- Equine viral Arteritis (EVA).
- Epizootic cellulitis.
- Pinkeye.
- Equine typhoid.

Equine viral arteritis (EVA)

- Highly contagious respiratory viral disease of horses worldwide.
- It is primarily a respiratory disease.
- Significant reproductive implications involving abortions and often carried by stallions (persistent carriers).
- Most severe in very young and very old horses, and in horses under stress (weather, work, etc.).

Etiology: Equine arteritis virus (EAV)

- EAV is a small, enveloped RNA virus, Family: Arteriviridae.
- One of the most important equine viral respiratory pathogens.
- The virus is not resistant out side the body and survival at or above 37°C is short-lived.
- EVA can maintain infectivity in tissue or fluid specimens IF IT IS FROZEN.

Transmission

- Horizontal transmission (lateral); inhalation of nasal fluids mainly; but also by urine, feces, lacrimal fluid and vaginal discharge. Stallions and mares may be infected by this way.

- Venereal transmission; from infected stallion to susceptible (seronegative) mares.

- Prolonged excretion of virus with semen is important for the maintenance of the virus in the population.
- Introduction of a persistently infected stallion into a naïve population is the main cause of outbreaks of EVA.

Pathogenesis

- Following inhalation exposure, EAV invades the respiratory epithelium and multiplies in both bronchial and alveolar macrophages.
- These transport the virus to the regional lymph nodes, where it undergoes a further cycle of replication before being released into the bloodstream within the macrophage.

- The cell-associated viremia disseminate EAV throughout the body.
- By day 6–8 the…… virus localizes in the vascular endothelium and medial myocytes of the smaller blood vessels, especially the arterioles, and causes a panvasculitis with necrosis and degeneration of tunica media of affected vessels.

- These lesions give rise to edema and hemorrhage, which are believed to result from activation of proinflammatory cytokines.
- It can also be found in the epithelium of certain tissues, particularly the adrenals, seminiferous tubules, thyroid, and liver.

- Virus is present in respiratory tissues for 7-14 days; and in other tissues for 28 days.
- Infection of semineferous tubules of stallions leads to excretion of virus with the semen for weeks, months and even for years.

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- Abortion mostly results from a myometritis that gives rise to impairment of the placental circulation and death of the fetus.

Clinical signs:

1. **Subclinical form:** The majority of naturally acquired infections with EAV are in apparent; especially after venereal infection of mares. Abortion is not necessarily associated with clinical disease in the mare.

2. Clinical form:

Similar to any infectious agent that causes vasculitis; most commonly:

a) Fever--- loss of appetite (anorexia), depression

b) Swelling (edema), most notably of the legs, scrotum, sheath or mammary glands,

c) Nasal discharge, initially watery (serous),

d) Coughing, sneezing.

Oedema of scrotum in an EVA-infected stallion

e) conjunctivitis that may be accompanied by tearing down the face and swelling around the eyes,

f) skin rash (urticaria), often localized to the cheeks or sides of the neck,

Oedema around the eye

Severe swelling and congestion associated with conjunctivitis

Oedematous swelling and urticaria in the neck

Swelling and oedema of the left hind limb

h) abortion; Pregnant mares abort at any time between 3 and 10 months into gestation.

i) pneumonia ± enteritis in young foals.

Oedematous swelling around and over the eye

- Clinical signs of EVA in experimentally infected horses showing urticaria (a), distal limb edema (b), mucosal petechial hemorrhage (c), or preputial and distal limb edema (d).

- Stallions with equine viral arteritis may undergo a period of short-term sub fertility.
- This has been observed in individuals that develop a high and prolonged fever and extensive scrotal edema.
- Affected stallions can show reduced libido associated with decreases in sperm motility, sperm concentration, and percentage of morphologically normal sperm.

- The changes in semen quality are believed to result from increased intratesticular temperature and not from the direct effect of EAV on spermatogenesis and testicular function.

- The frequency and severity of clinical illness associated with EAV infection tend to be greater in very young, old, or debilitated individuals.
- Regardless of severity of clinical signs, affected horses invariably make complete recoveries, even in the absence of symptomatic treatment.

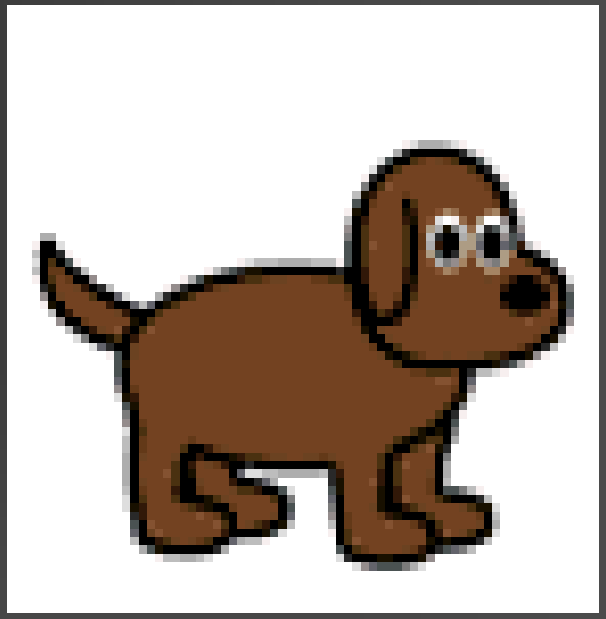
- Mortality in older horses is very rarely encountered in natural outbreaks.
- It can occur, however, in young foals up to a few months of age that succumb from a fulminating pneumonia or pneumo-enteritis.

Lesions

- The gross and microscopic lesions in fatal cases of equine viral arteritis reflect the extensive and considerable vascular damage caused by the virus.
- The most significant gross findings include edema, congestion, and hemorrhages, especially in the subcutis of the limbs and abdomen.

- Excess peritoneal, pleural, and pericardial fluid; and edema and hemorrhage of the intra-abdominal and thoracic lymph nodes and of the small and large intestine,


Home
is where
the cat is



- Pulmonary edema, emphysema and interstitial pneumonia, enteritis, and infarcts in the spleen have been reported in naturally acquired fatal cases of the disease in foals.

- Aborted fetuses are often partly autolyzed. Gross lesions are usually absent; if present, they are limited to an excess of fluid in body cavities and a variable degree of interlobular pulmonary edema.
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Diagnostic Testing

- Diagnosis based on clinical signs is difficult due to the wide array of clinical signs and frequency of unapparent/mild signs.
- Diagnosis is made by virus isolation and/or paired serology.

Virus isolation

sampling can include:

- whole blood (EDTA or heparin),
- Nasopharyngeal swabs, conjunctival swabs, fetal or placental tissues/fluids.

Virus isolation sampling should be initiated promptly once clinical signs manifest. EVA is fragile at room temperatures, but stable when frozen. Samples should be frozen and shipped with freezer packs.

Serology

- Paired (acute and convalescent) sera should include a time interval of 3-4 weeks.
- Previous vaccination history should be considered when interpreting titers. Vaccinated individuals may have an active serologic response or a rapid rise in titer in response to exposure.

- Virus neutralization (VN), A titer of 1:4 or greater on a single sample or a fourfold increase in the viral titer between individual samples indicates a recent infection.
- Unfortunately the viral titer **does not distinguish between natural EAV infection and those antibodies produced from vaccination**.

Other tests include:

*complement Fixation (CF),
*indirect fluorescent antibody,
*agar gel immunodiffusion,
*the enzyme-linked immunosorbent assays (ELISA

- **Shedding Time of Organism Past Resolution of Clinical Signs:** Carrier stallions continue to shed through semen, but not through the respiratory tract. Only stallions develop into the carrier state.

Prevention of Equine Viral Arteritis

- Horses of all ages should be vaccinated annually using a modified live virus vaccine.
- Foals under six months of age or pregnant mares in the last two months of gestation should not be vaccinated.

Vaccination:

1.A highly attenuated, modified live virus product (MLV). safe and effective in stallions and non-pregnant mares.

- The indications for vaccination against EVA have been:

1) To protect stallions against infection and subsequent development of the carrier state.

2) To immunize seronegative mares before being bred with EAV-infective semen.

3) To curtail (LIMIT) outbreaks in non-breeding populations.

Note:

- Vaccinated horses may become viremic and transmit disease while remaining clinically normal.
- Revaccination results in enhanced serologic response.
- 2. The second vaccine is an inactivated, adjuvanted product prepared from virus grown in equine cell culture. In the absence of appropriate safety data, the vaccine is not currently recommended for use in pregnant mares

Differential diagnosis:

- Equine influenza.
- Equine rhinopneumonitis, infection with equine rhinitis A and B viruses.
- Equine adenoviruses,
- Purpura hemorrhagica are among the more common equine diseases that clinically resemble equine viral arteritis.

EVA must also be also differentiated from: *Equine infectious anemia.

*Toxicosis caused by CERTAIN PLANTS

*Allergy-induced urticaria.

*Dourine.

*African horse sickness.

Abortion caused by EAV must be differentiated from that due to equine herpesvirus 1 or 4.

- A helpful but not confirmatory distinguishing feature is that mares that abort from EAV may display prior clinical evidence of equine viral arteritis, whereas mares seldom exhibit any premonitory clinical signs in the case of equine herpesvirus abortion.

- Furthermore, EAV-infected fetuses are often somewhat autolyzed at time of expulsion and very frequently are devoid of any gross lesions.
- In contrast, herpesvirus-infected fetuses are invariably fresh and usually display characteristic gross and microscopic lesions.

- Treatment"

There is no viral specific treatment available for EVA.

Treatment primarily consists of **supportive care** including rest, **NSAID therapy**, **antibiotics** to control secondary infection, and **diuretics** to control edema