

# AUJESZKY'S DISEASE (PSEUDORABIES)

PATOMORPHOLOGY II  
UNIVERSITY WARMIA AND MAZURY,  
OLSZTYN

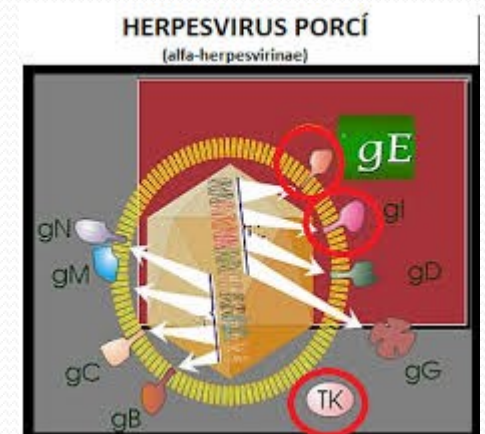
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# ETIOLOGY

- Alphaherpesvirus
  - Genus: Varicellovirus
  - Single seotype
- Highly contagious
- Natural hosts:
  - Domestic and feral swine  
→ can become latent carriers
  - Most mammals are susceptible



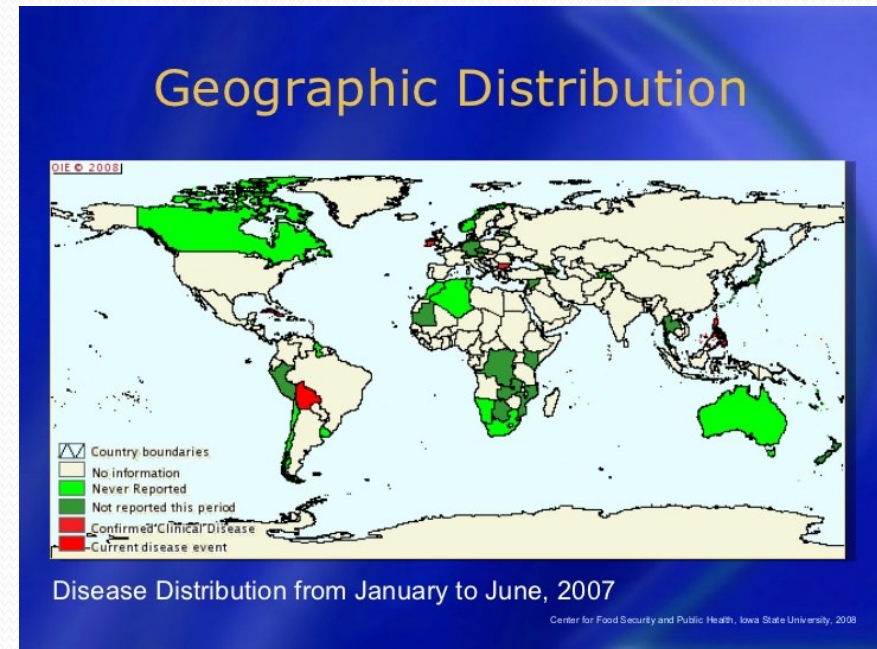
# HISTORY

- 1902, Hungary → Aujeszky first identifies ADV in cattle and dogs
  - Determines swine are natural hosts
- 1931, U.S.
  - “Mad itch” recognized as Aujeszky’s disease
- 1983, U.S.
  - 18,8% U.S. breeding swine seropositive



# EPIDEMIOLOGY

- Europe, Southeast Asia, Central and South America
- Other reports
  - Cuba, Samoa, Rwanda
- All U.S. states are status V (pseudorabies free)
- Presence of ADV in feral swine a concern for domestic herds



# PATHOGENESIS

- Depend on virulence of the strain, age and route
- Localizes in epithelium of tonsils
- Primary site of replication is epithelium of tonsils and nasopharinx
- Highly virulence strain → short period of viremia → dissemination to many tissues
- Tropism for the CNS and upper respiratory tract
- Spread from primary site along nerves to the CNS, spinal cord and nerve trunks
- Localizes in ganglia, e.g the trigeminal nerve ganglia and paravertebral ganglia
- Become latent → reactive to stress

# MORBIDITY/MORTALITY

- Disease most common in pigs
- Morbidity
  - Up to 100%
  - Up to 20% abortions
  - Often no signs in feral pigs
- Mortality
  - Highest in younger animals
  - Decreases with age
  - Always fatal in other species





# TRANSMISSION (PIGS)

- Most common
  - Respiratory
  - Oral
  - Nose-to-nose contact
- Aerosol
- Fomites
  - Contaminated bedding and water
  - Meat products or carcasses
- Venereal – feral swine
- Latent carriers possible





# TRANSMISSION (OTHER SPECIES)

- Contact with infected pigs
- Ingestion of contaminated raw meat
- Rarely lateral transmission



# CLINICAL SIGNS IN PIGS

- Incubation period: 2 to 6 days
- < 1 week old piglets
  - Fever, listlessness, anorexia
  - Neurological signs
    - Tremors, paddling, seizures, dog-sitting
  - High mortality within 24 to 36 hours
- Older piglets
  - Similar signs
    - Vomiting and respiratory
  - Lower mortality



- Weaned pigs
  - Respiratory and
  - neurological signs
  - Recover in 5 to 10 days
- Adult pigs
  - Mild or inapparent infection
  - Respiratory and neurological signs
  - Pregnant sows: reproductive signs
- Feral swine often asymptomatic



# CLINICAL SIGNS: OTHER SPECIES

- Cattle and sheep
  - Intense pruritus
    - Licking, rubbing, gnawing, self-mutilation
  - Neurological signs
- Dogs and cats
  - Similar to cattle and sheep
  - Resembles rabies
- Death in 1 to 2 days

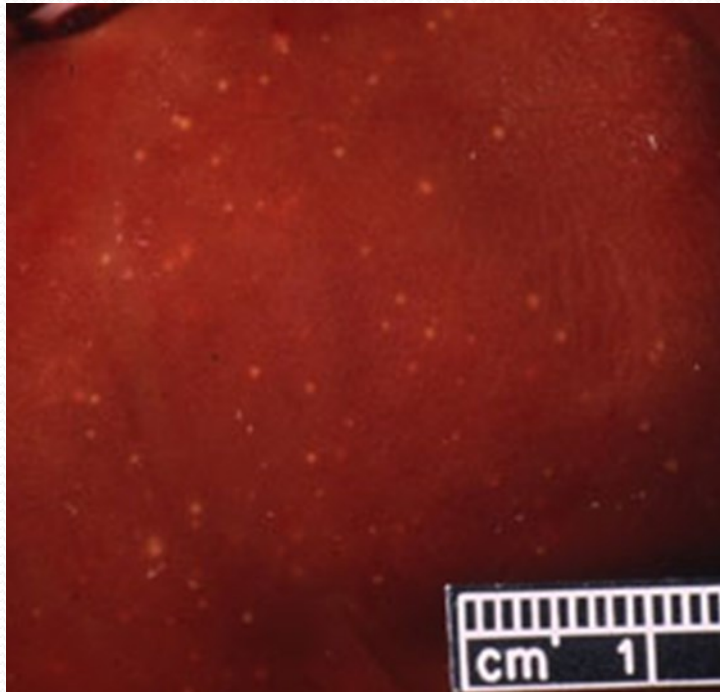


# POST MORTEM LESIONS

- Lesions often subtle or absent
- Serous or fibrinonecrotic rhinitis
- Pulmonary:
  - Edema
  - Congestion
  - Consolidation
- Keratoconjunctivitis
- Congested and hemorrhagic lymph nodes and meninges
- Necrotic foci in other organs







Membranes surrounding eye and nasal cavities are crusted and periorbital area with serous exudate.

Liver with miliary lesions, white, multifocal and diffuse.

Aborted fetuses, death autolysis.



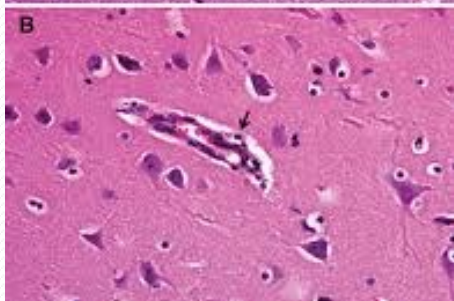
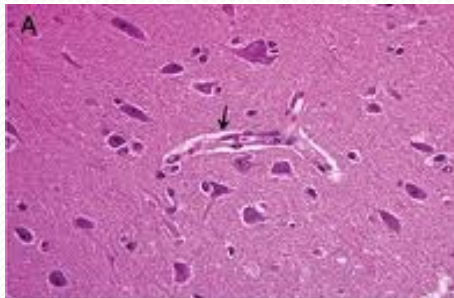


Rhinitis in snout of pig  
Post-mortem lung  
Lesions on nose of piglet



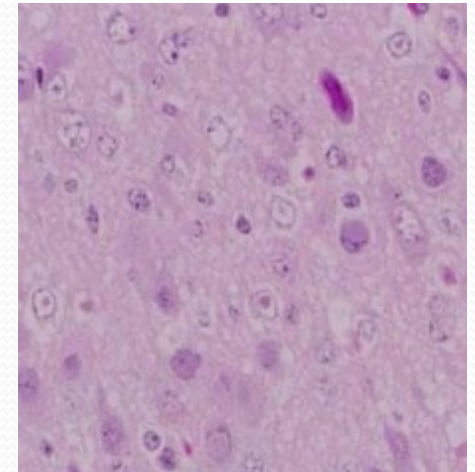
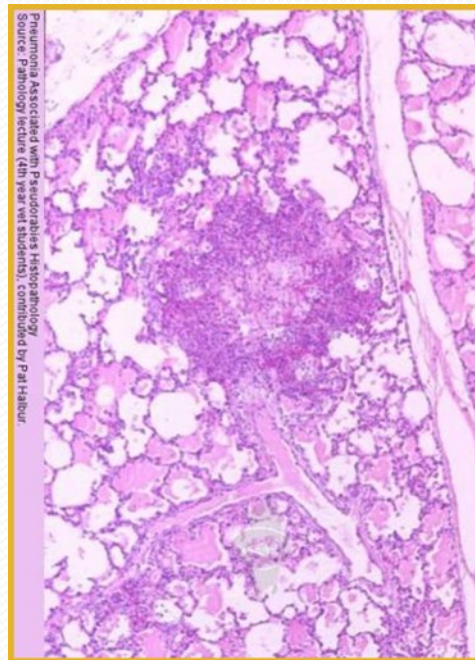
# MICROSCOPIC LESIONS

- Pigs
  - Neurological → neuronal degeneration and necrosis
    - Nonsuppurative meningoencephalitis
    - Panencephalitis
    - Ganglioneuritis
  - Respiratory
    - Necrotic tonsillitis, bronchitis, bronchiolitis, alveolitis
  - Focal necrosis
  - Intranuclear inclusion bodies
  - Uterine wall thickened by inflammatory edema
  - Necrotic placentitis
- Other species
  - Spinal cord lesions

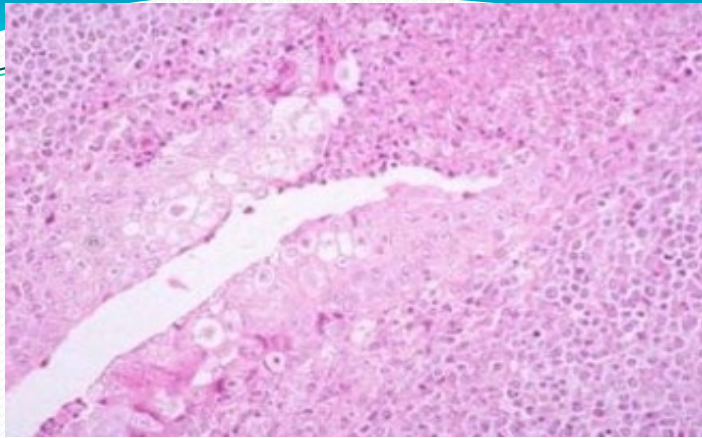


Non purulent encephalitis

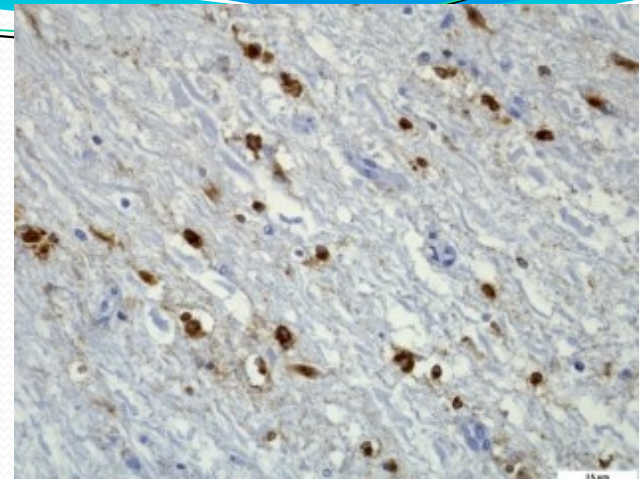
## Pneumonia



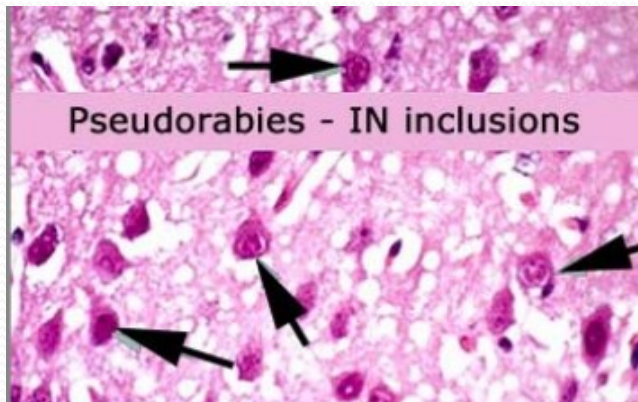
Eosinophilic and basophilic inclusion bodies are seen in the nucleus of neurons



Eosinophilic inclusion bodies are seen in the nucleus of epithelium of tonsillar crypt



Immunoperoxidase staining can be done on brain sections: the nuclei of infected cells would show a brownish precipitate





# DIFFERENTIAL DIAGNOSIS

## Pigs

- Porcine polioencephalomyelitis
- Classical or African swine fever
- Hemagglutinating encephalomyelitis infection
- Streptococcal meningoencephalitis
- Swine influenza
- Erysipelas
- Nipah virus infection
- Salt or organic poisoning

## Other species

- Rabies
- Scrapie in sheep

# DIAGNOSIS: LABORATORY

- Clinical signs suggestive
- Virus isolation
- Detection of viral DNA or antigens
  - Immunofluorescence, immunoperoxidase, virus neutralization assays, PCR
- Serology
  - Virus neutralization, latex agglutination, ELISAs



# PREVENTION AND CONTROL

- IMMEDIATELY notify authorities
- Federal
  - Area Veterinarian in Charge (AVIC)
- State
  - State Animal Health Officials
- Quarantine:
  - Isolation and testing of new animals
  - Biosecurity measures
    - Prevent entry
    - Double fencing
  - Disinfection
    - Phenols, quaternary ammonium compounds
    - Inactivated by heat, sunlight



# PREVENTION

- Depopulation and repopulation
  - Premises cleaned, disinfected
  - Left empty for 30 days
- Test and removal
  - Test breeding herd monthly
  - Remove positive animals
- Offspring segregation
  - Vaccinate breeding herd
  - Remove young weaned pigs



# VACCINATION

- Protects pigs from clinical signs
- Decrease virus shedding
- Does not provide sterile immunity or prevent latent infections
- Attenuated, inactivated, gene-deleted vaccines
  - Vaccinated pigs which become infected can be detected



# BIBLIOGRAPHY

- <https://prezi.com/59upsds2tgvt/pseudorabies-prv/>
- James F. Zachary, M. Donald McGavin. “Pathologic Basis of Veterinary Disease” Elsevier.
- <https://journals.sagepub.com/doi/pdf/10.1177/030098588602300311>
- <http://www.cfsph.iastate.edu/DiseaseInfo/index.php?lang=en>