nasal discharge is present which often progresses to a mucopurulent discharge. Eyelids are often swollen with serous to mucoid ocular discharge.

Diagnosis of herpesviral infection is generally based on the presence of intranuclear inclusion bodies, electron microscopic identification of viral particles, isolation of the virus, and/or immunohistochemical confirmation using anti-herpesvirus antibodies.

At necropsy, in addition to the oropharyngeal lesions, enlargement and ecchymosis of the liver can be observed as well as pseudomembrane formation in the stomach.

Histopathology of the mucosal epithelium from the tongue to the pharyngolaryngeal region reveal diffuse areas of degeneration and necrosis, with an accumulation of necrotic cellular debris and fibrin on the surface (a pseudomembrane) (Fig 1). The mucosa is usually infiltrated by mixed inflammatory cells. Polymorphic eosinophilic or amphophilic inclusion bodies are visible in the nuclei of mucosal epithelial cells, in some cases occupying the entire nucleus (Figs. 2, 4).

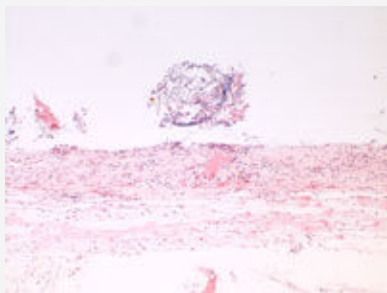


Figure 1. Histological section of the dorsal hard palate. Note the ulceration and the presence of surface necrotic cell debris (Pseudomembrane) (x5 obj.). HE Stain.

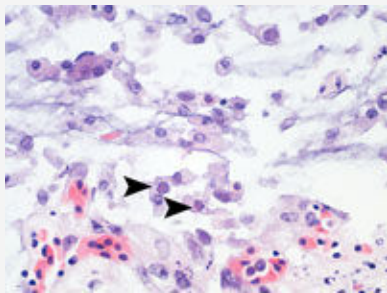


Figure 2. Histological section of the dorsal hard palate. Note the intranuclear amphophilic inclusion bodies in the nuclei of sloughed glandular and squamous epithelial cells. (x65 obj.). HE Stain.

Similar lesions are also present in the liver, spleen, esophagus, stomach, cerebrum, and lungs (Fig 3 & 4), adrenal glands, kidneys, duodenum, jejunum, colon, and pancreas of tortoise.

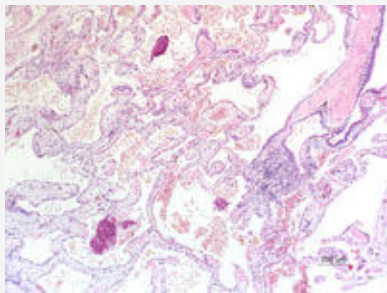


Figure 3. Histological section of the lung with plentiful intra-luminal granulocytic and necrotic exudate (x2 obj.). HE Stain.

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JOURNAL Articles(with e-links)

1. Wills SJ, Arrese M, Torrance A, Lloyd S, Pratschke K, Whitbread T, Gould S. Pneumonyssoides species infestation in two Pekingese dogs in the UK. J Small Anim Pract. 2008 Feb;49(2):107-9. [Link](#)

Two male, neutered, Pekingese dogs aged four years and 12 years were presented for acute-onset nasal pruritus and sneezing following a visit to a beach in northern Scotland. Routine nasal investigations revealed the presence of the canine nasal mite Pneumonyssoides both by direct visualisation and histopathologically. Resolution of clinical signs was observed following selamectin treatment. To the authors' knowledge, this report describes the first cases of Pneumonyssoides infestation in non-travelled UK dogs.

2. Cemazar M, Tamzali Y, Sersa G, Tozon N, Mir LM, Miklavcic D, Lowe R, Teissie J. Electrochemotherapy in Veterinary Oncology. J Vet Intern Med. 2008 Jun 4. [Link](#)

Electropermeabilization is a method that uses electric field pulses to induce an electrically mediated reorganization of the plasma membrane of cells. Electrochemotherapy combines local or systemic administration of chemotherapeutic drugs such as bleomycin or cisplatin that have poor membrane permeability with electropermeabilization by direct application of electric pulses to the tumors. Preclinical studies have demonstrated excellent antitumor effectiveness of electrochemotherapy on different animal models and various tumor types, minimal toxicity, and safety of the procedure. Based on results of preclinical studies, clinical studies were conducted in human patients, which demonstrated pronounced antitumor effectiveness of electrochemotherapy with 80-85% objective responses of the treated cutaneous and SC tumors. Clinical studies in veterinary oncology have demonstrated that electrochemotherapy is very effective in the treatment of cutaneous and SC tumors of different histologic types in cats, dogs, and horses. The results of these studies have also demonstrated approximately 80% long-lasting objective responses of tumors treated by electrochemotherapy. Primary tumors of different histologic types were treated. Electrochemotherapy in veterinary oncology has future promise to be highly effective, and could be used to treat primary or recurrent solitary or multiple cutaneous and SC tumors of different histology or as an adjuvant treatment to surgery.

3. Parker JS, Monnet E, Powers BE, Twedt DC. Histologic examination of hepatic biopsy samples as a prognostic indicator in dogs undergoing surgical correction of congenital portosystemic shunts: 64 cases (1997-2005). J Am Vet Med Assoc. 2008 May 15;232(10):1511-4. [Link](#)

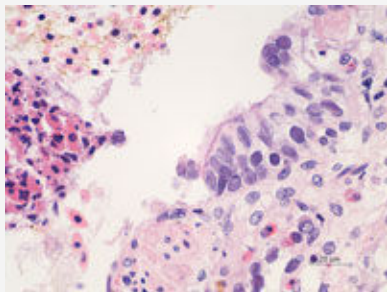


Figure 4. Histological section of lung including respiratory (ciliated) epithelium with numerous intranuclear inclusion bodies adjacent to a coagulum of necrotic cell debris. (x65 obj.). HE Stain.

Tortoises that survive the primary infection are likely to host the virus for life and consideration of the overall health status of the tortoise is important. The presence of serum neutralising antibodies does not protect from re-infection and does not block the appearance of clinical signs. Therefore separation of exposed/infected animals from unexposed individuals is important and effective environmental cleaning is also paramount.

References:

1. Y. Une; K. Uemura; Y. Nakano; J. Kamiie; T. Ishibashi; Y. Nomura. Herpesvirus infection in tortoises (*Malacochersus tornieri* and *Testudo horsfieldii*). *Vet Pathol* 1999 36: 624-627
2. Reptile Medicine and Surgery. Douglas R Mader, 2nd ed, Herpesvirus in Tortoises, p814-821. 2006.
3. Hunt CJ. Herpesvirus outbreak in a group of mediterranean tortoises (*Testudo* spp). *Vet Clin North Am Exot Anim Pract.* 2006 Sep;9(3):569-74.

A retrospective study of 64 dogs that underwent exploratory laparotomy for an extrahepatic (n = 39) or intrahepatic (25) congenital PSS were reviewed. All H&E-stained histologic slides of hepatic biopsy samples obtained at the time of surgery were reviewed by a single individual, and severity of histologic abnormalities (ie, arteriolar hyperplasia, biliary hyperplasia, fibrosis, cell swelling, lipidosis, lymphoplasmacytic cholangiohepatitis, suppurative cholangiohepatitis, lipid granulomas, and dilated sinusoids) was graded. The median follow-up time was 35.7 months, and median survival time was 50.6 months. Thirty-eight dogs were alive at the time of final follow-up; 15 had died of causes associated with the PSS, including 4 that died immediately after surgery; 3 had died of unrelated causes; and 8 were lost to follow-up. None of the histologic features examined were significantly associated with survival time. Findings suggested that results of histologic examination of hepatic biopsy samples obtained at the time of surgery cannot be used to predict long-term outcome in dogs undergoing surgical correction of a PSS.

LATEST NEWS

Gene Therapy Improves Survival And Quality Of Life Of Dogs With Cancer

The therapy uses a nonviral DNA molecule, called a plasmid, which encodes for growth hormone-releasing hormone (GHRH). This stimulates the endogenous growth hormone and another growth substance, insulin-like growth factor-1 (IGF-1), which have anabolic effects.

The therapeutic process involves injecting the DNA fragment into a muscle and applying electroporation--short, mild, controlled electric fields--in the area of the injection. It opens the cell membrane pores and traps the DNA inside the cells, which allows the production of GHRH. This thwarts the body's natural process of eliminating a foreign body, in this case the DNA molecule.

The researchers tested the gene therapy in 55 companion dogs that had cancer and anemia and were receiving cancer treatment. Three months after the injection, 54 percent of the dogs had responded to gene therapy, as apparent on blood testing. Dogs that responded to therapy survived 84 percent longer, compared with dogs that did not respond to gene therapy and untreated control dogs that received a placebo injection. Although the response rate dropped to 47 percent at 4 months, it was still 22 percent higher than in control dogs.

Additional info: [External Link](#)

SIDE STORY

Meticillin-resistant Staphylococcus aureus in a veterinary orthopaedic referral hospital: staff nasal colonisation and incidence of clinical cases.

Nasal bacterial swabs were collected from veterinary staff and environmental surfaces swabbed at six monthly intervals for meticillin-resistant Staphylococcus aureus monitoring over an 18 month period. The incidence of meticillin-resistant Staphylococcus aureus-associated postoperative wound complications of two veterinary orthopaedic surgeons was reviewed for a period when one was positive for nasal meticillin-resistant Staphylococcus aureus.

Meticillin-resistant Staphylococcus aureus was isolated from a maximum of two out of 10 staff on each occasion. The persistently infected clinician was primary surgeon in 180 cases, of which four developed meticillin-resistant Staphylococcus aureus-associated wound complications. None of 141 operations led by the other surgeon developed meticillin-resistant Staphylococcus aureus-associated complications.

Veterinary workers are at increased risk for meticillin-resistant Staphylococcus aureus colonisation, so it is likely that many veterinary patients are treated by meticillin-resistant Staphylococcus aureus-positive staff. Nasal colonisation of veterinary surgeons with meticillin-resistant Staphylococcus aureus appears to present only a small risk to their patients when appropriate infection control procedures are followed.

Read More : [External Link](#)

BIOPSY TIPS

Liver Cytology

• Cytology of the liver is not suitable for any disease in which the histological structure is required for proper judgement. This applies to the vast majority of liver diseases. FNA is useful only if it is possible for the diagnosis to be made on single isolated cells. This applies to the identification of tumour cells from a local lesion, or changes which are diffusely present in all hepatocytes such as steatosis (fatty liver) of steroid hepatopathy. Possible underlying liver pathology will, however, not be identified*.

This is also applicable to most cases in which visceral pathology is suspected including aspiration of the kidney, intestine, spleen as well as the lung.

*Ref: WSAVA Standards for Clinical and Histological Diagnosis of Canine and Feline Liver Disease. Saunders Elsevier, St. Louis, Missouri, USA, 2006. ISBN 0-7020-2791-X.

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