Rinderpest (Cattle Plague)

rinderpest is an acute or subacute highly contagious disease of ruminants and swine, and of major importance to the cattle industry, characterized by erosive or hemorrhagic lesions of all mucous membranes

Etiology

Cause:

- Bovine morbillivirus

Host Range

- **All cloven-hoofed animals are susceptible (not all are clinical)**
- **Most clinical cases occur in cattle and water buffalo**
- **Sheep, goats, and yak are mostly subclinical**
- Camels – asymptomatic infections only

Clinical Findings:

Incubation 3-5 days

Acute high fever

Mucosal phase: **Nasal/ocular mucopurulent discharge, anorexia, depression, profuse salivation**

Diarrhetic phase: **Severe bloody diarrhea, prostration, dehydration, shock, death**

Convalescence: **may take many weeks, return to full health Profound leukopenia, hemoconcentration, hypoproteinemia, and hypochloremia**

Gross Findings:

- Dehydrated, soiled, fetid carcass
- Focal erosions of upper GI and respiratory tracts; ulcers rare
- Circumscribed, pinpoint, raised, partially coalescing, greyish-white necroses, followed by erosion (ulcer seldom form) of the epithelial lining of oral cavity, particularly inner surface of lower lips, gums, cheeks near the commissaries, border and ventrum of the free portion of tongue, on the caudal hard and soft palate, pharynx, and upper part of the oesophagus. They appear as a bran mash sprinkled on the surface.
- Rarely affects rumen, reticulum

Gross Findings

- Erosions, ulcers, edema of abomasums
- Hemorrhagic, necrotic, edematous Peyer's patches.
- The ileo-caecal valve is congested, haemorrhagic, and displays large necrotic areas and erosions.
- Hemorrhage and congestion along the crests of the mucosal folds of the cecum, colon, rectum (zebra stripes)
- Congestion, swelling and erosion of vulval and vaginal mucosa

- **Microscopic Findings:**

Stratified squamous epithelium of the mouth

1. **syncytial cell formation; cytoplasmic eosinophilic inclusions and, less frequently, similar nuclear inclusions.**
2. **Circumscribed ballooning degeneration of epithelial cells of the spinous cell layer without formation of vesicles;**
3. **sloughing of the necrotic cellular debris leaving clearly demarcated erosions.**
4. **infiltrations of mononuclear cells and granulocytes**

Microscopic Findings

lymphoid tissues: including:

(tonsils, lymph nodes, spleen and mucosa-associated lymphoid tissues):

characterized by:

1. **syncytial cell formations; intracytoplasmic and intranuclear inclusions are observed.**
2. **lymphocytic destruction and depletion, first seen in the germinal centres and later in the T cell areas.**

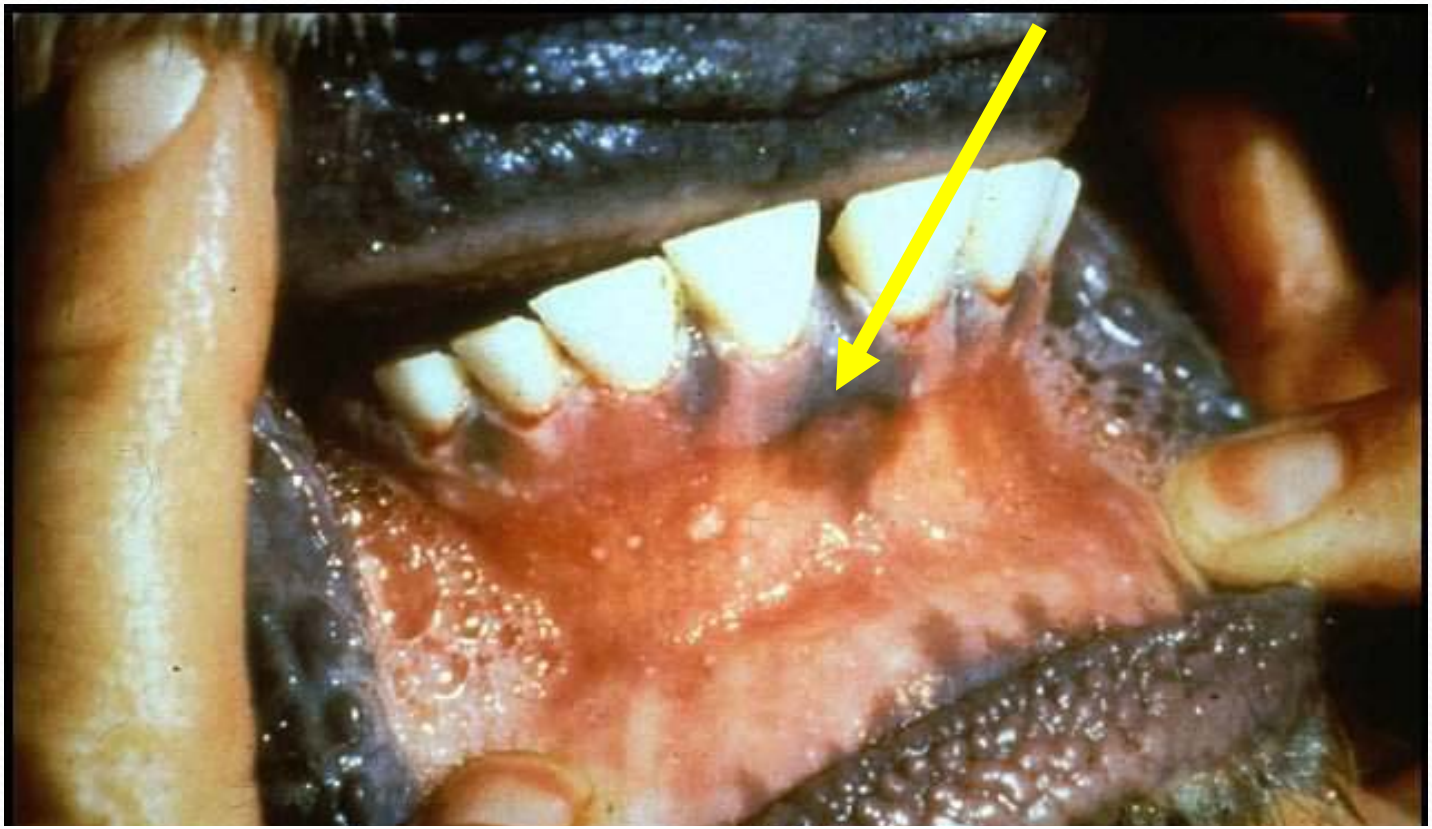
Microscopic Findings

- ❖ The destruction of lymphocytes (lymphoid necrosis) leaves a fibrillar, somewhat eosinophilic acellular matrix. The matrix may be surrounded by lymphocytes, plasma cells, nuclear debris and macrophages.
- Focal mucosal necrosis just above basal layer, extending to the surface
- Necrosis of intestinal crypts with resultant erosions and ulcers
- Syncytia; intracytoplasmic and intranuclear eosinophilic inclusion bodies in infected epithelial cells
- Minimal inflammation

Clinical Signs

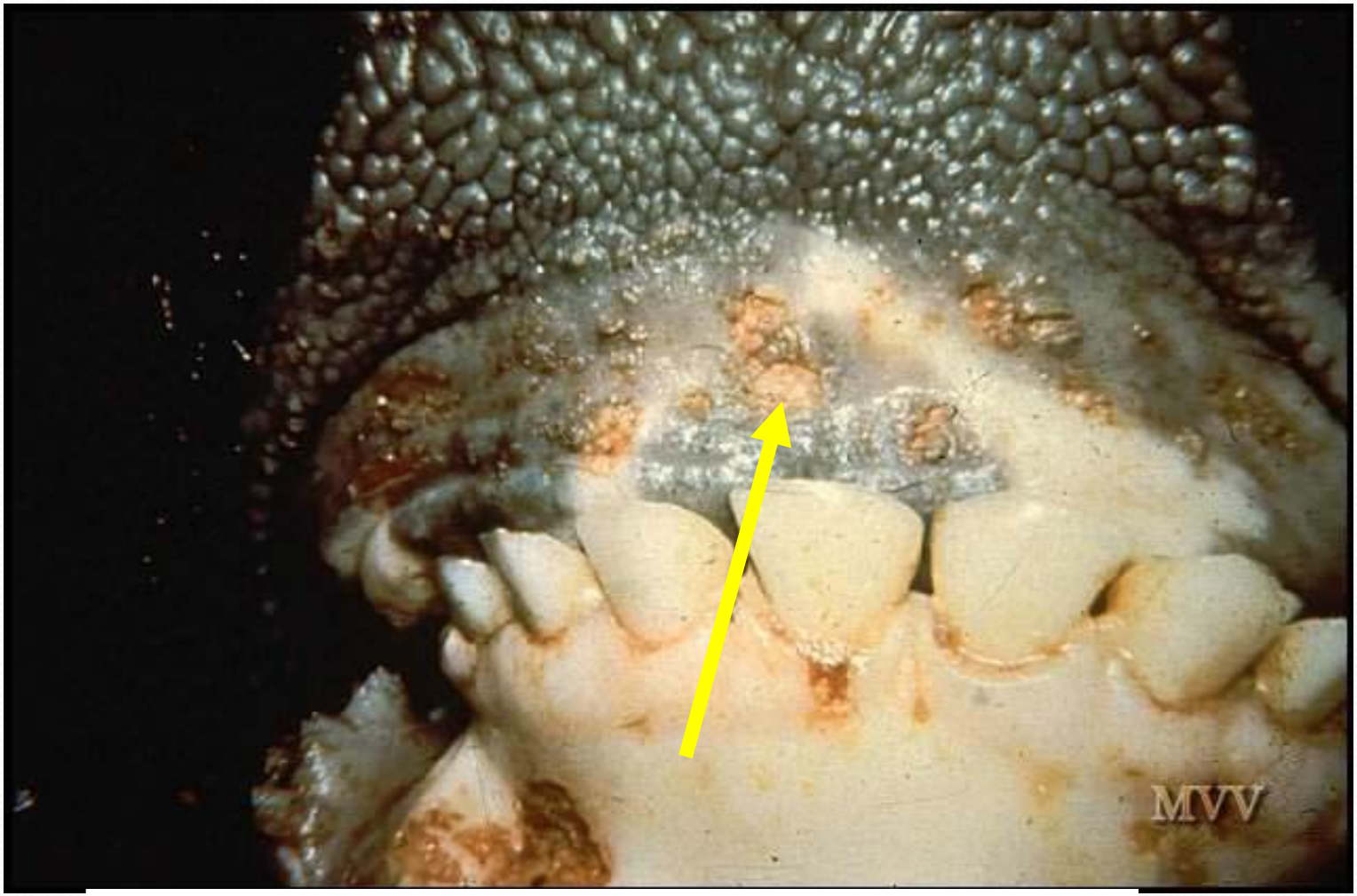
Depression, Diarrhea, Dehydration and Death

Gross lesions



Early focal mucosal erosions

Gross lesions



Mucosal erosions – "cigarette burns"

Gross lesions

Advanced mucosal erosions

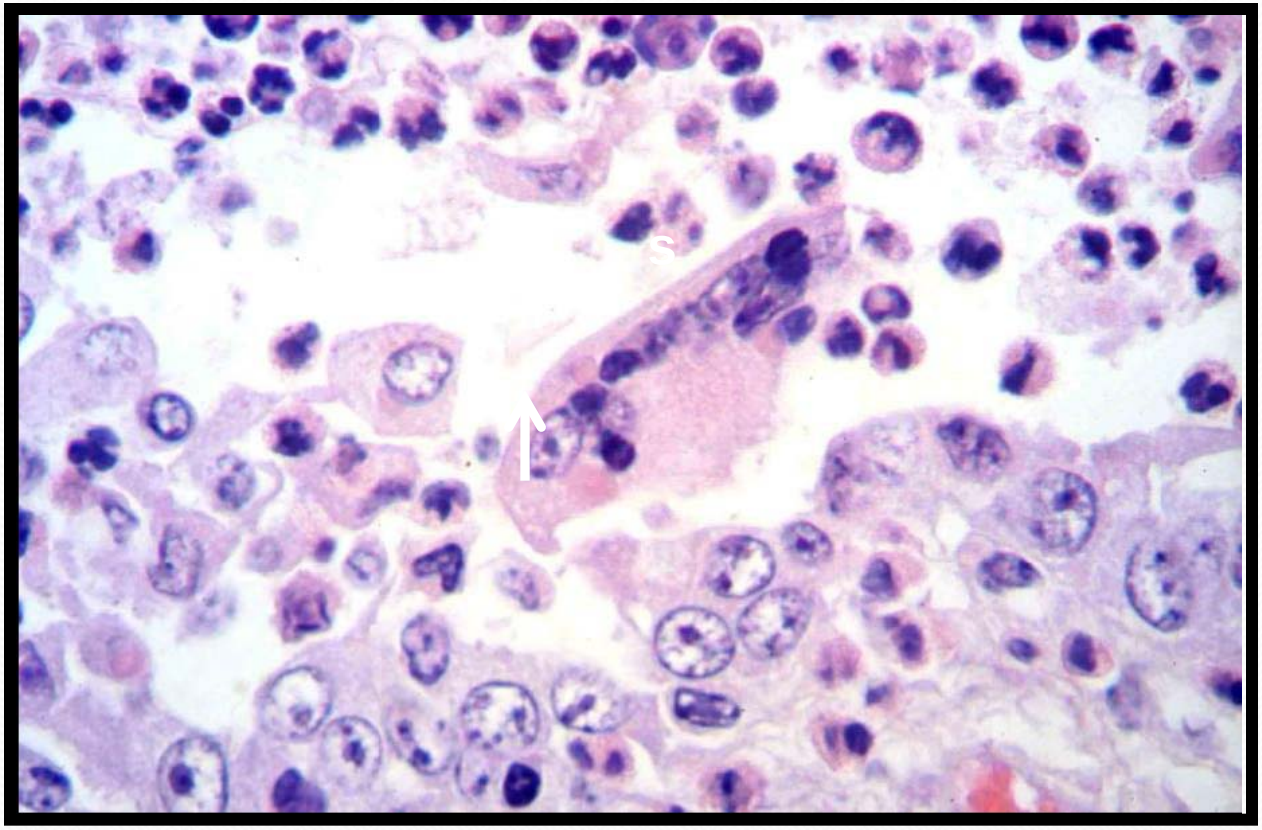
Gross lesions

Rinderpest Erosions on the dental pad and the hard palate

Gross lesions

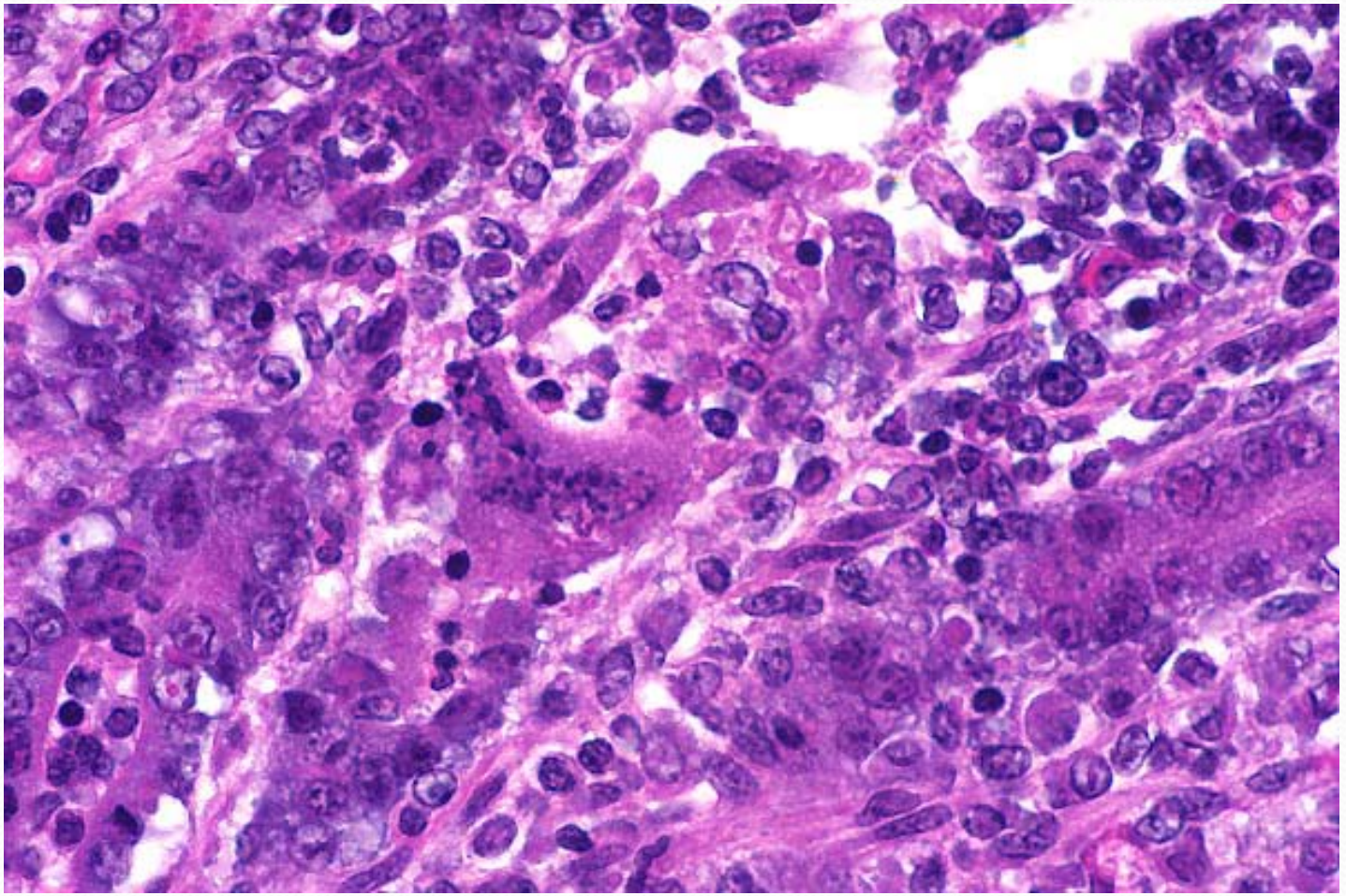
Ulceration and diphteritic membrane over Peyer's patch, Rinderpest

Microscopic lesions



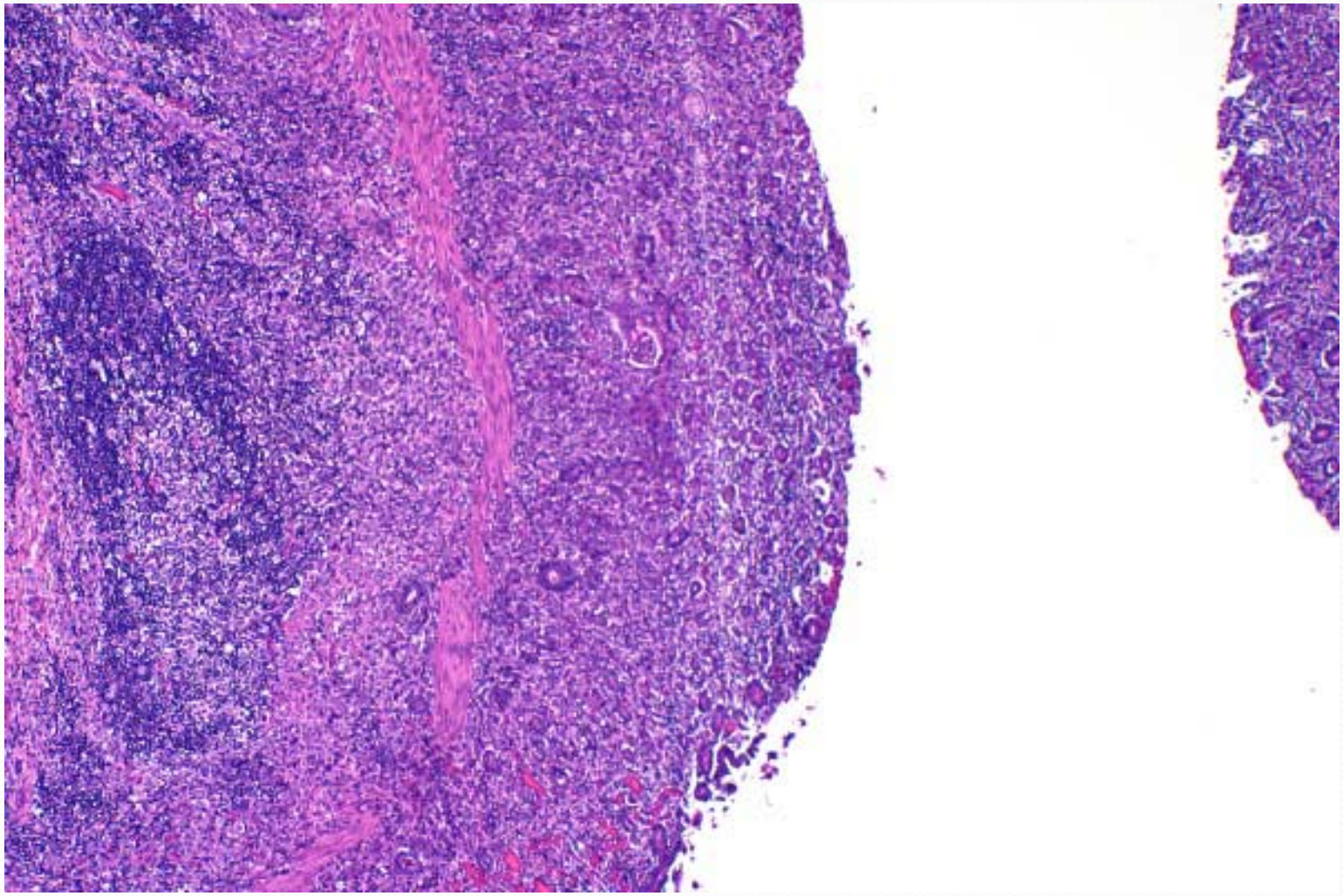
Cattle Multinucleate syncytial cell (s)with a cytoplasmic inclusion body (arrow). Morbillivirus infection.

Microscopic lesions



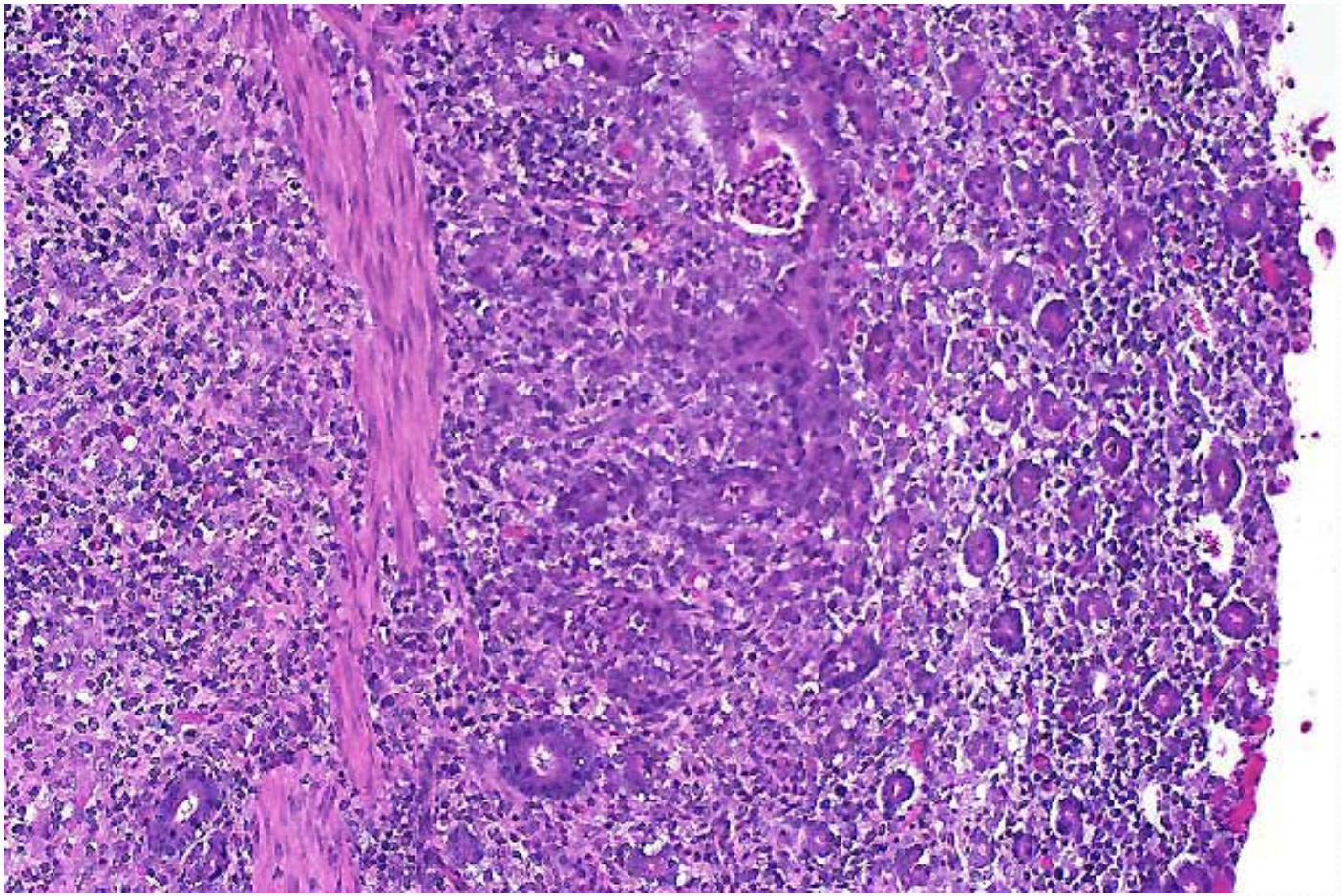
Some enterocytes contain an eosinophilic intranuclear inclusion body that marginates chromatin and is surrounded by a clear halo.

Microscopic lesions



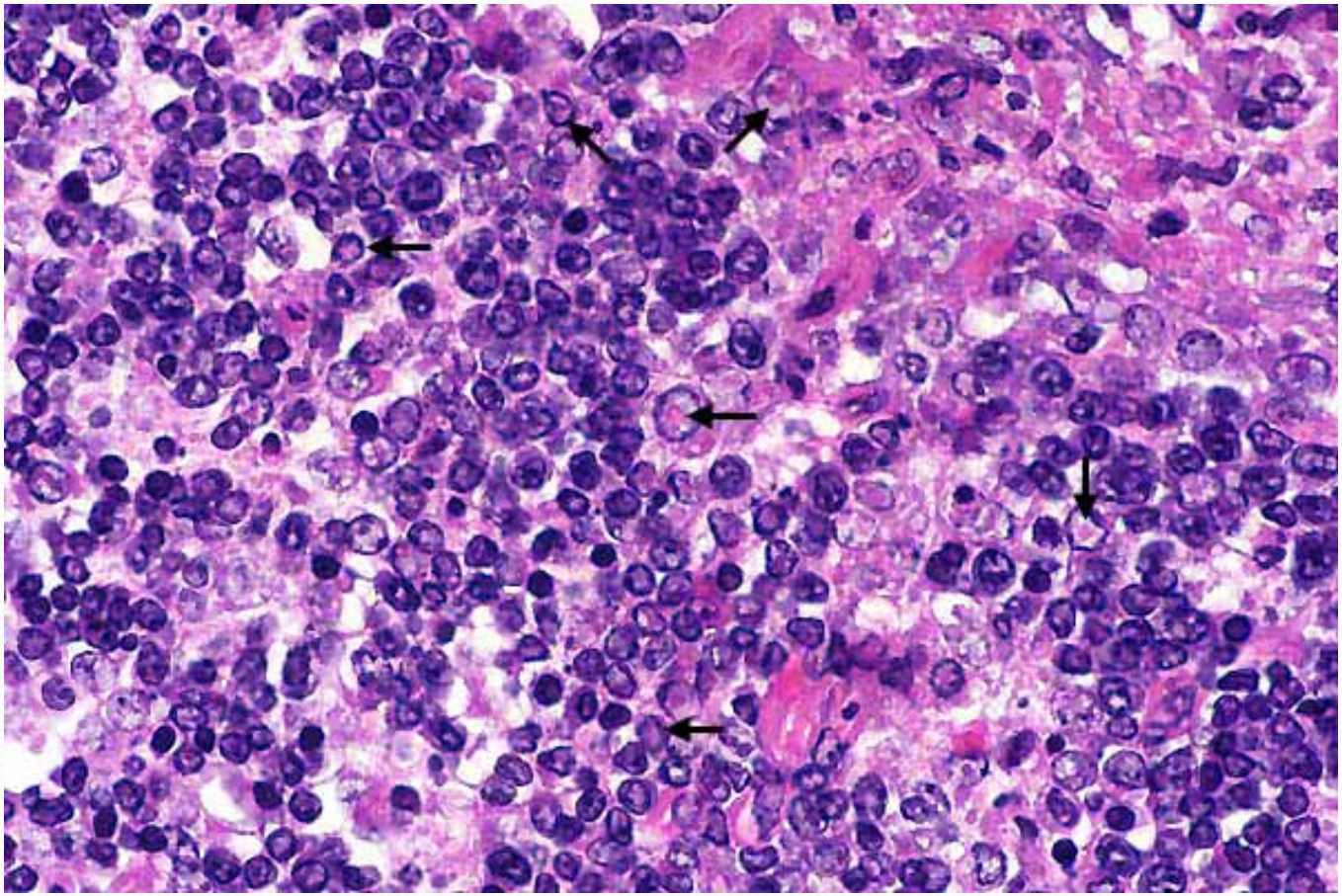
Diffuse inflammation of the lamina propria and submucosa. Loss of colonic crypt. Lymphoid depletion of GALT.

Microscopic lesions



Crypt necrosis and regeneration

Microscopic lesions



Intranuclear inclusion body that marginate the chromatin in some lymphoid cells