Blue Tongue
Sore Mouth

Definition:

It is non-contagious viral disease of sheep, goats and cattle characterized by oral ulceration, tongue cyanosis and lameness.

It is not zoonotic.

The disease is seen most often in sheep, occasionally in goats, and rarely in cattle and being mild.

Cause:

RNA virus belongs to genus *Orbivirus* of family Reoviridae.

Route of infection:

Insects' bite; Culicoides spp.

The virus cannot be transmitted between susceptible animals without the presence of the insect carriers.

Pathogenesis:

After insect bite → viral replication in regional lymph nodes and spleen then → disseminates to the blood resulting in viraemia → followed by infection of the endothelial linings of arterioles, capillaries, and venules throughout the body (Endetheliotropic). resulting in endothelial damage which results in :

- Microvascular thrombosis.
- Increase Vascular permeability.

The main Microscopic lesions reflected from the endothelial damage are:

Edema, hemorrhage as well as Ischemic necrosis of many tissues.

Clinical signs:

1. Fever, widespread hemorrhages of the oral and nasal mucosae, excessive salivation, and nasal discharge.
2. In acute cases the lips and tongue are swollen with Cyanosis of tongue and ulceration.
3. Lameness,

P.M. lesions:

-Alimentary tract

a. Ulcers and erosions in oral mucosa.
b. Tongue is edematous and cyanotic (so called blue tongue) due to local venous congestion as a result of thrombosis of the lingual vein.
c. Ulcer in rumen and reticulum.
d. Petechial hemorrhage on abomasum.
e. Congestion and hemorrhage in intestine .

Cardiovascular system:

Petechial hemorrhage on the base of pulmonary artery (Pathognomic lesion).

This hemorrhage may be present at the base of aorta, subendocardium and epicardium.

Skin, interdigital space and muscles:

Skin is encrusted.

Interdigital space is hyperemic.

Inter-muscular edema and hemorrhage.

Multifocal areas of myo-degeneration.

Microscopic lesions:

a. Vascular thrombosis followed by edema and hemorrhage.
b. Skin showing necrosis of squamous epithelium with cellular infiltration in dermis.
c. Muscle infarction.

N.B:

- **The virus can cross the placenta in pregnant ewes producing abortion or teratogenic effects depending upon the stage of gestation.**
- **At 50-55 days of gestation → Hydranencephaly and retinal dysplasia.**
- **At 75 days → porencephaly.**
- **After 100 days → Mild focal meningoencephalitis.**

Rift Valley Fever (RVF)

Definition:

It is an acute viral disease of sheep , goats , cattle and man (zoonotic) characterized by hepatitis, abortion in cattle and high mortalities in lambs and calves.

Human infections have also resulted from the bites of infected mosquitoes.

To date, no human-to-human transmission of RVF virus has been documented.

Outbreaks of RVF in animals can be prevented by a sustained program of animal vaccination.

Cause:

RNA virus belongs to Bunyaviridae

Route of Infection:

Mosquitoes bite, Culex, Aedes.

Pathogenesis:

- Virus transmitted by mosquitoes bite → viraemia.
- Virus lodged in blood vessels of liver, spleen , L.N and other tissues.

Clinical signs:

1. In young lambs and calves

Abdominal pain , collapse and death within 24 hrs with fever.

2. Adult sheep and cattle

Fever, abortion, diarrhea, vomiting and mucosal erosions.

3. Man

Influenza-like symptoms such as sudden onset of fever, shivering, vomiting, epistaxis, muscle pain and headache. Complications of retinal damage causing temporary blindness may occur.

P.M lesions:

1. **The Liver is enlarged, yellowish in color, small grey white foci of necrosis with petechial hemorrhages and subcapsular hematoma.**
2. **The wall of gall bladder shows picture of cholecystitis; congestion, edema and sometimes petechial hemorrhage.**
3. **Spleen and L.N are enlarged with petechial hemorrhages and necrosis .**
4. **Erosions on mucous membrane of buccal cavity**
5. **Ulceration of intestinal mucosa in the terminal portion of ileum, caecum and colon**
6. **The lungs showing hyperemia, edema and subpleural hemorrhage. Apical and cardiac lobes show fibrinous inflammation.**
7. **Cutaneous hemorrhages and petechial hemorrhages in serous membranes.**

Microscopic lesions:

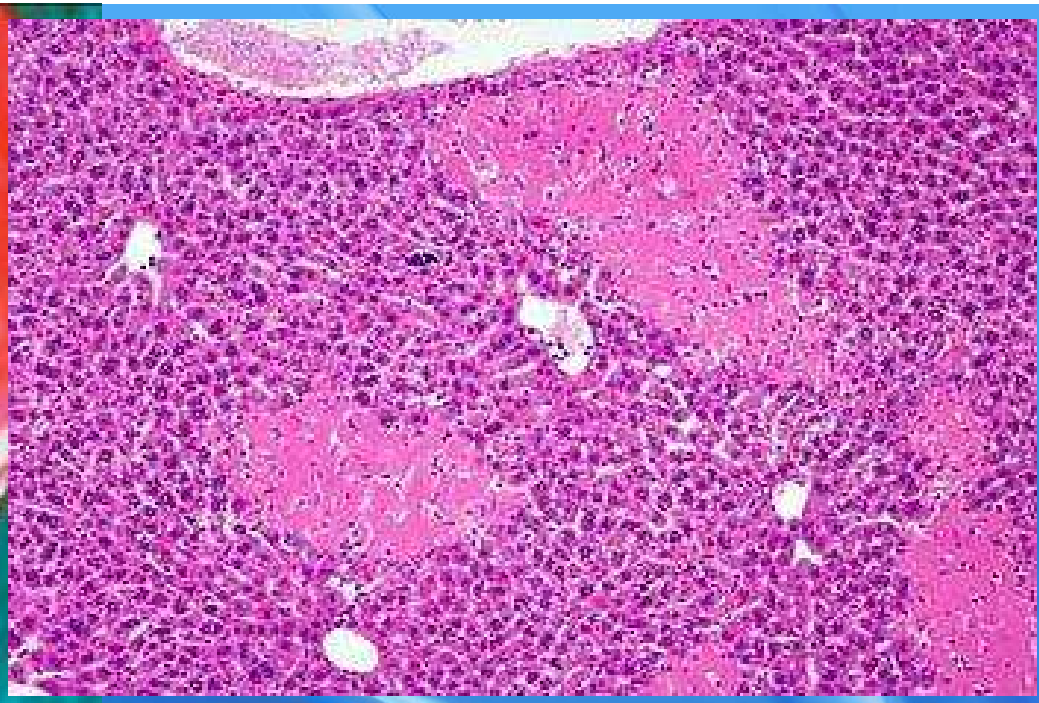
1. **Liver; Focal areas of coagulative necrosis (Paracentral necrosis) surrounded by inflammatory cells.**
2. **The cytoplasm of the necrotic cells is esinophilic with pyknotic nuclei.**
3. **The hepatic cells and Kupffer cells contain acidophilic I/N inclusion bodies.**
4. **Blood lagoons: Areas filed with blood scattered in liver parenchyma.**

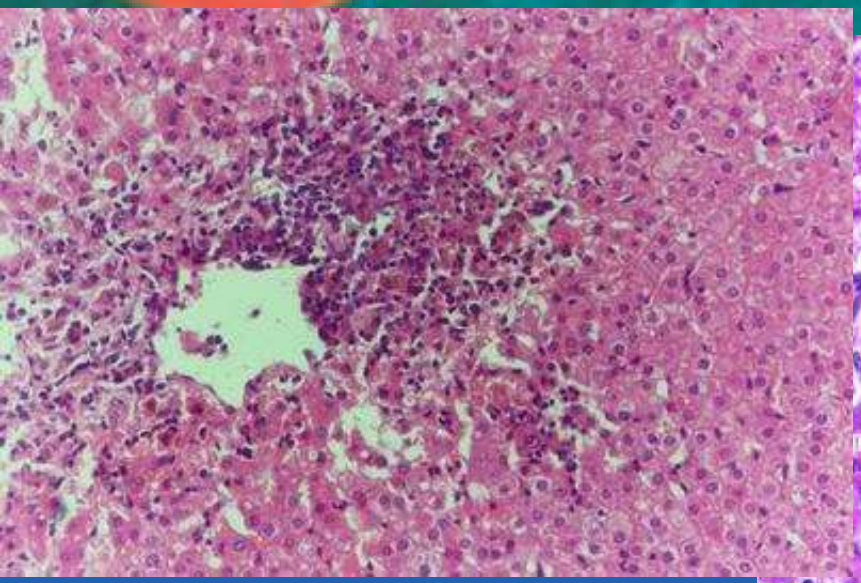
In adult pregnant Ewes, abortion may occur with retention of placenta and if fetus alive, it is very weak.

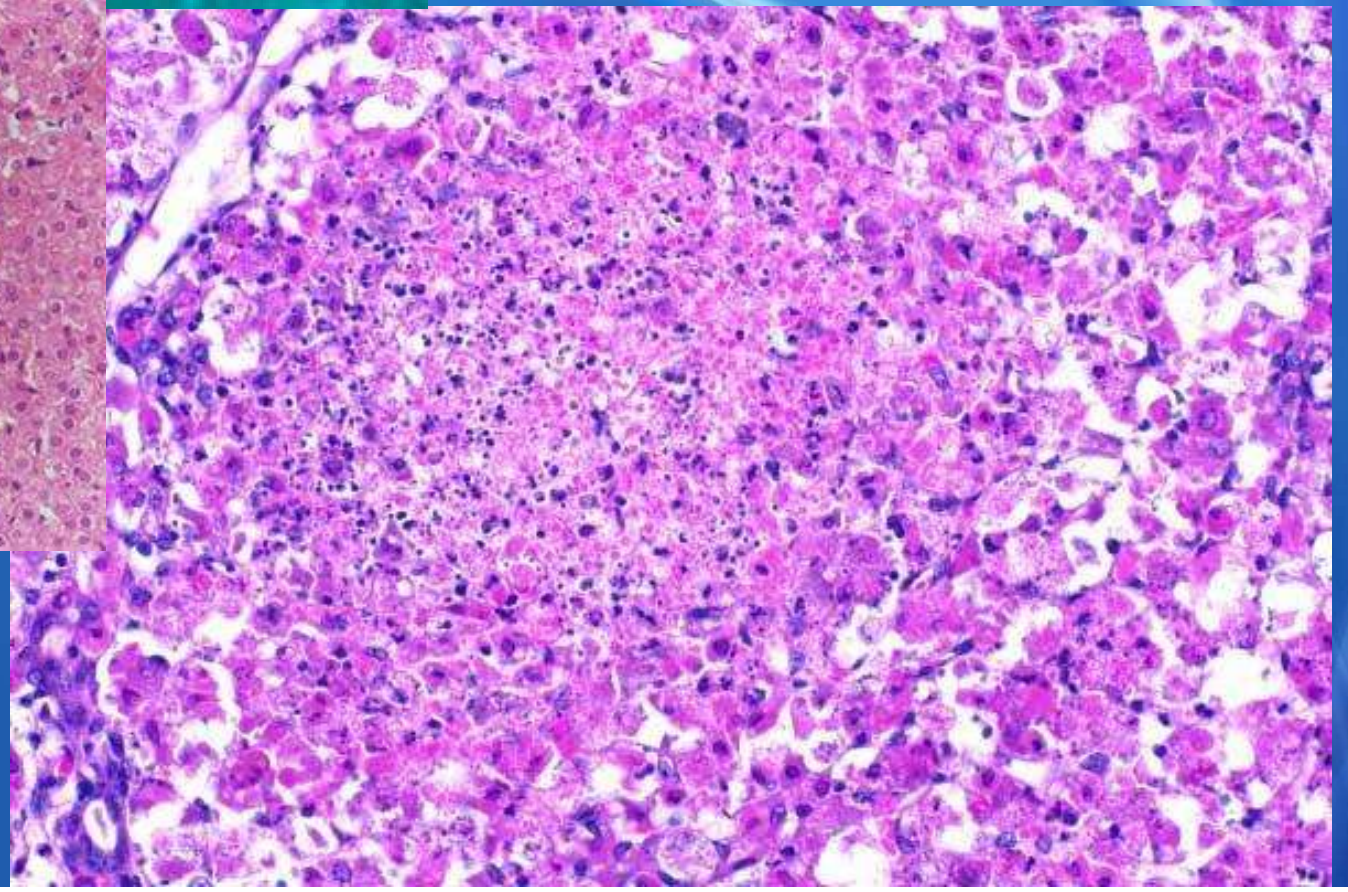
P.M lesions in fetus:

- **Liver is completely destructed.**
- **Some hepatic cells contain I/N inclusions.**
- **Hemorrhage in all internal organs.**

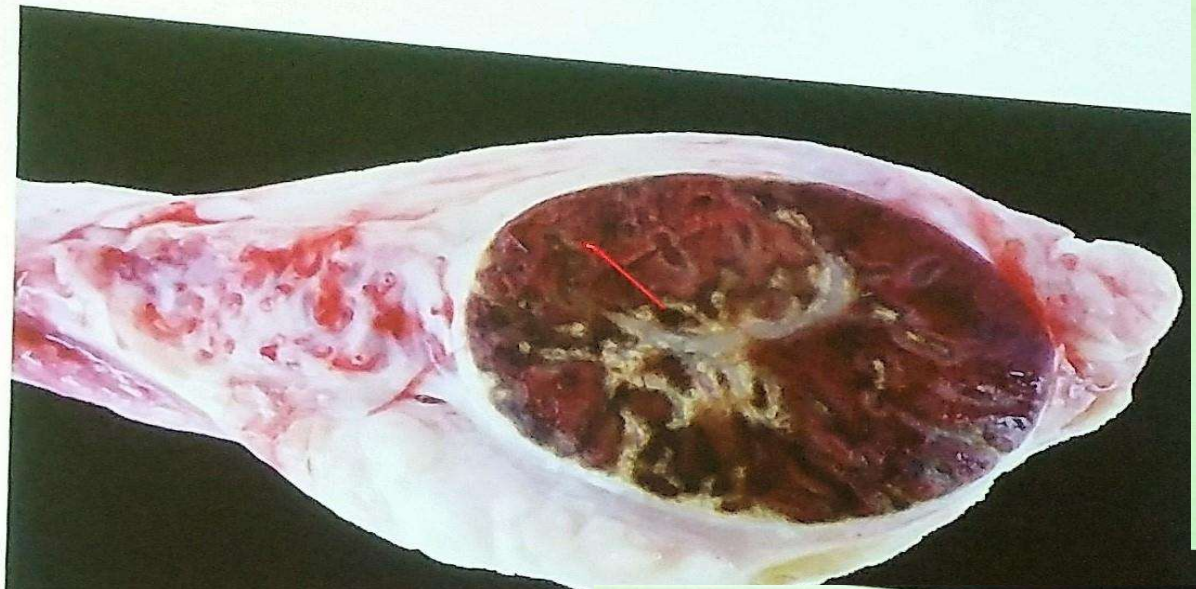
petechial hemorrhages in serous membranes with hemorrhagic enteritis.



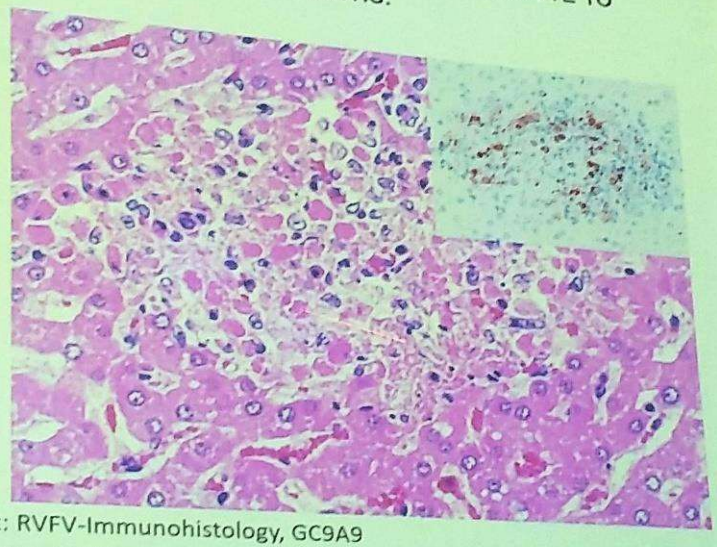




SHEEP, TESTIS: SEVERE, DIFFUSE NECROSIS.



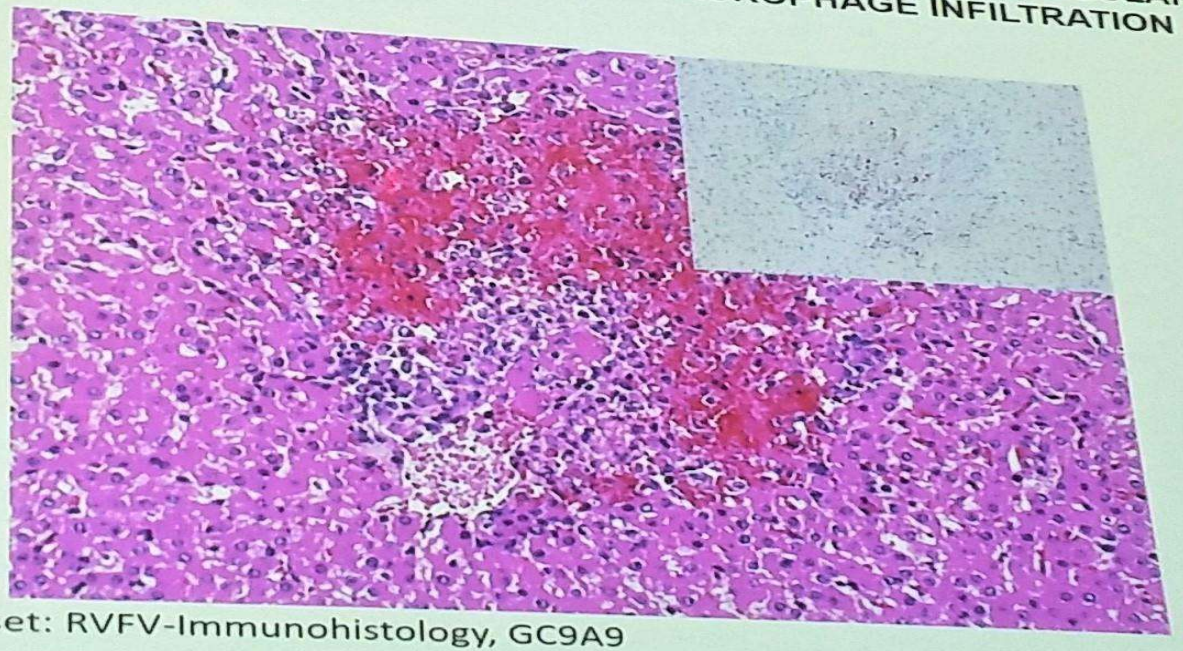
PATHOHISTOLOGY REAVEALS A MULTIFOCAL, ACUTE TO SUBACUTE NECROTIZING HEPATITIS.



Inset: RVFV-Immunohistology, GC9A9

P17-791, 34/75-strain, subcutaneous infection, 4 d.p.i.

PATHOHISTOLOGY REVEALS CENTROLOBULAR HEPATOCELLULAR DISSOCIATION WITH HEMORRHAGE, MACROPHAGE INFILTRATION AND THROMBOSIS.



Inset: RVFV-Immunohistology, GC9A9

P17-859, ZH501-strain, subcutaneous infection, 4 d.p.i.

Sheep Pox

Definition:

It is an infectious disease of sheep and goat characterized by typical pox lesions not only in skin but also in the internal organs (generalized) causing high morbidity and mortality.

Causative agent:

Poxviridae, genus capripox, strain sheep pox and goat pox. It is epitheliotropic, DNA virus.

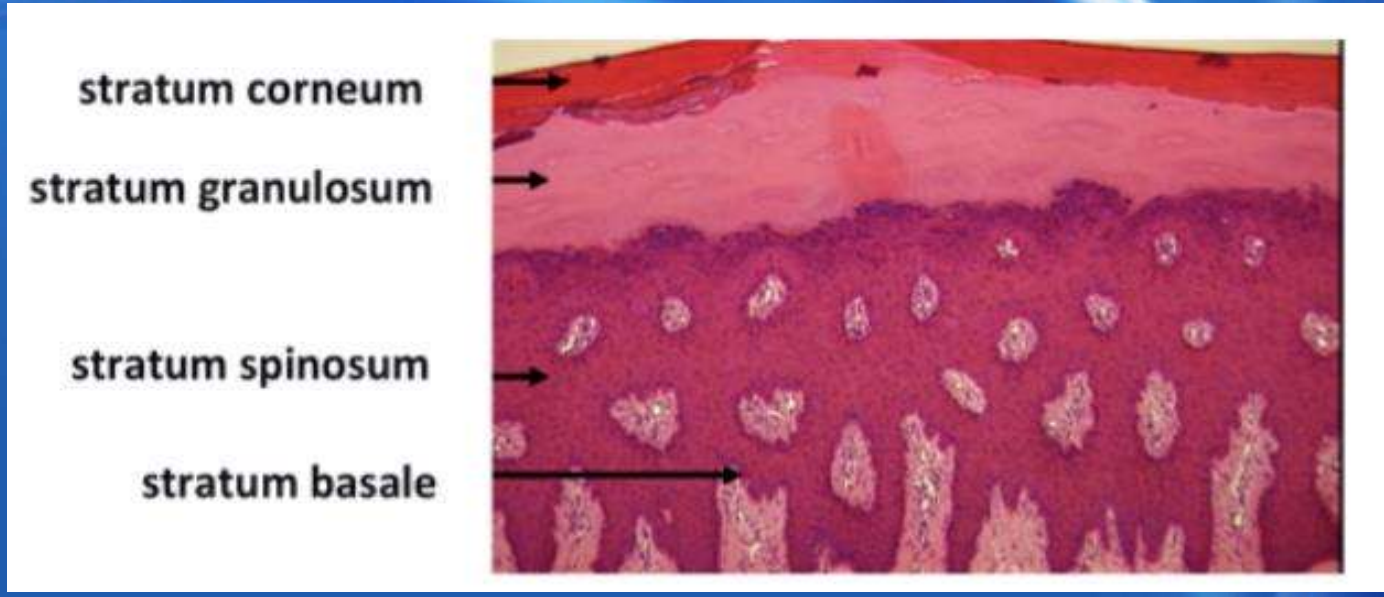
The same lesions as in cattle but also found in mouth, pharynx, abomasum and also found in trachea and lungs.

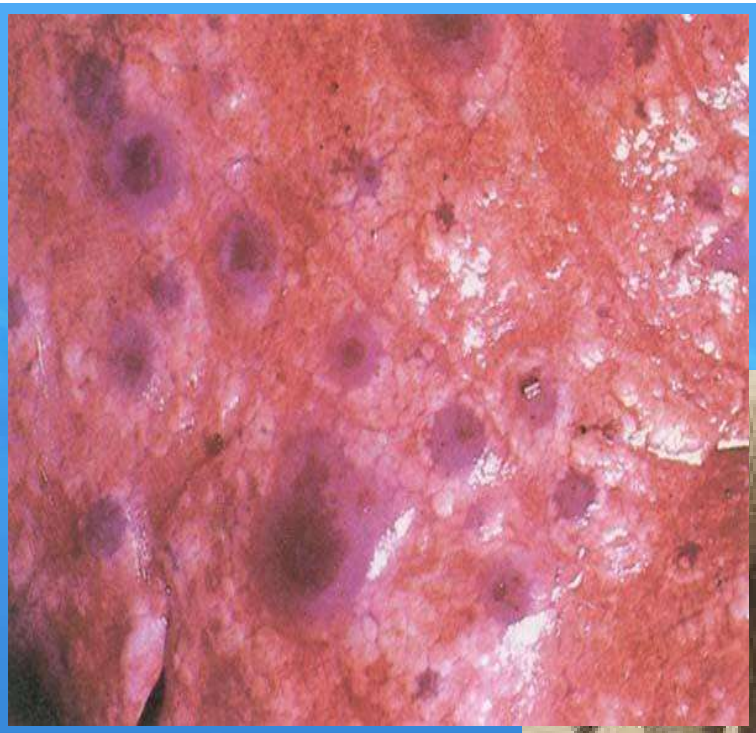
Pathogenesis and PM lesions:

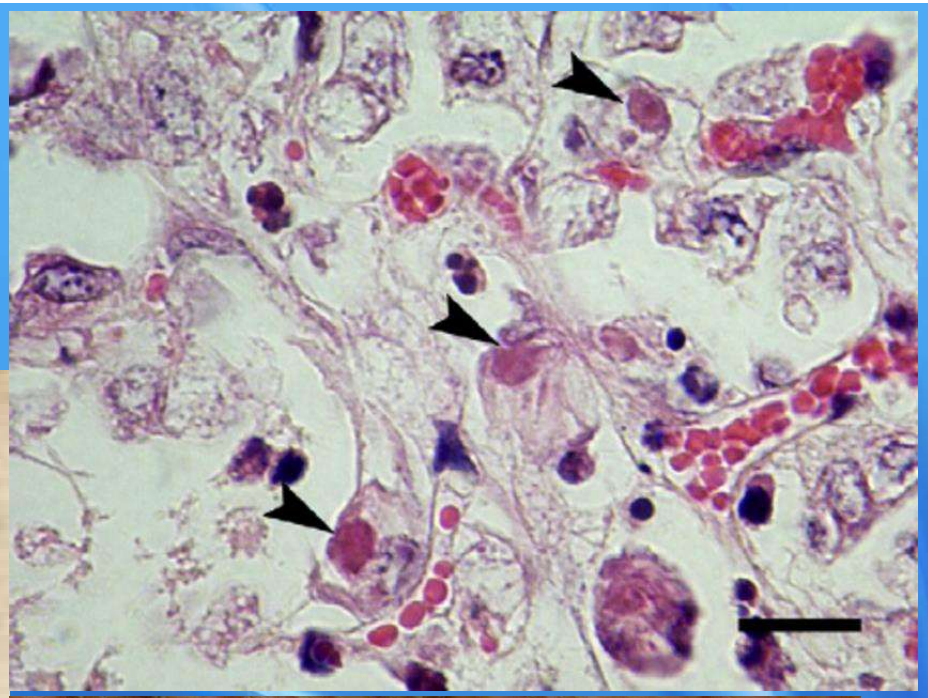
It begin as localized reddened raised area(**macules**) → **Papules** (tiny vesicles) → **Vesicles**, the vesicles are varied in size and shape round in udder and oval to elongated on teats, red to bluish white in colors, and surrounded with inflamed rim.
The content of vesicles are first clear but become turbid later → After 8-12 days vesicles showed depressed center and contain purulent discharge when **pustules** are formed. → Which then dry forming a **crust** that finally adheres to the underlying tissue, leave a raw reddened surface when removed → **Scar** is formed by healing.

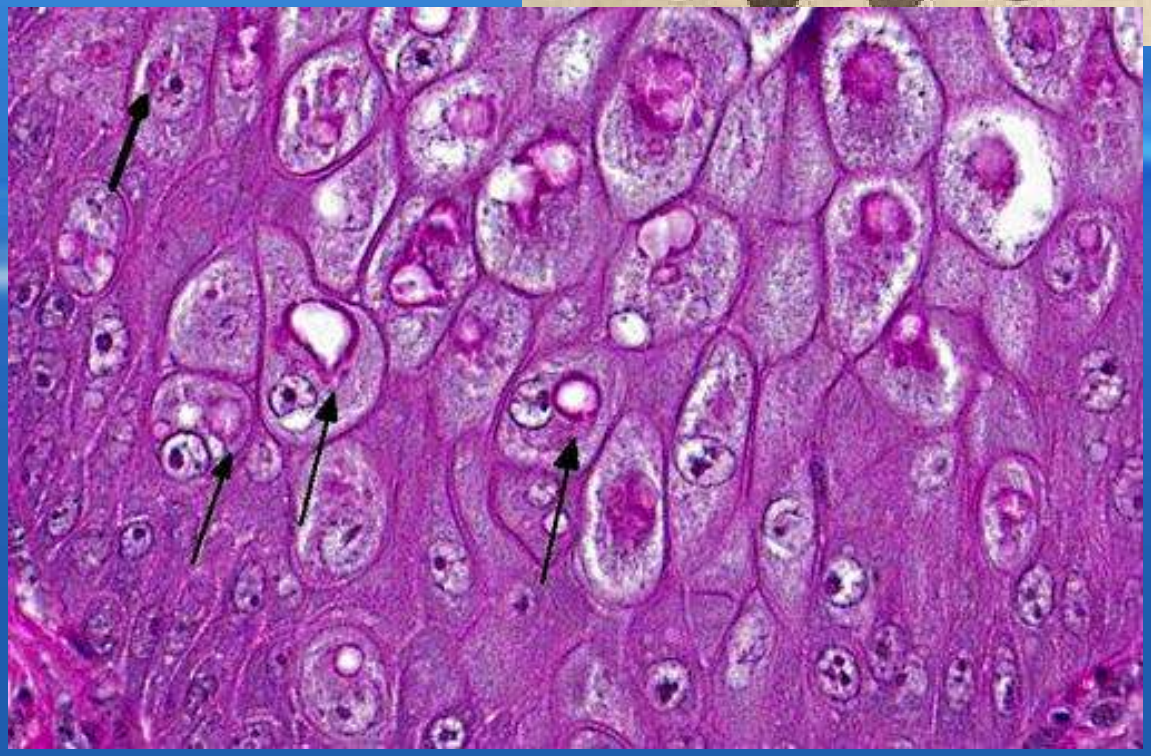
Microscopic lesions:

The epidermal and dermal lesions are as in cattle. but the deep dermis contains characteristic cells (sheep pox cells) which are infected monocytes, macrophages and fibroblast cells with the virus and appeared with nuclei with marginated chromatin and large vacuole in the center of the nucleus as well as I/C inclusion bodies were seen in these cells.









Contagious pustular dermatitis

contagious ecthyma (ORF)

Definition: it is a viral disease of sheep and goats as well as human characterized by papules at mouth commissures, oral cavity and nose.

Cause: parapox virus.

Route of infection: direct contact with infected materials.

Pathogenesis and postmortem findings: papules, pustules and thick scab especially at mouth commissures, oral cavity and nose.

Microscopic findings:

1- **Epidermal lesions:** Vacuolar degeneration and intracytoplasmic basophilc inclusions in epidermal cells.

2-Dermal lesions: dermatitis which manifested by lymphocytic infiltration with perivascular cuffing and vascular congestion as well as **pathognomonic lesion**, which is a down-growth of the epidermal cells (**pseudocarcinomatous hyperplasia**).

Pestes Des petits Ruminant (PPR)

Definition: it is viral disease of sheep and goat similar to cattle plague.

Cause: RNA virus antigenically related to cattle plague. i.e. The vaccine of one of them can be used against the other.

Pathogenesis and PM lesions: It is quite similar to Cattle plague.

Maedi Sheep Disease
or Ovine Progressive Pneumonia

Definition: it is viral disease of sheep characterized by lympho-follicular interstitial pneumonia and increase lung weight.

Cause: RNA (Retro virus- maedi-visna).

Maedi : shortness of respiration. Visna : meningoencephlitis.

Route of infection : inhalation.

Pathogenesis : the virus stimulates the proliferation of the peribronchial lymphoid tissue and sometimes the alveolar epithelium.

Postmortem findings :

1- Lung is enlarged (Diffuse) and heavy weight with ribs imprints.

2- Enlargement of bronchial and medistinal lymph nodes.

3- Meningoencephalitis and arthritis.

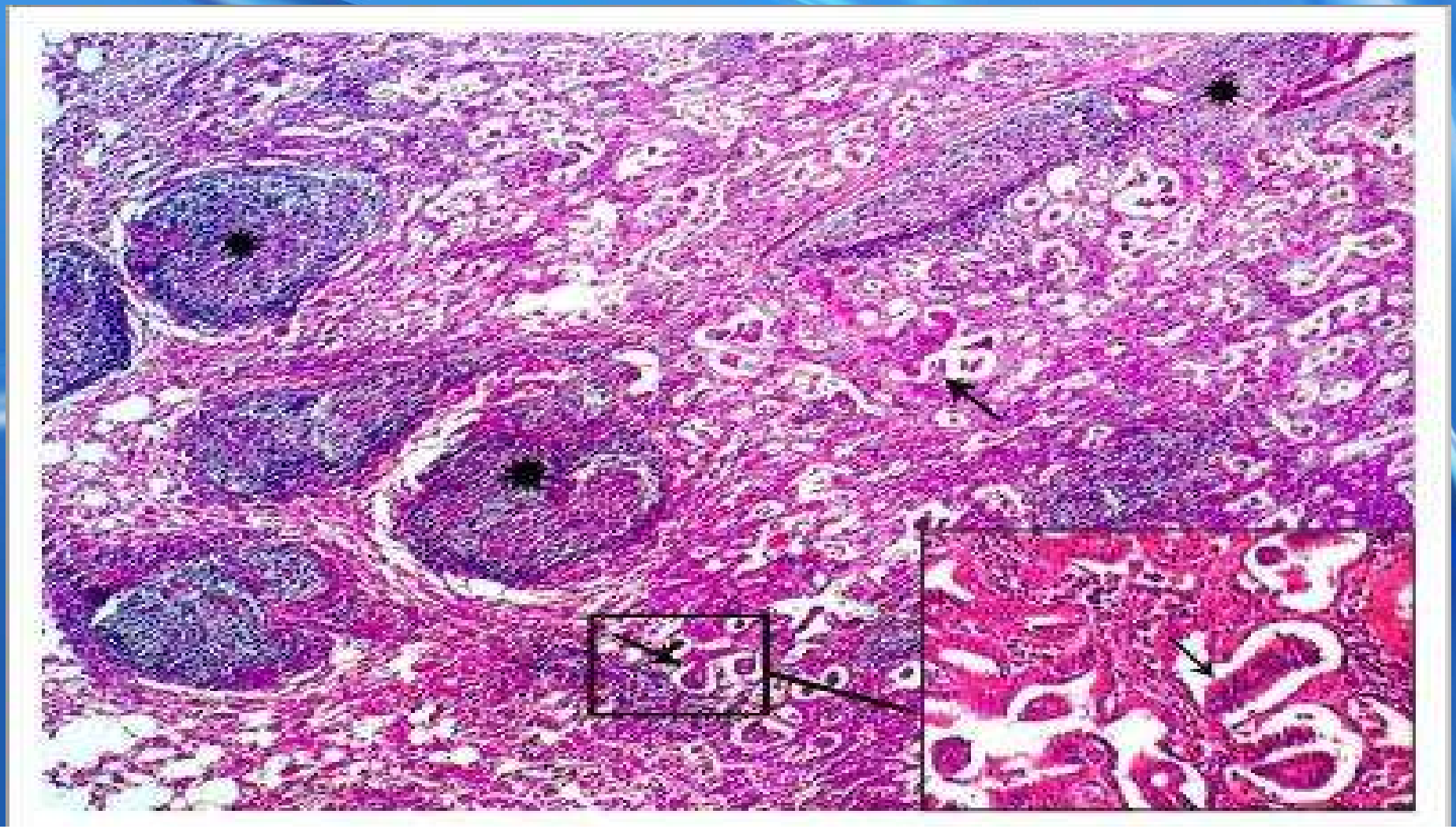
Microscopic findings:

1- Proliferation of the lympho-follicular sheath around bronchi, bronchioles and blood vessels.

2- Hyperplasia of smooth muscle of terminal bronchioles.

3- Hyperplasia of pneumocyte type II may be seen.

4- Intracytoplasmic inclusions.



Jaagsiekte or pulmonary adenomatosis virus

Def: it is viral disease of sheep characterized by lung nodules.

Cause: RNA (Retro virus). Jaagsiekte : Driving sickness.

Route of infection: Inhalation.

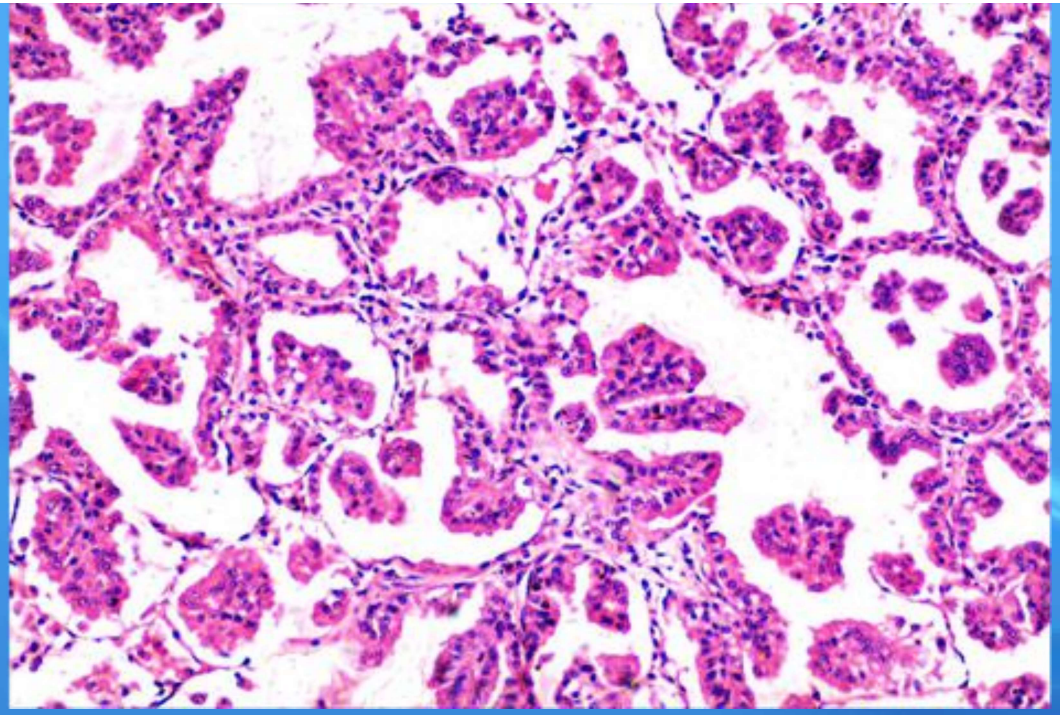
Pathogenesis: The virus stimulates the proliferation of the bronchial and alveolar epithelium resulting in marked hyperplasia of Clara cells and Pneumocyte type II leading to adenomatous appearance of bronchiolar and alveolar epithelium.

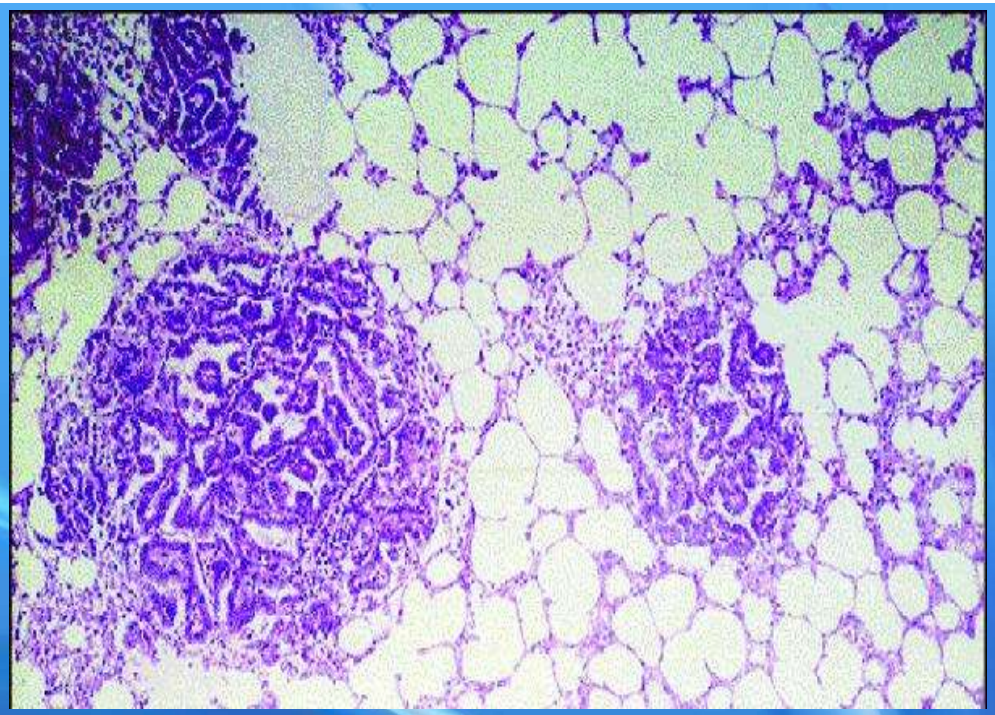
Postmortem findings:

1- Lung is enlarged and increased in weight with multiple nodules allover lung tissue.

Microscopic findings:

The bronchioles and alveoli lined by columnar and cuboidal epithelium in the form of finger like projection (adenomatous growth).





Maedi virus	Jaagsiekte virus
No adenomatosis in alveoli	Adenomatosis in alveoli
Intracytoplasmic inclusions present	Absent
Lesion is diffuse	Lesion is local
Lymph nodes affected	Lymph nodes are not affected