

SPECIFIC DISEASES OF CATTLE

Diseases caused by viruses

Foot and mouth disease (FMD, Aphthous fever)

FMD is an acute viral and extremely contagious disease of cloven footed animals such as cattle, sheep, goats, pigs and antelope. It is manifested by vesicles and erosions in the muzzle, nares, mouth, feet, teats, udder and pillar of the rumen. There are three main strains of viruses causing FMD, namely A, O and C. Three additional strains, SAT 1, SAT 2 and SAT 3 have been isolated from Africa and a further strain ASIA-1 from Asia and the Far East.

Transmission: Direct and indirect contact with infected animals and their secretions including saliva, blood, urine, faeces, milk and semen, aerosol droplet dispersion, infected animal by-products, swill containing scraps of meat or other animal tissue and fomites and vaccines.

Antemortem findings:

Before vesicle formation:

1. Incubation is 1 - 5 days or longer
2. Morbidity: Nearly 100 %
3. Mortality: variable depending on the strain of virus and its virulence and susceptibility of host; 50 % in young animals, 5 % in adults
4. Fever up to 41.7°C
5. Dullness
6. Lack of appetite
7. Drastic drop in milk production.
8. Uneasiness and muscle tremors

Vesicle formation:

9. Smacking and quivering of lips
10. Extensive salivation (Fig. 1) and drooling
11. Shaking of feet and lameness

The vesicles and later erosions are commonly found on the muzzle, tongue (Fig. 2), oral cavity, teat and on the skin between and above the hoofs of the feet. In more chronic cases in cattle the hoof become loose and the animal may walk with characteristic “clicking” sound (Slippering).

Some strains of FMD, particularly in swine, sheep and goats cause erosions instead of vesicles.

Postmortem findings :

1. Necrosis of heart muscle(tiger heart), usually only in young acutely infected animals.
2. Ulcerative lesions on tongue, palate, gums, pillars of the rumen and feet.

Remarks : Latent infections with Salmonella organisms were reported in animals affected with FMD.

Differential diagnosis in bovine and ovine species : Vesicular stomatitis, allergic stomatitis, feedlot glossitis, photosensitization, bluetongue, rinderpest, infectious bovine rhinotracheitis, malignant catarrhal fever, bovine papular stomatitis, bovine viral diarrhoea, pseudocowpox, ovine pox, contagious ecthyma, footrot, mycotoxicosis and increased salt in concentrate.



Fig. 1: Excessive salivation in a cow affected with FMD.

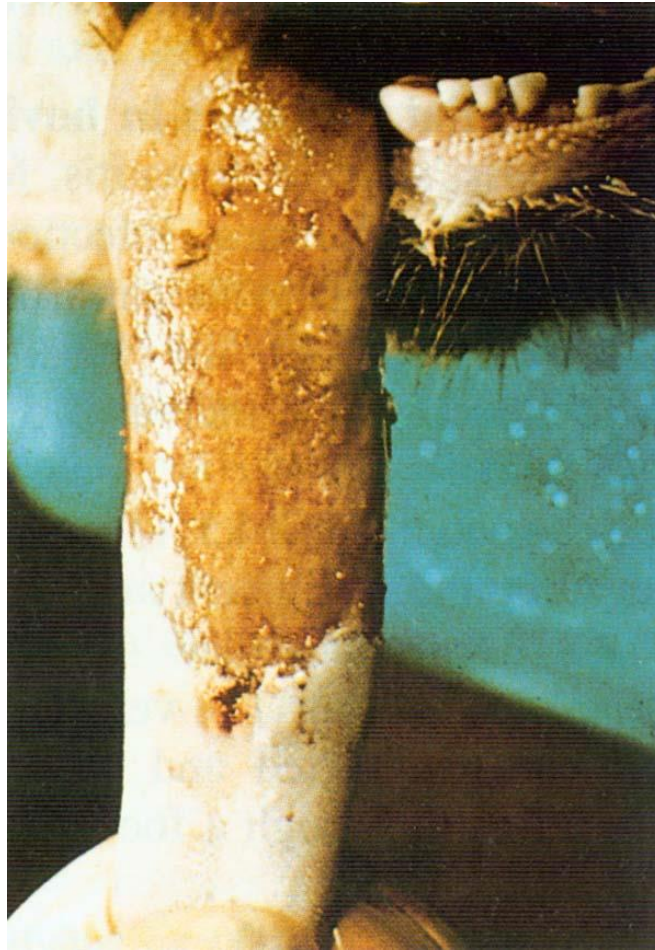


Fig 2: FMD. Extensive areas of eroded epithelium on a bovine tongue.

Rinderpest (RP)

Rinderpest is an acute, highly contagious, fatal viral disease of *cattle*, *buffalo* and *wild ruminants* manifested by inflammation, haemorrhage, erosions of the digestive tract, wasting and often bloody diarrhoea. Human is not susceptible to RP virus.

Transmission : Direct contact with infected animals or their excretions and secretions and fomites. The virus appears in the blood and in secretions before the onset of clinical signs and this may cause infection in abattoirs and stockyards.

Antemortem findings :

1. Incubation: 3 – 10 days or longer
2. Morbidity: Up to 100 % in a susceptible herd
3. Mortality: 50 % and may reach 90 – 95 %
4. High fever (41–42°C)
5. Nasal discharge and excessive salivation

6. Punched out erosions in the mouth (Fig. 3)
7. Loss of appetite and depression
8. Abdominal pain (grunting, arched back)
9. Constipation followed by bloody diarrhoea and straining
10. Dehydration and rough hair coat
11. Marked debility
12. Abortion
13. The classical “milk fever position” in cattle

Postmortem findings :

1. Punched out erosions in the oesophagus
2. Edema or emphysema of the lungs
3. Haemorrhage in the spleen, gallbladder and urinary bladder
4. Haemorrhagic or ulcerative lesions in the omasum
5. Congested abomasum filled with bloody fluid. Ulcers may also be observed.
6. Severe congestion and haemorrhage in the intestine and enlarged and necrotic Peyer's patches (Fig. 4)
7. Last portion of the large intestine and rectum are haemorrhagic showing “tiger stripping” of longitudinal folds
8. Enlarged and edematous lymph nodes
9. Emaciated carcass.

Remarks : Rinderpest virus is sensitive to environmental changes and is destroyed by heat, drying and great number of disinfectants.

Differential diagnosis : Bovine viral diarrhoea, malignant catarrhal fever, infectious bovine rhinotracheitis, bluetongue, coccidiosis, foot and mouth disease, vesicular and necrotic stomatitis and bovine papular stomatitis. Vesicular diseases do not have accompanying haemorrhage and blisters should be differentiated from erosions (ulcers) seen at RP.

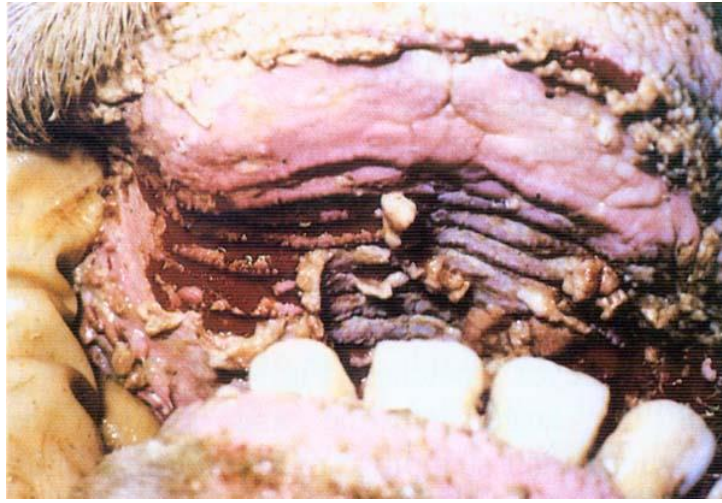


Fig. 3: Rinderpest Erosions on the dental pad and the hard palate which resemble FMD.



Fig. 4: The mucosal surface of Peyer's Patches showing necrosis and congestion.

Malignant catarrhal fever (MCF)

An acute viral disease of *cattle*, *deer* and *buffalo* characterized by inflammation of mucous membranes of the nose, eyes, corneal opacity, profuse nasal discharge and enlargement of lymph nodes. MCF is arbitrarily divided into peracute, intestinal, head-eye and mild forms according to antemortem findings. It is not communicable to man.

Transmission: Close contact between cattle and wildebeest (gnu, antelope), by common use of drinking troughs or by direct contact

between cattle and newborn wildebeest and placenta of parturient dams. In American or European MCF, cattle are infected from sheep.

Antemortem findings :

1. Incubation: 9 – 44 days
2. Morbidity is low and mortality is high
3. Increased temperature
4. Bilateral ocular and nasal discharges
5. Dyspnea and cyanosis
6. Loss of appetite
7. Encrustation of muzzle and eczema of the perineum, scrotum and udder
8. Erosions on the lips, tongue, gums, soft and hard palate
9. Swollen reddened eyelids, corneal opacity and conjunctivitis (Fig. 5)
10. Photophobia associated with corneal opacity and blindness
11. Reluctance to swallow because of oesophageal erosions and drooling
12. Enlarged body lymph nodes
13. Rarely, uncoordinated movements and shivering

Postmortem findings :

1. Lesions are not present in acute cases
2. Crater like erosions of the nose, mouth, conjunctiva, oesophagus and gastrointestinal tract
3. Lungs may be congested, swollen or emphysematous
4. White areas in the kidneys
5. Swollen and reddened abomasal folds
6. Intestinal edema and petechial haemorrhage
7. “Tiger striping” in the distal colon (Fig. 6)
8. Enlarged and reddened lymph nodes
9. Dehydrated and emaciated carcass

Differential diagnosis : Bluetongue, rinderpest, bovine viral diarrhoea/mucosal disease, foot and mouth disease, vesicular stomatitis



Fig. 5: Malignant catarrhal fever Early stages of corneal opacity, conjunctivitis and the reddening of the eye lids.



Fig. 6: Malignant catarrhal fever. "Tiger striping" in the distal colon.

Rabies

This is an acute infectious viral disease of the central nervous system in mammals.

Transmission : It is usually transmitted through the saliva by a bite from a rabid animal, commonly the dog or jackal. Man is infected the same way.

Antemortem findings :

Furious form

1. Incubation from 2 weeks to 6 months or longer
2. Restlessness

3. Aggressive, may attack other animals
4. Sexual excitement
5. Bellowing
6. Paralysis and death

Paralytic form

7. Sagging and swaying of the hind quarters
8. Drooling and salivation
9. The tail is held to one side
10. Tenesmus or paralysis of the anus
11. Paralysis
12. The animal falls to the ground
13. Death after 48 hours of decubitus

Postmortem findings: Possible inflammation of gastrointestinal mucosa

Lumpy skin disease

Acute pox viral disease of *cattle* manifested with sudden appearance of nodules on the skin.

Transmission : Insect vectors by direct and indirect transmission.
Seasonal and geographic distribution.

Antemortem findings :

1. Incubation: 4 – 14 days
2. Fluctuating fever
3. Diarrhoea
4. Nasal discharge and salivation
5. The first lesion appear in the perineum
6. Various sized cutaneous nodules (Fig. 7) may occur throughout the body
7. Skin lesions may show scab formation
8. Swelling of superficial lymph nodes and limbs, and lameness
9. Infertility and abortion
10. Secondary infection may lead to joint and tendon inflammation

Postmortem findings :

1. Ulcerative lesions in the mucosa of the respiratory and digestive tract
2. Reddish, haemorrhagic to whitish lesions in the lungs

3. Edema (interlobular) and nodules in the lungs (Fig. 8)
4. Heart lesion (endocardium)
5. Thrombosis of skin vessels followed by cutaneous infarction and sloughing..

Differential diagnosis : Allergies, screw-worm myiasis, urticaria, dermatophilosis (streptothricosis), bovine herpes dermatopathic infection, cattle grubs, vesicular disease, bovine ephemeral fever, photosensitization, besnoitiosis (elephant skin disease), sweating weakness of calves, bovine farcy and skin form of sporadic bovine lymphomatosis



Fig. 7: Lumpy skin disease. Various sized cutaneous nodules in a severe case of lumpy skin disease.



Fig. 8: Cut surface of the nodules in the parenchyma of the lung and interlobular edema.

Bovine viral diarrhoea (BVD)

This is an infectious viral disease of *cattle* manifested by an active erosive stomatitis, gastroenteritis and diarrhoea.

Transmission: Direct contact with clinically sick or carrier animals, indirect contact with feedstuffs or fomites contaminated with urine, nasal and oral secretions or faeces and contact with aborted fetuses. Transmission through aerosol droplet dispersion or by insect vector may also be a possibility. Virus may persist in recovered and chronically ill cattle which are considered a potential source of infection.

Antemortem findings :

1. Incubation: 1 – 3 days
2. Fever
3. Congestion and erosions in the mucous membranes of the oral cavity
4. Depression and anorexia
5. Cough, polypnea and salivation
6. Dehydration and debilitation
7. Foul-smelling diarrhoea
8. Cessation of rumination
9. Reduced milk supply
10. Abortion in pregnant cows
11. Laminitis
12. Congenital anomalies of the brain (cerebellar ataxia) and arthritis in young calves

Postmortem findings :

1. Shallow erosions present on the entrance of the nostrils, mouth, pharynx, larynx, oesophagus, rumen (Fig. 9), omasum, abomasum (Fig. 10), caecum and less frequently in Peyer's patches in the small intestine.
2. Erythema of the mucosa with submucosal haemorrhage in the abomasum, small intestine, caecum and colon. Stripped appearance on the caecal and colon mucosa is similar to that seen in rinderpest.
3. Cerebral hypoplasia and cataracts in calves.

Differential diagnosis : Malignant catarrhal fever, rinderpest, blue tongue and vesicular diseases. The latter produce vesicles which are not

present in BVD. Diseases with no oral lesion nor diarrhoea include salmonellosis, Johne's disease and parasitism.



Fig. 9: BVD. Congestion and erosions in the ruminal mucosa.

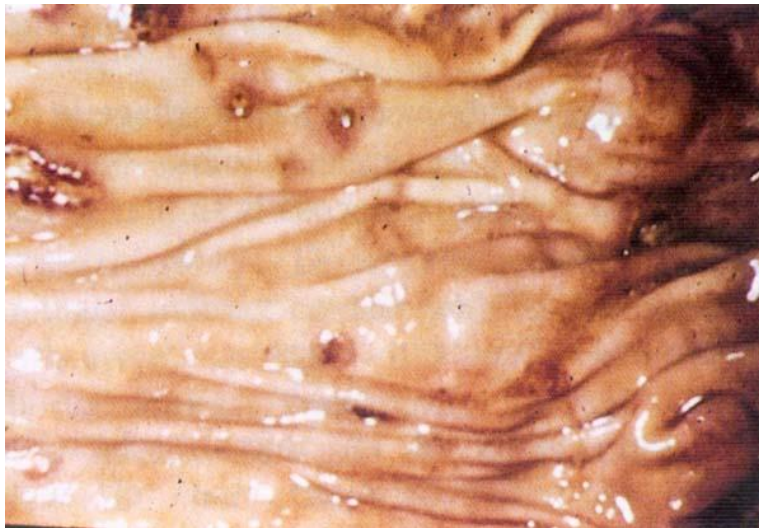


Fig. 10: BVD. Inflammation of the abomasum (abomasitis, gastritis).