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Popular Article

African Swine Fever: Contagious Viral Disease of Pigs

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Introduction

African swine fever (ASF) is an infectious disease of domestic and wild pigs of all breeds and ages, caused by ASF virus (ASFV) is the only member of the Asfarviridae family, genus Asfivirus. The clinical syndromes vary from per-acute, acute, subacute to chronic, depending on the virulence of the virus. Acute disease is characterized by high fever, hemorrhages in the reticuloendothelial system, and a high mortality rate. Soft ticks of the Ornithodoros genus, especially *O. moubata* and *O. erraticus*, have been shown to be both reservoirs and transmission vectors of ASFV. The virus is present in tick salivary glands and passed to new hosts (domestic or wild suids) when feeding. It can be transmitted sexually between ticks, transovarially to the eggs, or transtadially throughout the tick's life.

Transmission

- Direct transmission: contact between sick and healthy animals
- Indirect transmission: feeding on garbage containing infected meat (ASFV can remain infectious for 3–6 months in uncooked pork products)
- biological vectors – soft ticks of the genus *Ornithodoros*
- fomites include, premises, vehicles, implements, clothes
- Within tick vector: transstadial, transovarial, and sexual transmission occur.



Clinical Signs



Fig.1: This photograph showing slight fever, reduced appetite and depression in pig



Fig. 2: This photograph showing skin redness and cyanotic areas in pig

Peracute (highly virulent virus): Sudden death with few signs

Acute form (highly virulent virus): Fever (40.5–42°C), early leucopenia and thrombocytopenia (48–72 hours), reddening of the skin (white pigs) – tips of ears, tail, distal extremities, ventral aspects of chest and abdomen, anorexia, listlessness, cyanosis and incoordination within 24–48 hours before



death, increased pulse and respiratory rate, vomiting, diarrhoea (sometimes bloody) and eye discharges may occur, death within 6–13 days, or up to 20 days, abortion may occur in pregnant sow, in domestic swine, the mortality rate often approaches 100%

Subacute form (moderately virulent virus): Less intense signs; slight fever, reduced appetite and depression, duration of illness is 5–30 days, abortion in pregnant sows, death within 15–45 days, mortality rate is lower (e.g. 30–70%, varies widely).

Chronic form (moderately or low virulent virus): Various signs: loss of weight, irregular peaks of temperature, respiratory signs, necrosis in areas of skin, chronic skin ulcers, arthritis, pericarditis, adhesions of lungs, swellings over joints, develops over 2–15 months, low mortality.

Lesions



Fig. 1: Gross photograph showing Petechial haemorrhages on cortical region of kidney

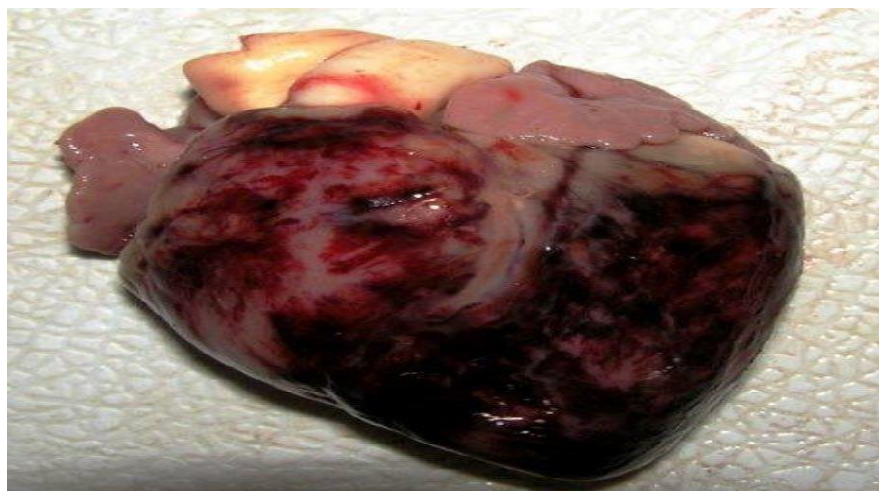


Fig. 2: Gross photograph showing presence of petechial and ecchymoses hemorrhages in the epicardium



Acute form (not all lesions are seen; this depends on the isolate)

- Pronounced haemorrhages in the gastrohepatic and renal lymph nodes
- Petechial haemorrhages of the renal cortex, also in medulla and pelvis of kidneys, congestive splenomegaly
- Oedematous areas of cyanosis in hairless parts, cutaneous ecchymoses on the legs and abdomen
- Excess of pleural, pericardial and/or peritoneal fluid, petechiae in the mucous membranes of the larynx and bladder, and on visceral surfaces of organs.
- Oedema in the mesenteric structures of the colon and adjacent to the gall bladder; also wall of gall bladder.

Chronic form

- Focal caseous necrosis and mineralization of the lungs may exist, lymph nodes enlarged

DIAGNOSIS: Diagnosis should be based on clinical findings.

Differential diagnosis

- Classical swine fever (CSF or hog cholera) not possible to differentiate ASF and CSF by clinical or post-mortem examination; essential to send samples for laboratory examination
- Porcine reproductive and respiratory syndrome (PRRS)
- Erysipelas, Salmonellosis, Aujeszky's disease (or pseudorabies) [younger swine], Pasteurellosis

Laboratory diagnosis

Samples

Identification of the agent

- A complete set of field samples should be submitted and especially:
 - Blood collected during the early febrile stage in EDTA (0.5%),
 - Spleen, lymph nodes, tonsil, lungs, kidney and bone marrow kept at 4°C

Serological tests

- Serum collected within 8–21 days after infection in convalescent animals

Procedures

Identification of the agent

- Isolation: cell culture inoculation (primary cultures of pig monocytes or bone marrow cells –



most isolates produce haemadsorption)

- a. Haemadsorption test (HAD) in primary leukocyte cultures – positive HAD test result is definitive for ASF diagnosis, negative HAD samples should also be tested by PCR to rule out the presence of virus.
- b. Antigen detection by fluorescent antibody test (FAT) – positive FAT plus clinical signs and appropriate lesions can provide a presumptive diagnosis of ASF.
- c. Detection of virus genome by the polymerase chain reaction – PCR techniques are particularly useful when samples may be unsuitable for virus isolation or antigen detection (putrefaction)
- d. Pig inoculation is no longer recommended for use.

Serological tests

- a. Enzyme-linked immunosorbent assay
- b. Indirect fluorescent antibody (IFA) test – should be used as a confirmatory test for sera from areas that are free from ASF and are positive in the ELISA, and for sera from endemic areas that give an inconclusive result in the ELISA.
- c. Immunoblotting test or immunoperoxidase staining – used as an alternative to the IFA test to confirm equivocal results with individual sera.

PREVENTION AND CONTROL

Sanitary prophylaxis

ASFV-recovered carrier swine and persistently infected wild pigs require special consideration in controlling the disease.

Free countries

- Careful import policy for animals and animal products
- Proper disposal of waste food from aircraft or ships coming from infected countries. Efficient sterilization of garbage.

In outbreaks

- Rapid slaughtering of all pigs and proper disposal of cadavers and litter is essential
- Thorough cleaning and disinfection. Designation of infected zone, with control of pig movements
- Detailed epidemiological investigation, with tracing of possible sources (up-stream) and possible spread (down-stream) of infection
- Surveillance of infected zone, and surrounding area



Infected countries

- Avoid contact between pigs, wild suids and soft tick vectors or their habitats (Africa) – i.e. prevent pigs from wandering

Medical prophylaxis

- No treatment
- No vaccine to date

