ECVP/ESVP Summer School in Veterinary Pathology

Summer School 2014 – Toxicological Pathology (177)

Slide2, K-2. (06-09344) Dog

Description (14)

Multifocal cortical necrosis with inflammatory cells, fibrin - often surrounds crystal aggregates. (2) Tubular rupture (1)

Cortical convoluted tubules variably filled with rounded or pyramidal pale yellow birefringent crystals arranged as rosettes and sheaves (calcium oxalate crystals) (3)

Tubular epithelium often fragmented and sloughing into lumen (2)

Interstitium infiltrated with degenerative neutrophils, also extensive cell debris and free red blood cells (RBCs) (2)

Remaining tubules have attenuated epithelium (1) and some contain casts, either eosinophilic homogenous to granular material (hyaline casts) (1) or degenerative neutrophils and debris (granular casts) (1)

Multifocally, glomerular capillary loops are thickened and hyalinized, there is mesangial thickening, and glomerular basement membranes are thickened and hyalinized (bonus 1 – hard to see due to poor staining)

There are tubular intranuclear inclusions, deeply eosinophilic, elongated brick shaped (bonus 1, background aging change)

Morphologic Diagnosis(es) (3)

Tubular necrosis and interstitial nephritis with intralesional birefringent crystals consistent with calcium oxalate, diffuse, severe, acute (3)

Most likely etiologic agent (1)

Ethylene glycol (Source: antifreeze)

Differentials for crystals: sulfonimides, melamine-cyanuric acid crystals (pet food nephropathy) – Distribution different for these crystals

Mechanism (2) (see notes)

Case information: 8 yr old Great Dane dog.
Gross findings: perirenal edema, urine cloudy pink to yellow
Urinalysis: pH 5.5, protein 3+, blood 3+, SG 1.025
Kidney scraping wet mount: pyramidal refractile crystals arranges in rosettes and sheaves.
Ethylene glycol: 275 ppm by GC/FID