

Lumpy Skin Disease: Contagious viral disease of cattle

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Definition

- Lumpy skin disease (LSD) is a poxvirus disease of cattle characterised by fever, nodules on the skin, mucous membranes and internal organs, enlarged lymph nodes, oedema of the skin, emaciation, and sometimes death.

Etiology

- Family *Poxviridae*
 - Genus *Capripoxvirus*
- Brick shaped, enveloped virus (320 × 260 nm).
- ds DNA, complex symmetry.
- Closely related to sheep and goat pox

Transmission

- Primary route: biting insects
- Minor route: direct contact
 - Cutaneous lesions, saliva,
 - nasal discharge, milk, semen
- Spread related to movement of cattle

Pathogenesis

Entry of virus through skin or respiratory tract



Local virus replicates in epidermis, dermis (keratocytes), or in respiratory epithelium, virus enter in local lymph node and also in reticulo-endothelial cells

Virus identified by macrophages and replicate in cytoplasm of macrophages



Virus exits via efferent lymphatic vessels into blood



Virus disseminates into the body and Enter skin via infected macrophages.



Keratinocytes, myocytes, fibrocytes and endothelial cells get damaged

Clinical Signs

- Incubation period
 - 2 to 5 weeks
- Fever, emaciation, and ocular discharge.
- Decrease in milk production and swollen superficial lymph nodes.
- Nodules on all over the body especially in the skin of the muzzle, neck, nares, eyelids, ear, legs, scrotum, udder, perineum and tail.



Fig:1 Nodules were observed on muzzle, nares and upper lips.



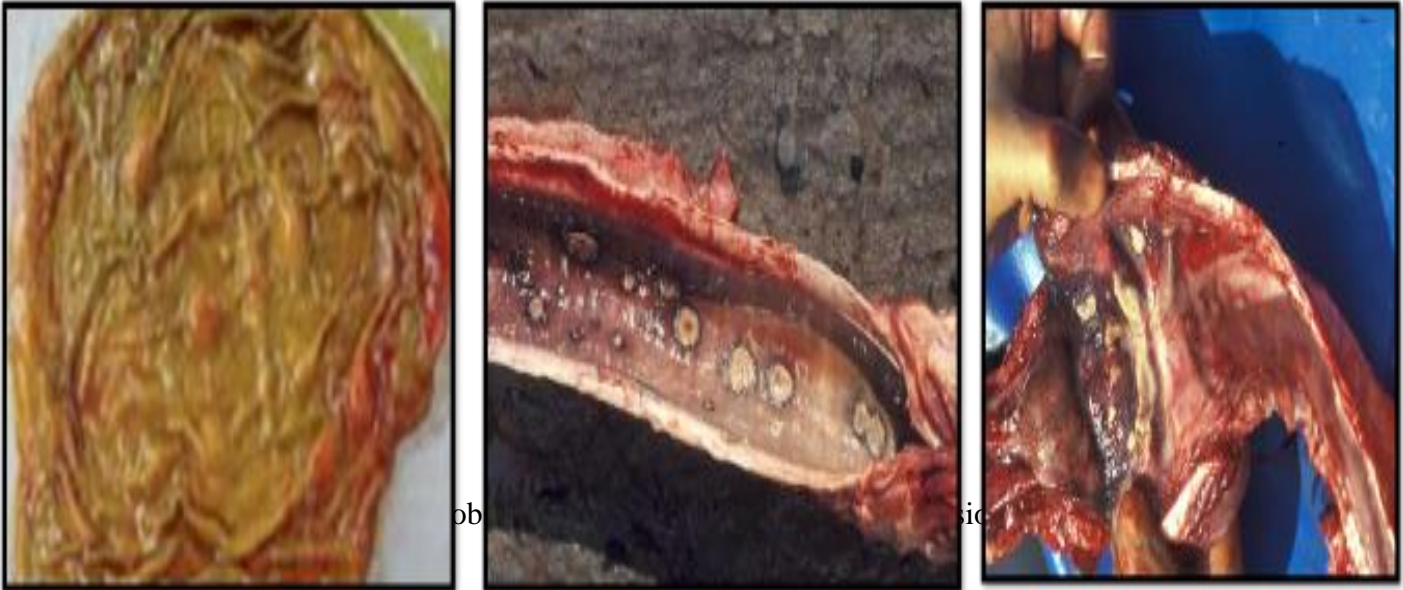
Fig:2 Lachrymal discharge, Corneal opacity and blindness were observed in some cases.



Post Mortem Lesions

Characteristic skin nodules

- Hemorrhagic lesions in the mucous membranes throughout the GI tract
- Nodules in lungs
- Hemorrhages in spleen, liver and rumen.



Diagnosis

- **Clinical**
 - Characteristic skin nodules
- **Laboratory**
 - Virus isolation and identification
 - Molecular techniques i.e. PCR
- Electronmicroscopy in combination with history
 - Serology: i.e. ELISA

Treatment

- There are no specific antiviral drugs available but, supportive treatment can be given to the infected animals which include the treatment of the skin lesions and antibiotics against secondary skin infection and pneumonia, and some anti-inflammatory drugs.
- Treatment with enrofloxacin along with antihistaminic, NSAIDs, and Vit B complex for 3-10 days depending upon the severity of cases was the most cost-effective as compared to other treatment protocols.



- The use of diclofenac gel in the swelling region and the application of sulphonamide powder on nodular lesions was found effective by Paul (2020).
- The tropical application of antiseptic ointment with fly repellent properties can be a good choice.
- Ivermectin strongly inhibits in vitro replication stage of lumpy skin disease virus (99.82% inhibition) and sheep pox virus (99.87% inhibition).
- Treatment of LSDV with ivermectin reduced the number of infectious virions at the attachment, penetration and replication stages

Prevention And Control

- Disinfection:
- Susceptible to:
 - Ether (20%)
 - Chloroform
 - Formalin (1%)
 - Sodium hypochlorite (2- 3%)
 - Phenol (2% for 15 minutes)
- Can survive up to 35 days in the environment in desiccated scabs

Vaccination

- Lumpi-ProVacInd was launched in August 2022.
- The vaccine has been jointly developed by ICAR's National Research Centre on Equines (NRCE) at Hisar, Haryana and the Indian Veterinary Research Institute (IVRI) at Izatnagar, UP, is a live attenuated vaccine.
- Other vaccines are: - Lumpyvax, Bovivax LSD, Lumpyshield-N and MEVAC LSD.
- Goat pox vaccine has been found effective and is being administered.
- Sheep and goat pox vaccine
 - Used in east, north Africa
 - May cause local, severe reaction
- Attenuated LSD strain
 - Used in South Africa
 - Neethling strain vaccine confers immunity up to 3 years

