

LEGIONELLA, BARTONELLA & UNUSUAL BACTERIA

? LEGIONELLA, BARTONELLA & UNUSUAL BACTERIA

? LEGIONELLA PNEUMOPHILA

? Morphology

- Gram-negative **thin bacilli**
 - Poorly stained with Gram stain (silver stain better)
 - Non-sporing
-

? Transmission (VERY HIGH-YIELD)

- **Aerosol inhalation**
 - Sources:
 - Air-conditioning systems
 - Cooling towers
 - Water systems
-

? Culture

- BCYE agar (Buffered Charcoal Yeast Extract)
- Requires:
 - Cysteine
 - Iron

? Intracellular Survival

- Survives in **macrophages**
- Inhibits phagosome–lysosome fusion

? Pathogenesis

Inhalation

?

Entry into lungs

?

Phagocytosis by macrophages

?

Intracellular multiplication

?

Cell lysis

?

Inflammation

?

Pneumonia

? Clinical Features (Legionnaires' Disease)

- High fever
 - Cough
 - Dyspnea
 - Atypical pneumonia
-

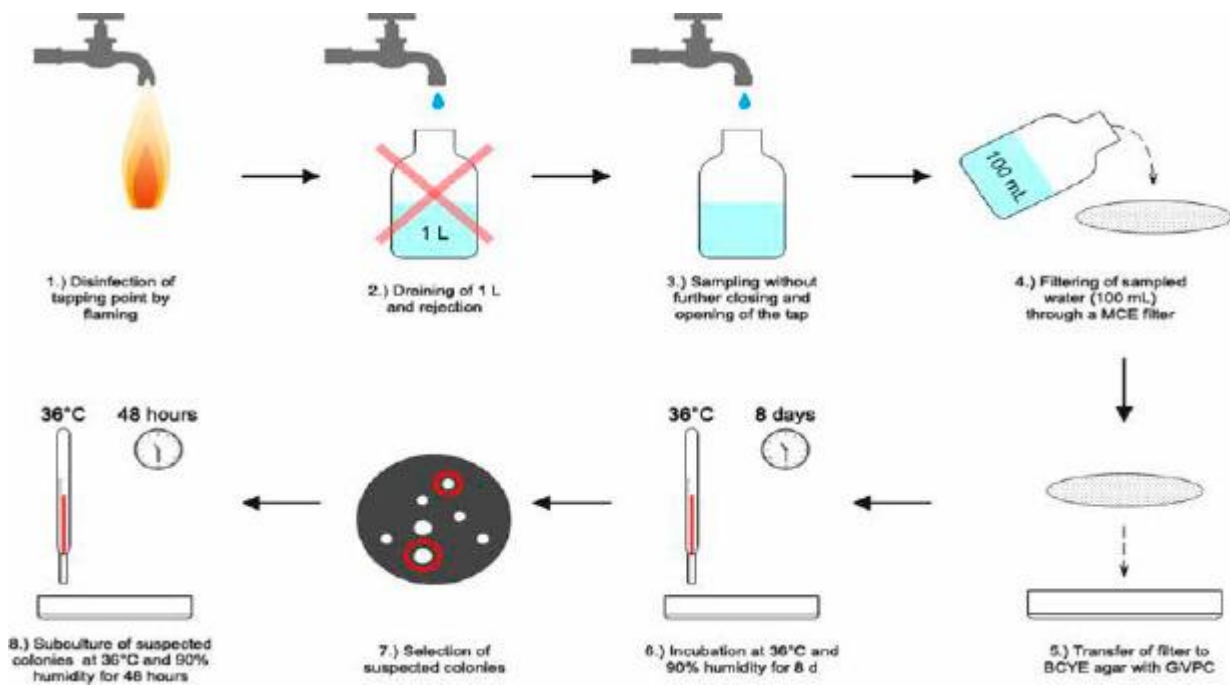
? Diagnosis (VERY HIGH-YIELD)

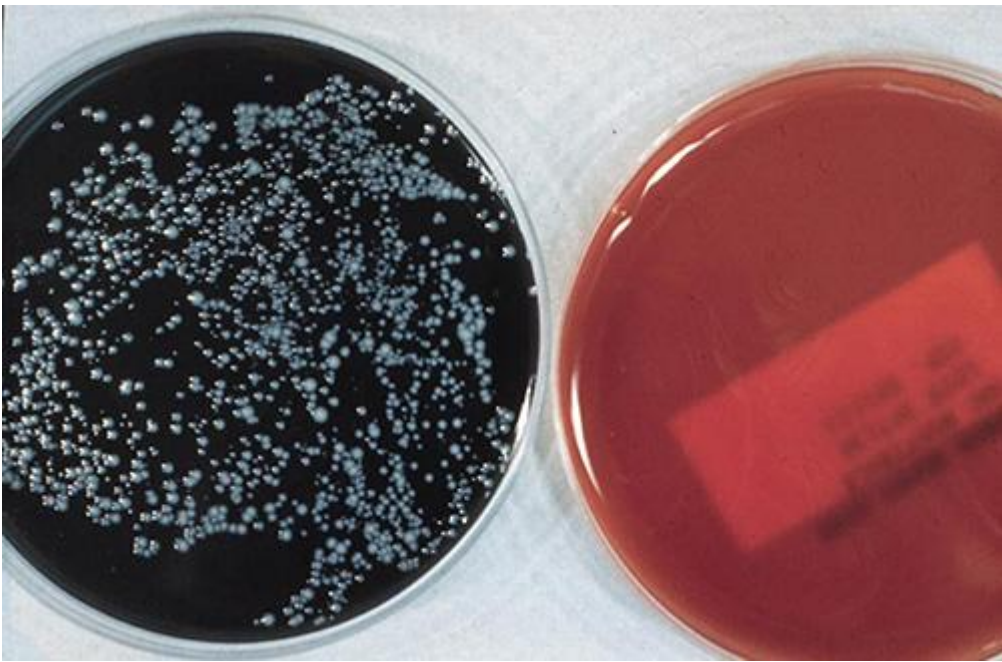
- **Urinary antigen test (rapid, most useful)**
 - Culture (BCYE agar)
 - PCR
-

? SLIDES (EXAM FAVORITE)

Legionella on BCYE agar









? BARTONELLA

? Bartonella henselae

- Causes **Cat scratch disease**

Transmission

- Cat scratch / bite

Clinical Features

- Regional lymphadenopathy
 - Fever
-

? Bartonella quintana

- Causes **Trench fever**

Transmission

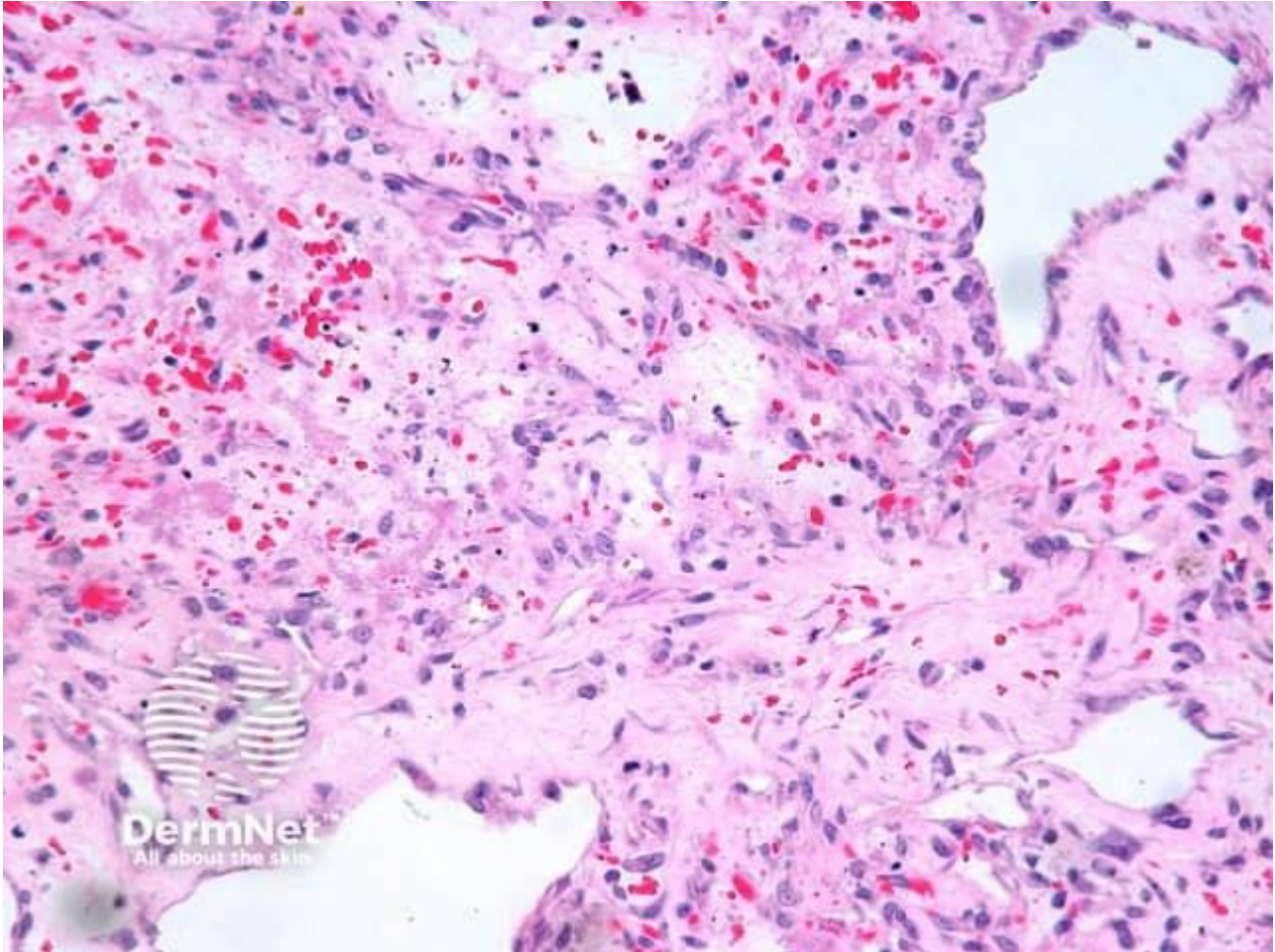
- Body louse
-

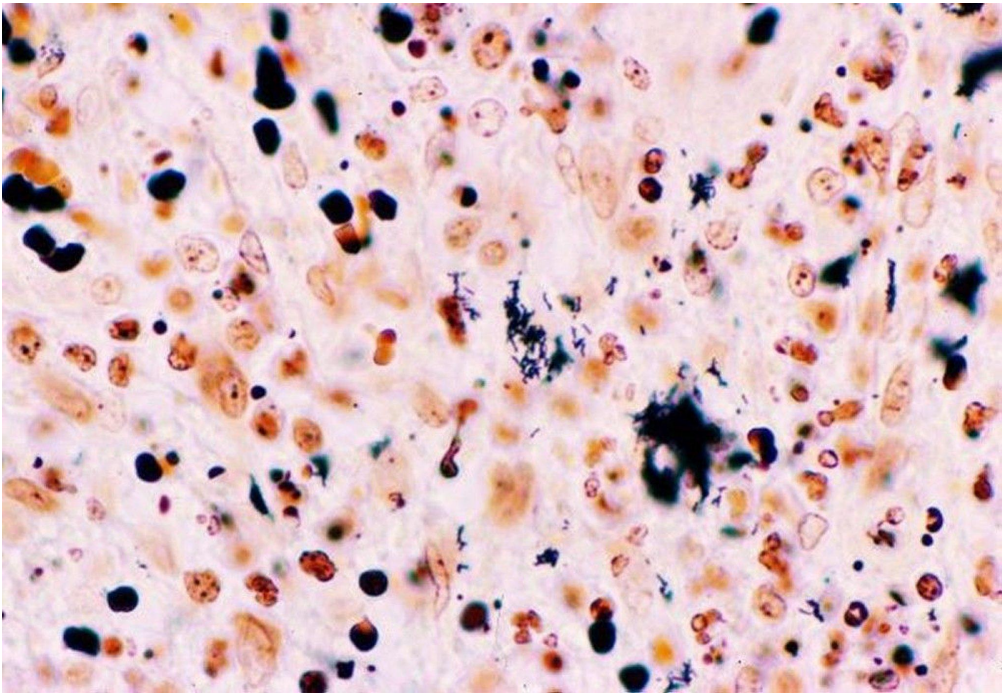
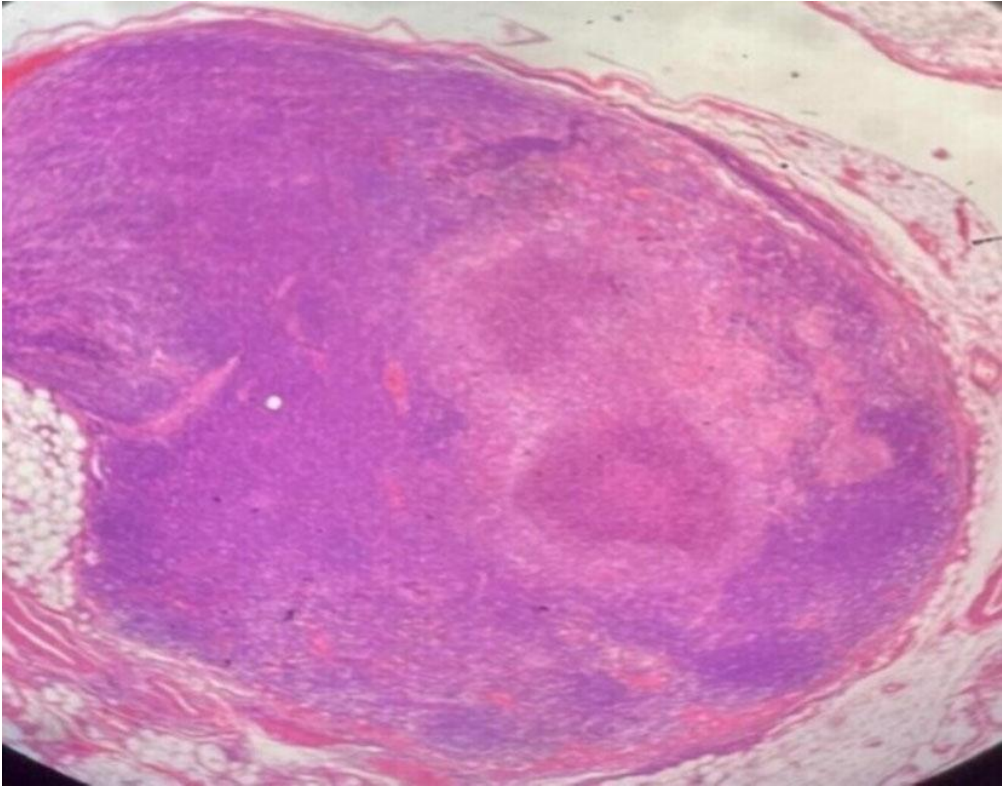
? Special Feature (VERY HIGH-YIELD)

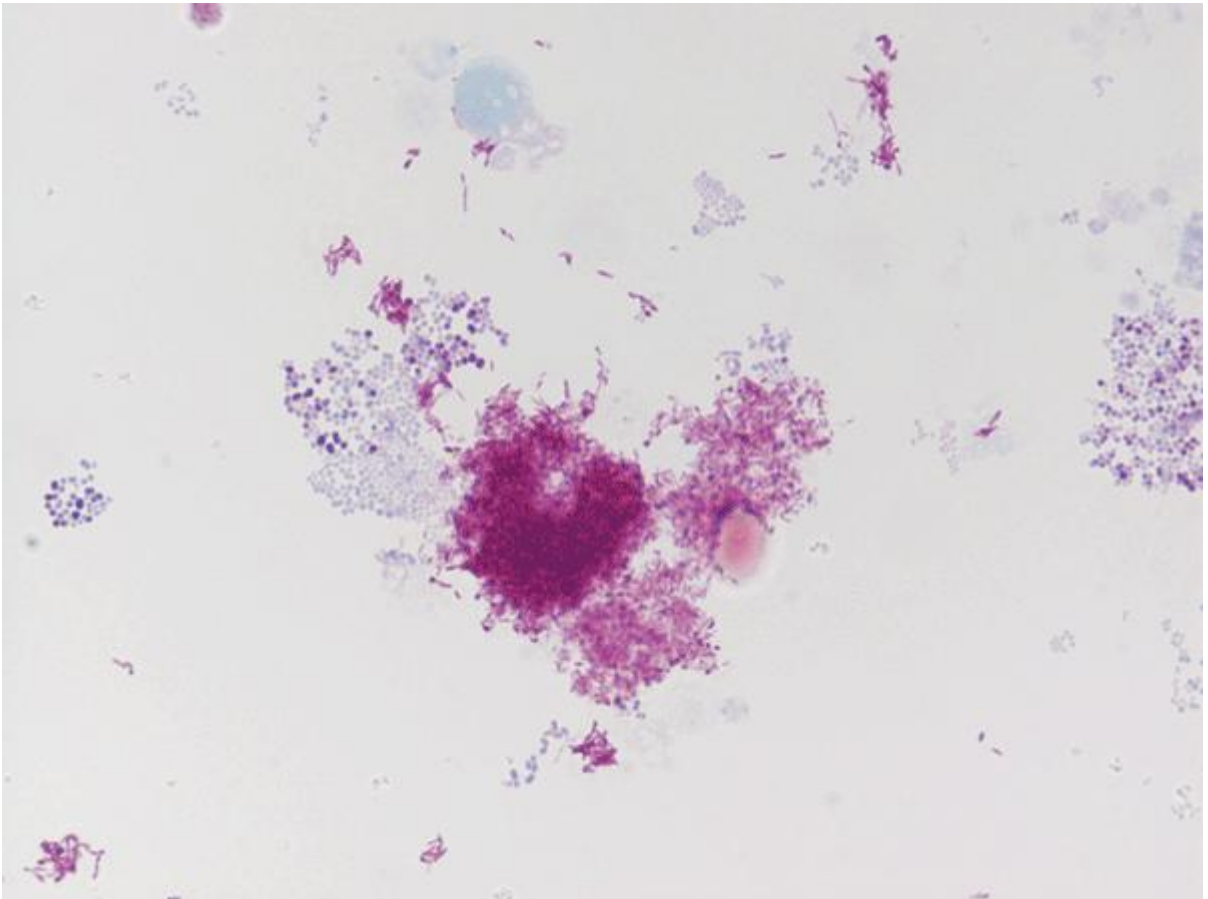
- **Angiogenesis ? Bacillary angiomatosis**
 - Seen in immunocompromised
-

? SLIDES (EXAM FAVORITE)

Bartonella histology









? STREPTOBACILLUS MONILIFORMIS

? Disease

- Rat bite fever
-

? Transmission

- Rat bite
-

? Clinical Features

- Fever
- Rash
- Arthritis

? WHIPPLE DISEASE

? Organism

- *Tropheryma whipplei*

? Pathogenesis

Infection

?

Macrophage infiltration

?

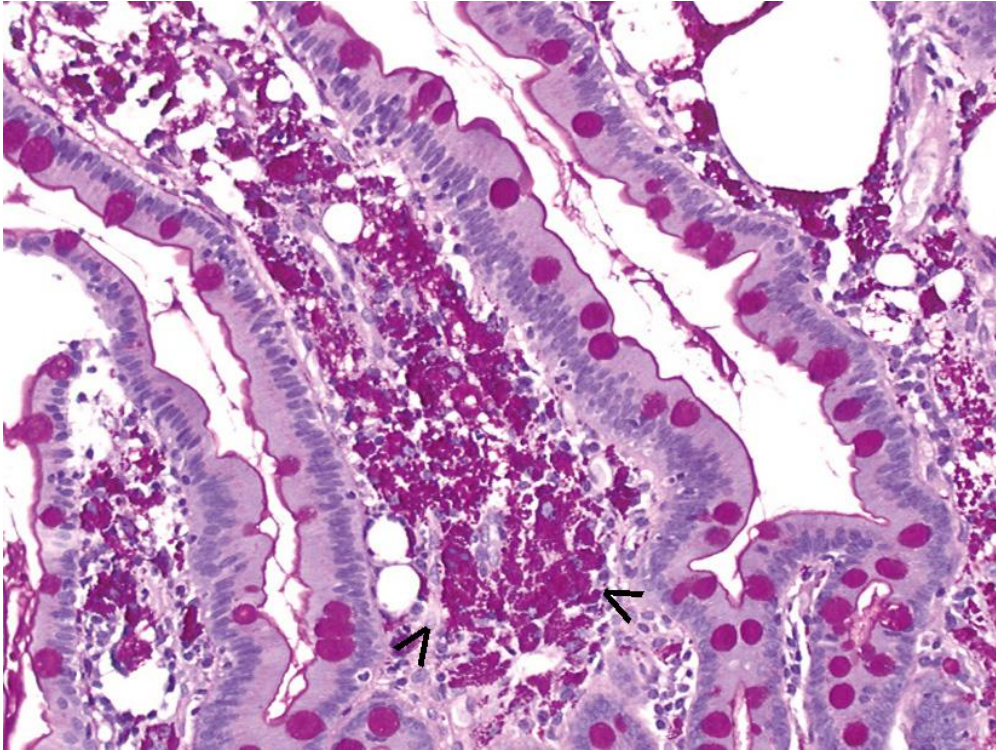
Malabsorption

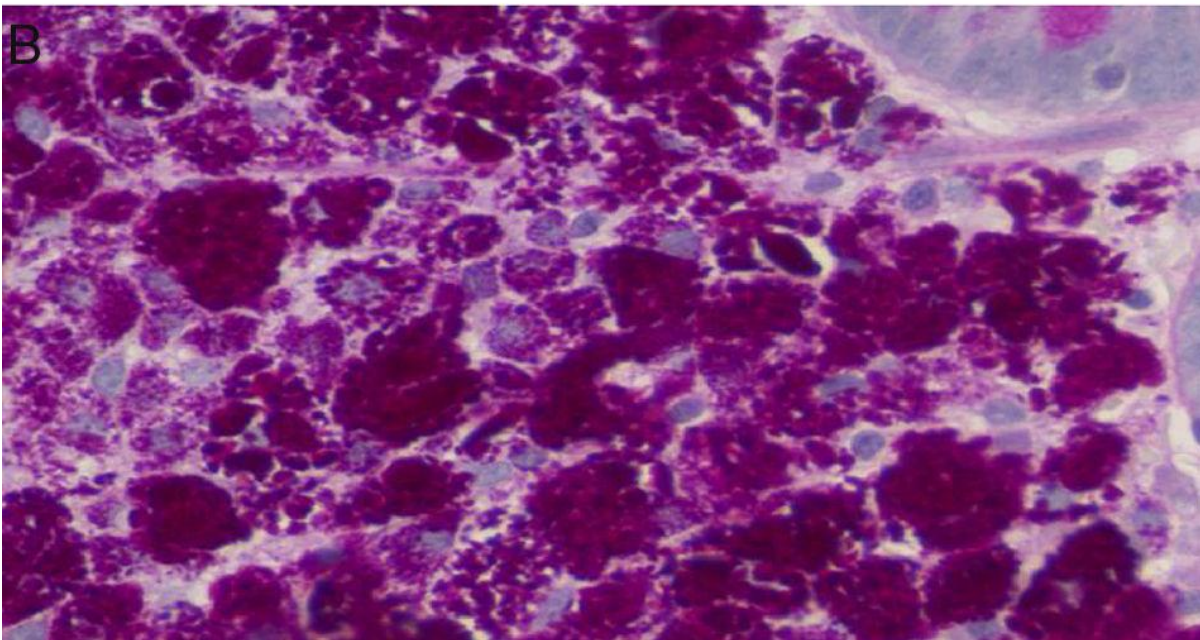
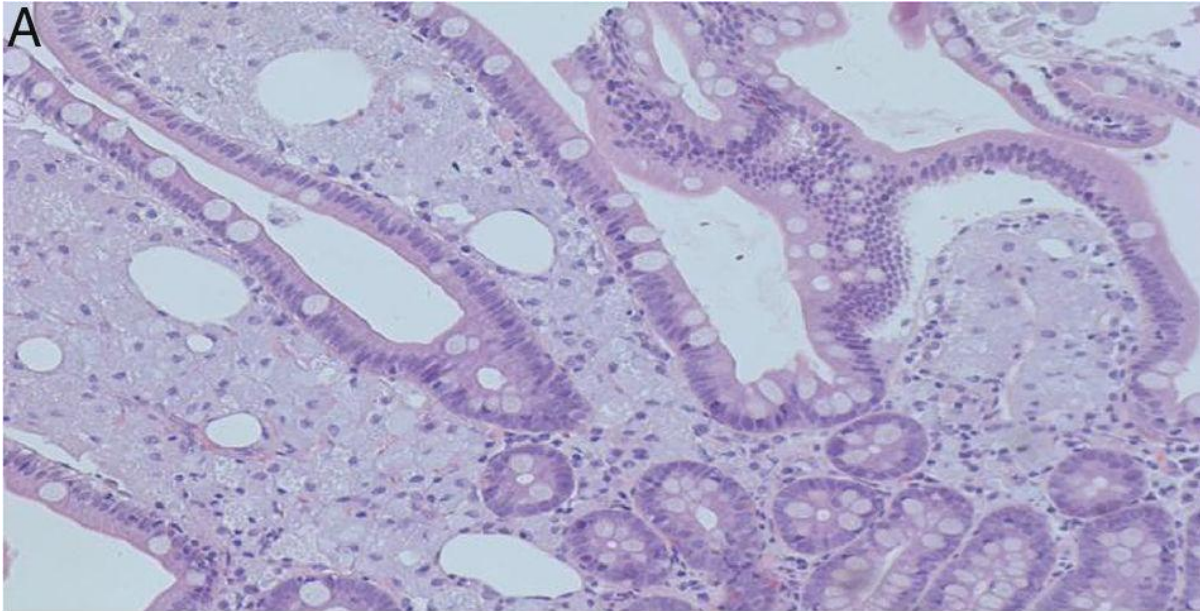
? Key Feature (VERY HIGH-YIELD)

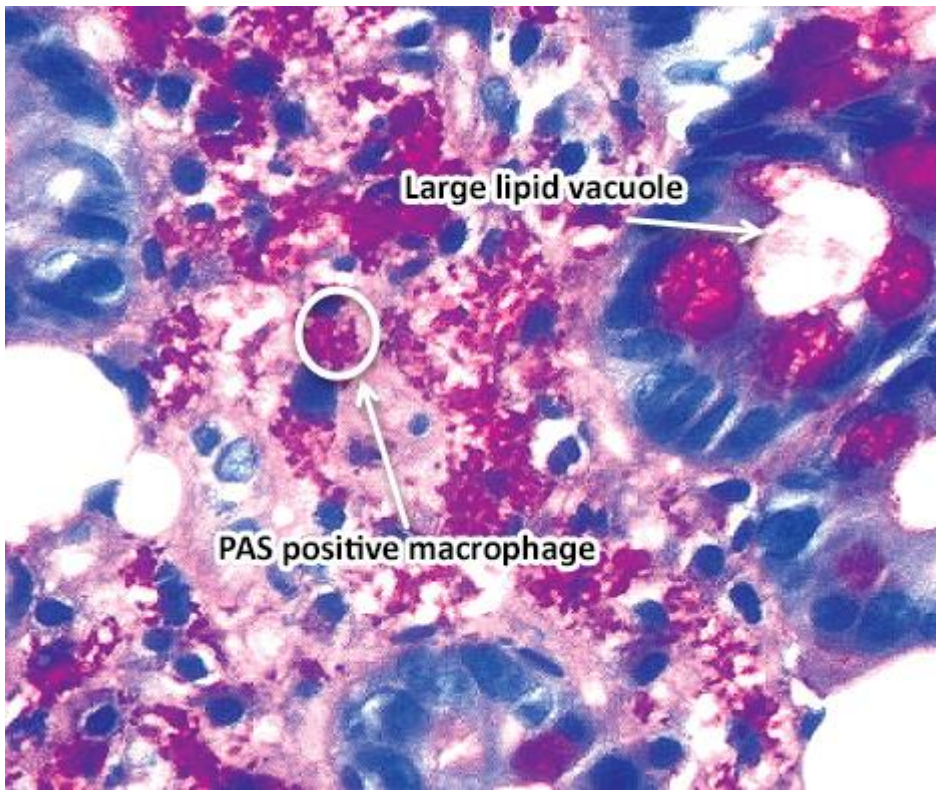
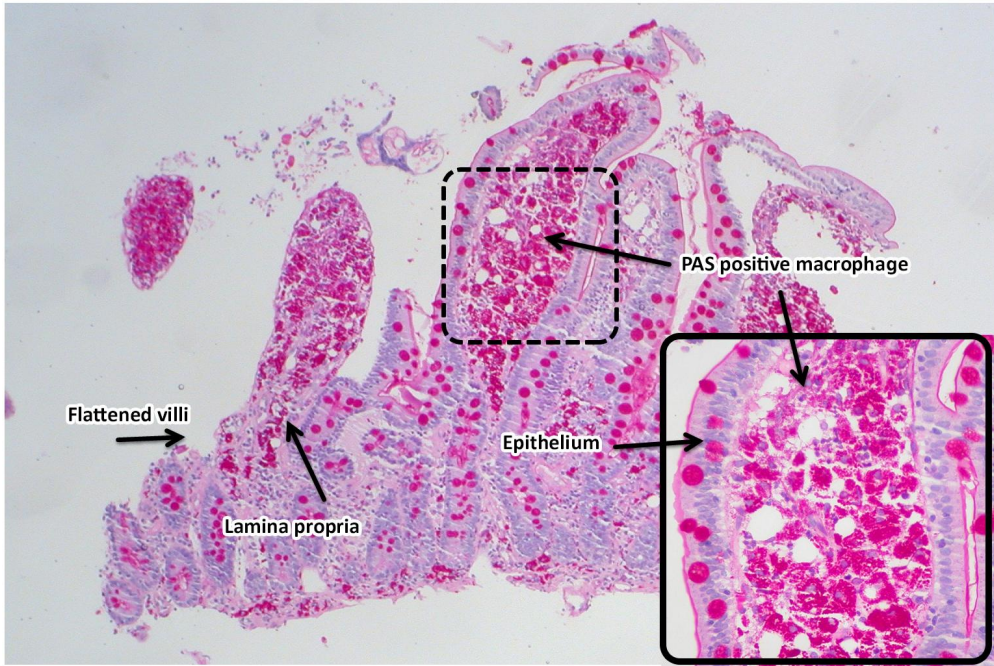
- PAS-positive macrophages

? SLIDES (EXAM FAVORITE)

PAS stain (Whipple disease)







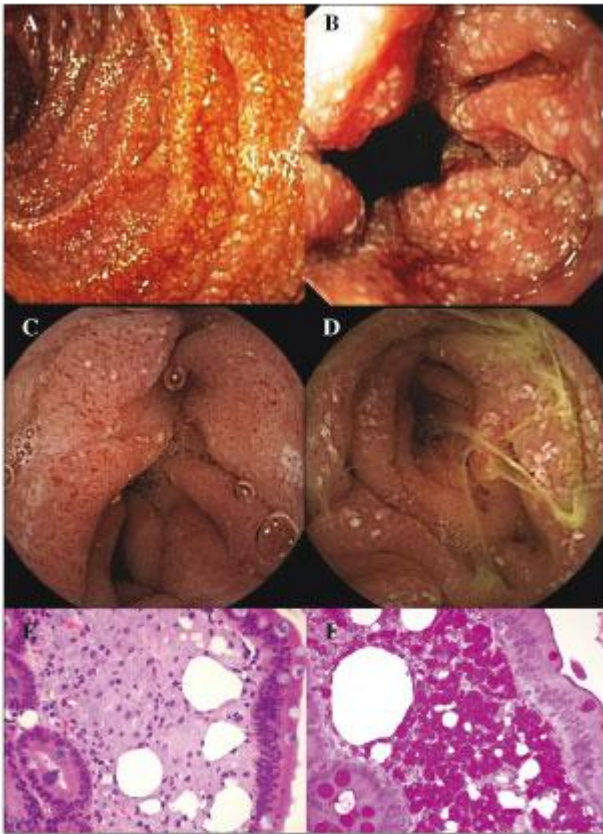


Fig. 1. Mucosa of the small bowel with areas of apparent atrophy and areas with whitish and red spots under the vision of gastroscopy (A,B) and capsule endoscopy (C,D). Duodenal biopsy specimens showed many foamy and periodic acid-Schiff (PAS) positive macrophages in the lamina propria; H&E, orig. mag. x20 (E,F).

? TABLES (VERY HIGH-YIELD)

? Legionella vs Typical Pneumonia

FEATURE	LEGIONELLA	TYPICAL (E.G., PNEUMOCOCCUS)
Transmission	Aerosol	Droplet
Staining	Poor Gram stain	Good Gram stain
Growth	BCYE agar	Blood agar

FEATURE	LEGIONELLA	TYPICAL (E.G., PNEUMOCOCCUS)
Intracellular	Yes	No

? Bartonella Species Comparison

SPECIES	DISEASE	TRANSMISSION
B. henselae	Cat scratch disease	Cat
B. quintana	Trench fever	Louse

? Zoonotic Infections

ORGANISM	SOURCE	DISEASE
Bartonella	Cat	Cat scratch disease
Streptobacillus	Rat	Rat bite fever
Pasteurella	Animal bite	Cellulitis
Yersinia pestis	Flea	Plague

? Unusual Bacteria Summary

ORGANISM	DISEASE
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Legionella	Pneumonia
Bartonella	Cat scratch disease
Streptobacillus	Rat bite fever
Tropheryma	Whipple disease

? DIAGRAMS / FLOWCHARTS

? Legionella Intracellular Survival

Inhalation

?

Macrophage uptake

?

Inhibits phagolysosome fusion

?

Intracellular multiplication

?

Cell lysis

?

Pneumonia

? Cat Scratch Disease Pathway

Cat scratch

?

Bacterial entry

?

Local infection

?

Lymph node involvement

?

Lymphadenopathy

? Zoonotic Transmission

Animal/vector

?

Human exposure

?

Entry into body

?

Infection

? HIGH-YIELD POINTS

- **Legionella ? intracellular + BCYE agar**
- **Urinary antigen ? best diagnostic test**
- **Bartonella ? angiogenesis (bacillary angiomatosis)**
- **Rat bite fever ? Streptobacillus**
- **Whipple disease ? PAS-positive macrophages**