

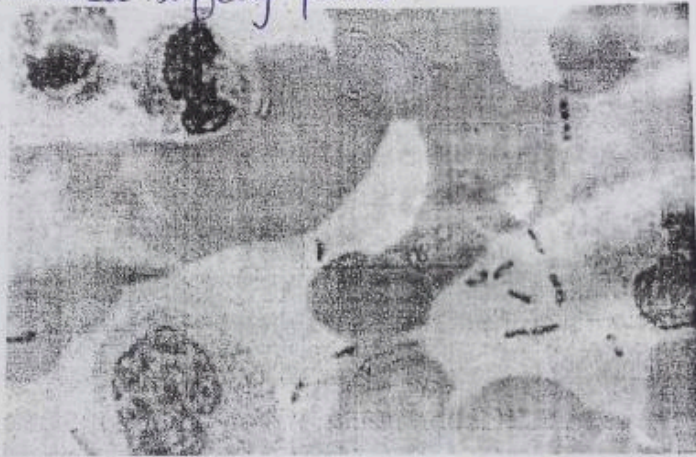
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(5)

Yersinia pestis is known as a Black death.
Yersinia enterocolitica
Yersinia pseudotuberculosis

A 27-year-old avid hiker returns from a trip to the Southwest to his home in Maine. He presents to the emergency department 3 days after his return with fever, chills, skin purpura, and an enlarged inguinal lymph node. Bacteria recovered from the lymph node resembled safety pins.

resembled safety pins.



1. What is the most likely etiology and infection? Bubonic plague caused by Yersinia pestis.
2. What is the other name of this disease? endotoxic.
3. Name the virulence factors. envelope capsular antigens, Vand W antigen.
4. What are the two cycles involved in the pathogenesis? exotoxins.
5. What are the two clinical presentations of the disease? alloading.
6. Which staining techniques are used to stain these organisms? The organism ms to stain and grow intracellularly.
7. Given that it is Gram negative and a lactose non-fermenter, how is this organism transmitted to humans to cause disease?
8. Name the other species of the bacterium.

KEY:

1. The patient most likely has **bubonic plague** (from a flea bite) caused by *Yersinia pestis*
2. Black death: **Due to** disseminated intravascular coagulation & cutaneous hemorrhages.
3. **Envelope capsular antigen**, called F-1, which protects against phagocytosis, **Endotoxin, Exotoxin** (two proteins known as V antigen & W antigen). V & W antigens allow organism to survive & grow intra-cellularly, but their mode of action unknown.
4. **Enzootic (sylvatic) cycle**: consists of transmission among wild rodents by fleas. Rodents mostly asymptomatic. Humans accidental hosts.
- ★ **Urban cycle**: which does not occur in the United States, consists of transmission of bacteria among urban rats, with **rat flea** as vector.
- 5 **Bubonic plague**: **Most frequent form**, begins with **pain & swelling of lymph nodes draining site of flea bite**. Systemic symptoms: **High fever**, myalgias, prostration. **Nodes enlarge & become exquisitely tender**. **Septic shock & pneumonia**.
Pneumonic plague: can arise either from **inhalation** of an aerosol or from septic emboli that reach lungs. Untreated bubonic plague fatal in approximately half of cases. Untreated pneumonic plague invariably fatal.
- 6 **Gram Stain**: Small, **gram-negative rod**, exhibits bipolar staining. **Giemsa or Wayson stain**: Typical safety-pin appearance of organism. **Fluorescent-antibody staining**: Identifies the organism in tissues. A rise in antibody titer to the envelope antigen can be useful retrospectively.
8. This organism is transmitted to humans via **flea bite or by inhalation**.

Giemsa
wayson
stain