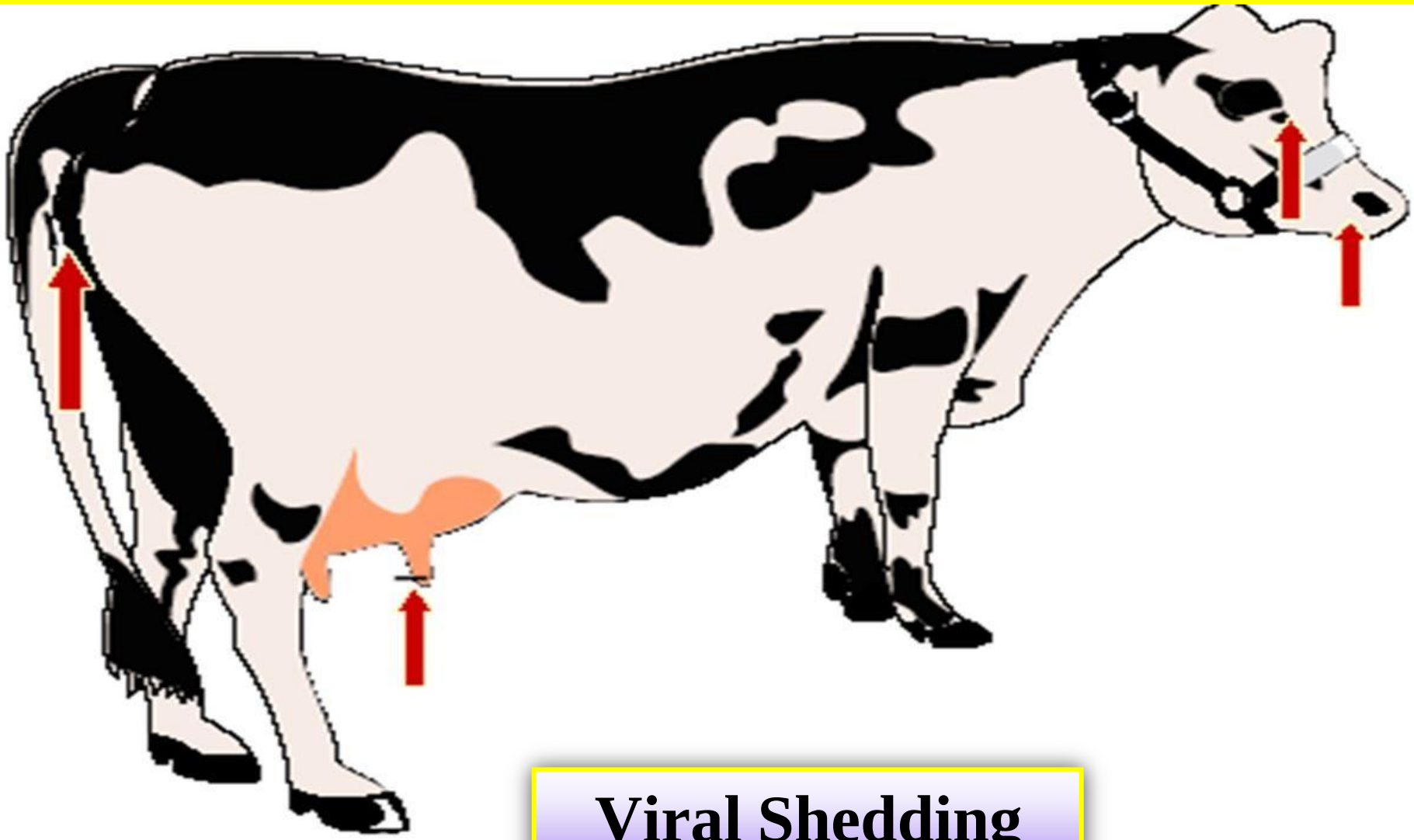
Bovine Viral Diarrhea

Mucosal Disease

1- Species Bovine viral diarrhea virus (BVDV) is an **RNA virus in genus Pestivirus**, family Flaviviridae.

2- BVDV gains access to the oropharyngeal mucosa **by ingestion or inhalation**, and primary replication is in **oropharyngeal lymphoid tissues**, including tonsils.

3- BVDV affects cattle of all ages but **mucosal disease most commonly occurs in cattle that are 6 months to 2 years of age.**



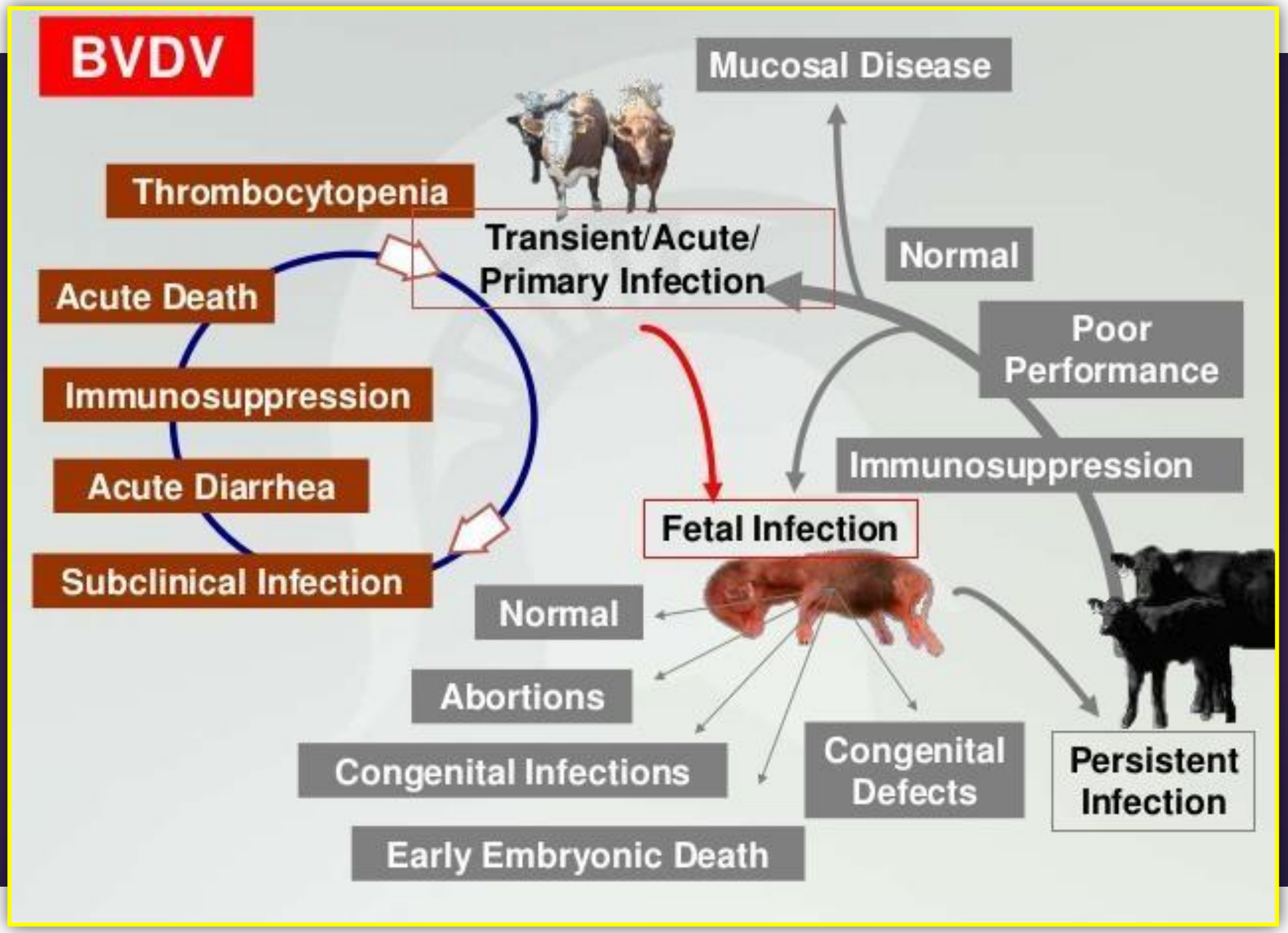
Viral Shedding

4- **Transmission vertical (dam to calf):** BVDV very efficiently **crosses the placenta** to infect the fetus at all stages of gestation.

5- **Transmission horizontal (between herdmates): direct contact** most efficient transmission, **Short range aerosol transmission likely**, **Oral contamination** of common after and water supply.

5- **BVD Clinical Presentations:**

- Acute/peracute-high fever,off feed, diarrhea, death within 48 hours.
- BVD associated diarrhea.
- BVD associated pneumonia.
- Hemorrhagic Syndrome fever,diarrhea, severe platelet depression, death.
- BVD associated reproduction problems and abortions.


BVDV
Mucosal Disease
Thrombocytopenia
Transient/Acute/
Primary Infection
Normal
Acute Death
Poor
Performance
Immunosuppression
Immunosuppression
Acute Diarrhea
Fetal Infection
Subclinical Infection
Normal
Abortions
Congenital Infections
Congenital
Defects
Persistent
Infection
Early Embryonic Death

5- <u>Effects on young stock (3-12 months of age)</u>:

- Unthrifty/Rough coats
- Diarrhea
- Coughing
- Ulcers in mouth
- Lameness
- Immunosuppression
- Often confused with parasitism
- High morbidity
- Low mortality

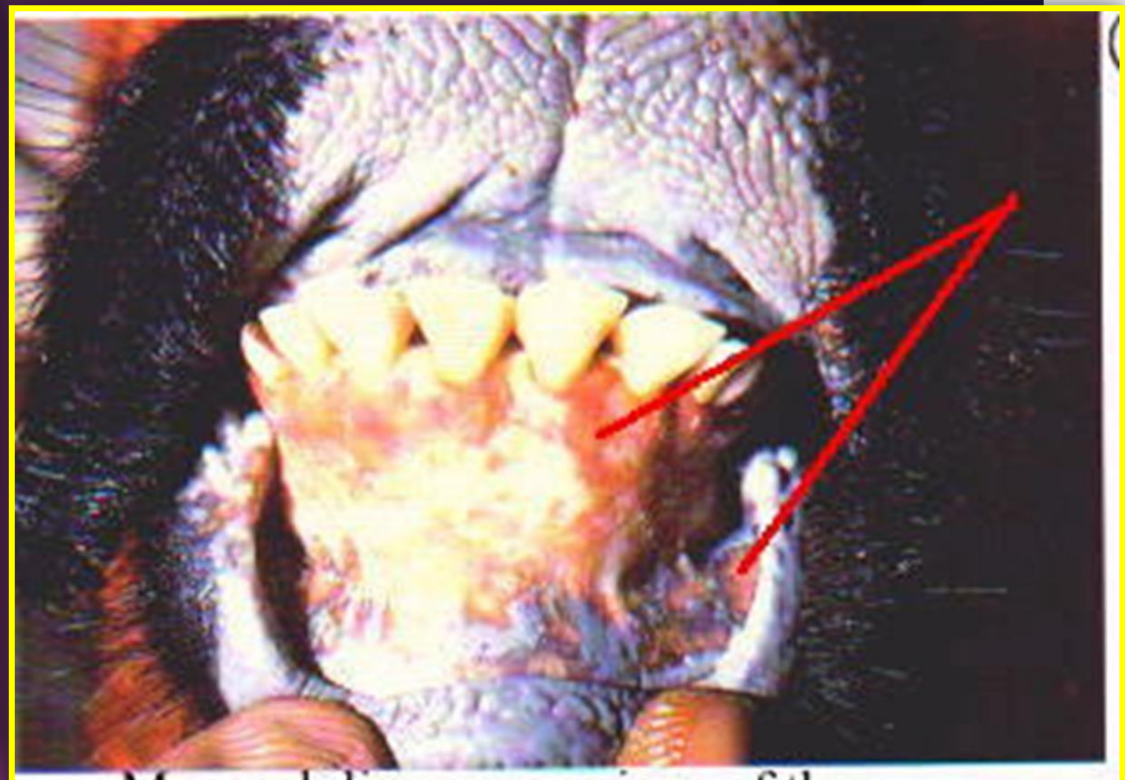
5- **BVDV Differential Diagnosis :**

a-From disease cause **oral lesion + diarrhea**:
M.C.F, R.P, I.B.R (alimentary form).

b- From disease cause oral lesion **without diarrhea**:
F.M.D, Vesicular stomatitis, Blue tongue, Bovine papular stomatitis & necrotic stomatitis.

c- From disease cause diarrhea **without oral lesion**:
Salomellosis, nutritional deficiency, parasitic diarrhea, enterotoxaemia & Johne`s disease.

Organ: Bovine, oral mucosa.
Lesion: There are numerous small gingival erosions



Mucosal disease: erosions of the gum and lips

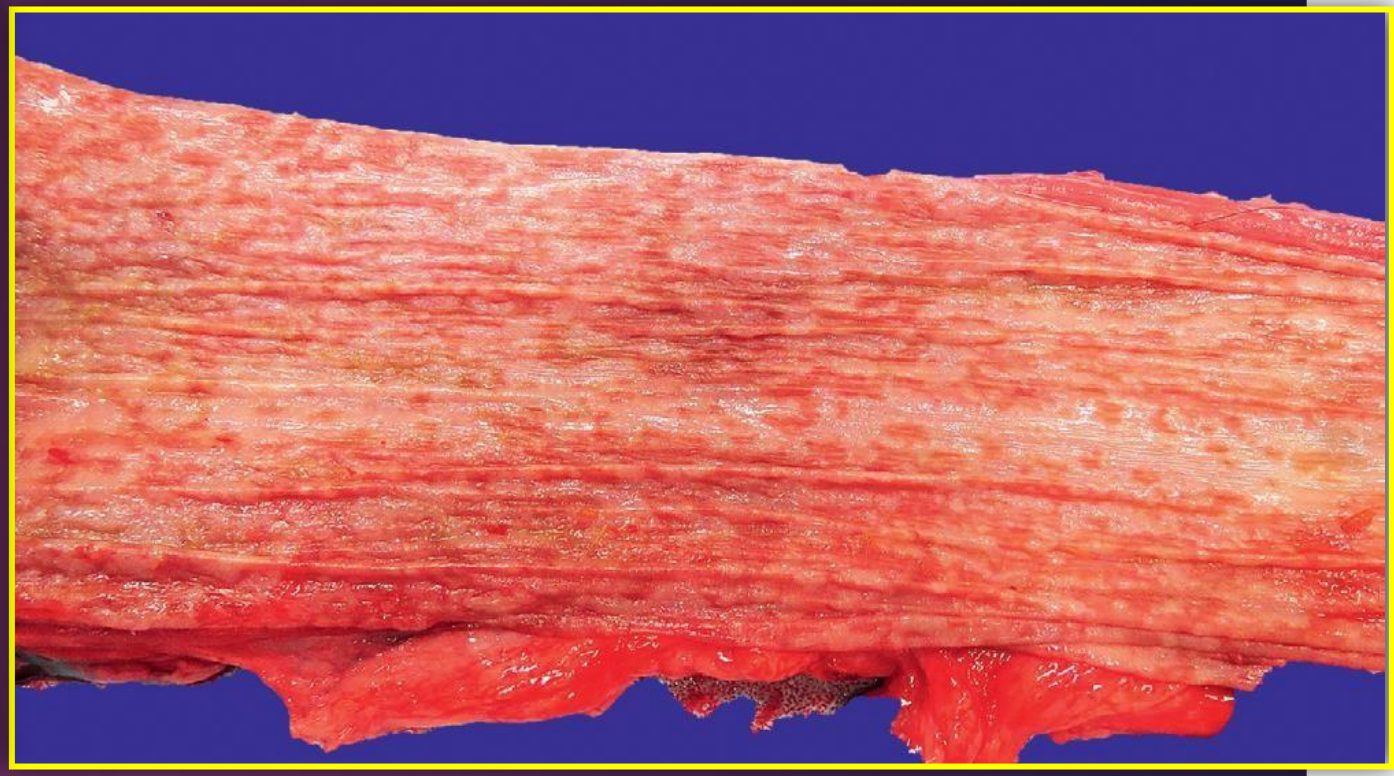
Erosive-ulcerative dermatitis of pastern in BVD.

Blunting and hemorrhage of papillae on the buccal mucosa as a result of necrosis induced by BVDV infection. A few remaining normal papillae are long with sharp points.

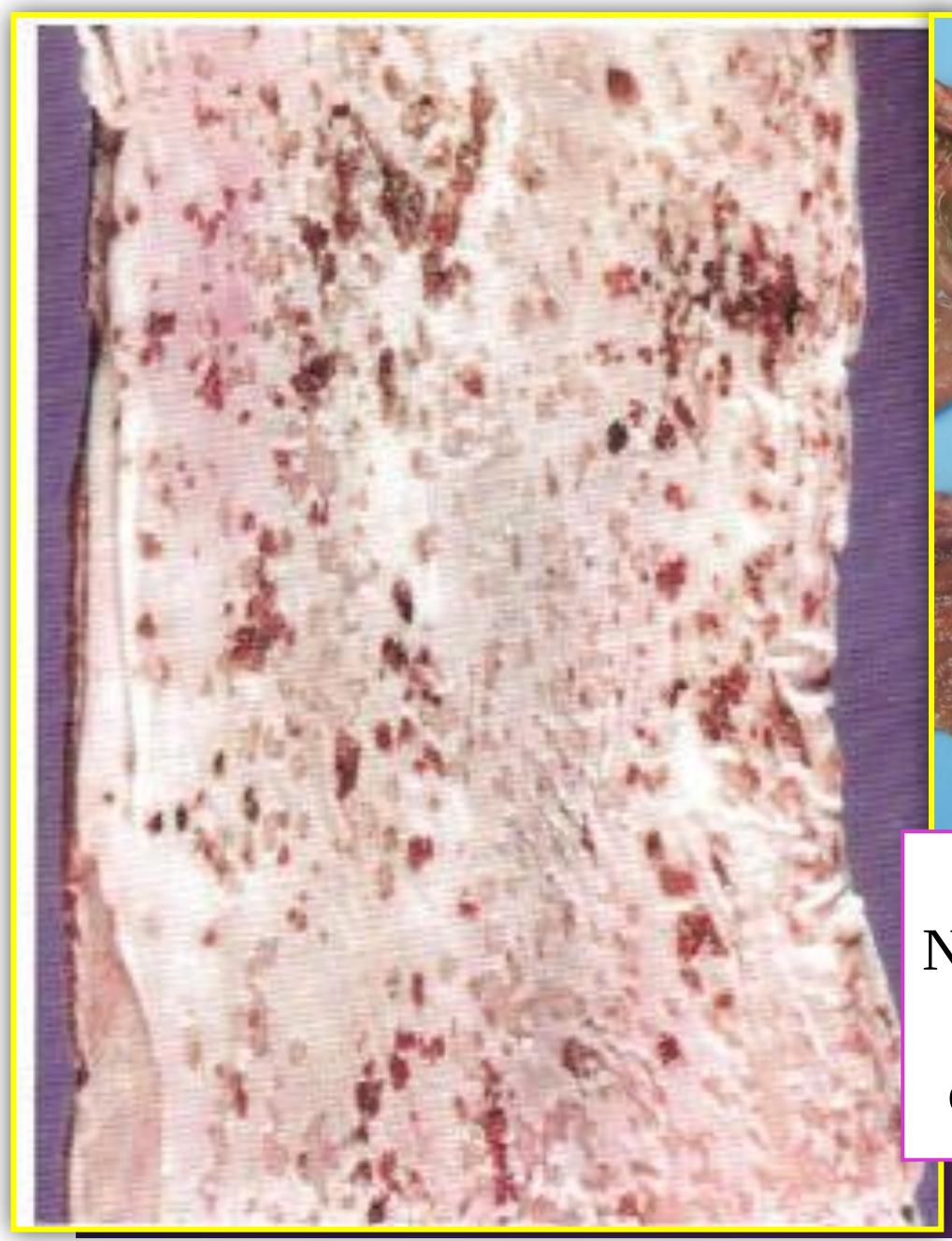
Ventral surface of tongue showing multiple confluent ulcers in BVDV.

Mucosal disease

Tongue: erosions on the dorsal surface

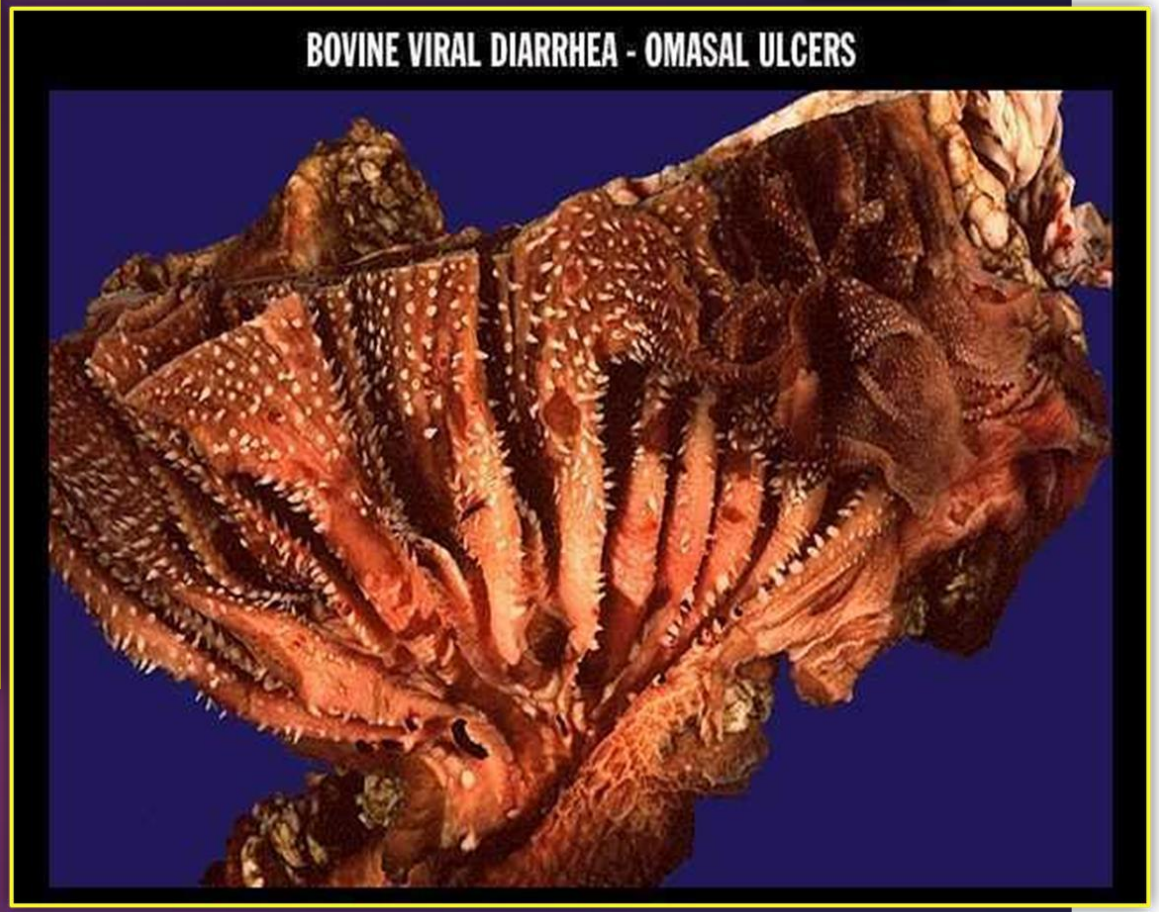


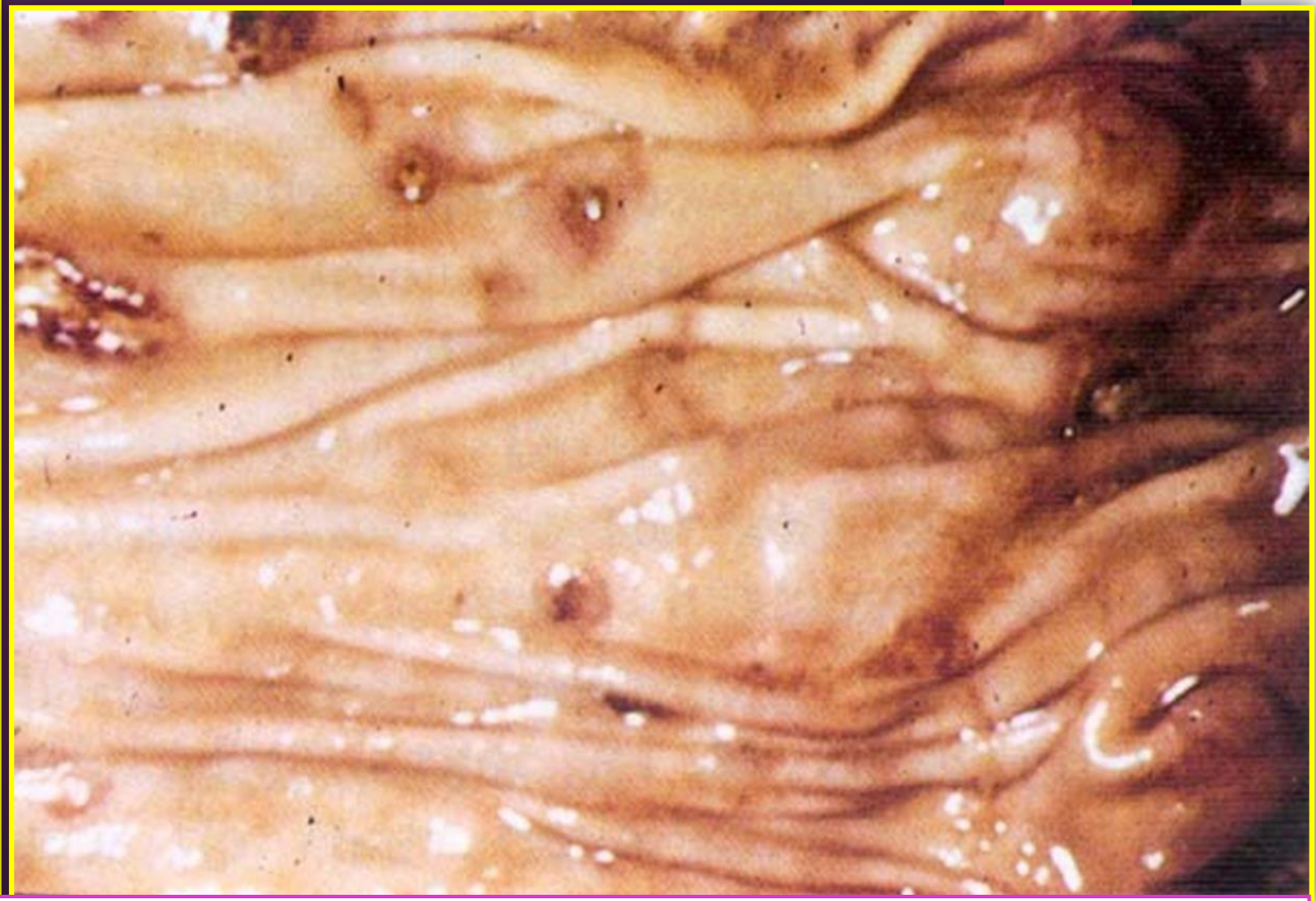
Longitudinal erosions and ulcers on the esophageal mucosa in BVDV.



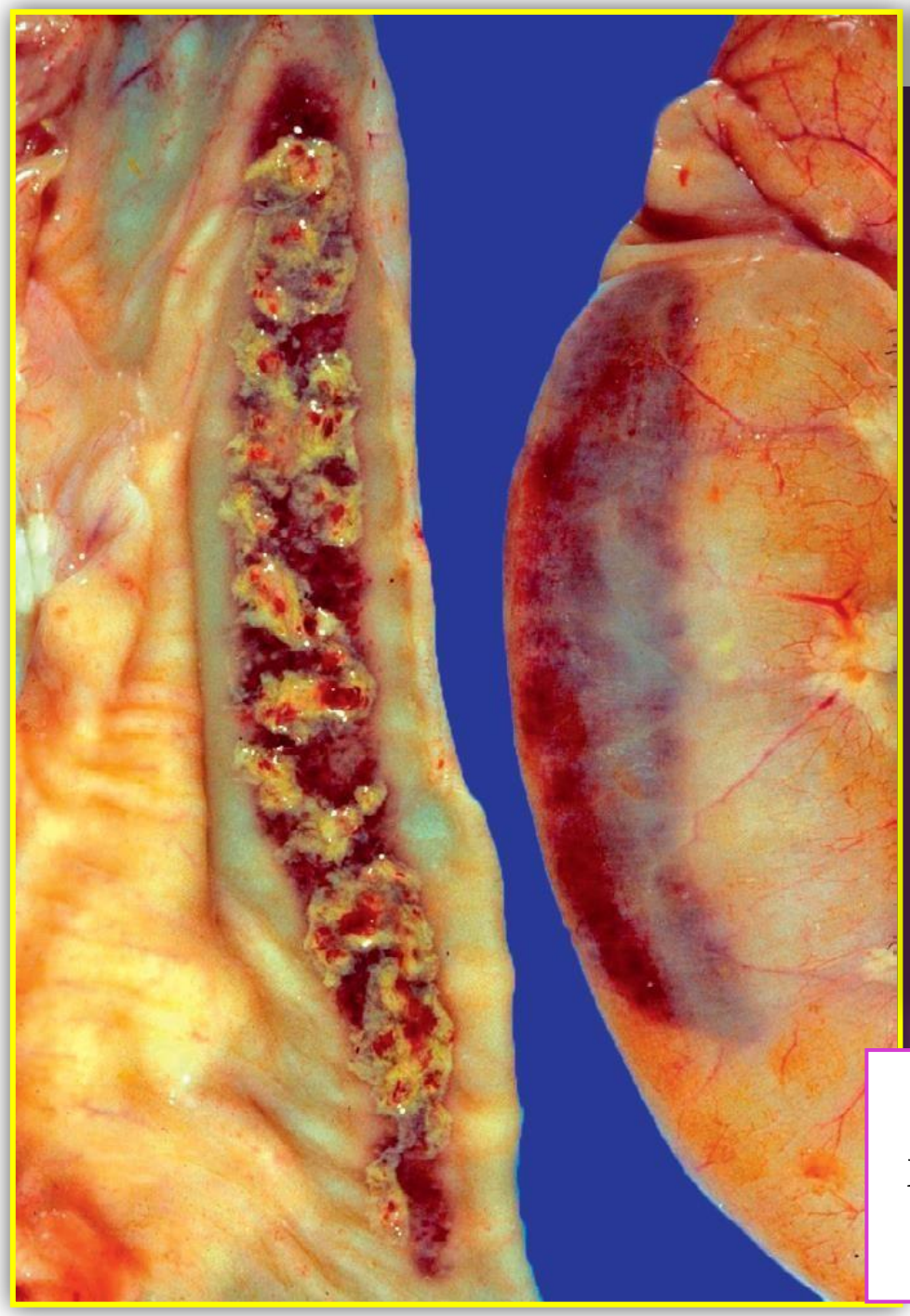
Ulcerative esophagitis, BVDV, esophagus, cow. Note the multiple variably sized (millimeter range) and variably shaped esophageal mucosal ulcers caused by the pestivirus of bovine viral diarrhea.

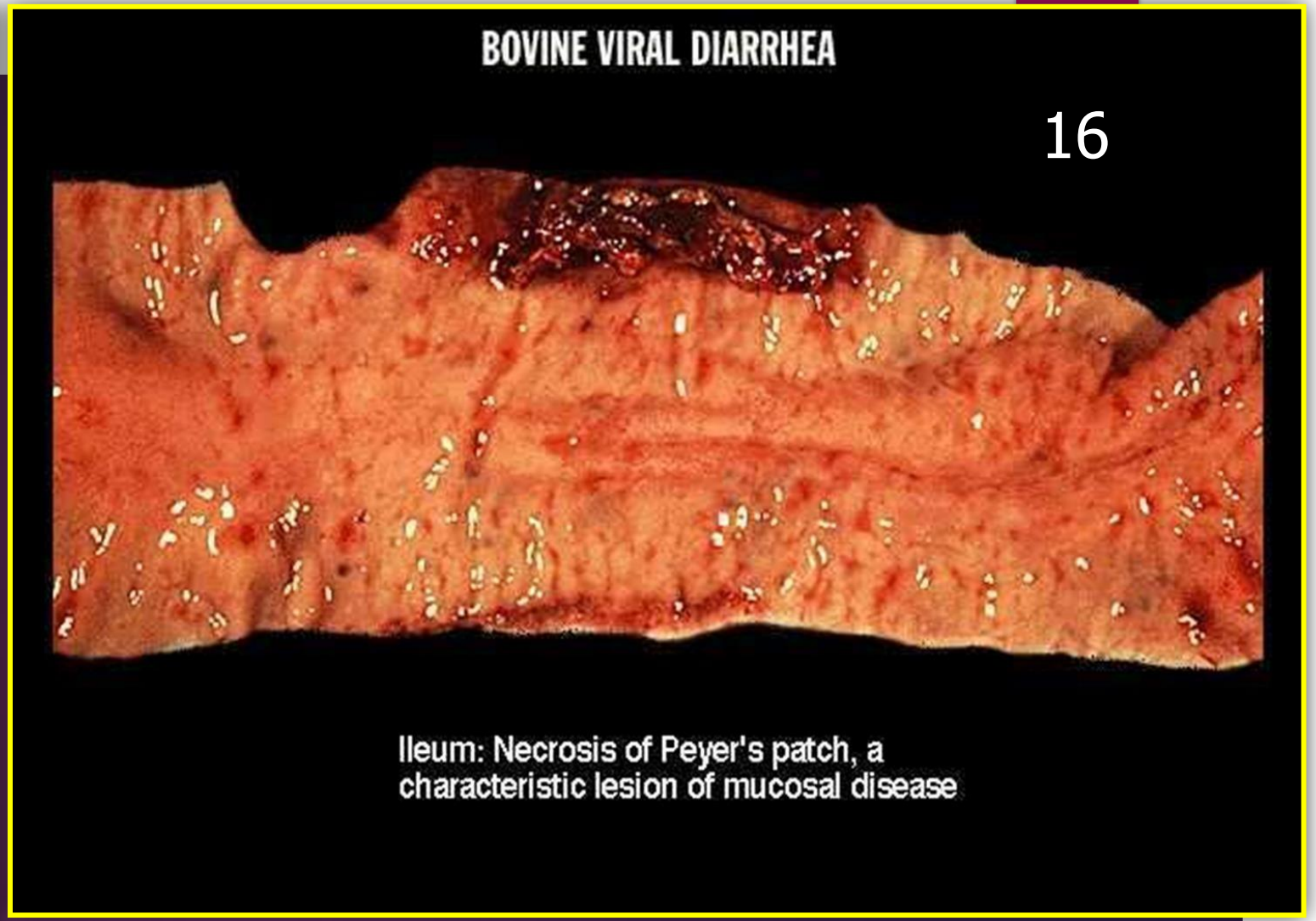
Focal and confluent ulcerative lesions on mucosa of dorsal sac of rumen in bovine viral diarrhea.





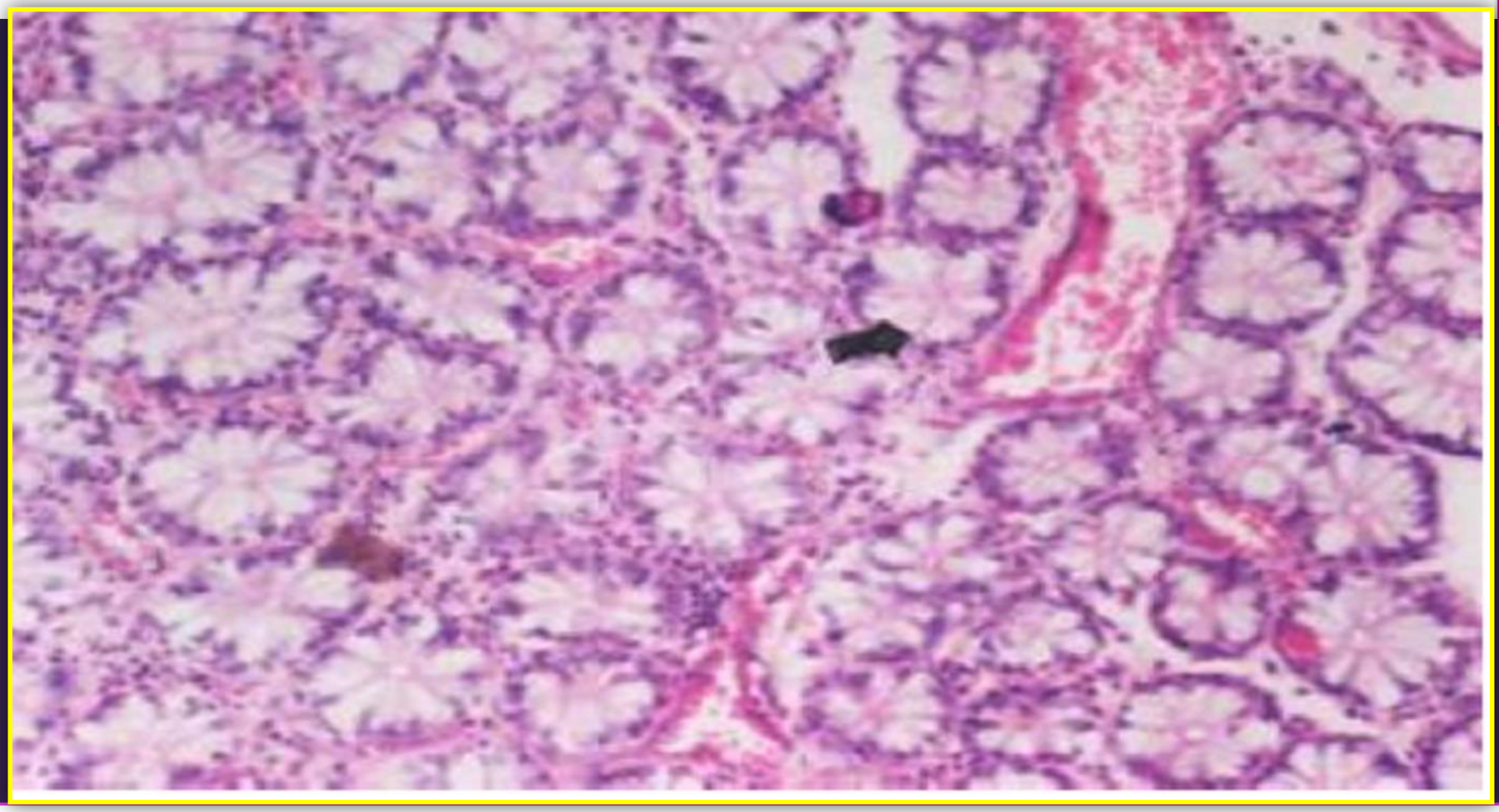
BVDV. Hemorrhage and ulceration of the abomasal mucosa.



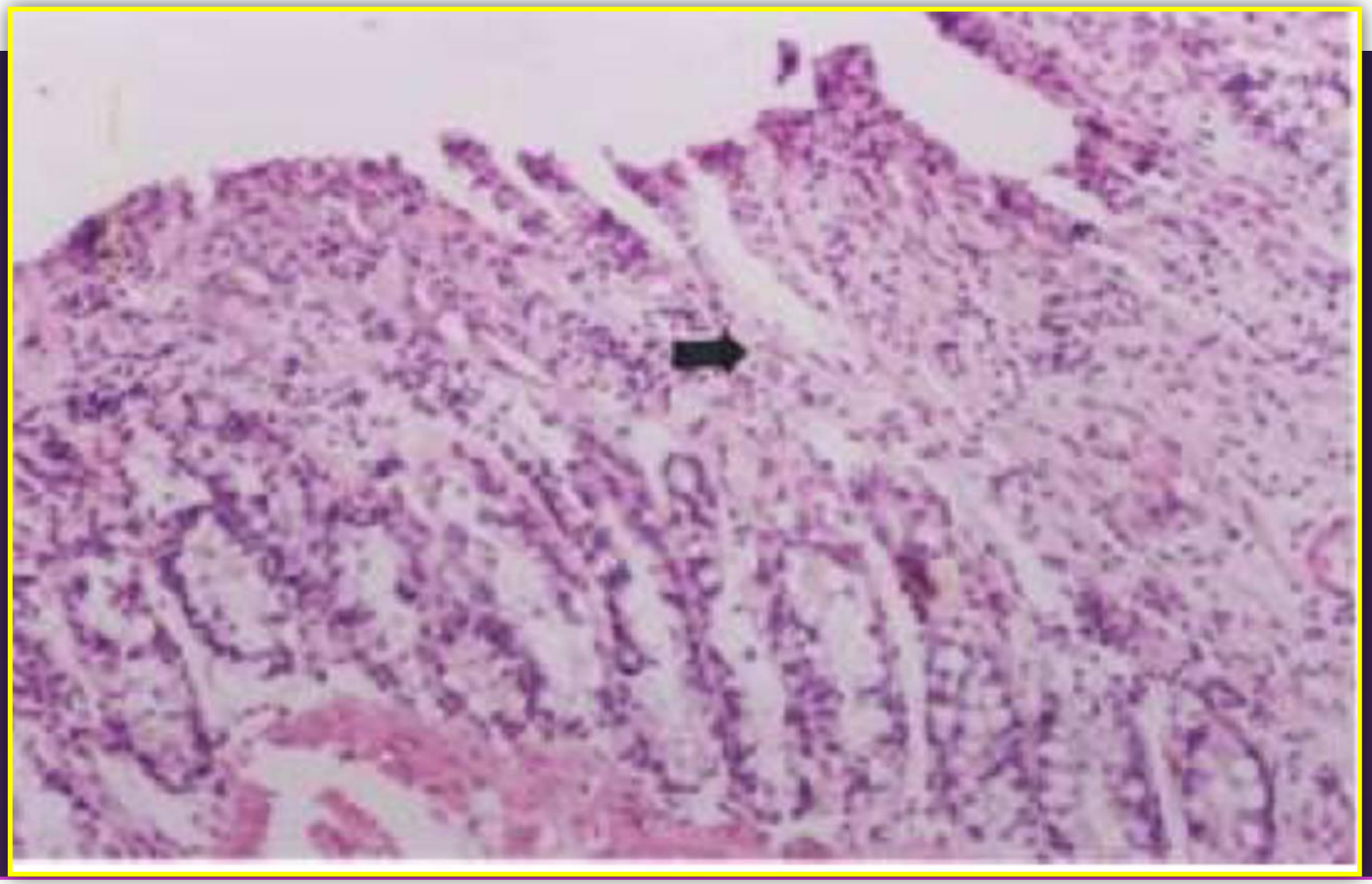


Fibrinohemorrhagic exudate over Peyer’s patch in the ileum (left). Deep red Peyer’s patch visible through serosa of small intestine (right).

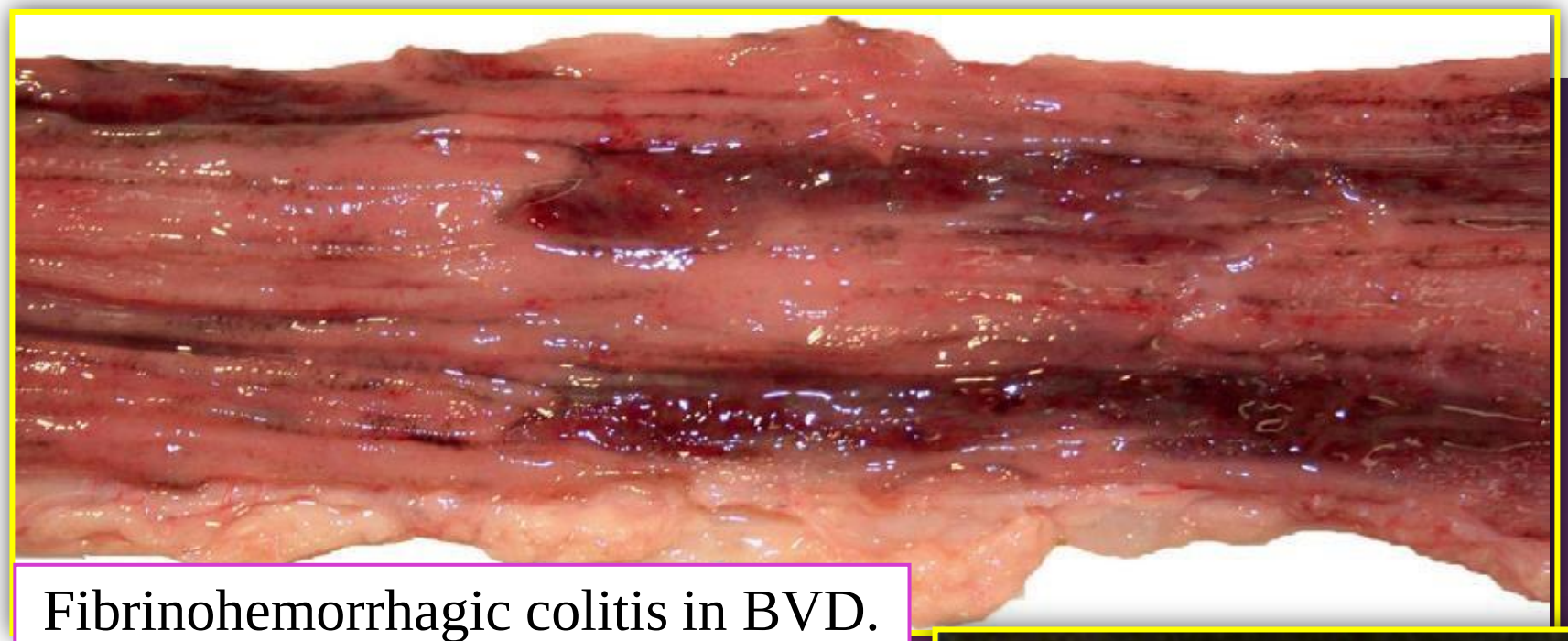
Bovine viral diarrhea, ileum, mucosa, cow.
Peyer's patches and the overlying epithelium are necrotic and covered with suppurative exudate.



Intestine of calf infected with BVD showing increase number of goblet cells, congestion of blood vessels and infiltration of lamina propria with inflammatory cells. H&E

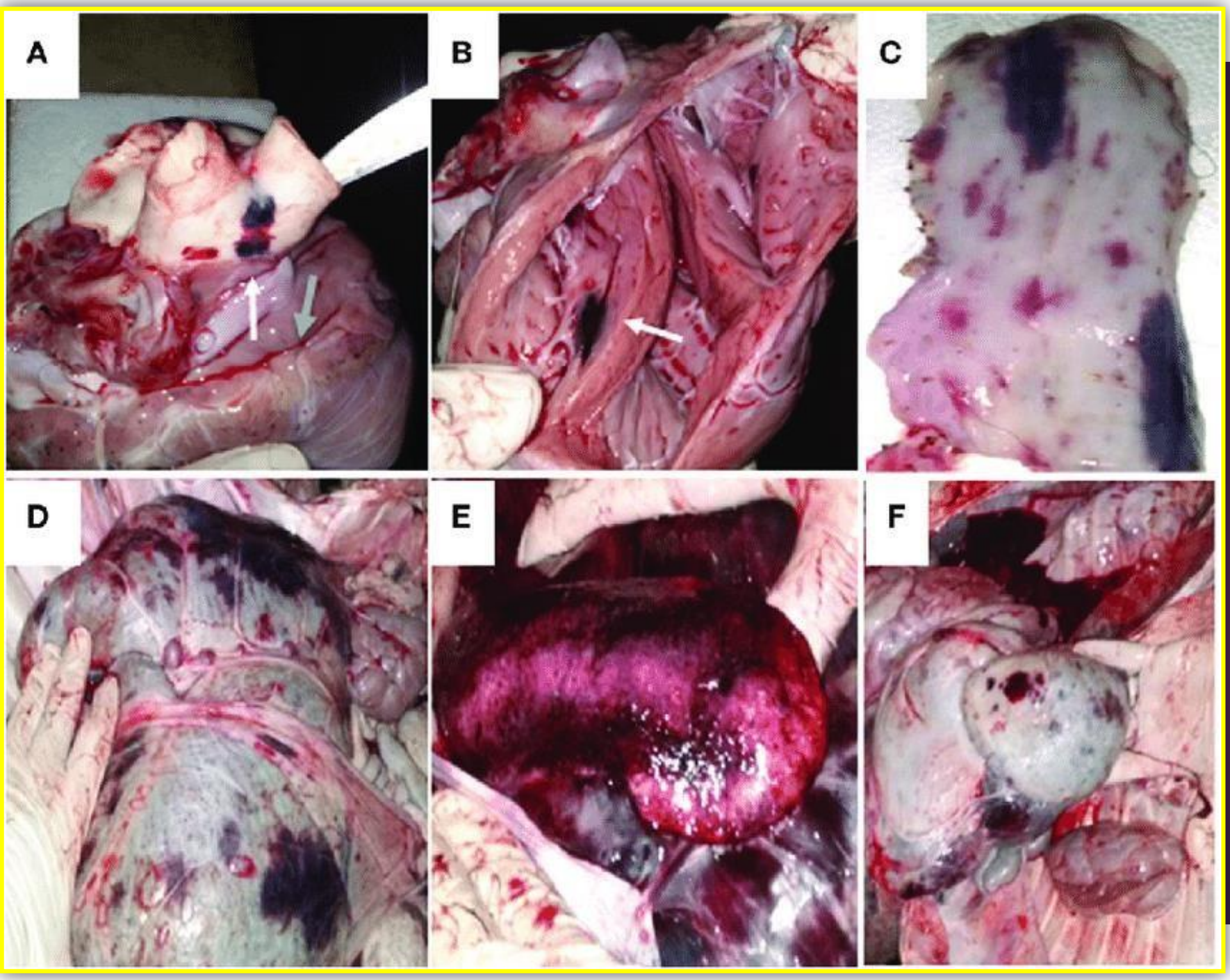


Intestine of calf infected with BVD showing necrosis of lining epithelium beside infiltration of lamina propria with inflammatory cells (necrotic enteritis). H&E

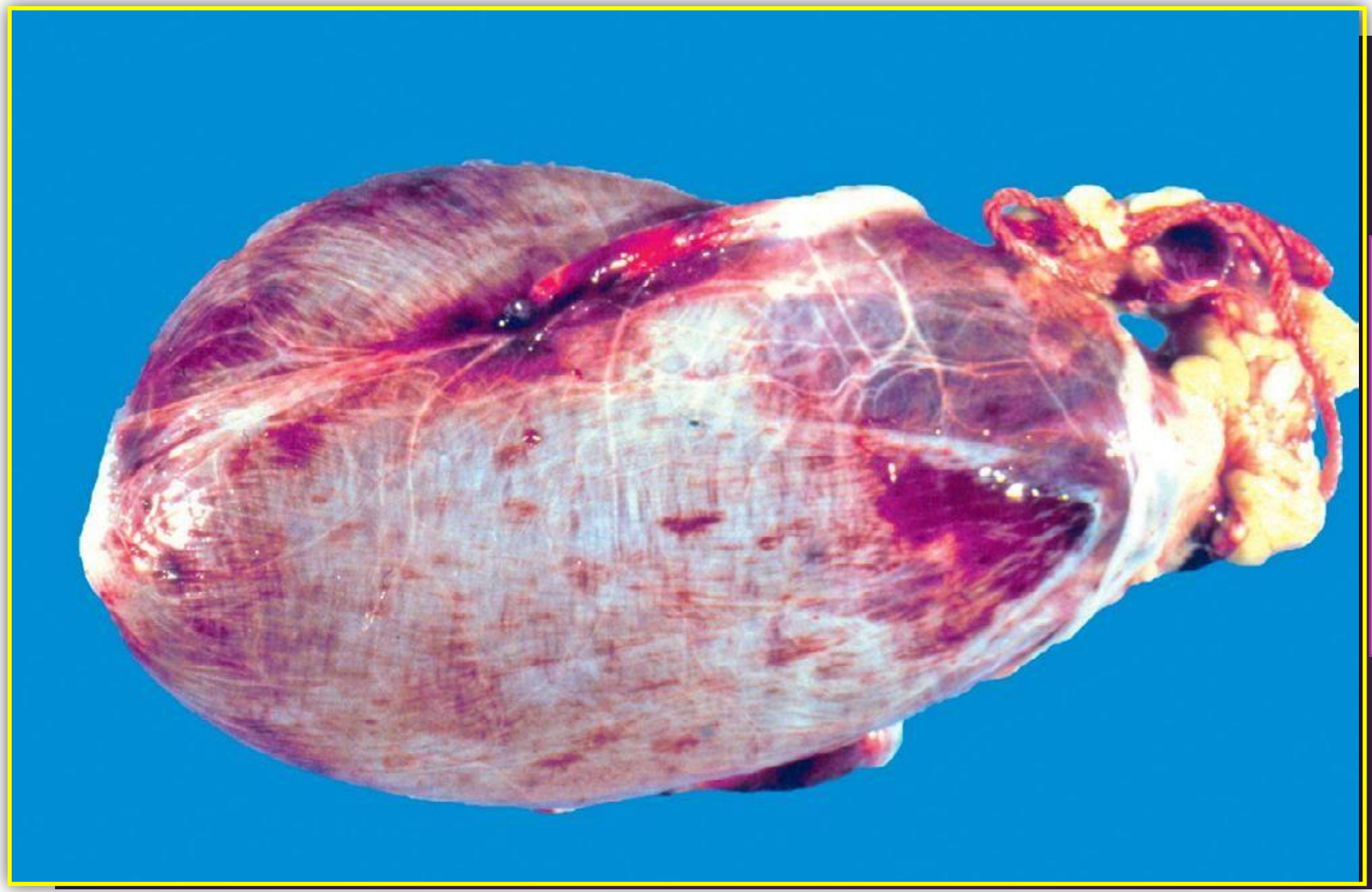


Fibrinohemorrhagic colitis in BVD.

Multifocal ulcerative colitis, colon, Multiple mucosal ulcers were caused by BVDV.



Necropsy of the animal infected with bovine viral diarrhea virus. The animal was found **dead on day 18 post infection.** (a) The white arrow indicates a disseminated bleeding in the base of the aorta and pulmonary arteries. The green arrow shows petechiae in the pericardium. (B) The white arrow depicts bleeding in the endocardium. Disseminated bleeding was found in esophagus (c), rumen (D), spleen (e), and reticulum (F).



Hemorrhages on the serosal aspect of the urinary bladder in the thrombocytopenic form of bovine viral diarrhea.