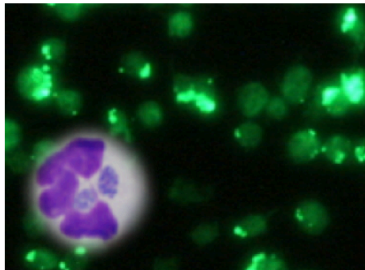


Podcast (Video Recorded Lecture Series):
Ixodes Coinfections for the USMLE Step One Exam



Ixodes scapularis



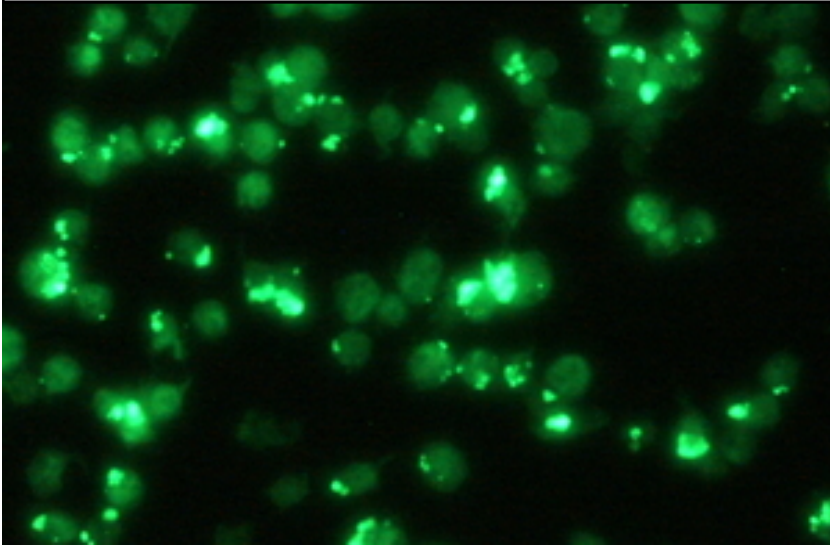
Anaplasma (morulae)



Babesia (maltese cross)

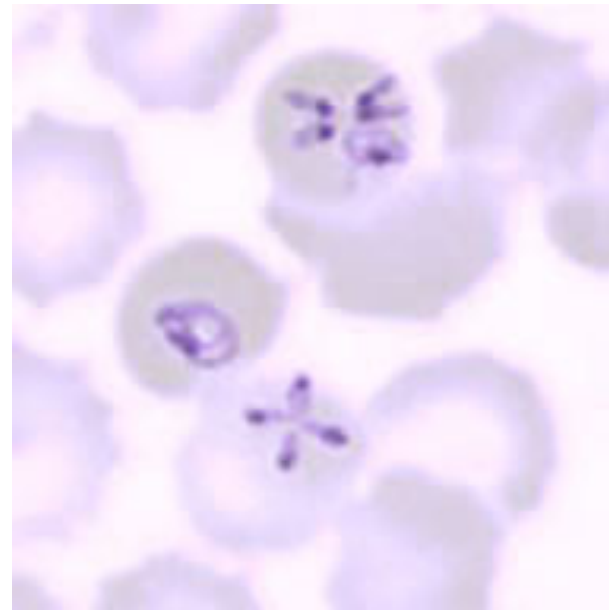
Howard J. Sachs, MD
www.12DaysinMarch.com
Email: Howard@12daysinmarch.com

Human Granulocytic Anaplasmosis



Anaplasma phagocytophilum
Intracellular pathogen

Leukopenia, Transaminase ↑
↓ Platelets

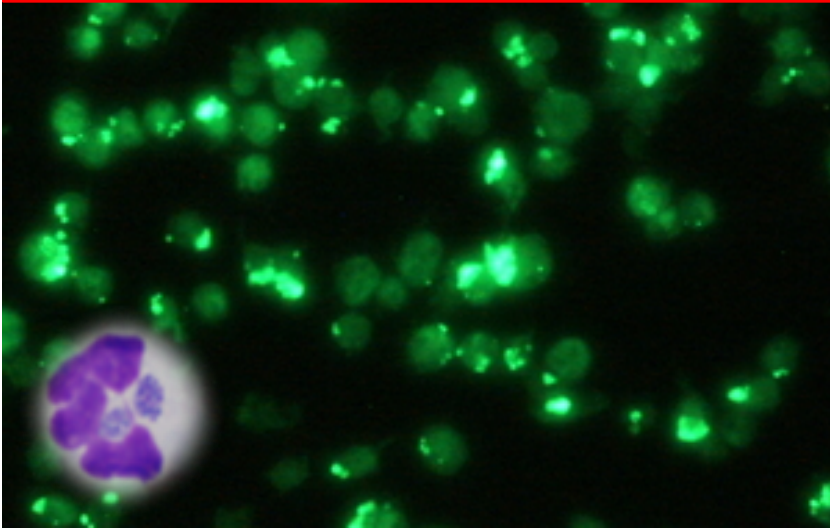


Babesia microti
Intracellular parasite

Fever, Hemolytic Anemia
↓ Platelets

Coinfection: Ixodes

Morulae



Anaplasma phagocytophilum
Intracellular pathogen

Leukopenia, Transaminase ↑
↓ Platelets

Knights of Malta (maltese cross)



Babesia microti
Intracellular parasite

Fever, Hemolytic Anemia
↓ Platelets

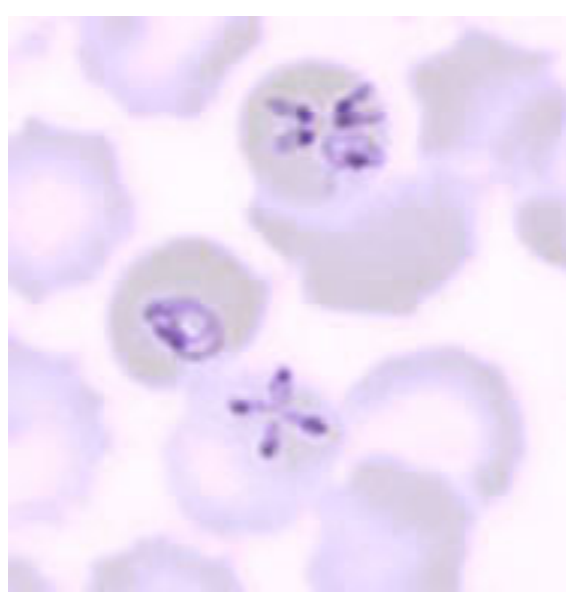
Coinfection: Ixodes



Ixodes



Patient has Lyme...



Merozoites
asexually budding

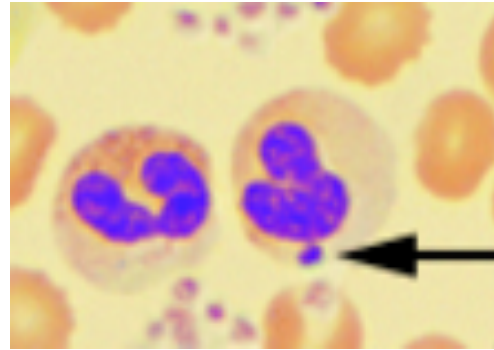
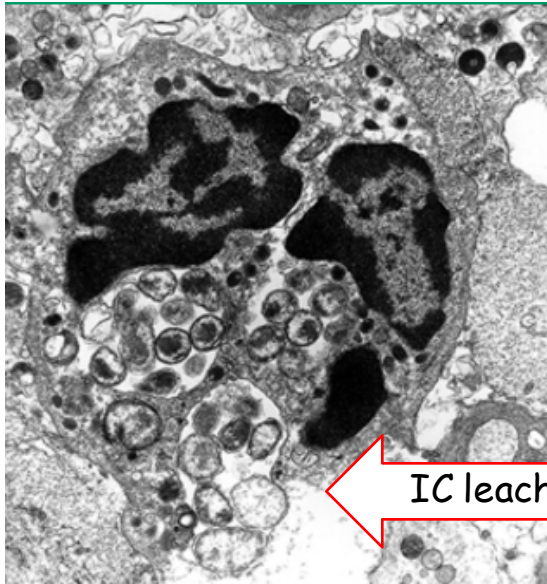
Babesiosis:

- Tick-borne **Protozoa** (not spirochete)
- **Maltese cross** is pathognomonic (not seen in malaria)
 - Dx: smear, PCR or IFA
- Clinical: fever and **hemolytic anemia**
- Labs: low plts/elevated liver chems
- Rx: **azithromycin** (macrolide - protein synthesis inhibitor; 50S ribosomal subunit) and **atovaquone**

Hemolytic anemia:

↓ HCT, haptoglobin
↑ LDH, indirect bilirubin (jaundice), reticulocytes

Phagosome → *Morulae*



Ixodes

HGA (human granulocytic anaplasma): Anaplasmosis

- Obligate intracellular bacterium; mouse reservoir
- Clinical: fever, flu-like, + rash, HA
 - Worse in elderly, infirm, immunocompromised
- Labs: leukopenia, ↓ plts, transaminitis
- Dx: Clinical suspicion, Buffy Coat (~60%), IFA (2 weeks later), PCR
- Rx: Doxycycline



Human Monocytic Ehrlichiosis: Lone star tick (*Amblyomma*), Deer reservoir
No coinfection with Lyme (*Ixodes*)