

Infections of the GI tract

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Background

Major cause of morbidity worldwide

> Transmitted by contaminated food, water



Only a small part of them arrives to the
desk of the histopathologis



Histopathological diagnosis of infection of the GI

- Differential diagnosis (IBD, ischemia)
- Confirmation of an infection
- Infections disease of the GI which the histopathology may be the first to suspect and diagnose

Epidemiology

- Affect all the population
- Clinical relevance: immunocompromised patients, transplanted..
- Intercontinental travel



Type of infections

Food-borne /Water-borne

Opportunistic infections

Viral infections

Parassitic and Helmintic

Symptoms: chronic debilitating diarrhea, systemic symptoms, immunocompromise history



IMPORTANCE OF
CLINICAL
INFORMATION

Histological patterns of GI infections

- Minimal or no histological changes
- Specific patterns of inflammation
- Infections with suggestive features
- Infections where infectious agents can be visualized on tissue sections



Points of the presentation

IBD mimickers

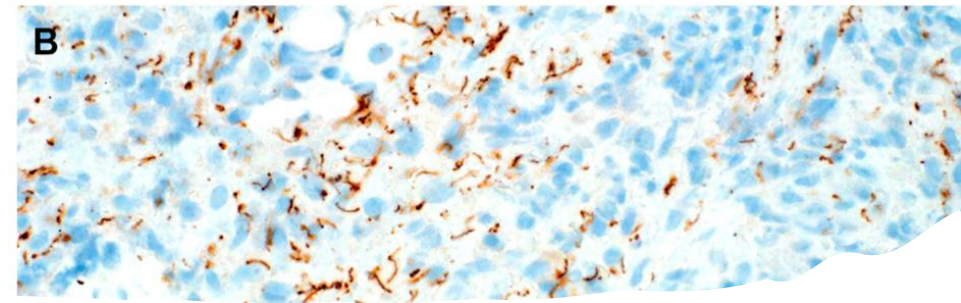
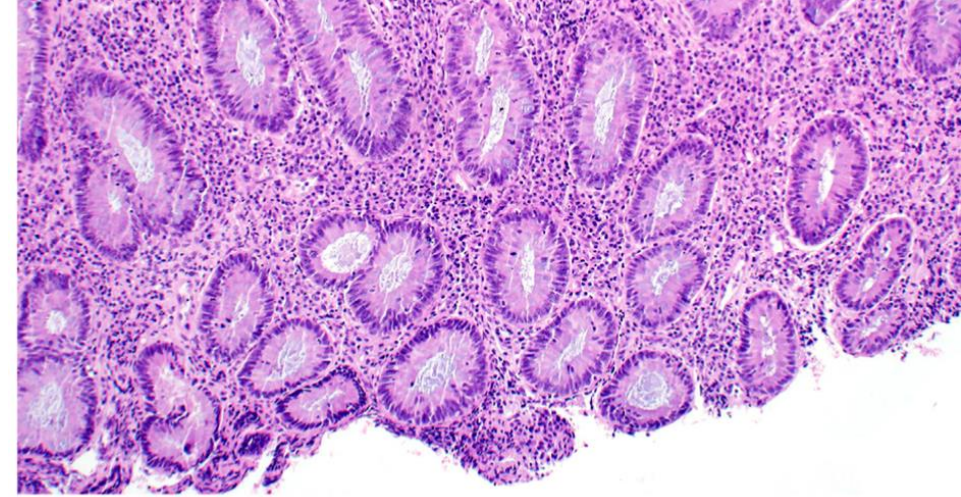
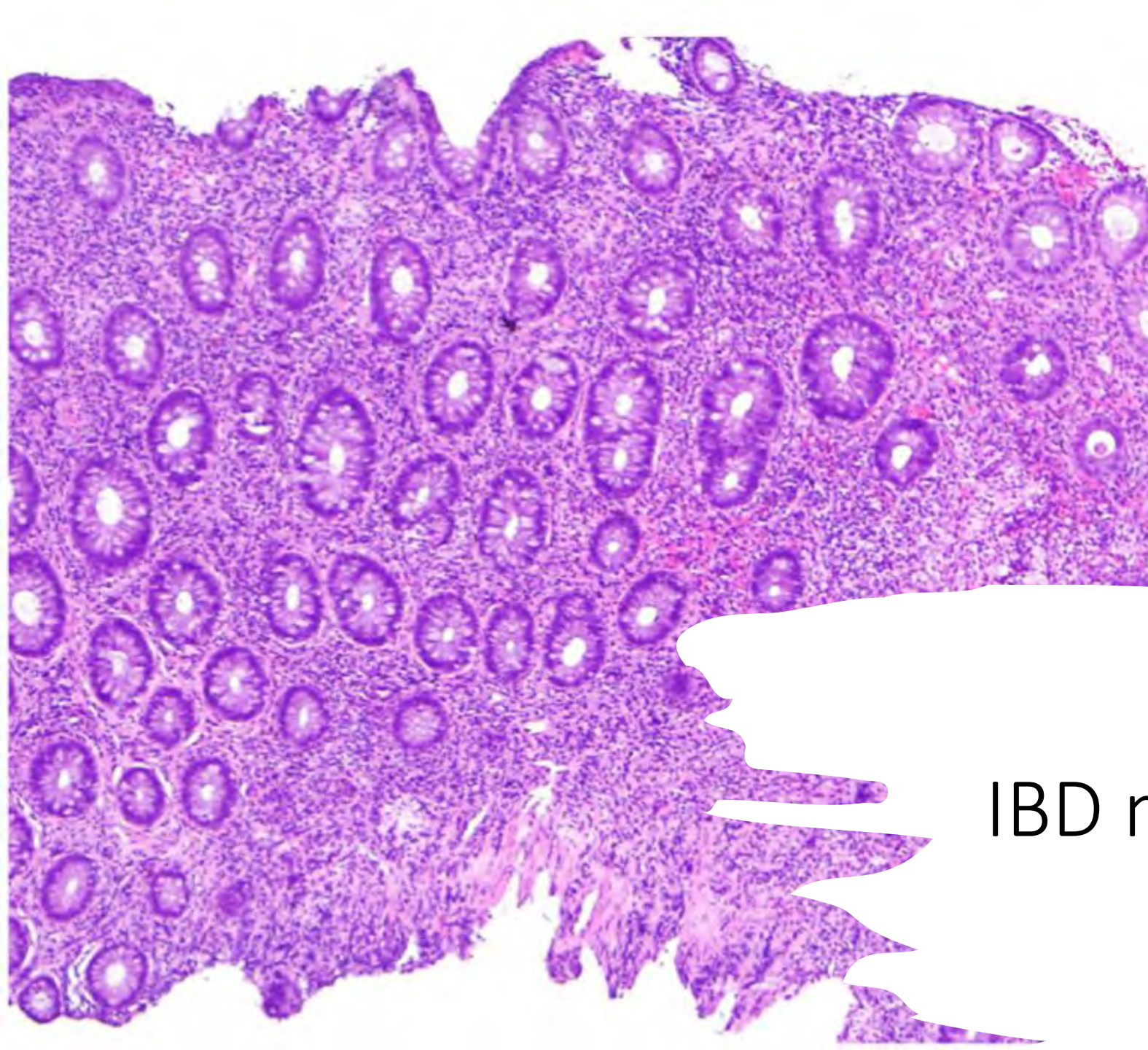
Ischemic mimickers

Small blue dots infections

Fungal infections of the GI tract

Viral infections

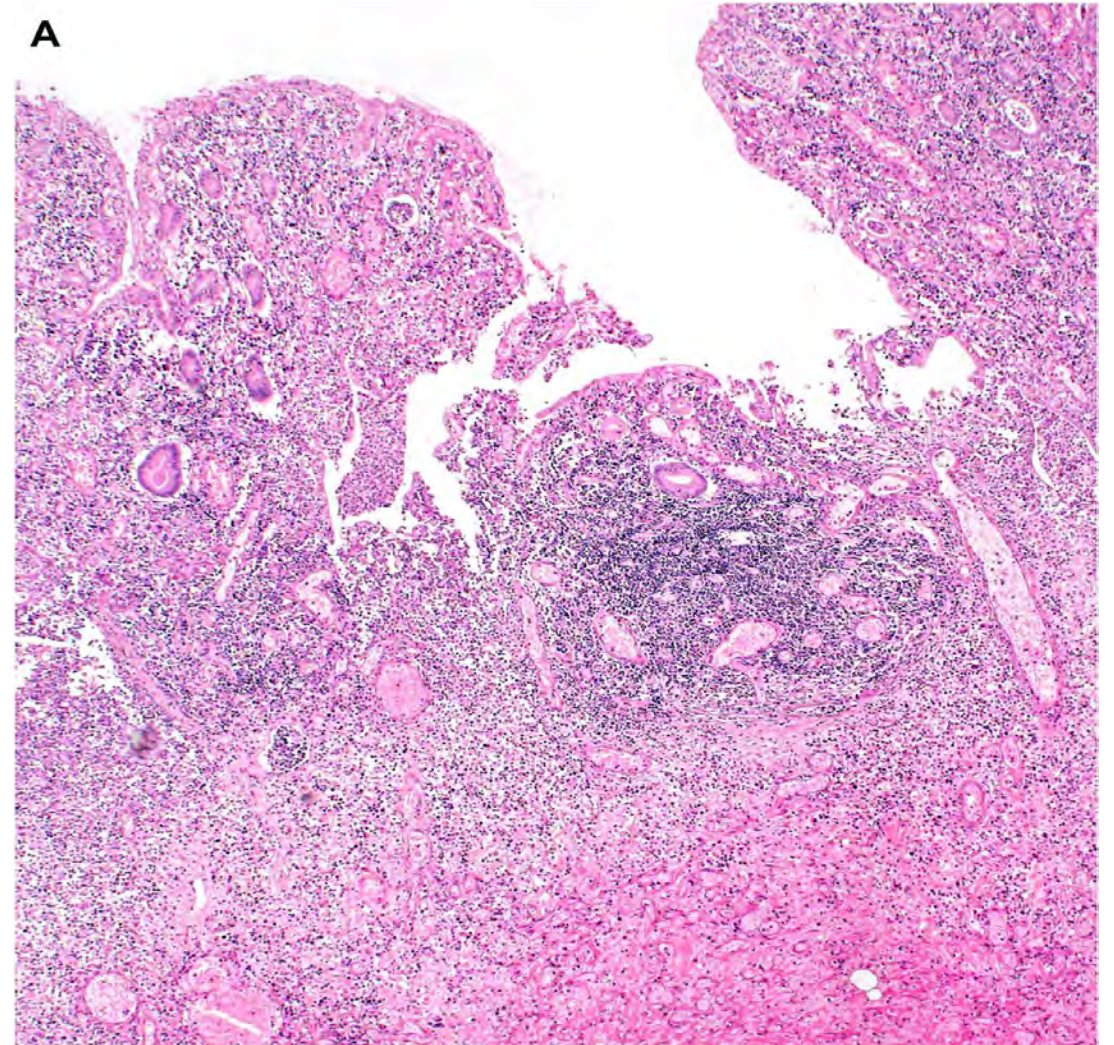
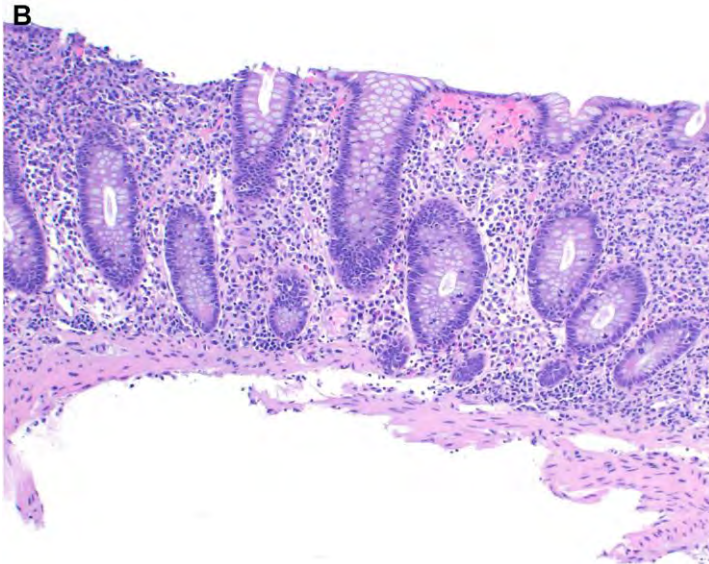
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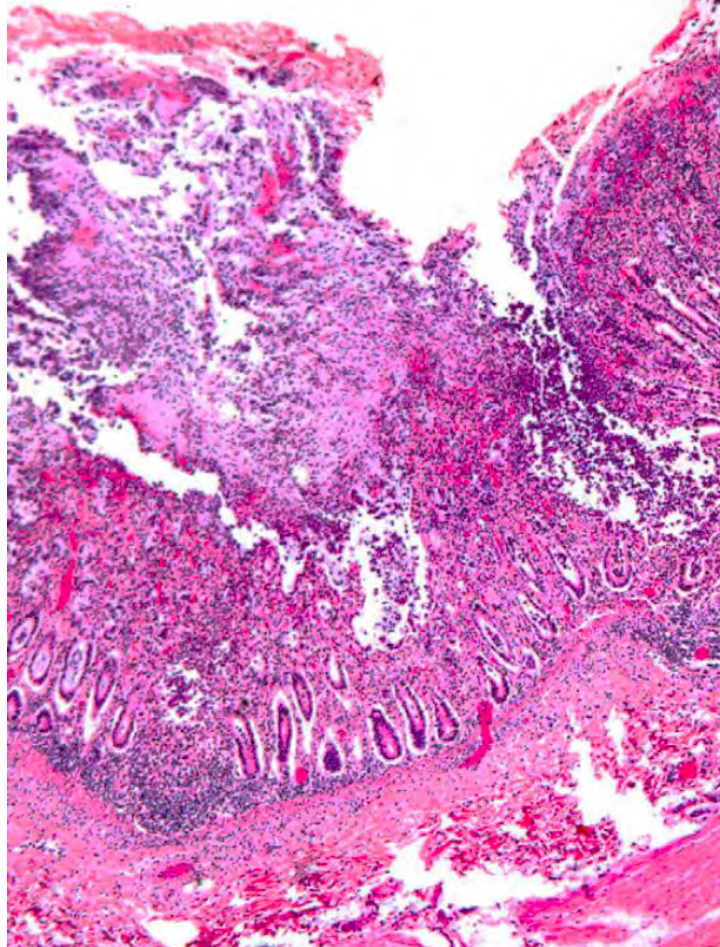
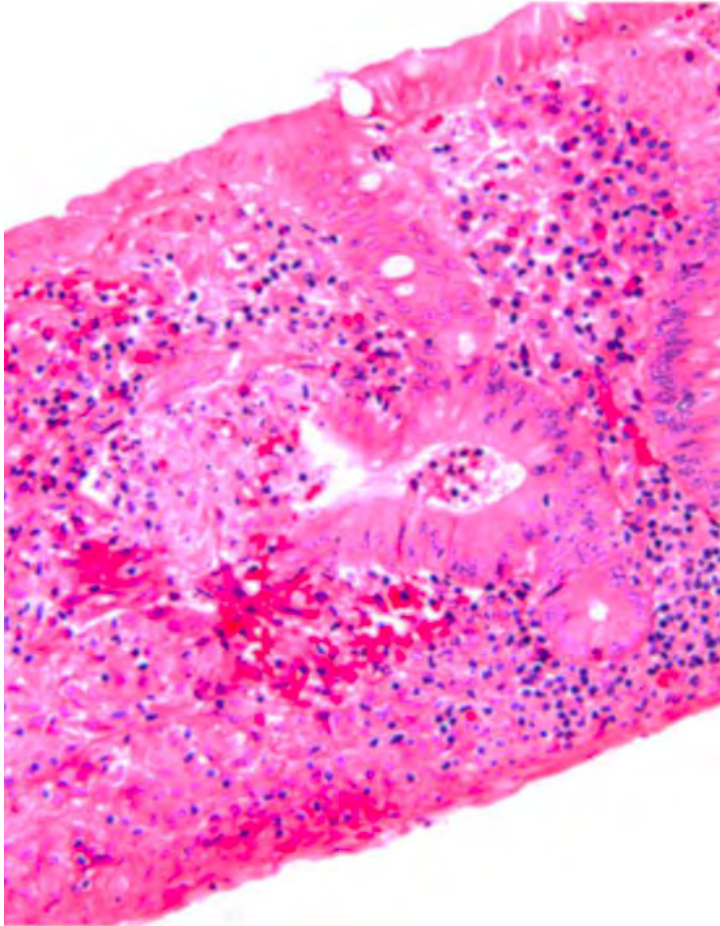


IBD mimickers

Salmonella Species

- ❖ Typhoid: enteric (typhoid) fever
- ❖ Localisation: ileum, right colon and appendix
- ❖ Macroscopy: aphtous ulcers around lymphoid follicles
- ❖ Microscopy: architectural distortion, sometimes basal plasmocytosis



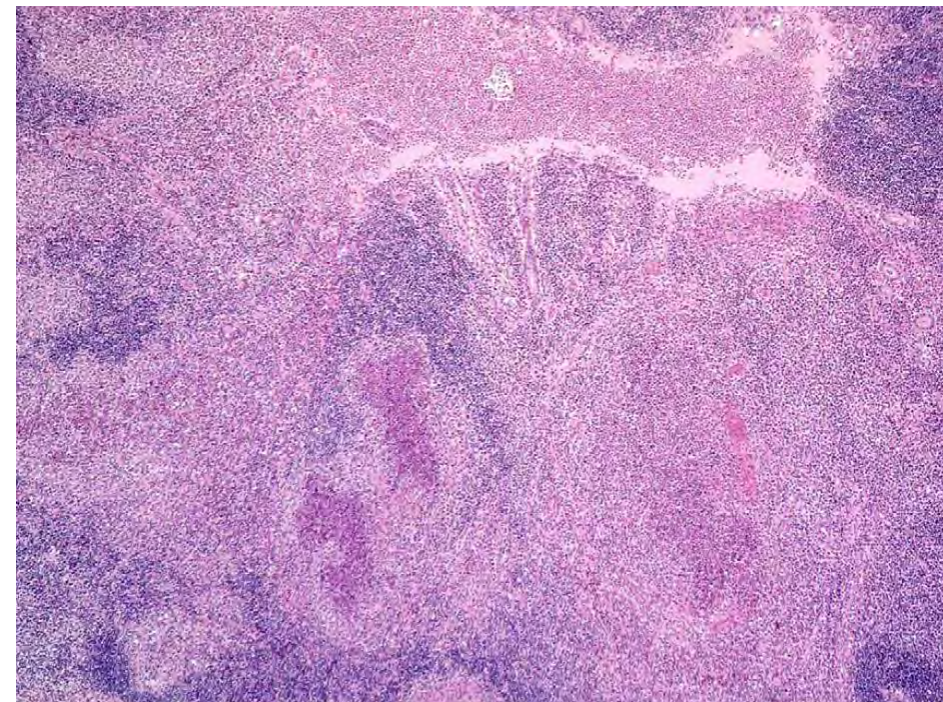
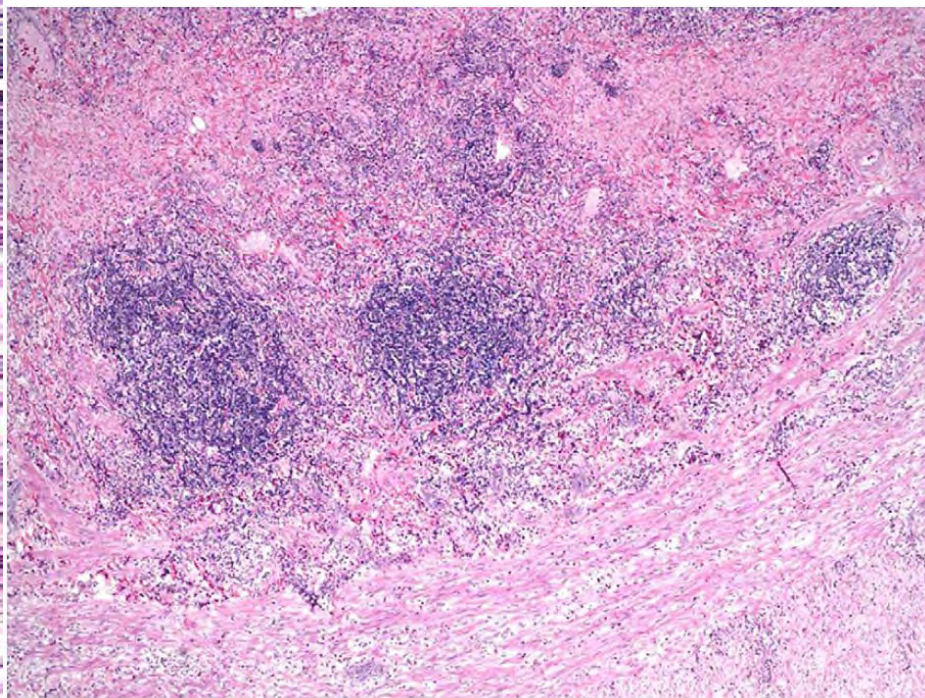
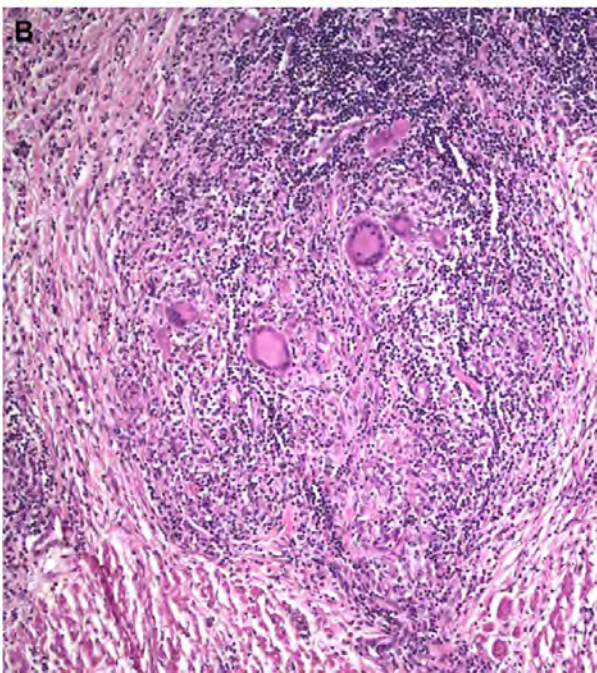
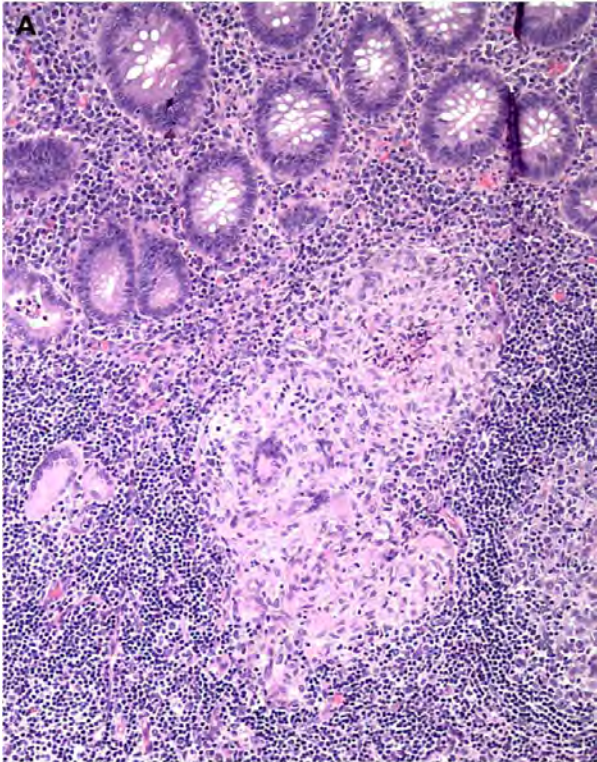


Shigella

- ❖ Localisation: colon
- ❖ Macroscopy: pancolitis (>left, continuous)
- ❖ Microscopy: acute phase (as infectious colitis) in chronic (crypt distortion)

Yersinia

- ❖ Localisation: ileo-caecal
- ❖ Macroscopy: thickened wall with aphtous ulcers
- ❖ Microscopy: transmural inflammation, granulomas, mural fibrosis

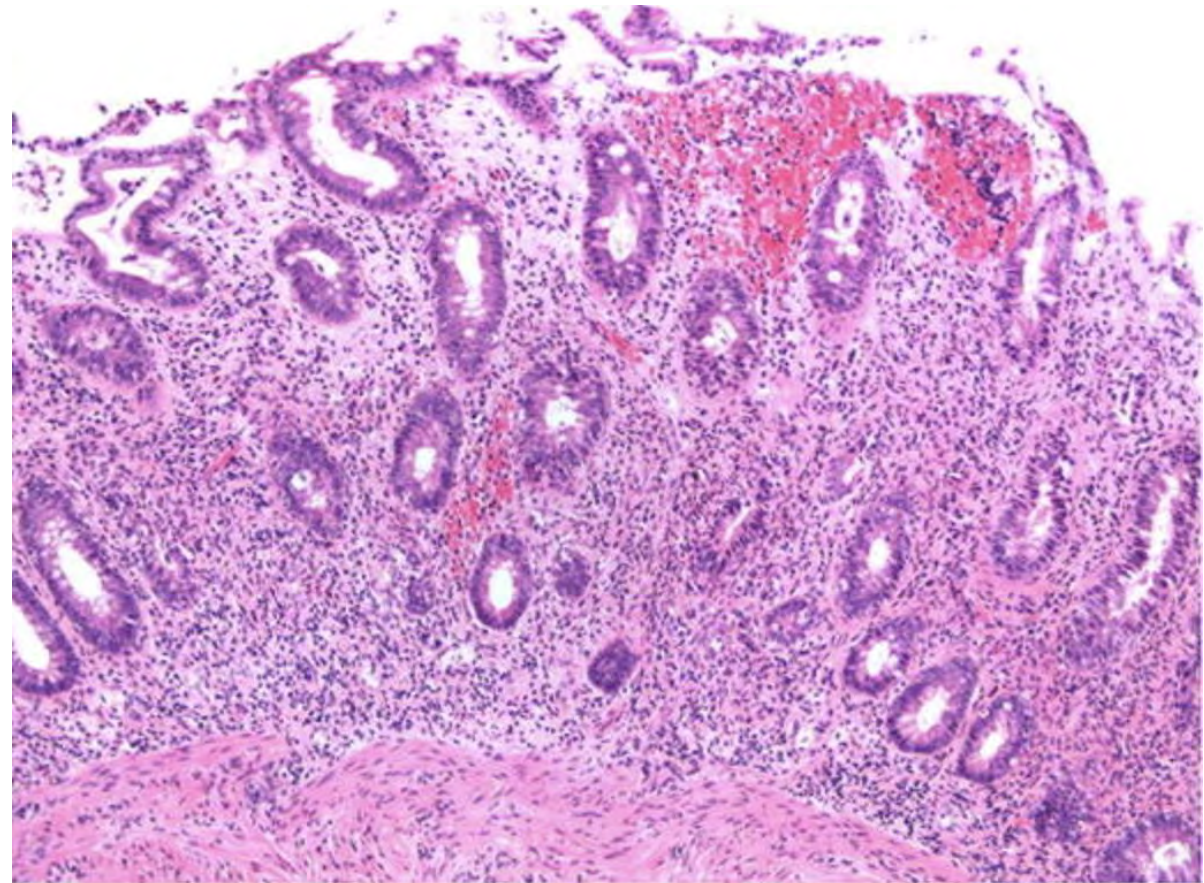


Campylobacter

Localisation: colon

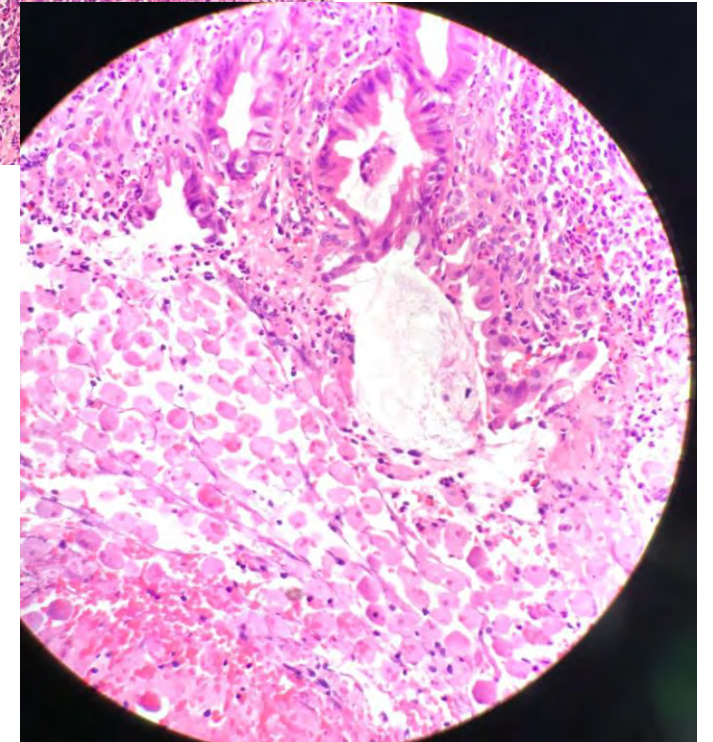
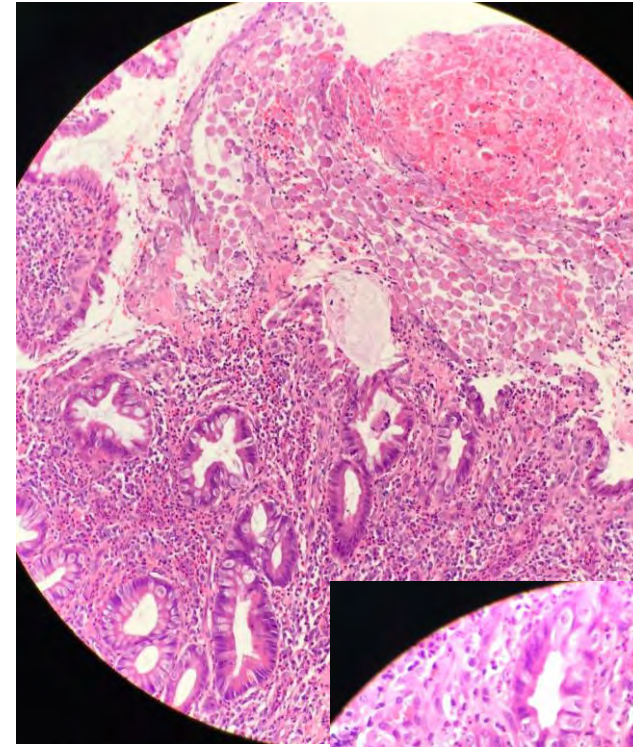
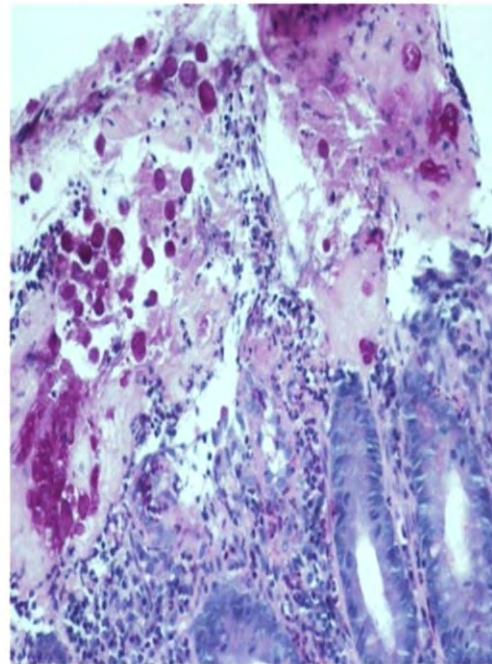
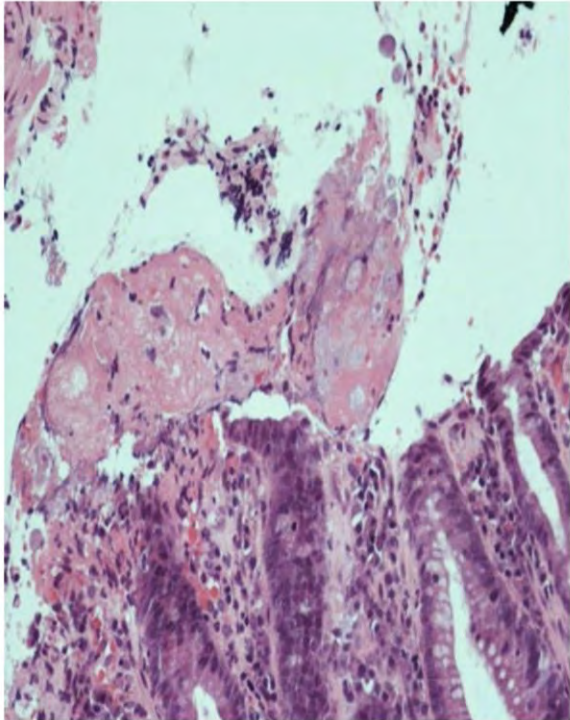
Macroscopically: erythema,
ulcers, friability

Microscopically: more acute
changes (crypt distortion,
loss mucin depletion)



Amebiasis

- ❖ *Entamoeba histolytica*
- ❖ Macroscopically: ulcers in the right colon and caecum
- ❖ Microscopically: flask shaped ulcers extending in submucosa with florid necroinflammatory exudate (mimicking pseudomembranes), microorganisms PAS+



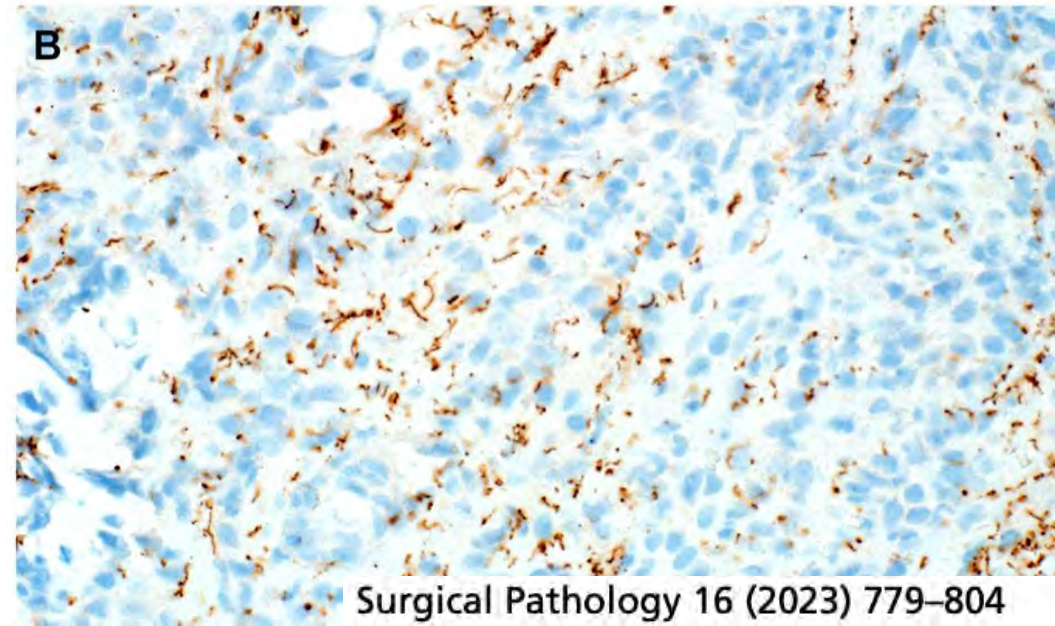
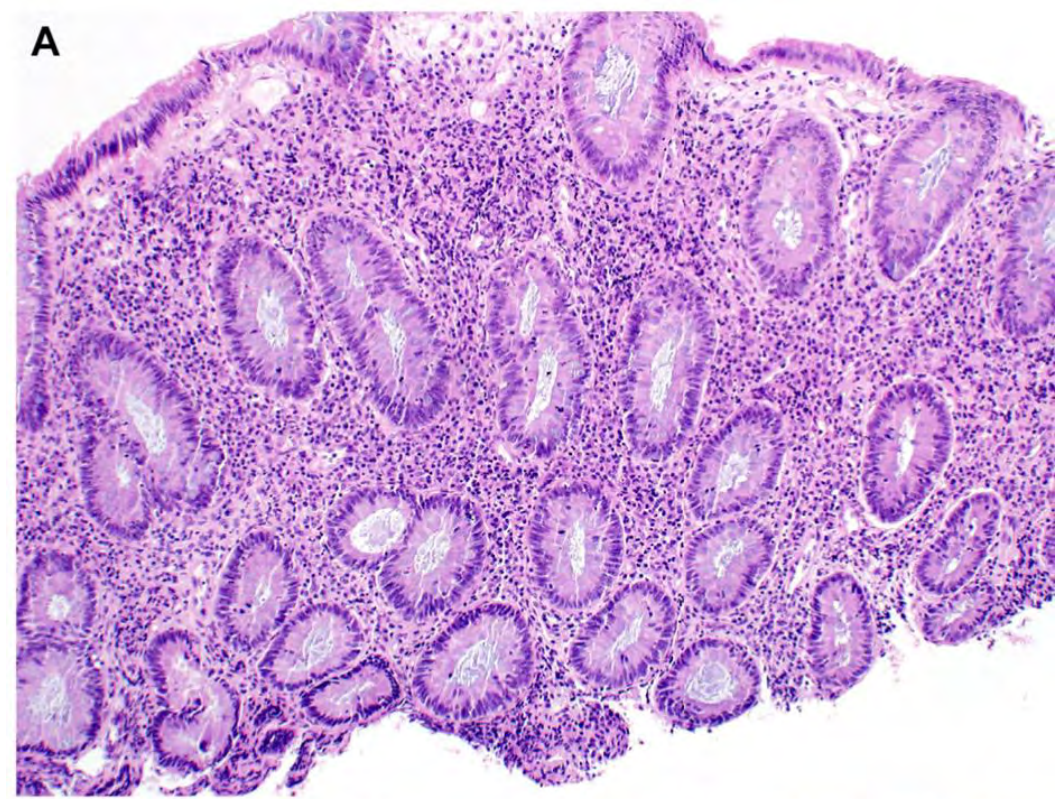
Syphilis

Treponema pallidum

MSM population, HIV+

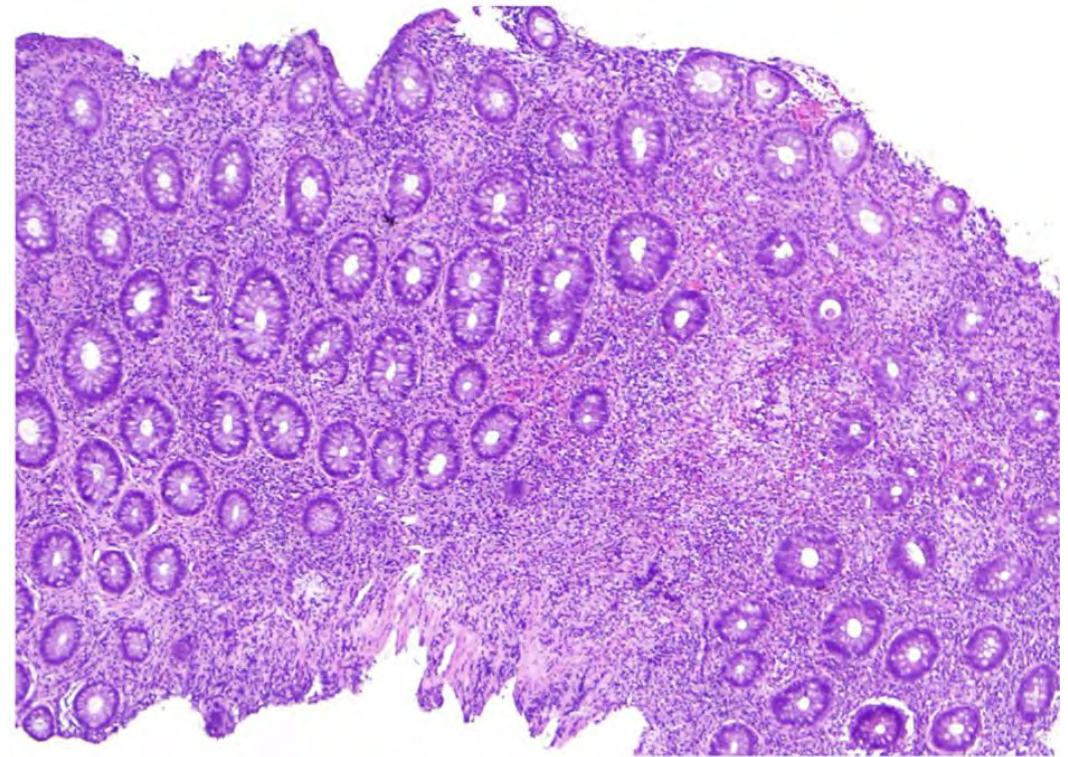
Macroscopy: ulcers, inflammatory polypoid lesions

Micoroscopically: ly-pc infiltration, crypt distortion, granulomas, less prominent neutrophilic infiltration.



Lymphogranuloma venereum

- ❖ Chlamydia trachomatis
- ❖ Most common in MSM population
- ❖ Macroscopically: ulcers, fistula and strictures
- ❖ Microscopically: ly-pc infiltration, prominent lymphoid follicles , neutrophils granulomas



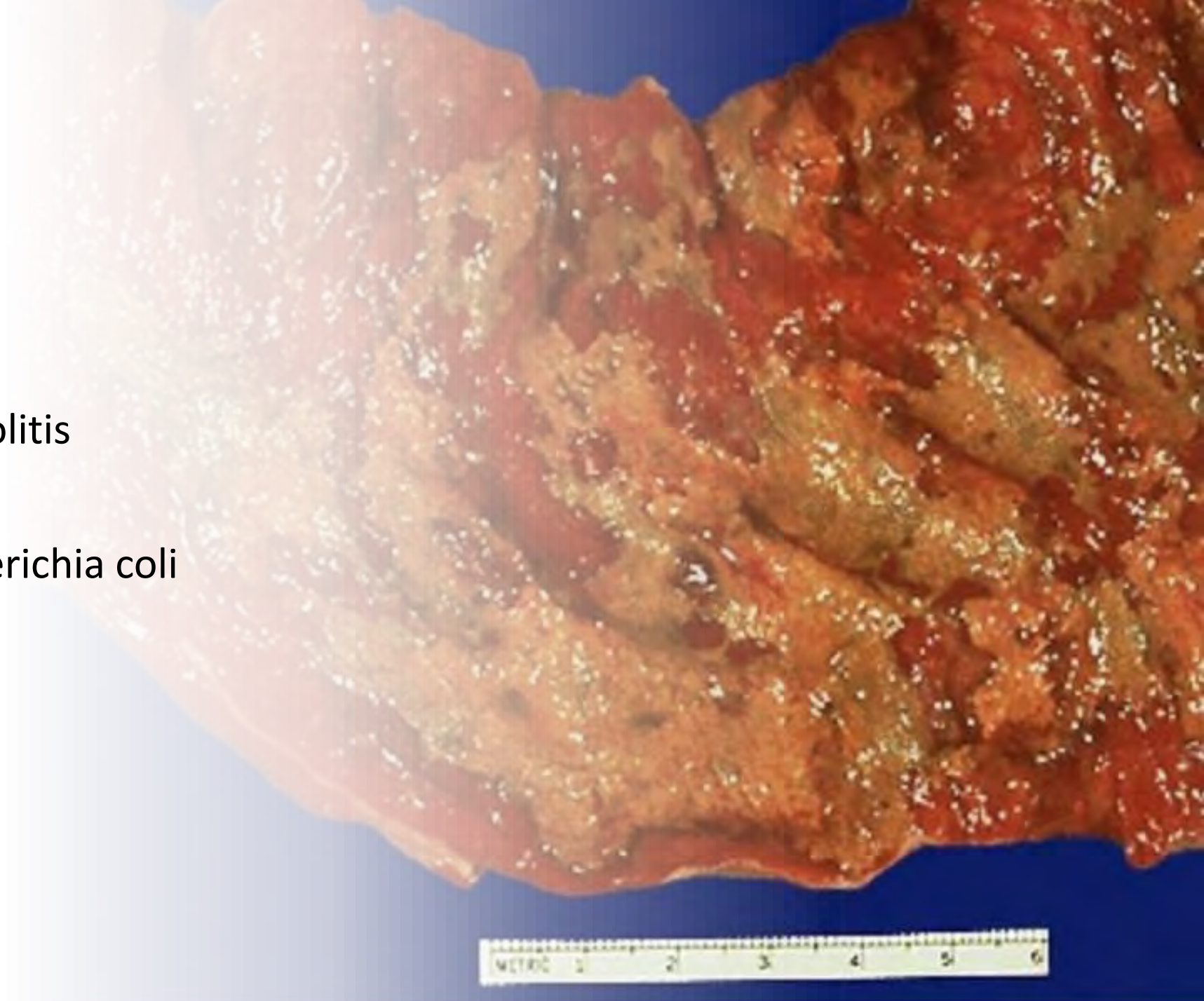
Infectious vs IBD

- IBD could be associated to infection
- Inflammation more acute and superficial in infections
- More chronic features in IBD
- Consider the complex features and not one by one
- Clinical and endoscopical information



Ischemic colitis mimickers

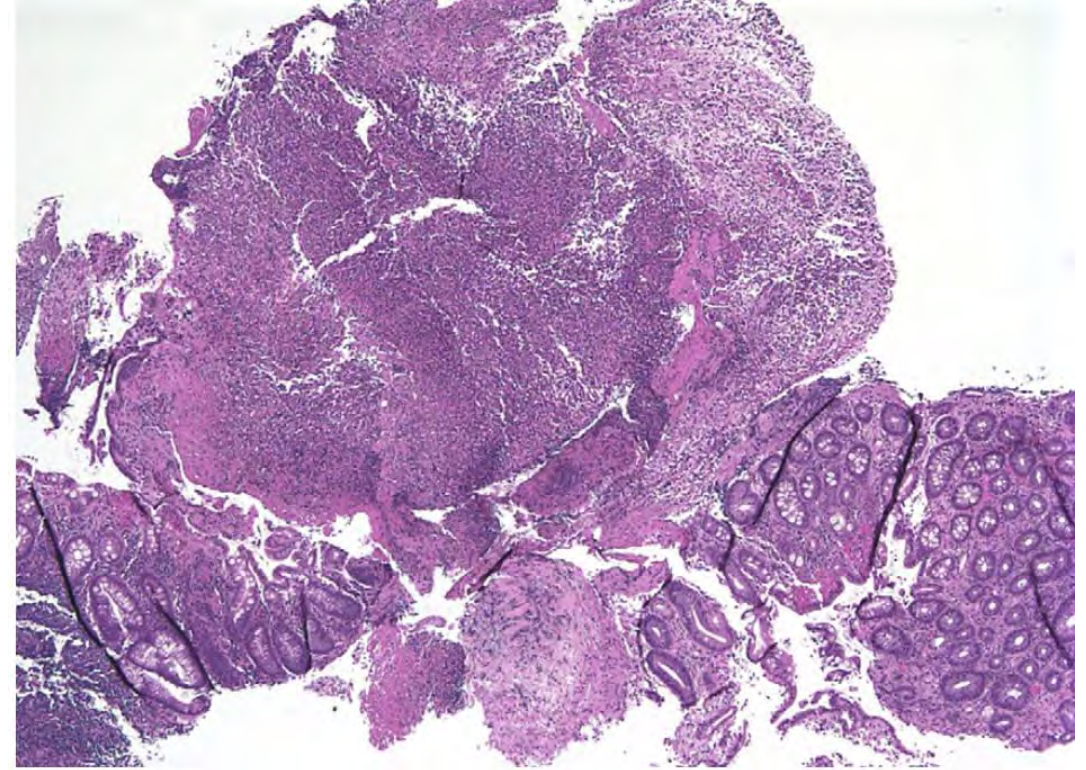
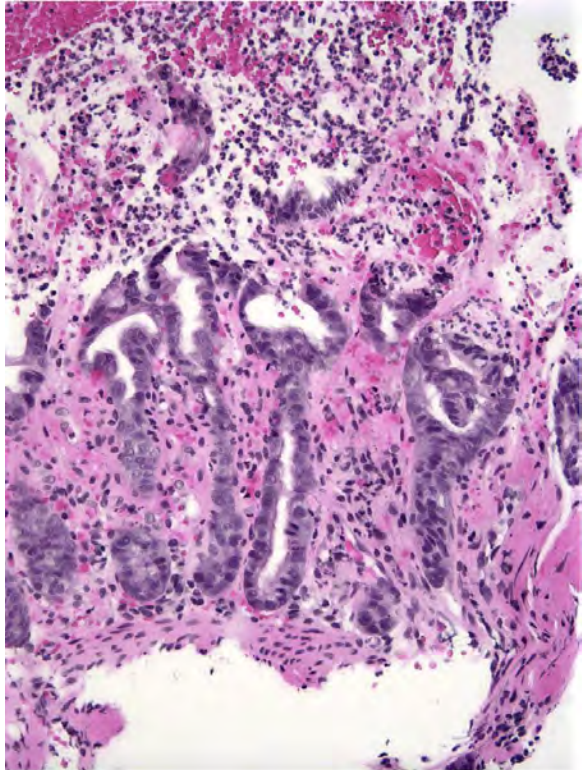
- Mimic or cause ischemic colitis
- Shigatoxin producing *Escherichia coli*
- *Clostridium Difficile*
- *Clostridium perfringens*
- CMV
- Vasotropic fungi



Shiga toxin producing Escherichia Coli

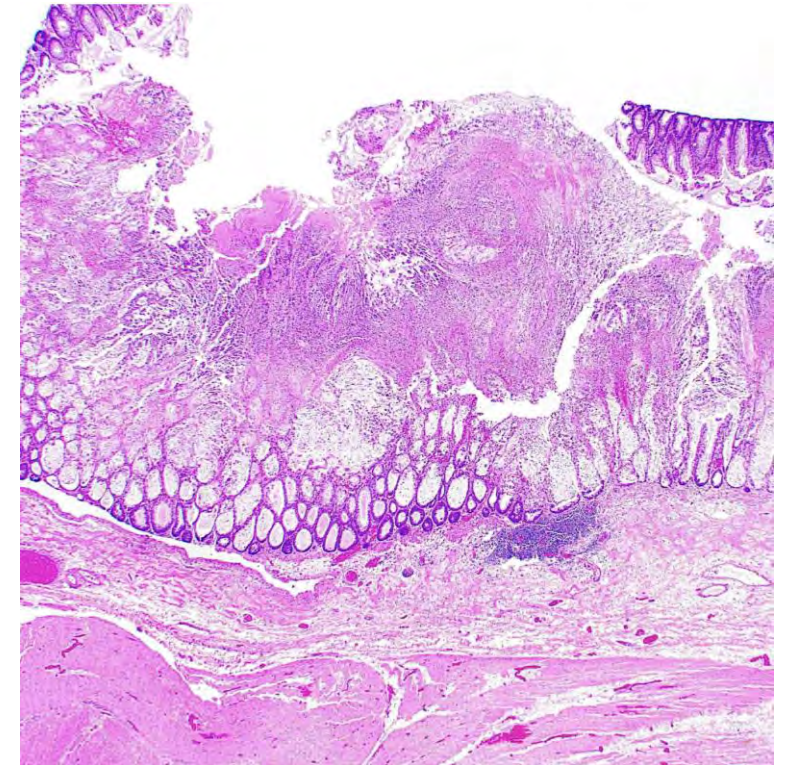
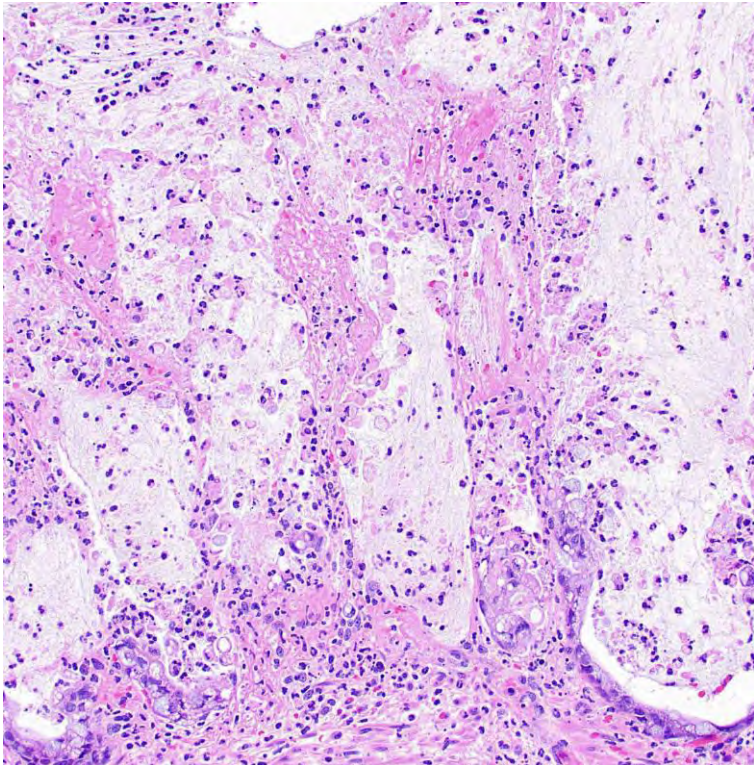
Bacteria that most frequently mimic ischemia

Histology: marked edema and hemorrhage in lamina propria and subserosa, mucosae neutrophil, crypts withering and necrosis. Sometimes pseudomembranes and microthrombi



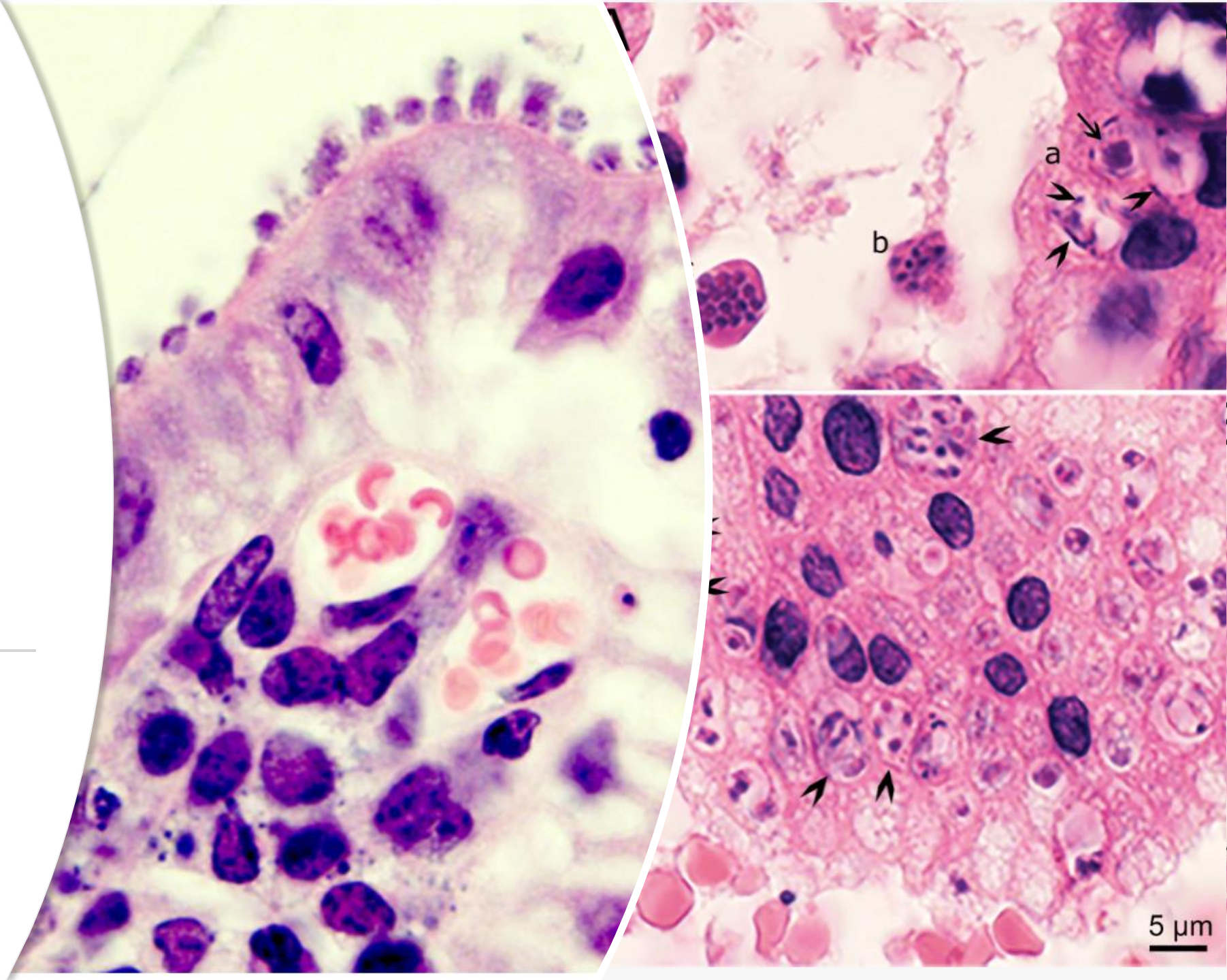
Clostridium Difficile

- Dilatated crypts with « exploding » or « volcanic » exudate, intercrypt necrosis
- Picture of ischemic colitis mimickers



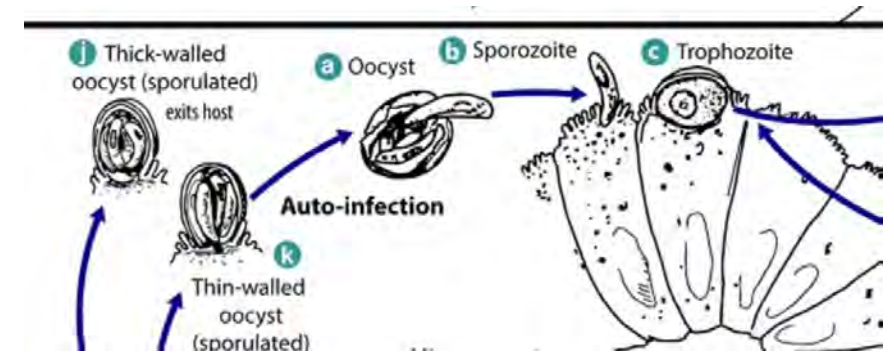
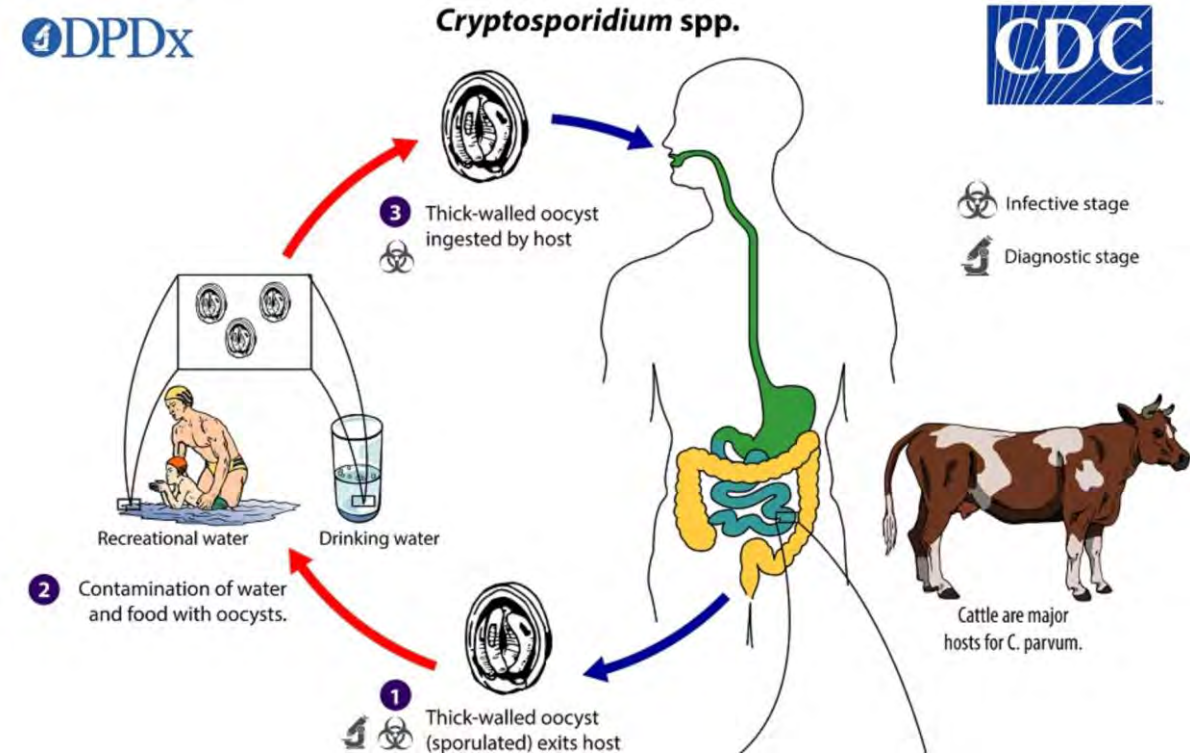


“Small Blue dots”
infections

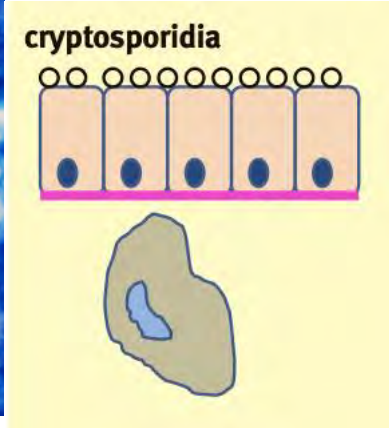
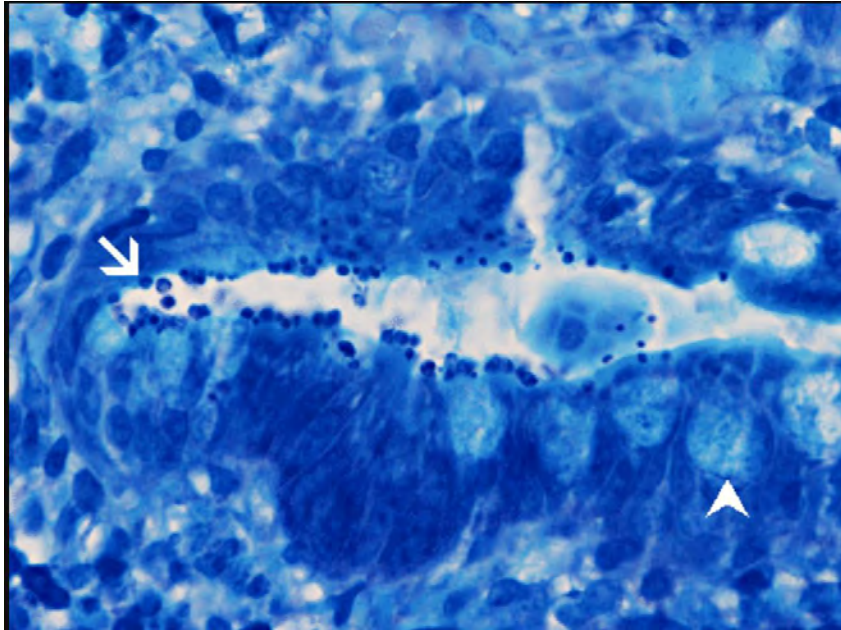


Cryptosporidium

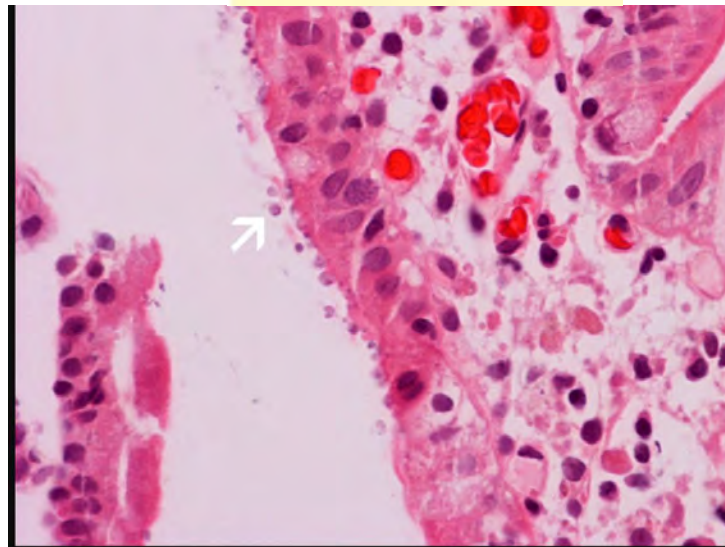
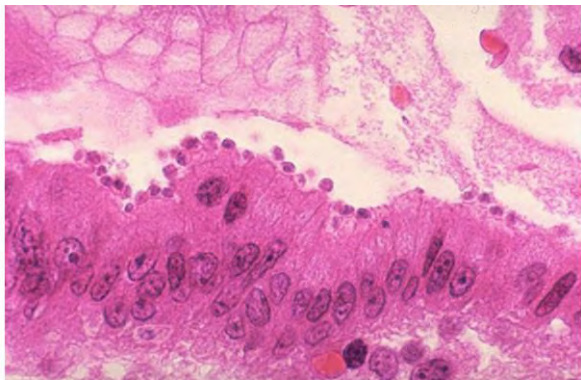
- ❖ > part infections *C. parvum*
- ❖ Obligate intracellular parasite
- ❖ Faeco-oral transmission
- ❖ Symptoms: watery and mucoid diarrhea, fever, headache

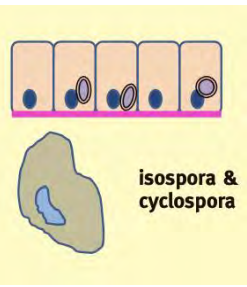


Cryptosporidiosis



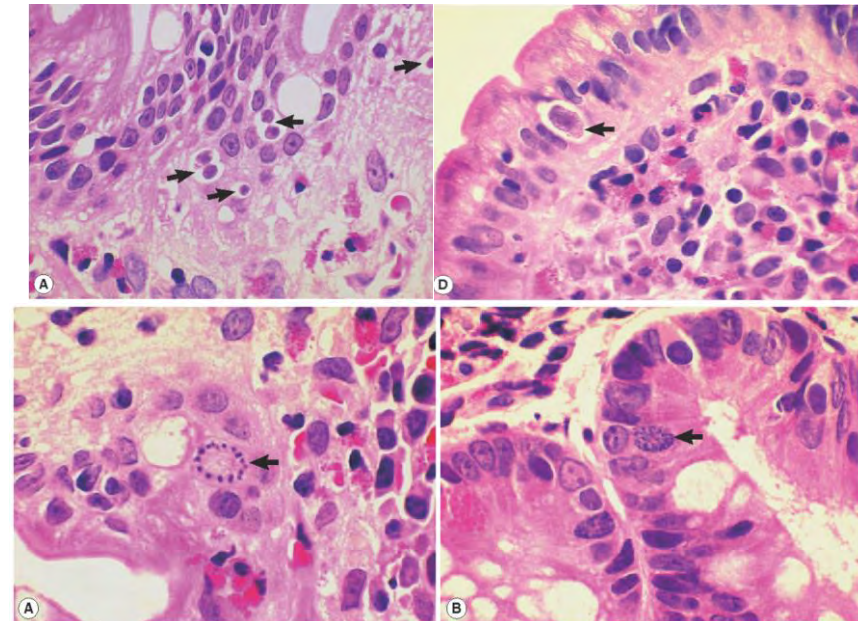
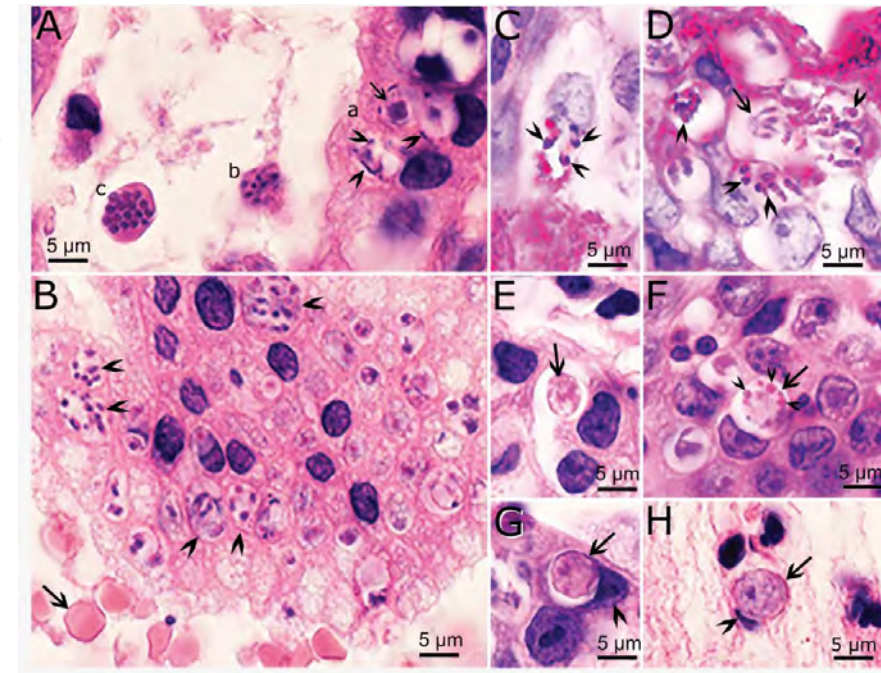
- Basophilic/amphophilic
- Round, 2-3mic
- Christmas tree lights appearance
- Stain with: Giemsa, PAS, silver and modified ZN, Gram





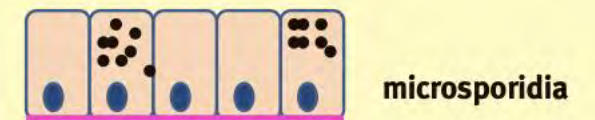
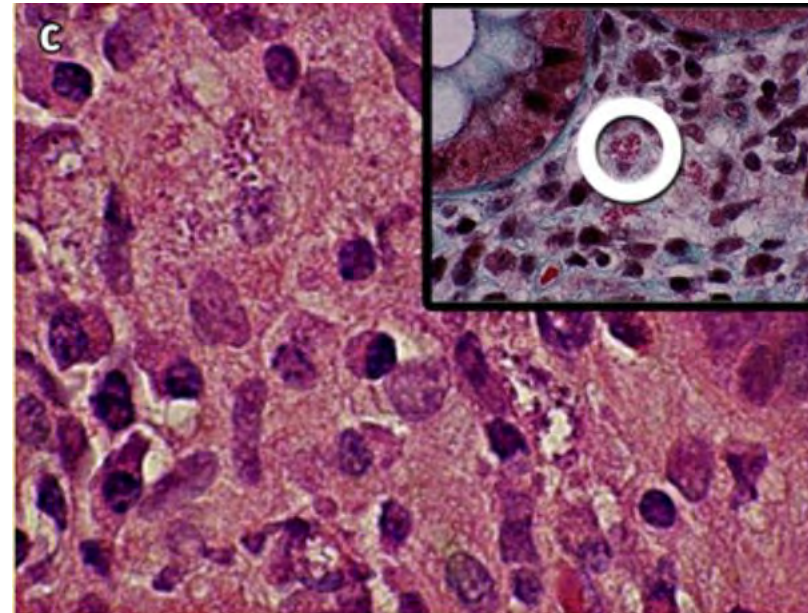
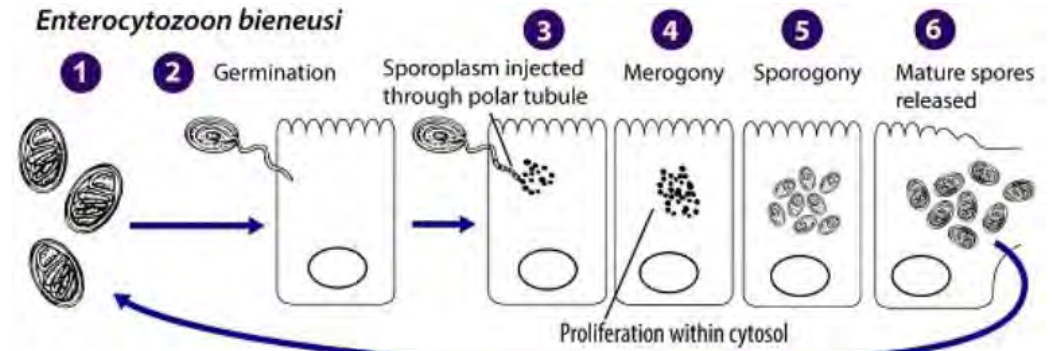
Cyclosporiasis et Isosporiadiis

- Diarrhea self limited in immunocompetent hosts
- Faeco-oral transmission of oocysts
- Complex part of the life cycle in host
- Biopsy: villus atrophy and inflammatory infiltration reach in eosinophils, “parassitophorous vacuoles”
- 20-30micron
- Isospora (PAS+, Grocott, Giemsa, Alcian Blue)
- Cyclospora (negative for PAS Grocott Gram)



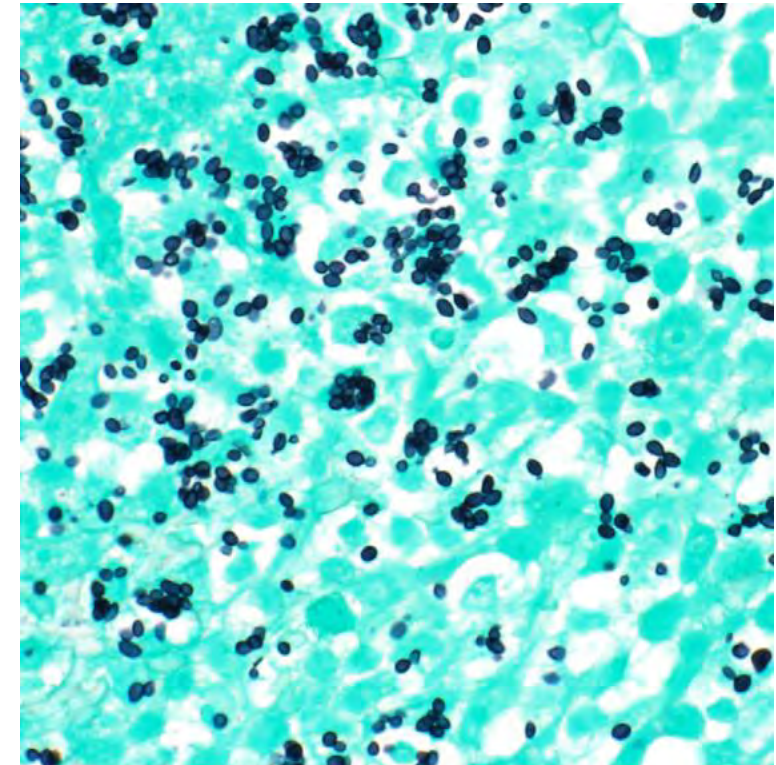
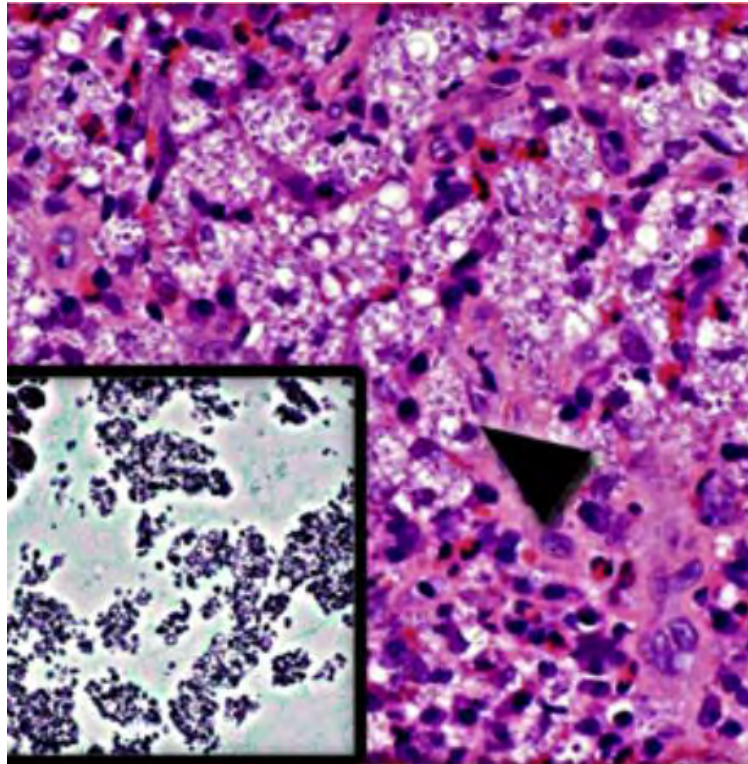
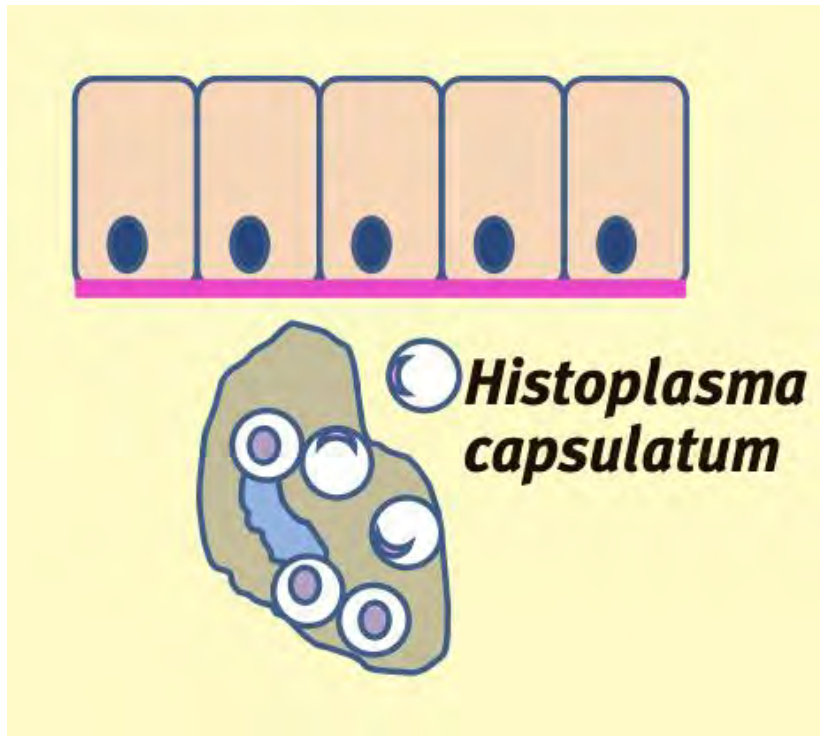
Microsporidiosis

- Transmission: ingestion, inhalation, trans mucosal
- GI tract, liver and biliary tract, conjunctiva
- Potentially affected cells; epithelium, mesenchyma, endometrium, macrophages
- Parassites 1-2micron
- Stainings: PAS, Massons trichrome (Giemsa variable, ZN negative)



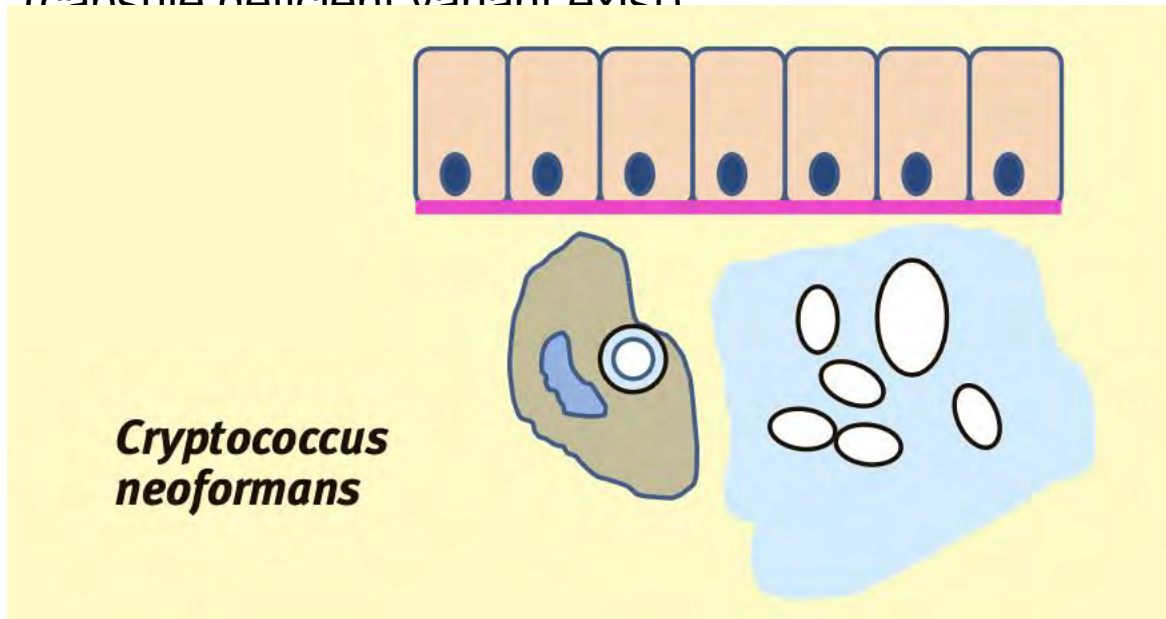
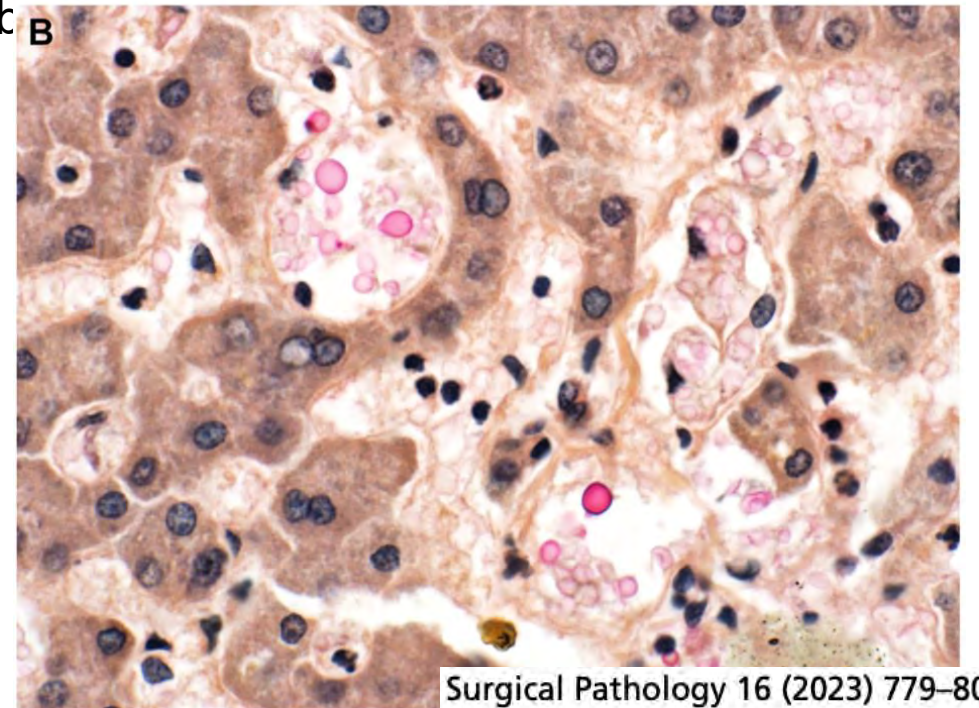
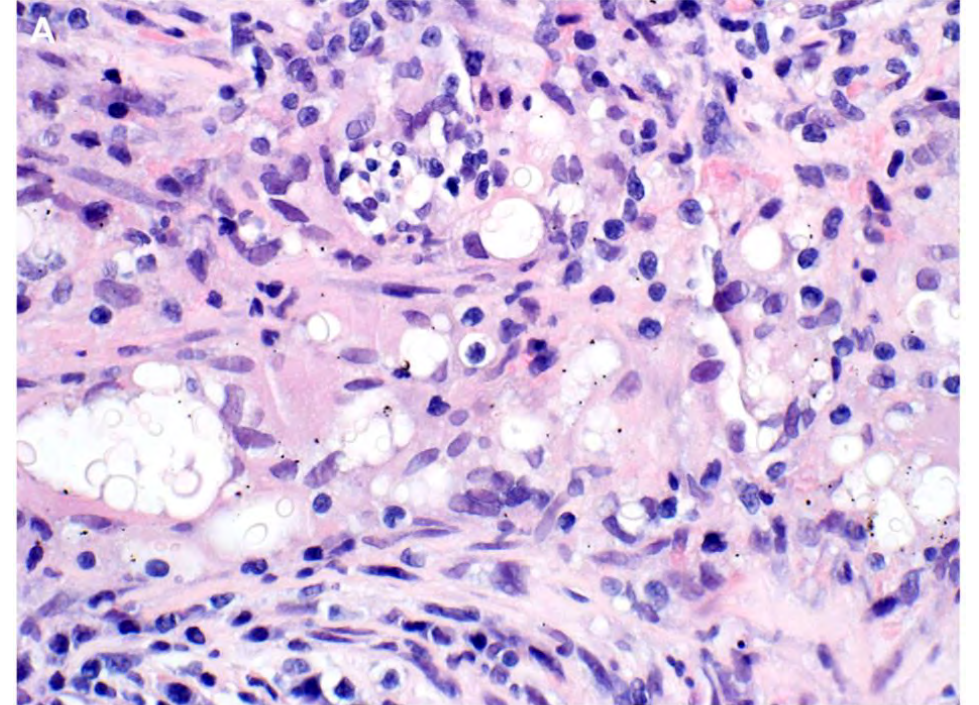
Histoplasma Capsulatum

- Fungus present in birds droppings and soil
- Infection in early age self limited -> immunocompromise -> reactivation
- Small (2-4 μ) in the cytoplasm of macrophages and giant cells
- Basophilic cytoplasm retracted from cell wall “fried egg” appearance
- Host response: suppuration with neutrophils, granulomas
- Positive for PAS, Grocott



Cryptococcosis

- Fungus
- bird droppings and soil
- Features: marked variation in size of the yeasts (2-20 mm), intracellular or extracellular, thick wall capsule, « bubble soap » appearance
- Host response: none or necrosis and granulomas
- PAS, Grocott, the capsule is positive for mucicarmin and Alcian b (capsule deficient variant exist)

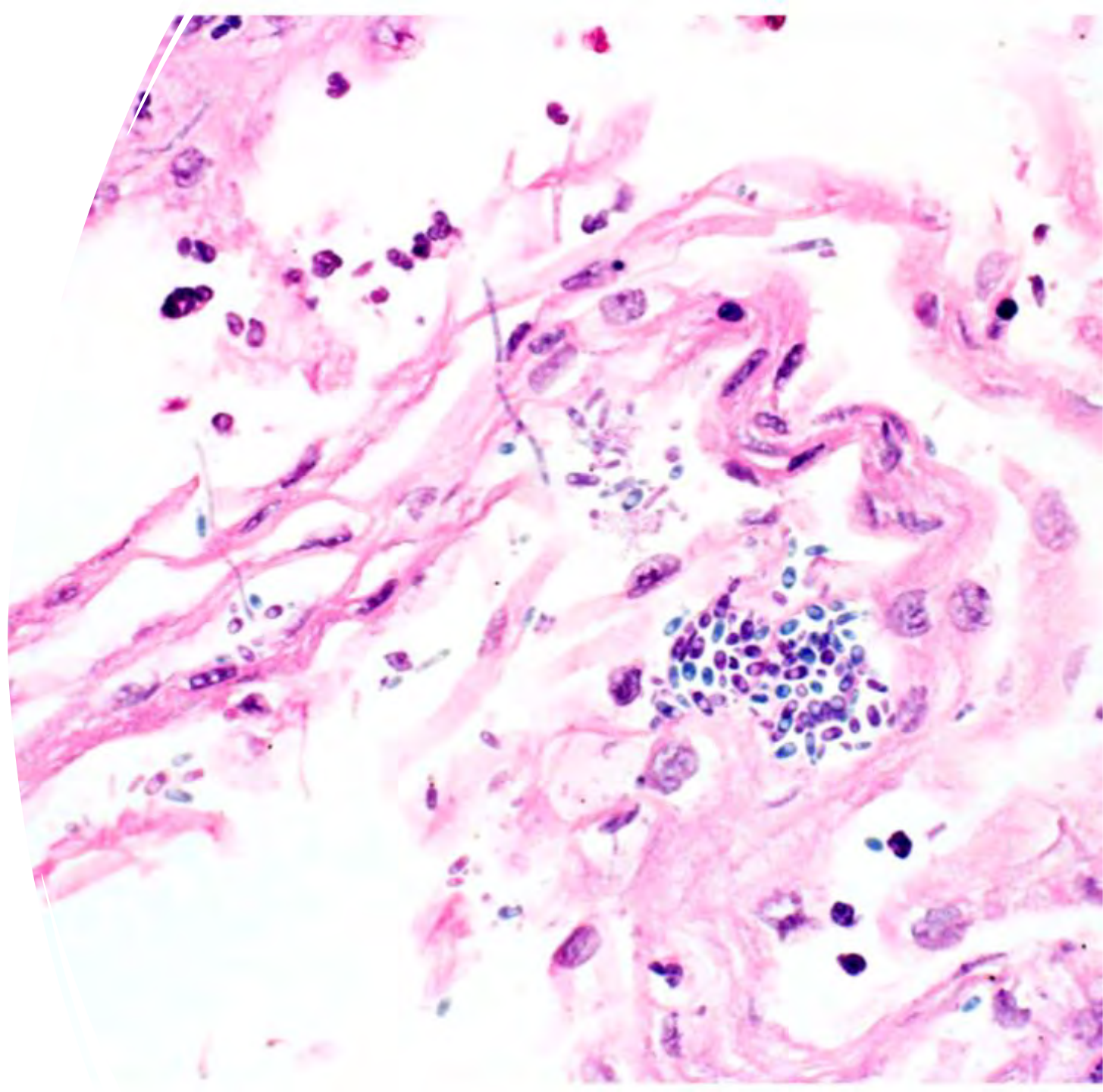


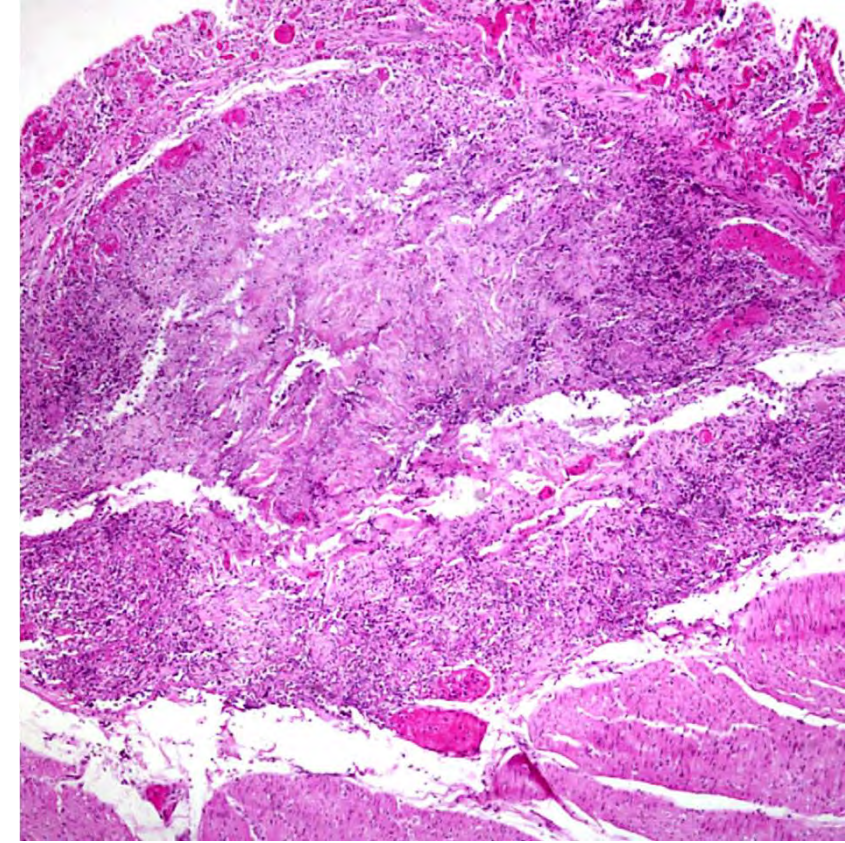
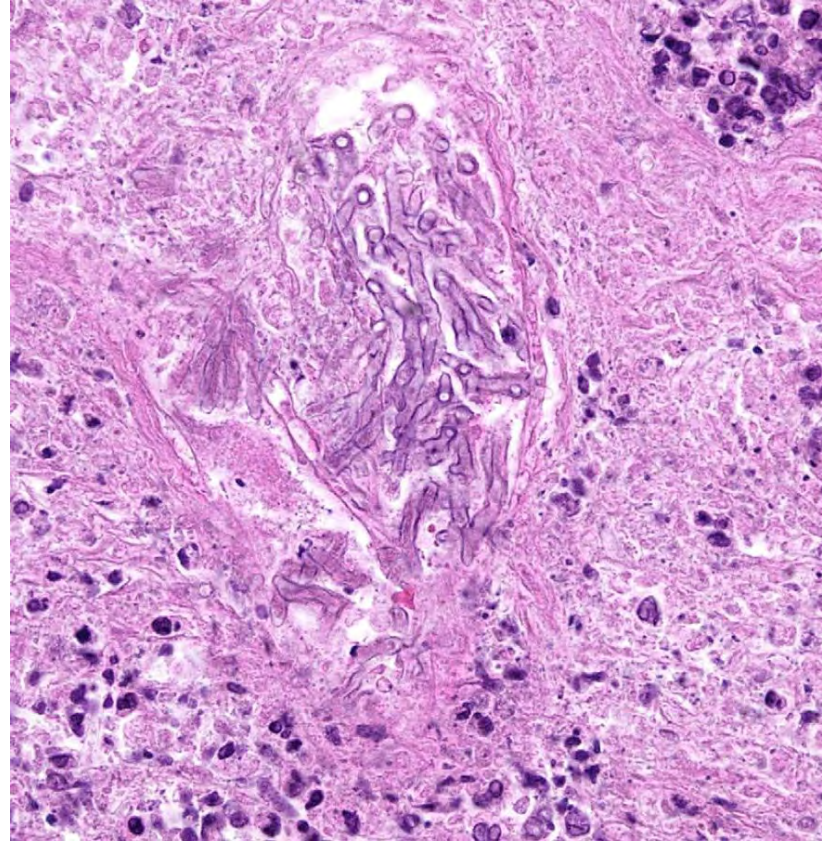


Fungal infections



-
- ❖ Incidence of fungal infections increased 2-3x last years
 - ❖ Not only in immunocompromised patients
 - ❖ Histology important tool because culture requires weeks
 - ❖ PAS, Grocott usefull for diagnosis

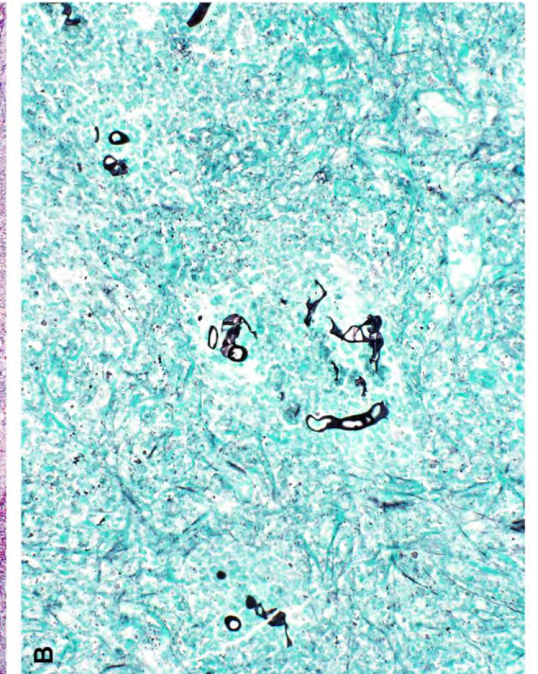
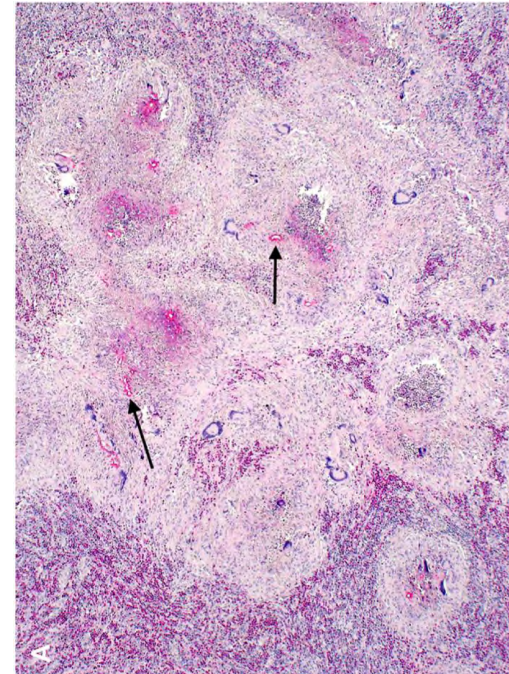
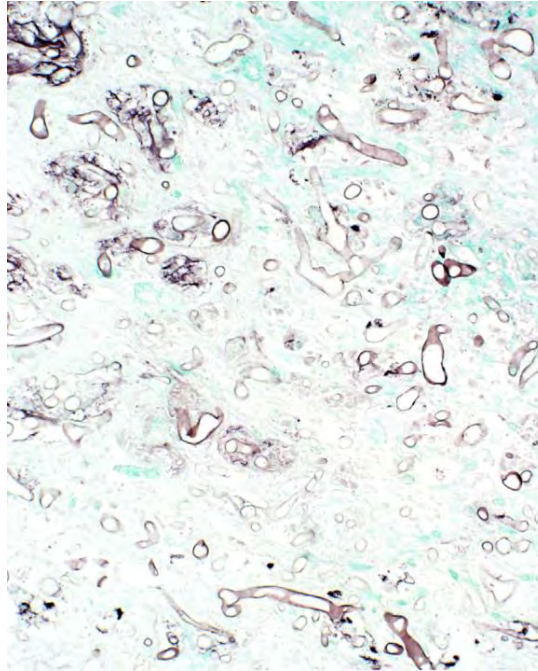
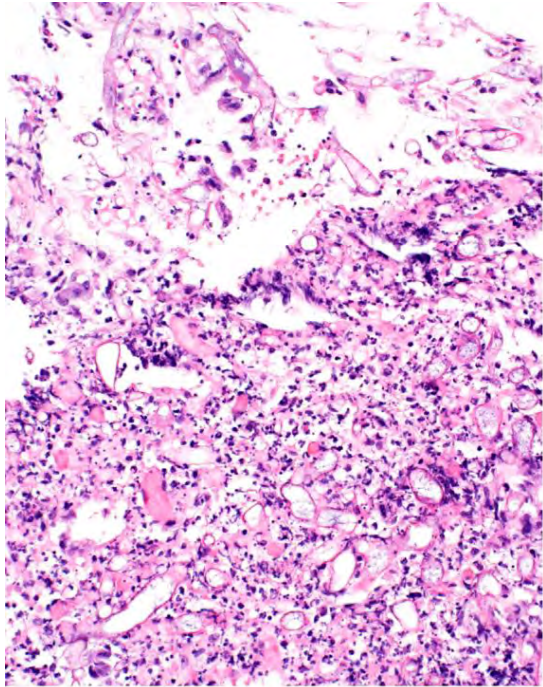




Aspergillus

- ❖ Immunocompromised patients
- ❖ Ischemic mimicker
- ❖ Symptoms: Gi bleeding, melena, abdominal pain, fever
- ❖ Features: nodular zone of ischemic necrosis centered on blood vessels containing fungi
- ❖ minimal to marked neutrophilic infiltrate / Granulomas /transmural infarction

Mucormycosis and B. Rarnarum (Basidioboulus ranarum)

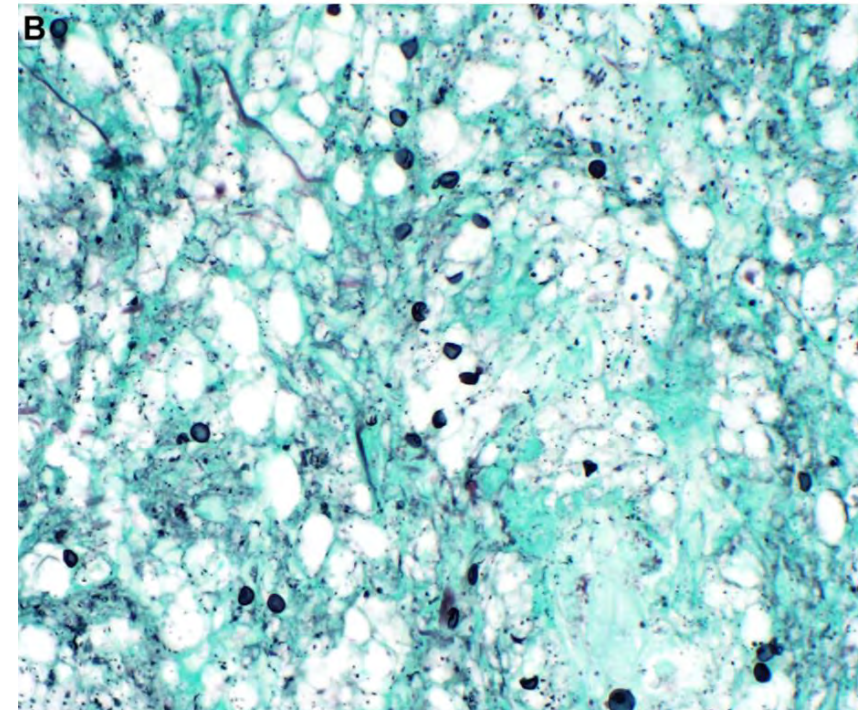
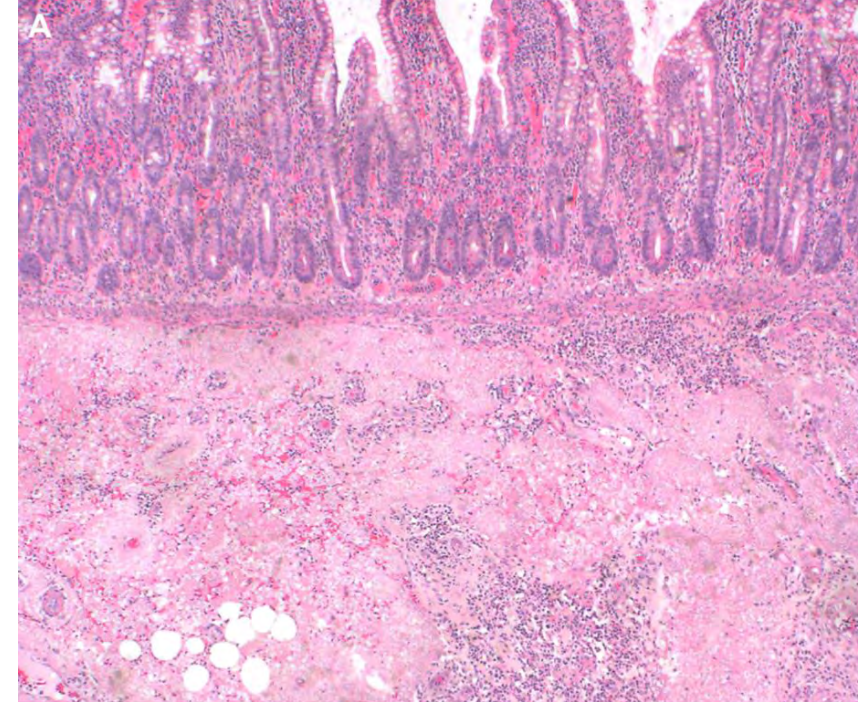


- Distribution: worldwide, associated with diabetes
- Morphology: Pauciseptate hyphae with ribbon-like thin walls. Haphazard branching Optically clear centers
- Host reaction: angioinvasion with ischemic necrosis and acute inflammation

- Distribution: south western USA, Saudi Arabia, desert country
- Morphology: similar to mucor
- Host reaction: granulomatous reaction rich in eosinophiles, Splendore-Hoeppli protein

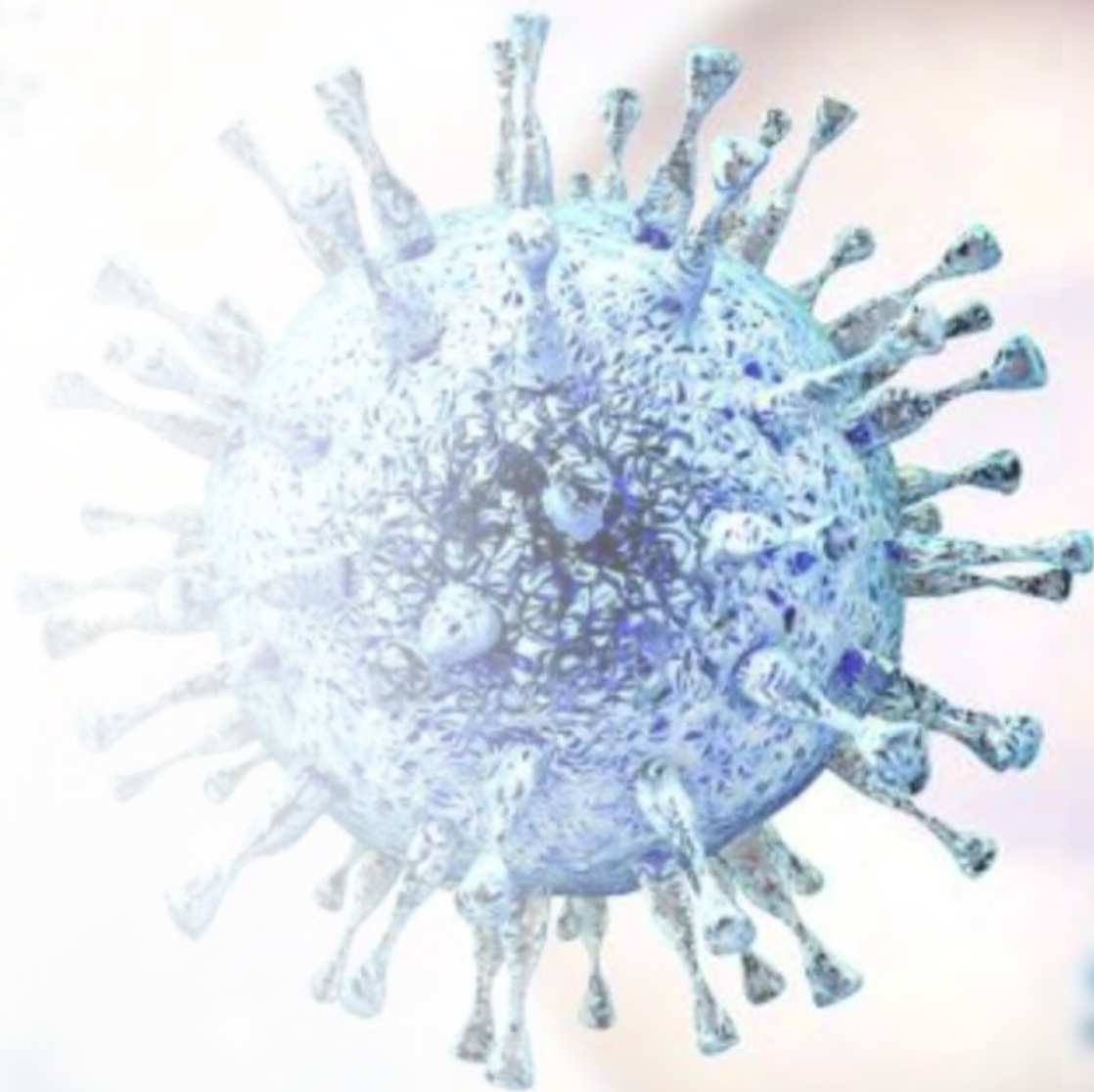
Pseudocystis

- ❖ Distribution: worldwide
- ❖ Features: Ovoid, Cup or crescent shaped if collapsed No buds Internal enhancing detail
- ❖ Host reaction: Characteristic foamy casts May have suppurative or granulomatous inflammation as well





Virus infections in the GI tract



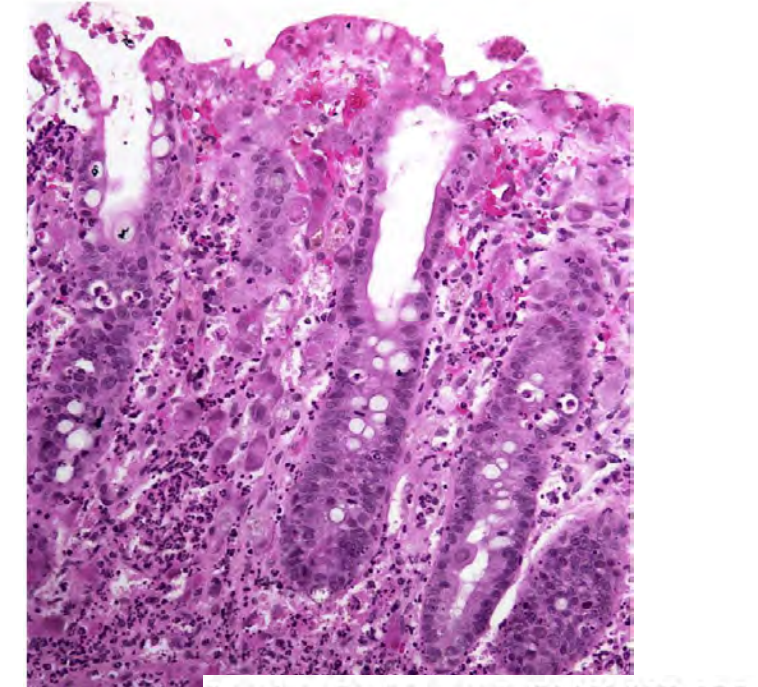
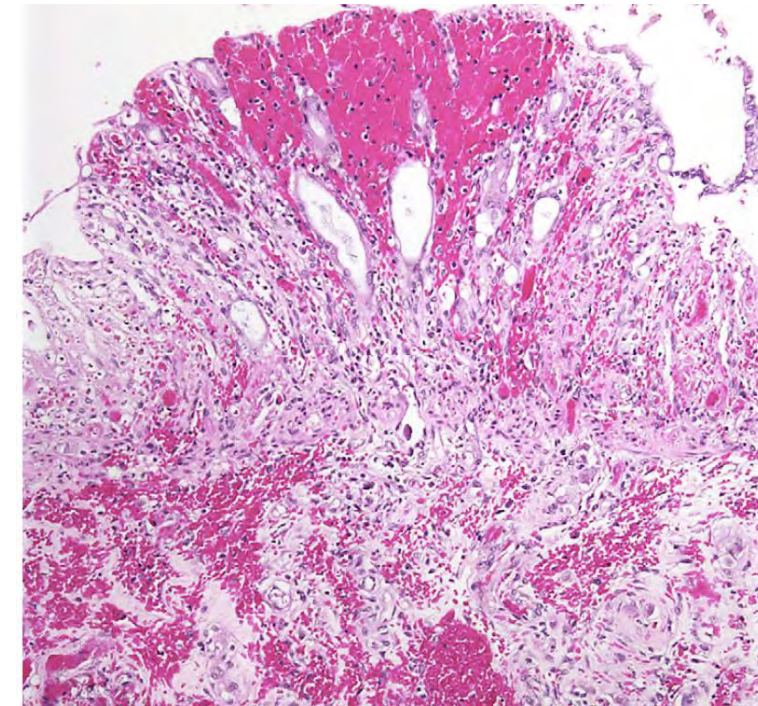
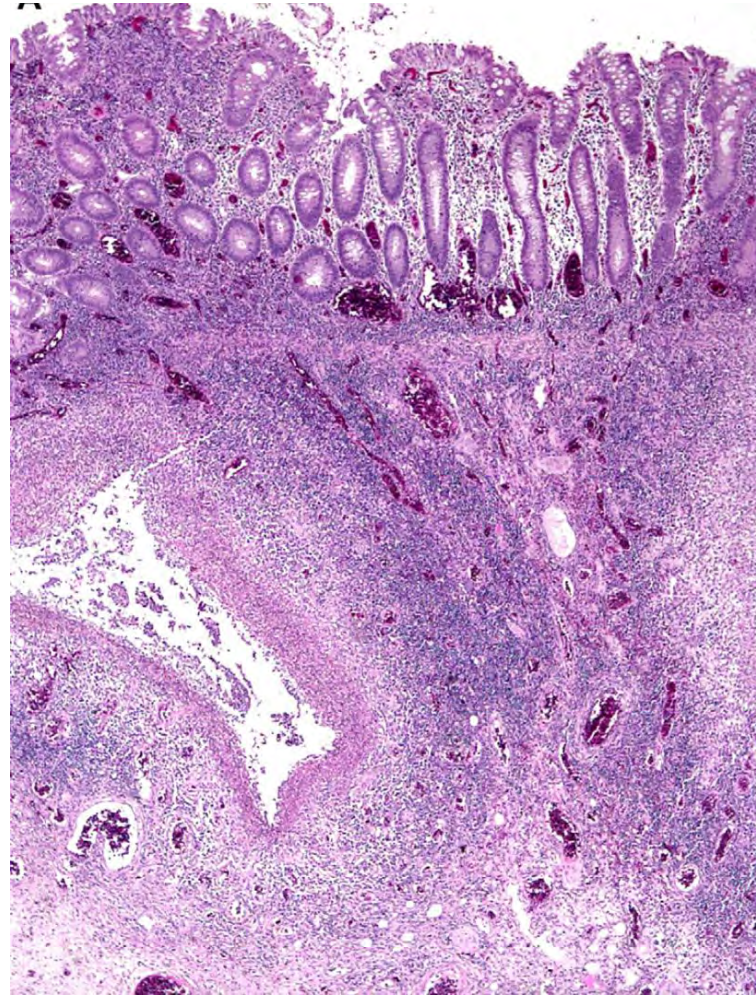
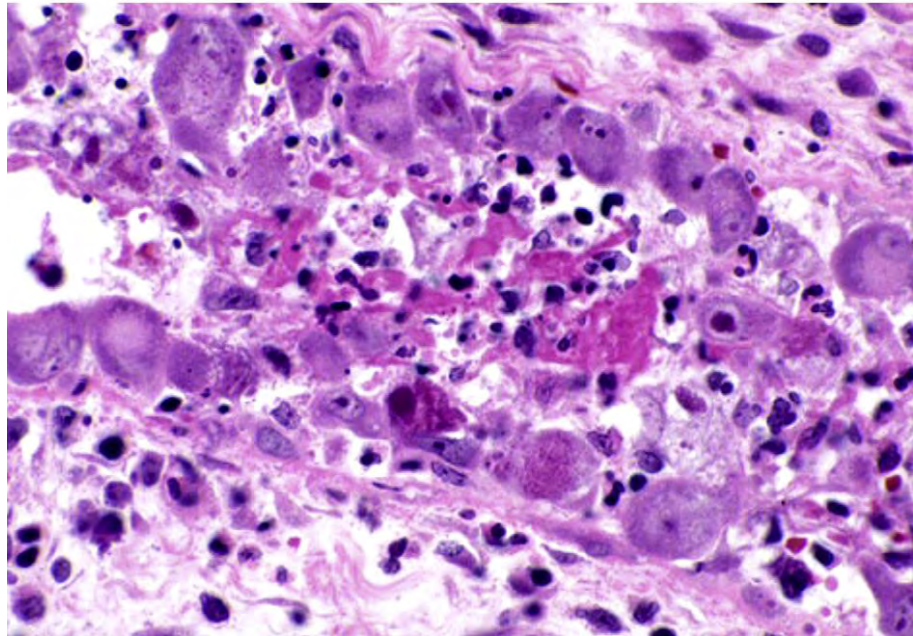
Cytomegalovirus infection

- Can mimic IBD and ischemic colitis
- Macroscopical features: ulcers may be single or multiple, and either superficial or deep, separated from normal mucosa (dd CD)



Histological features:

- Variable
- Mucosal ulceration
- Mixed inflammation with cryptitis, crypt abscesses
- Infected cells in deep of the ulcer
- Viral vasculitis

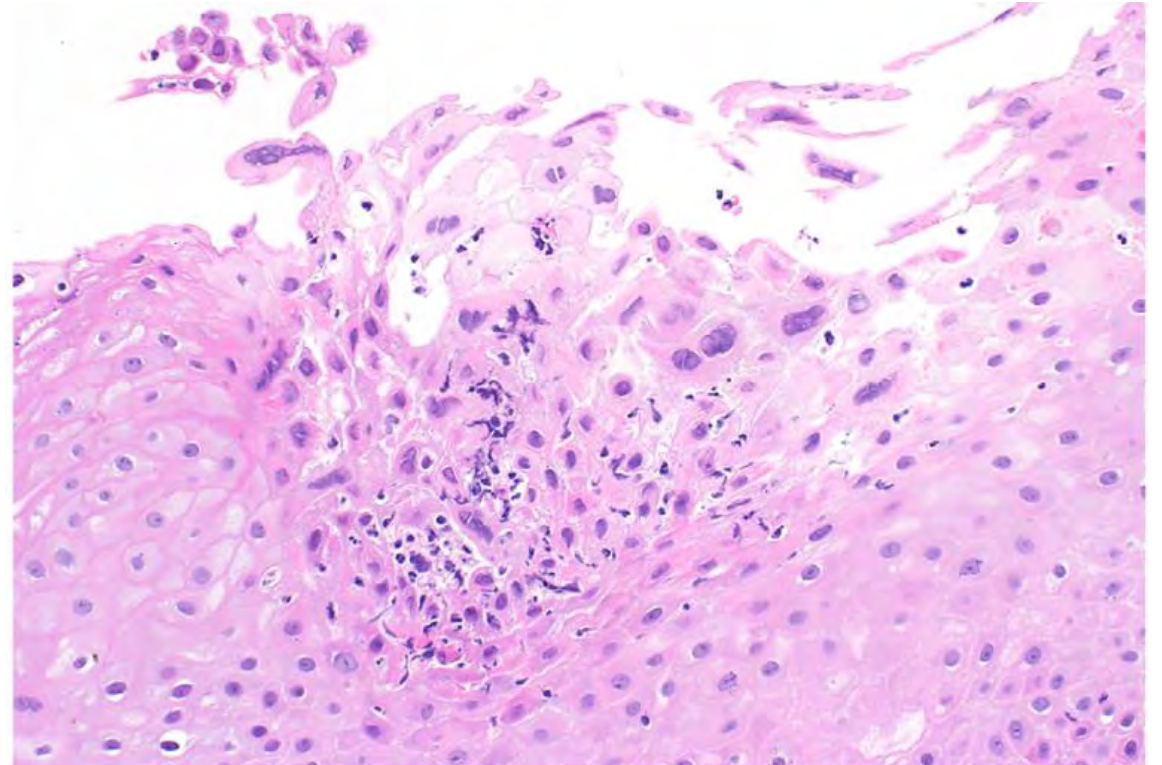
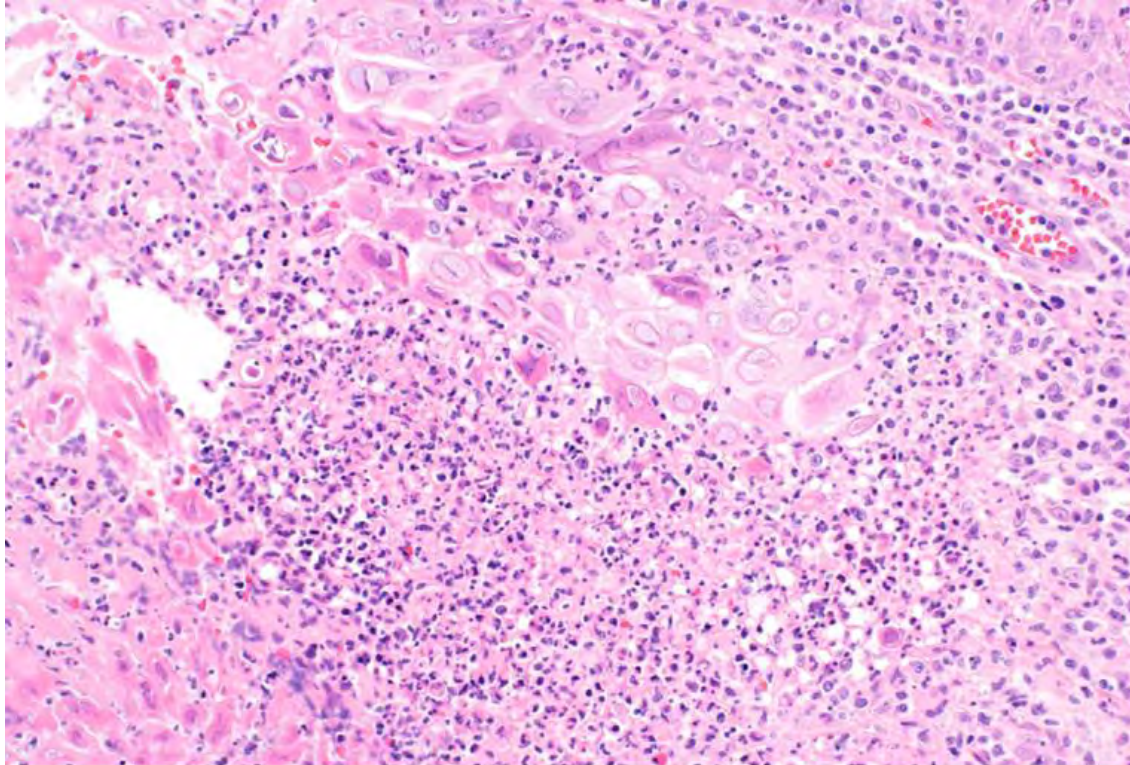


Herpes simplex Virus

Localisation: epithelial cells, rarely deeper

Type on inclusions: ground glass

Host reaction: Sloughing of epithelial cells, neutrophilic infiltrate;
multinucleated cells common

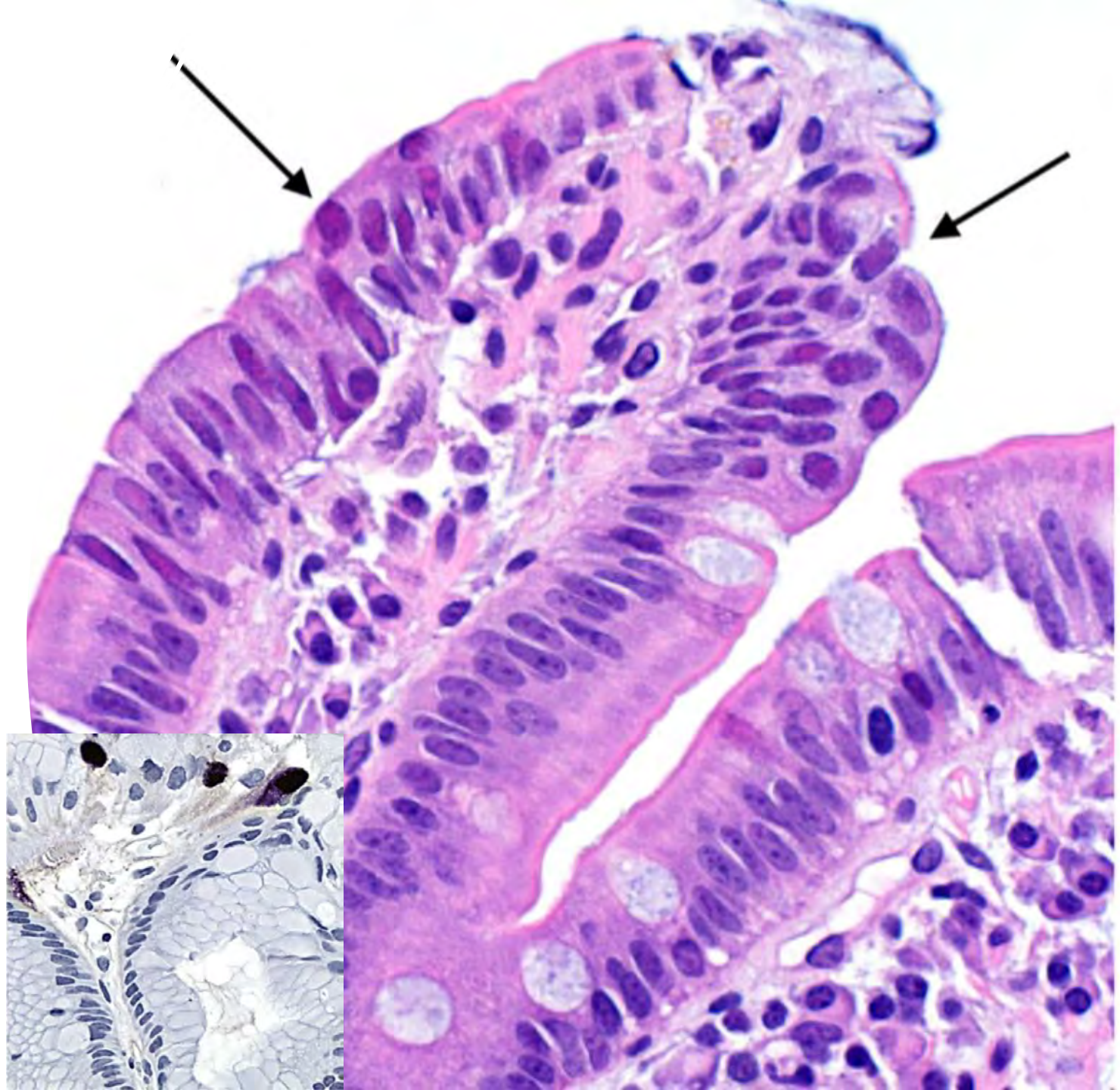


Adenovirus infection

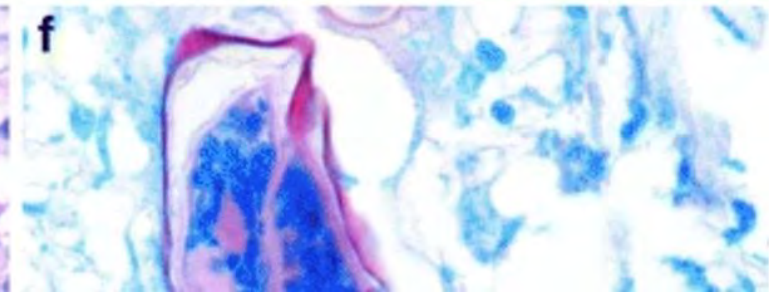
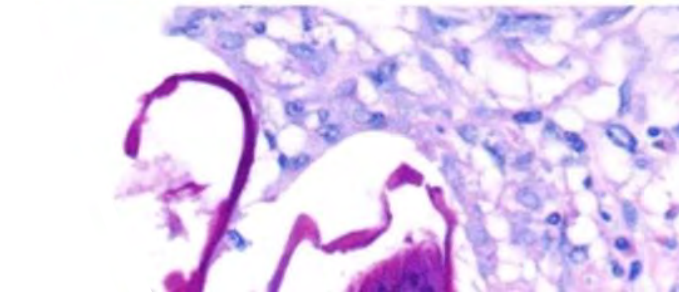
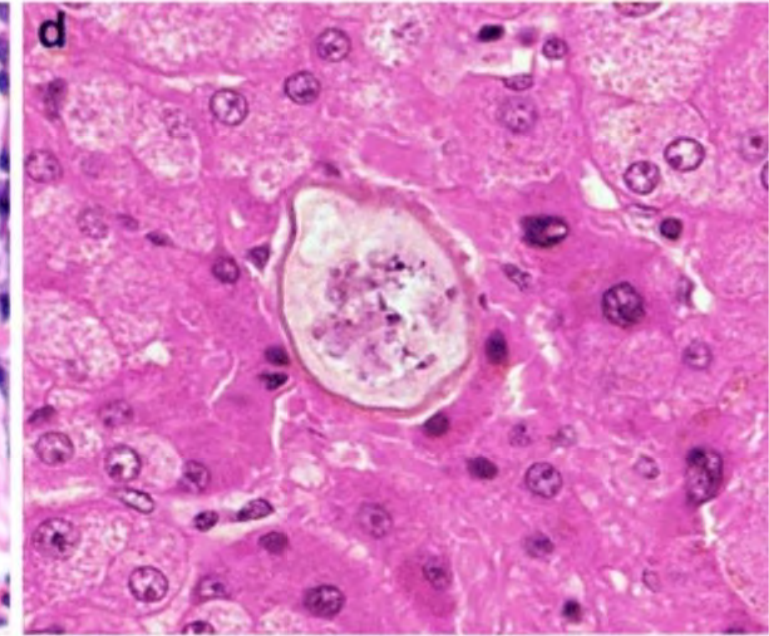
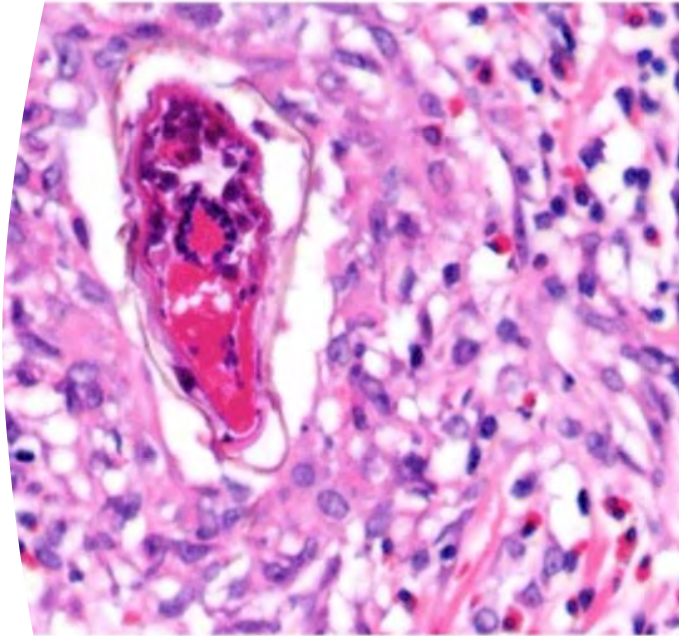
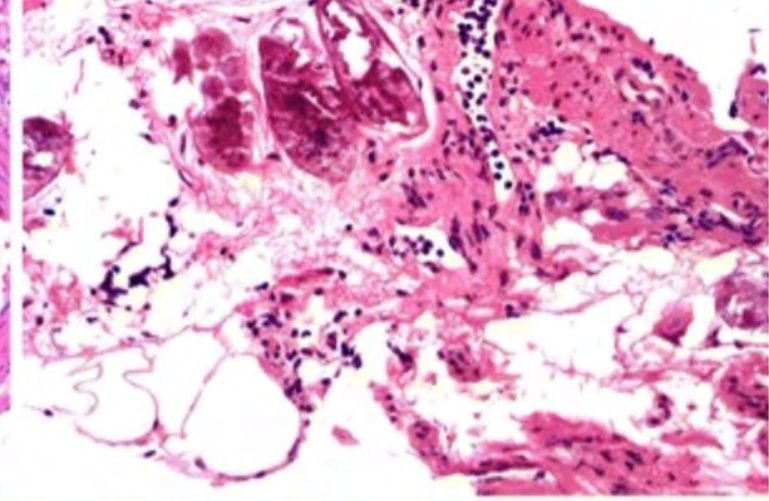
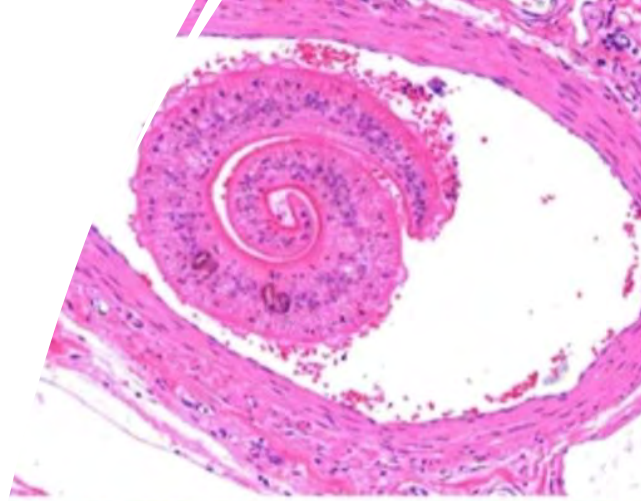
Localisation: surface epithelium especially goblet cells

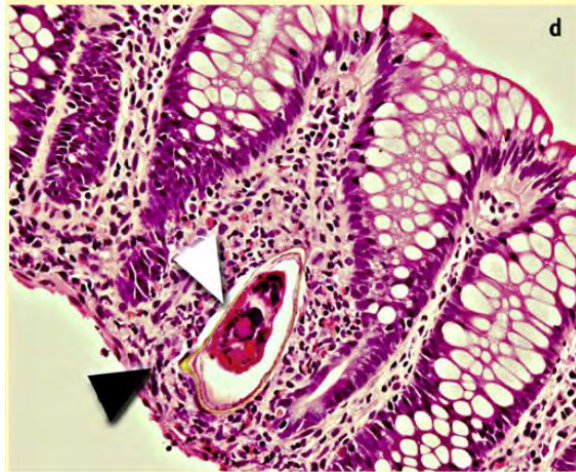
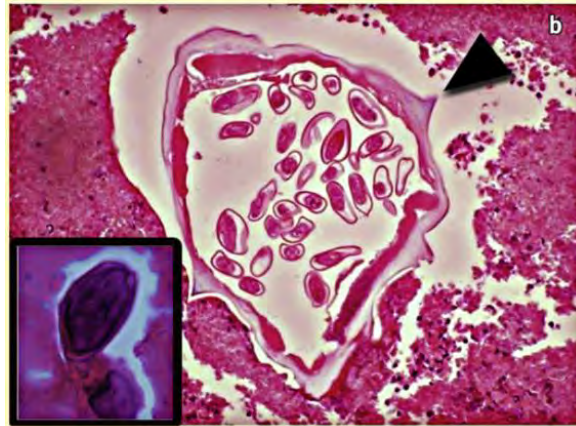
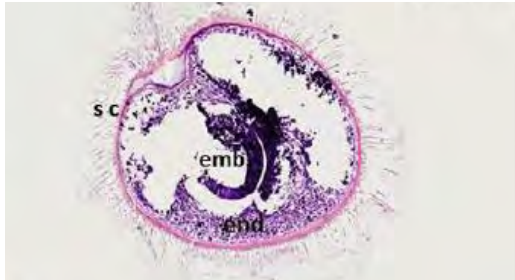
Type on inclusions: basophilic « smudge cell » filling entire nucleus, rarely eosinophilic inclusions with halo

Host reaction: surface disorder, cells not engaged



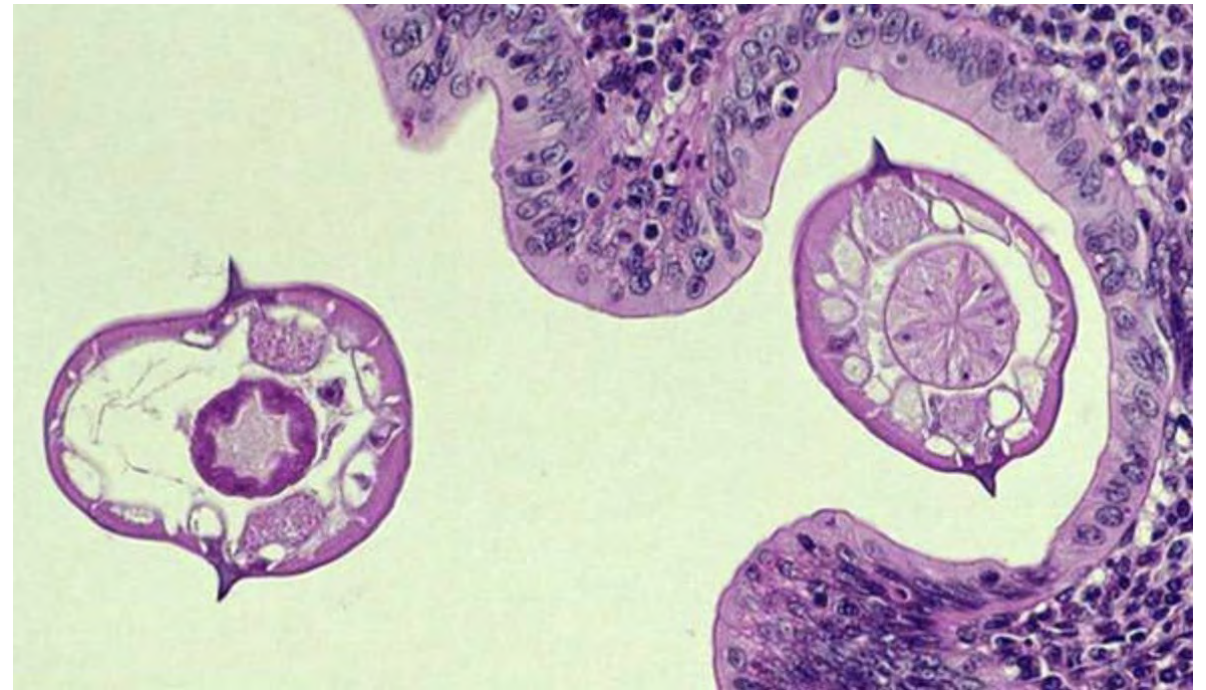
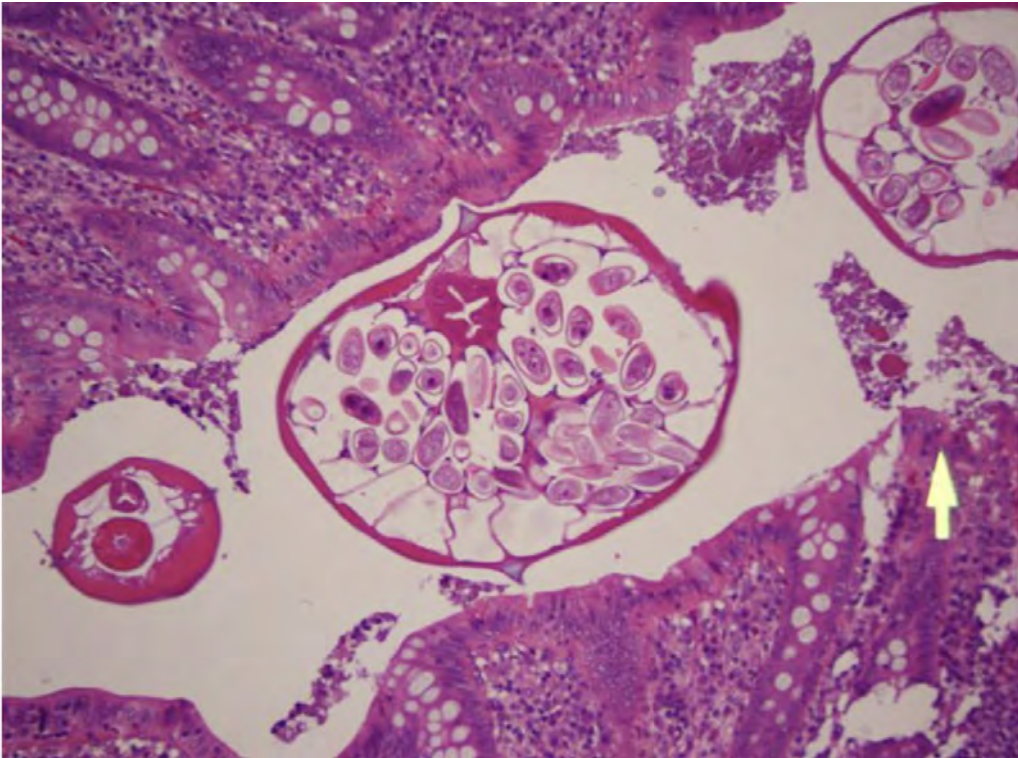
Worm infections



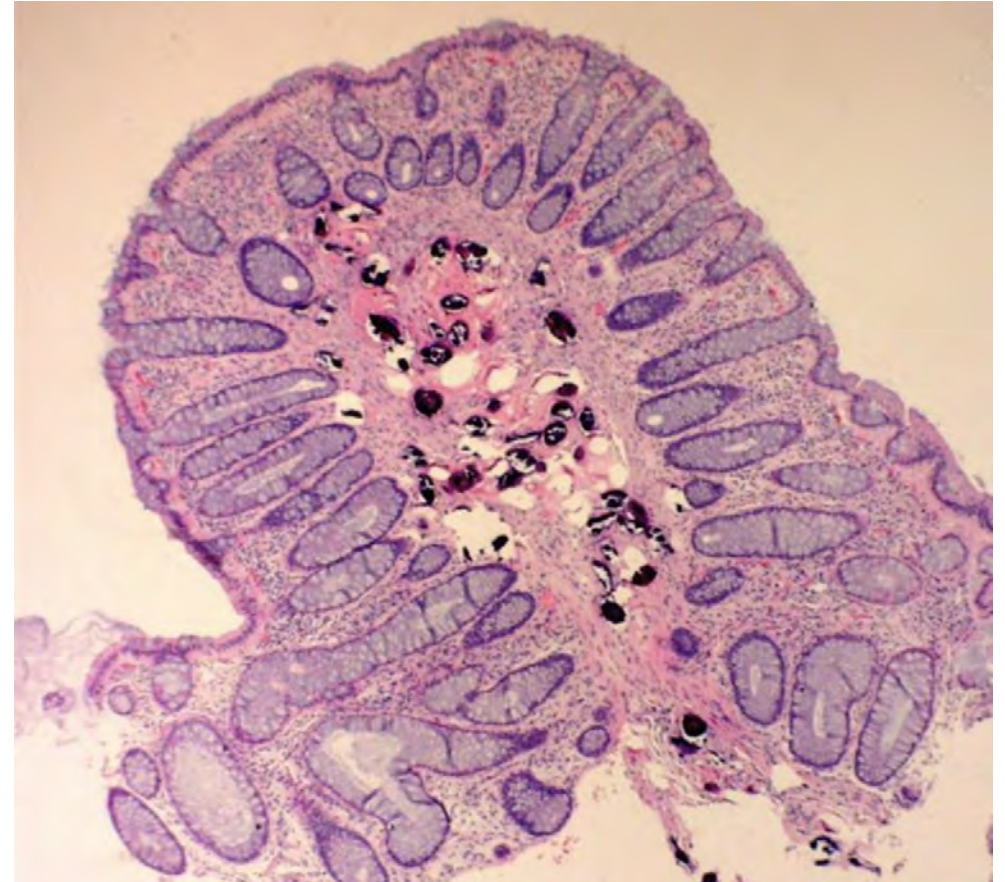
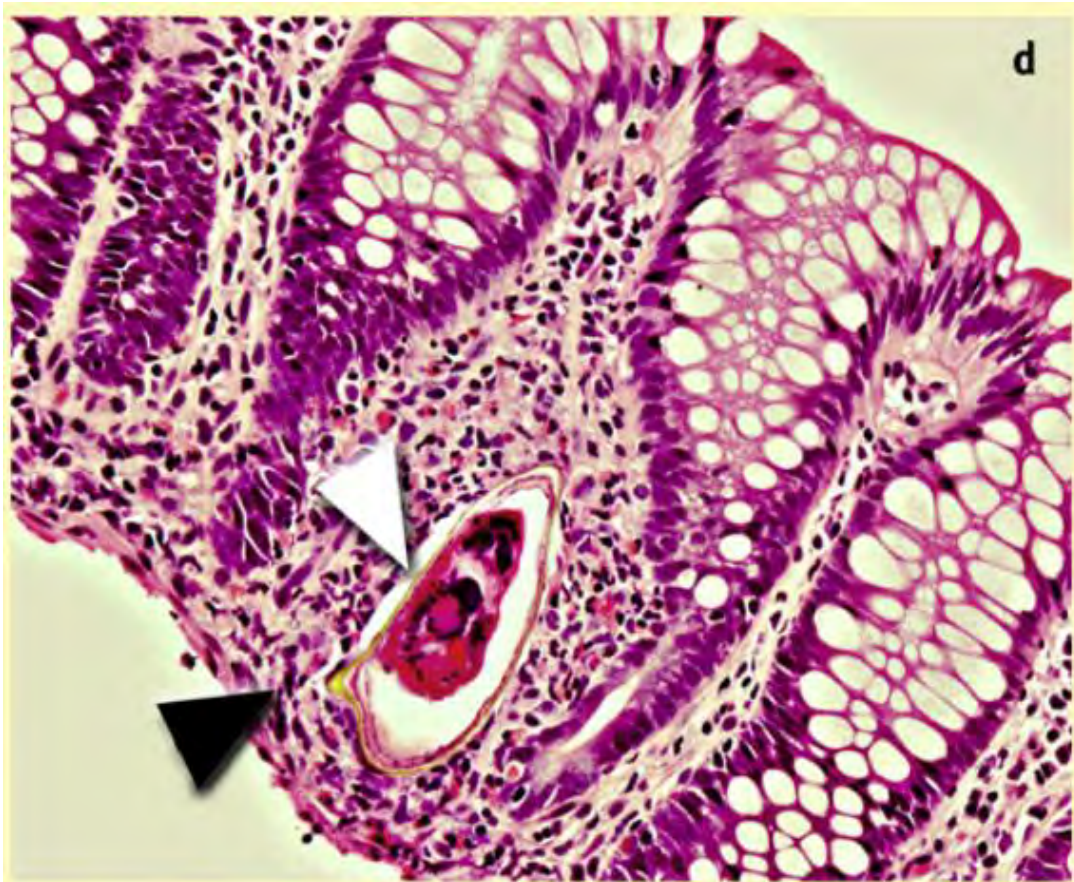


- Vegetables and seed are main differential diagnosis
- H&E is in general sufficient but Trichrome could be used to visualize the internal organs
- Important clinical information but they can thrive within the human gut for decades
- Geography variable
- Transmission: faeco-oral, ingestion of raw food containing larvae, larvae that penetrate the skin
- Special danger in immunocompromised patients

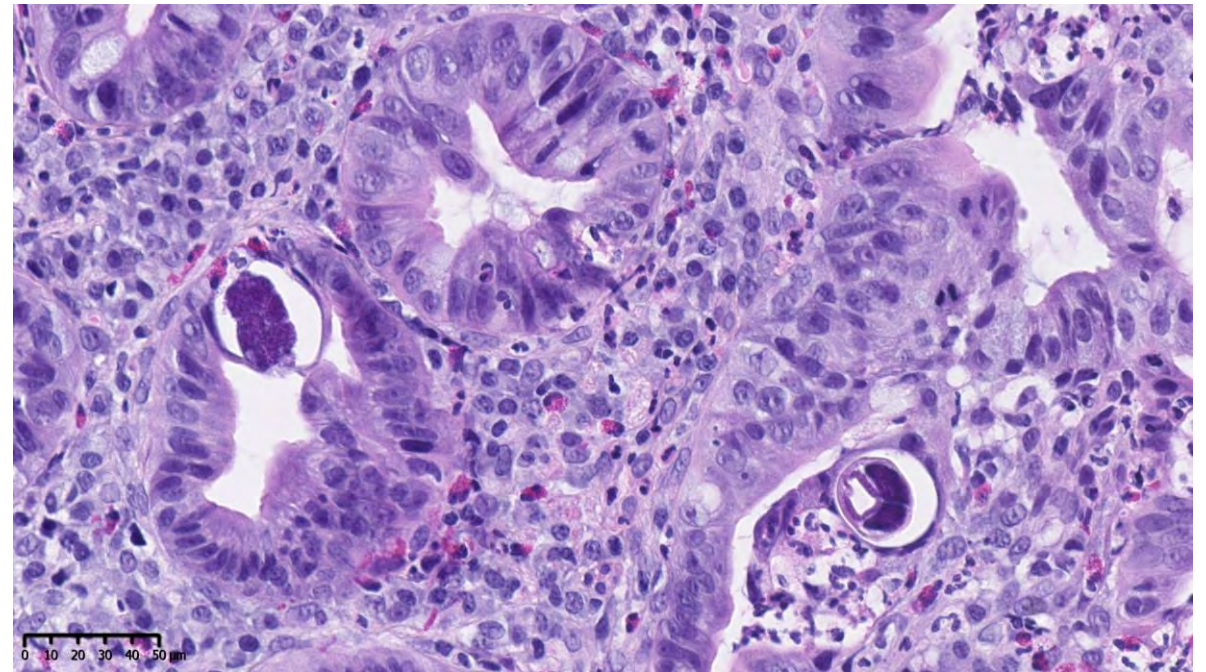
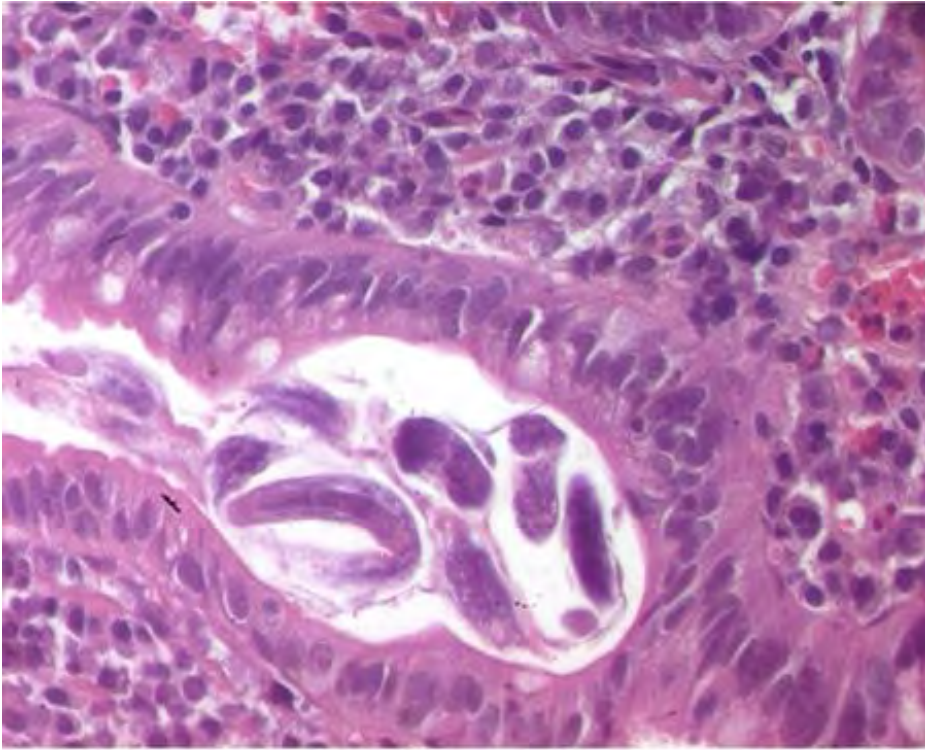
Enterobius Vermicularis



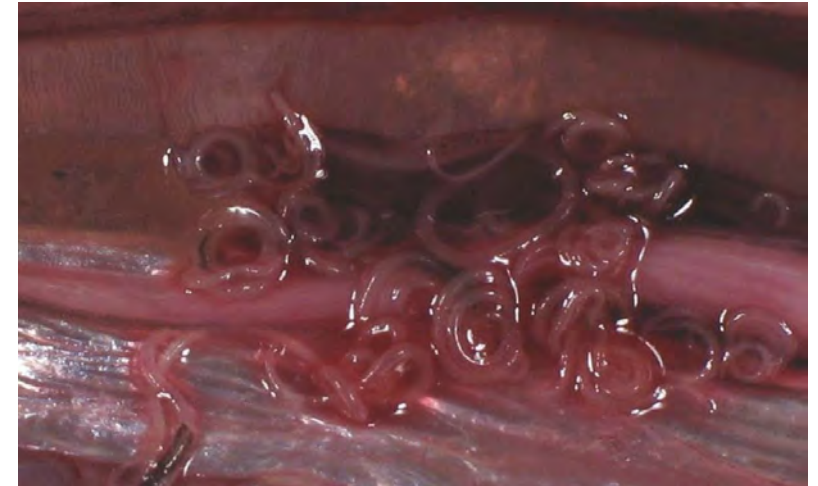
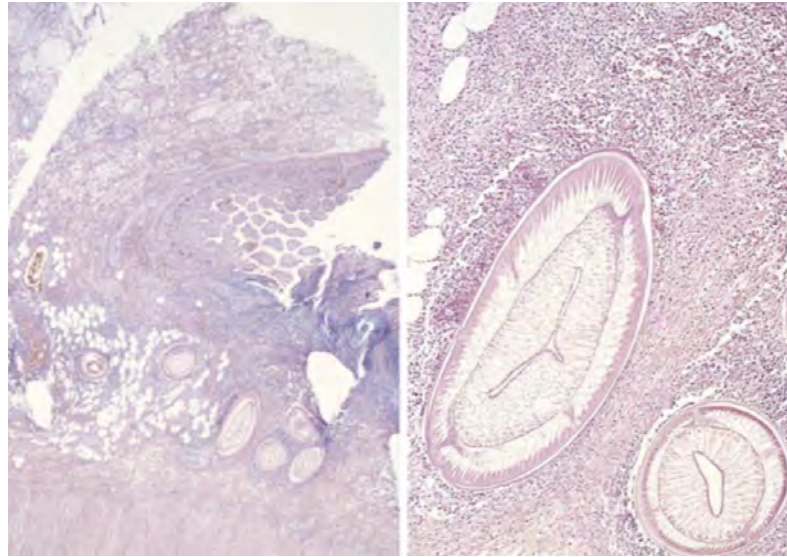
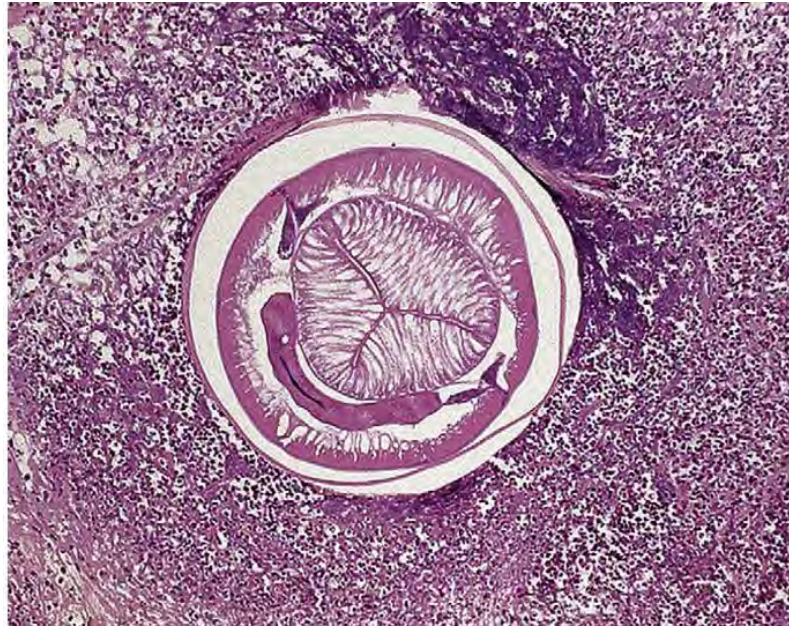
Schistosomiasis



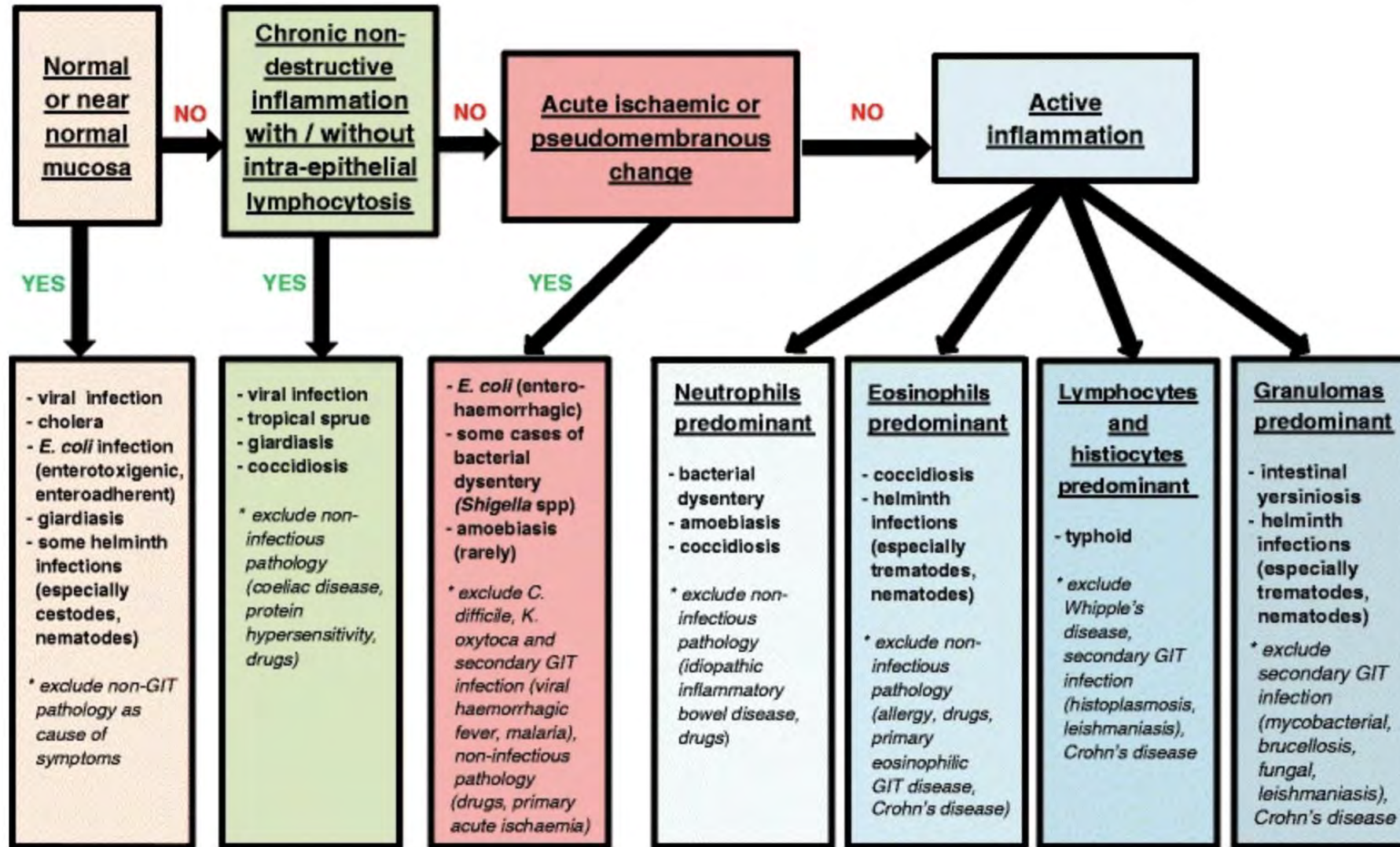
Strongiloides

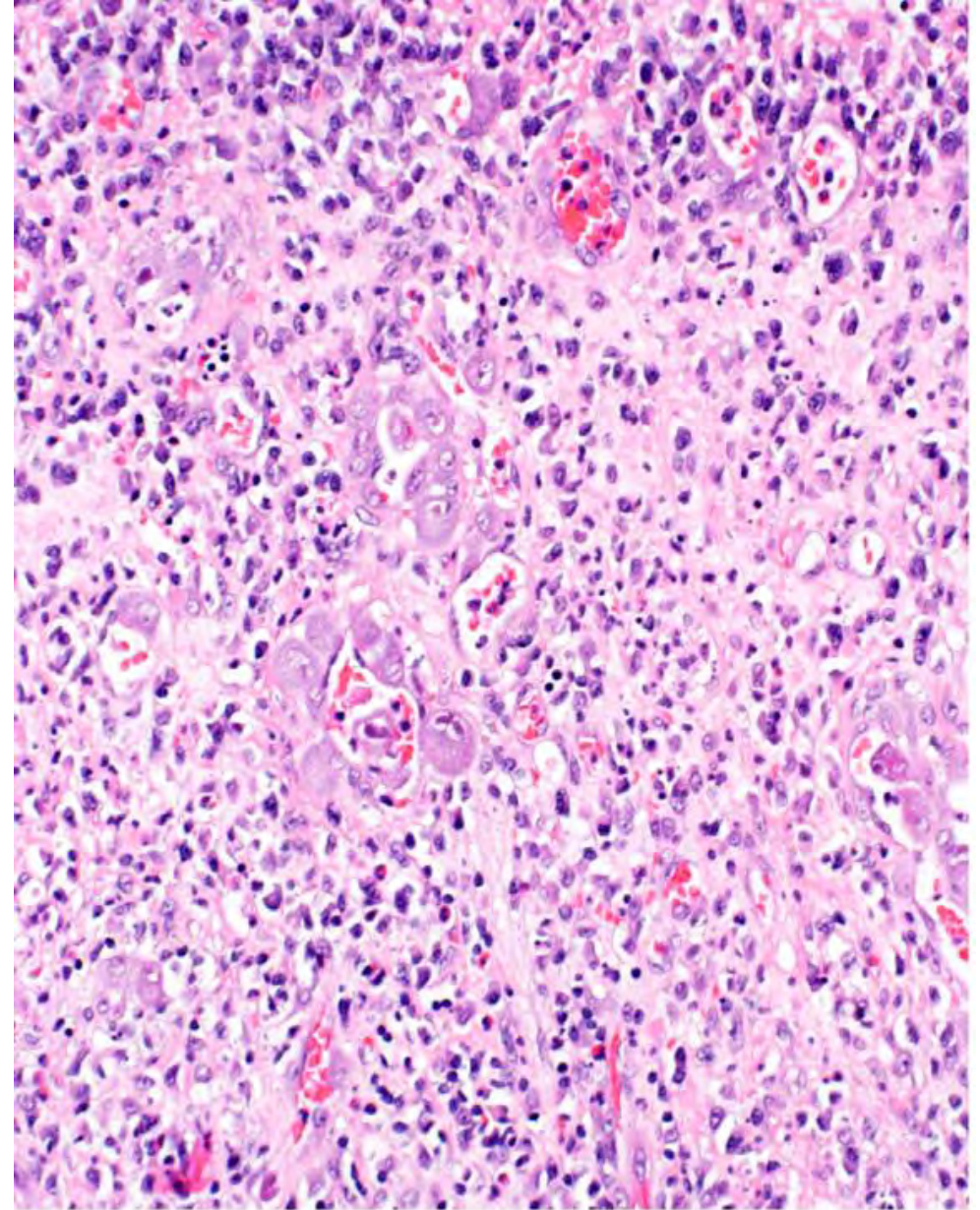
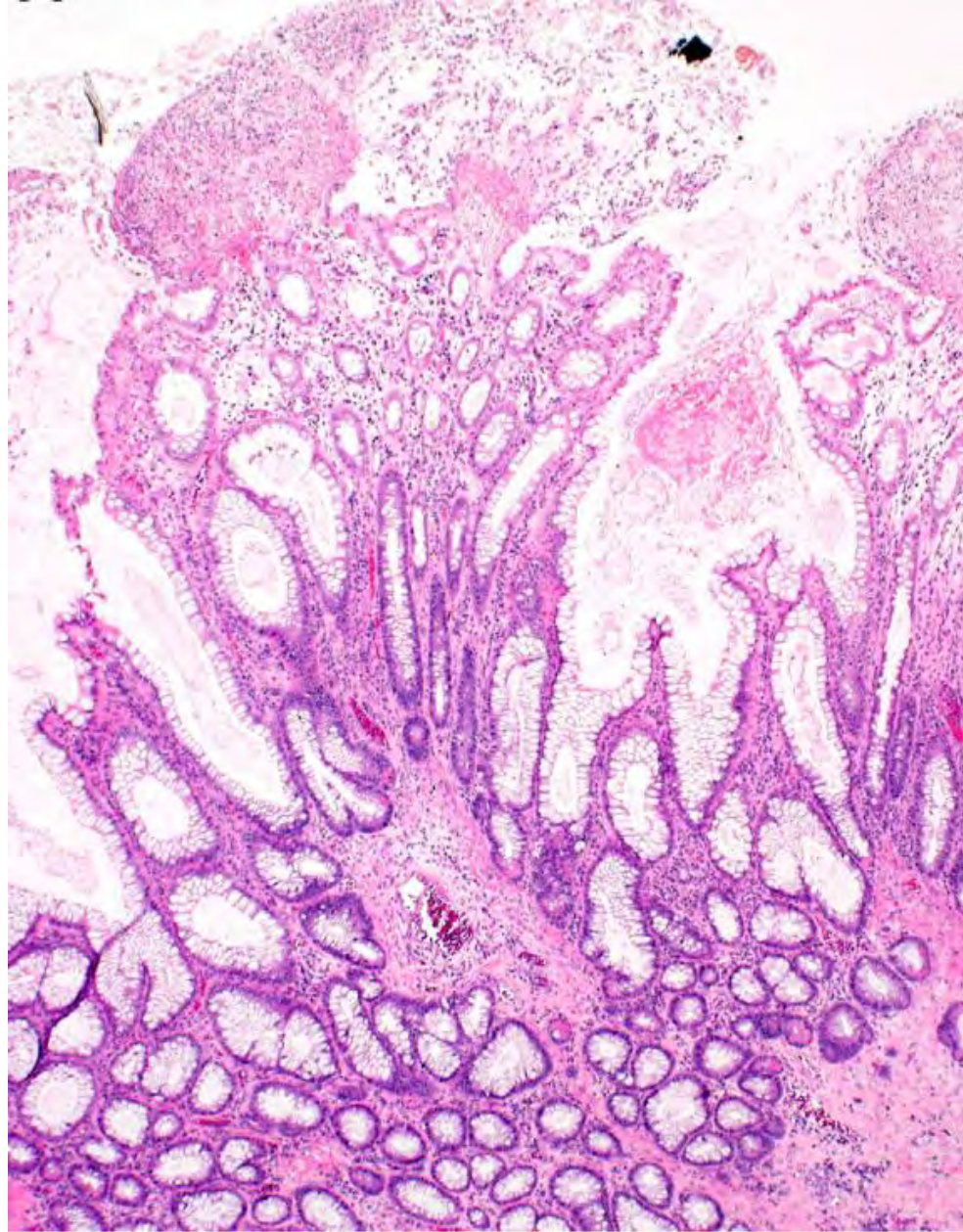


Anisakis



Histology of ENDOSCOPIC INTESTINAL BIOPSY





Take home message

- Infections of the GI tract could mimic other disease
- Consider underlying infection(eg,CMV,vaso- tropic fungi) in any immunocompromised person who has ischemic colitis.
- Consider infectious colitis in the differential diagnosis of any patient with a new diagnosis of chronic idiopathic inflammatory bowel disease (especially when features of chronicity are not well developed)
- Infections could be present in association with other diseases
- Molecular results must be correlated with the histologic findings, as well as available clinical and laboratory data.