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Introduction

- Tick-borne diseases are significant health concern, especially in regions with high tick populations like Pennsylvania.
- Lyme disease, Babesiosis and Anaplasmosis are three common tick-borne illnesses that can co-occur due to the shared vectors.
- Co-infections can complicate the clinical picture and delay diagnosis, leading to increased morbidity.
- Elderly patients with multiple comorbidities are at higher risk for severe outcomes.
- Less than 10 cases have been reported with triple infection with Lyme disease, Babesiosis and Anaplasmosis in the literature.

Case Presentation

- **HPI:** An 83-year-old male with multiple comorbidities significant for splenectomy for hemolytic anemia, thrombocytopenia, no recent history of tick exposure presented to the emergency department with altered mental status, fever, profound weakness and fatigue for 5 days.
- **Vitals signs:** Temp 38.2, BP 109/61 mmhg, HR 96/min, SPO2 96% on RA
- **Examination:** Neurological assessment indicated encephalopathy but otherwise unremarkable..
- **Laboratory findings :**Anemia, thrombocytopenia and elevated liver enzymes. Initial microbiology and infectious work-up was negative.
- **Hospital Course :**With continued fever and further diagnostic workup showed peripheral smear with babesiosis and PCR testing confirmed parasitemia with *Borrelia burgdorferi*, *Anaplasma phagocytophilum*, and *Babesia microti*.
- Patient was initially treated with Doxycycline, Atovaquone, and Azithromycin. Atovaquone and Azithromycin were discontinued due to elevated liver enzymes and hepato-toxicity, and treatment was covered with clindamycin and quinine during this time. Once LFTs normalized, the patient was restarted on atovaquone/azithromycin.
- Follow-up assessments showed significant neurological recovery but persist parasitemia. Patient was discharged on antibiotics.

Peripheral Smear

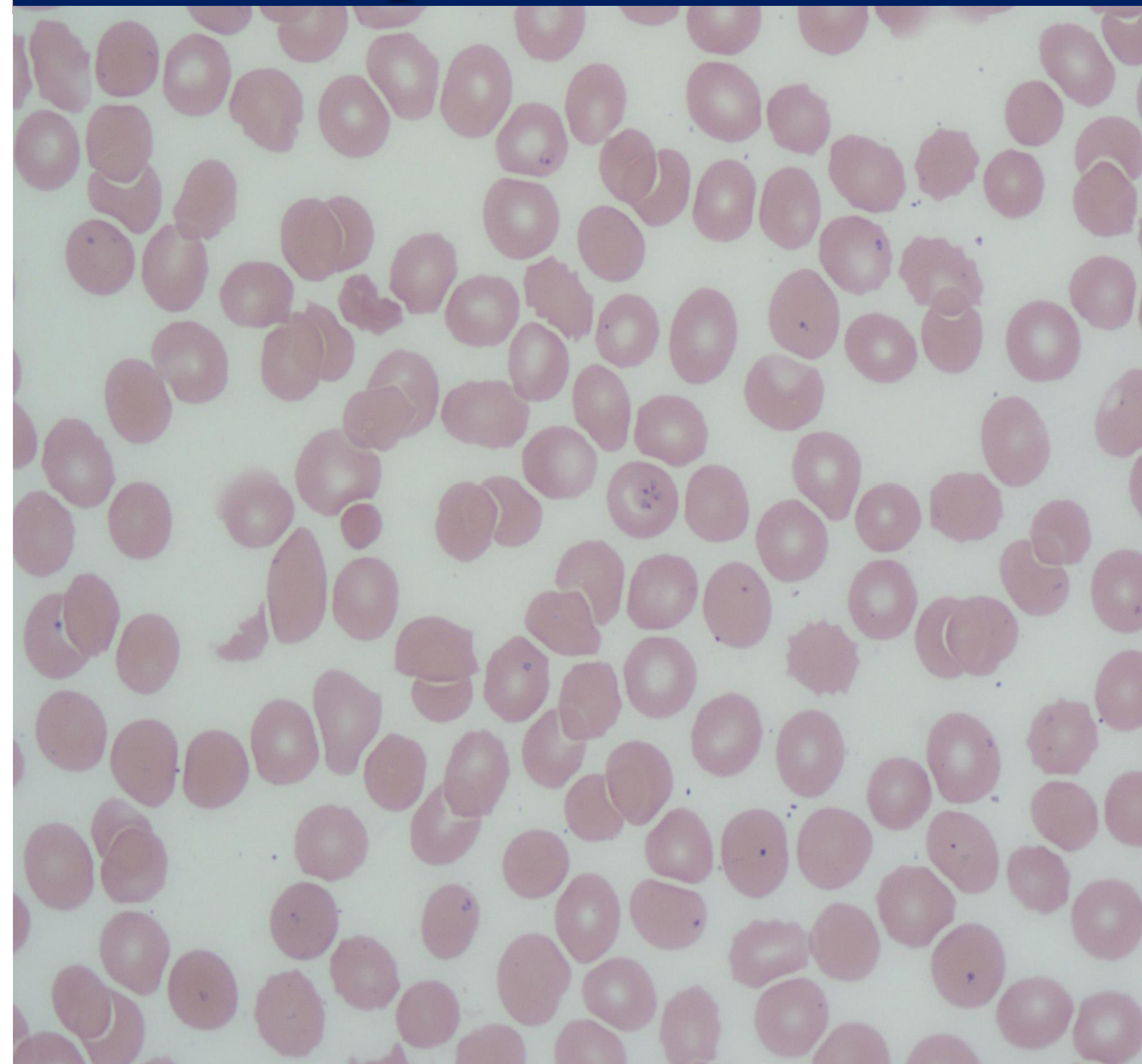


Fig 1: Intracellular Parasite (Babesiosis)

Geographic Distribution of Ixodes Species in US

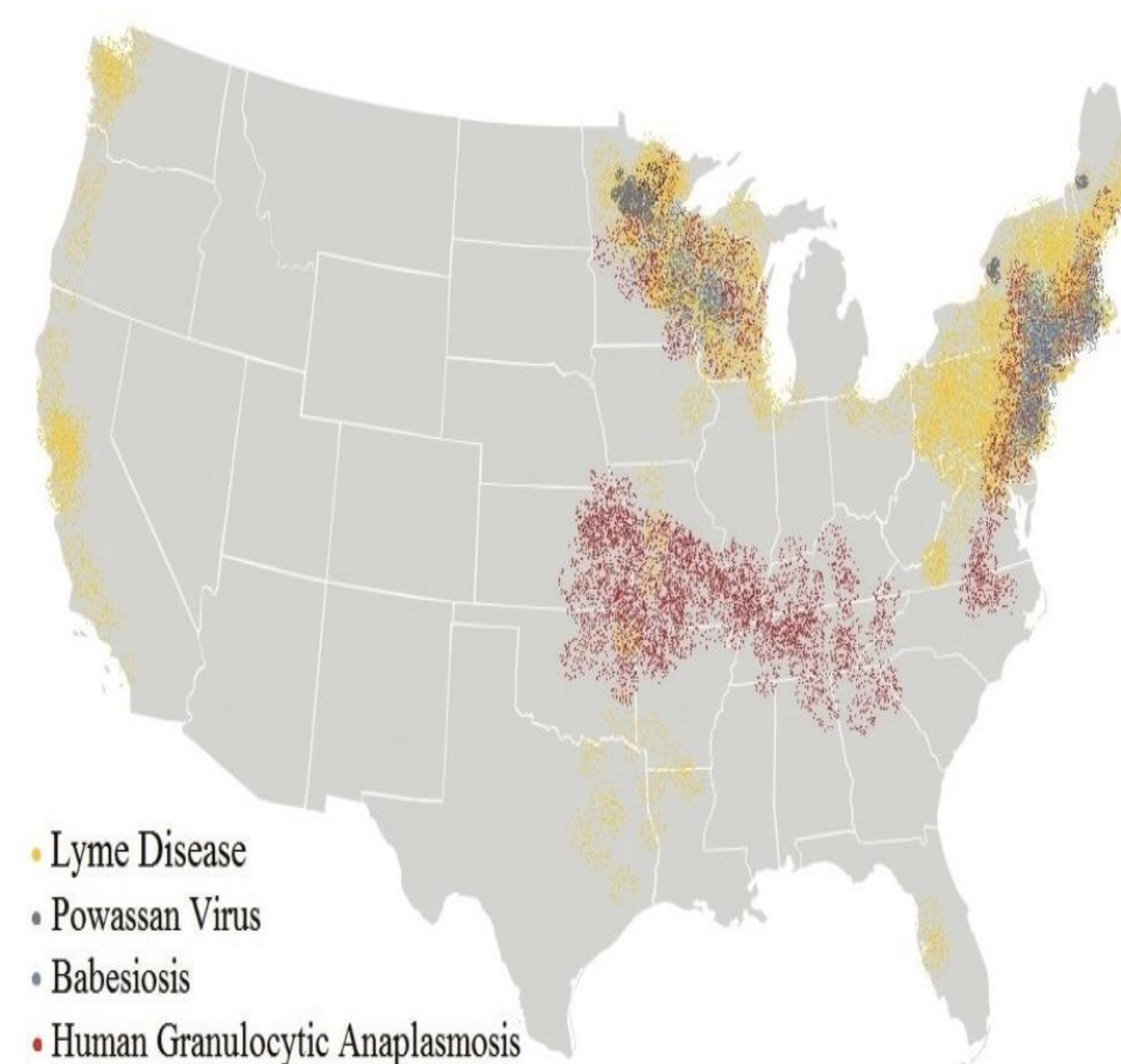


Fig 2: Approximation of the geographic distribution of reportable tick-borne diseases transmitted by Ixodes species in the United States, including Lyme disease, babesiosis, and human granulocytic anaplasmosis.

Discussion

- The co-infection of Lyme disease, Babesiosis, and Anaplasmosis presents a diagnostic challenge due to overlapping symptoms such as fever, fatigue and altered mental status, which are nonspecific and common in various medical conditions.
- In this elderly patient with multiple comorbidities and a history of splenectomy, the clinical presentation was further complicated, necessitating a high index of suspicion for tick-borne co-infections.
- Laboratory findings such as anemia, thrombocytopenia, and elevated liver enzymes pointed towards a systemic infection, but definitive diagnosis required specific serological and molecular tests.
- The patient's history of splenectomy likely exacerbated the severity of the parasitemia, as the spleen plays a critical role in filtering infected erythrocytes and mounting an immune response.

Conclusion

- This case illustrates the severe and complex nature of tick-borne co-infections, particularly in elderly patients.
- Early recognition and comprehensive treatment are critical in managing such cases.
- Clinicians should maintain a high index of suspicion for co-infections in patients presenting with nonspecific symptoms regardless of recent tick exposure, especially in endemic regions.

References

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