ECVP/ESVP Summer School in Veterinary Pathology

Summer School 2014 – Mock Exam

Case 1. Swine, lung Enzootic pneumonia

Histologic Description	*Points*
Style	1
First sentence 60-70 % of the parenchyma (0,5) is affected by severe BALT hyperplasia (0,5) and mild to moderate inflammation (0,5) of bronchi and bronchioles (0,5)	2
Bronchial wall (lamina propria and epithelium) infiltrated by:	0,5
Prevalence of small mature lymphocytes	0,5
plasma cells	0,5
Lesser numbers of non degenerated neutrophils	0,5
Bronchial lumen contain	0,5
abundant mucus	0,5
small numbers of viable and degenerated neutrophils/sloughed epithelial cells/erythrocytes (any)	0,5
Peribronchial/peribronchiolar tissue	0,5
Numerous nodular lymphoid aggregates	0,5
Expanded germinal center (0,5) with elevated numbers of centrocytes/centroblasts (II follicles/follicular hyperplasia) 0,5	1
Mild fibrosis	0,5
Adjacent alveoli:	0
atelettasis	0,5
lumens contain occasional neutrophils and erythorcytes (any)	0,5
Occasional macrophages/multinucleated giant cells/type II alveolar hyperplasia	0,5
Alveolar expansions (compensatory emphysema)	0,5
Septa are characterized by	0
Perivascular nodular lymphoid/follicular aggregates	0,5
Mild fibrosis	0,5
Lymphocytes and plasmacells	0,5
Hyperhaemia	0,5
Morphologic Diagnosis Chronic (0,5) moderate (0,5) multifocal (0,5) catarrhal (0,5) and lymphoplasmacytic bronchopneumonia (0,5) with severe BALT hyperplasia (0,5)	3
Name the disease Swine enzootic pneumonia	2
Etiology *Mycoplasma hyopneumoniae*	2
	20

Histopathologic Description:

Lung: Approximately 70 % of the pulmonary parenchyma is affected by severe BALT hyperplasia and moderate inflammation centered on bronchioles associated with severe atelettasis.Peribronchial interstitium is thickened by mild fibrosis, elevated numbers of plasmacells, lymphocytes and lesser numbers of neutrophils. Lymphoid peribronchial follicles are increased in diameter and in their center elevated numbers of centroblasts are present (BALT hyperplasia). Bronchi and bronchiole contain abundant amphophilic material (mucus) admixed with sloughed epithelial cells and occasional neutrophils. Most of the

alveoli especially adjacent to the bronchial lumens are collapsed (severe diffuse atelettasis). Within alveolar lumina are moderate numbers of foamy macrophages, rare multinucleated giant cells, and lymphocytes and plasmacells. There is marked interlobular and septal hypehaemia..

Morphologic Diagnosis: Lung: Pneumonia, bronchointerstitial, chronic, multifocal, moderate, with severe bronchial associated lymphoid tissue hyperplasia

Etiologic Diagnosis: Pulmonary mycoplasmosis **Cause:** *Mycoplasma hyopneumoniae*

Name the disease: Porcine enzootic pneumonia

General Discussion:

- Mycoplasmal pneumonia is a common chronic disease, important in grower-finisher pigs.
- Key component of fatal multifactorial pneumonia in 4-6-monyh-old pigs
- High morbidity and low mortality.
- Environmental and management factors risk factors (subclinical infections common).
- Increased susceptibility to secondary infection, most commonly *Pasteurella multocida*, but also *Arcanobacter pyogenes*, *Haemophilus*, *Streptococci*, *Staphylococci*, *Klebsiella*, and *Bordetella bronchiseptica*.
- Infection with *M. hyopneumoniae* exacerbates severity and duration of PRRS
- Porcine respiratory disease complex (PRDC) involves *Mycoplasma hyopneumoniae*, swine influenza virus (SIV), porcine circovirus type 2 (PCV2) and/or porcine respiratory and reproductive syndrome virus (PRRSV)

Pathogenesis:

- Transmitted by aerosol from pig to pig.
- Adhere to ciliated cells in trachea and bronchi via outer-membrane protein (P97).
- Binding results in ciliostasis, clumping and loss of cilia, with loss of epithelial cells and bronchial goblet cells.
- Cell membranes contain superantigens that induce polyclonal proliferation of lymphocytes (leading to polyclonal proliferation of lymphocytes).
- Unclear multifactorial stimulatory (mitogenic) effect on lymphocytes.
- Suppresses alveolar macrophage phagocytic response more susceptible to secondary bacterial pathogens.

Typical Gross Findings:

- Confluent consolidation of the cranioventral regions of the lungs in a lobular pattern.
- Atelectatic appearance with moist and meaty cut surface
- Gray-tan discoloration and thymus-like texture

- Severe Mucopurulent exudate exudative bronchopneumonia or lobar pneumonia

Typical Light Microscopic Findings:

- Acutely, neutrophilic bronchitis and bronchiolitis, and mixed neutrophil and macrophage accumulation in adjacent alveoli.
- Degenerate or ulcerated respiratory epithelium often with loss of cilia and hyperplasia of goblet cells in bronchi and bronchioles.
- Chronically, catarrhal bronchointerstitial pneumonia, with development of prominent
- peribronchial,peribronchiolar and perivascular accumulations of lymphoid tissue in chronic stages.

Differential Diagnosis:

- *Actinobacillus pleuropneumoniae* - fibrinonecrotic pleuropneumonia with caudo-dorsal distribution.
- *Pasteurella multocida* - suppurative bronchopneumonia usually without pleuritis.
- *Salmonella choleraesuis* - pulmonary consolidation or fibrinonecrotic pneumonia with prominent extrathoracic lesions, especially necrotizing hepatitis, but also splenomegaly, lymphadenopathy, colitis, and cutaneous hyperemia.
- *Bordetella bronchiseptica* - suppurative bronchitis with peribronchiolar fibrosis affecting suckling pigs; occasional cause of suppurative bronchopneumonia in older animals.
- Porcine respiratory coronavirus (PRCV) - necrotizing and proliferative bronchointerstitial pneumonia with squamous metaplasia and mild type II hyperplasia.
- Swine influenza virus - extensive necrotizing bronchiolitis and bronchitis, peribronchiolar mononuclear cuffs, cells in airways, type II hyperplasia and serofibrinous exudate in alveoli.
- Porcine reproductive and respiratory syndrome virus (genus *Arterivirus*) - interstitial pneumonitis in neonatal pigs with macrophage infiltrate in alveolar septa and alveolar spaces filled with necrotic cells and proteinaceous exudate, with no airway epithelial damage.