

INTRODUCTION

- Human granulocytic anaplasmosis (HGA) is a tick-borne infectious disease caused by *Anaplasma phagocytophilum* bacterium.
- It primarily affects granulocytes causing flu-like symptoms. Acute kidney injury (AKI) and pancytopenia are uncommon but serious presentations of HGA.
- We present a case of a patient who developed severe AKI and pancytopenia secondary to HGA.
- The patient's presentation and clinical course required comprehensive evaluation and management.

CASE HISTORY

- An 80-year-old male with a medical history of coronary artery disease, treated Lyme disease and normal baseline kidney function presented to our hospital with syncope lasting for two minutes.
- Vitals were significant for hypotension at 89/55.
- Laboratory studies revealed white cell count of 2,280 cells/uL, hemoglobin of 9.9 g/dL, platelets count of 25,000 cells/uL, blood urea nitrogen (BUN) of 37 mg/dL, creatinine of 1.8 mg/dL, potassium of 2.7 mmol/L, bicarbonate 14 mEq/L, calcium of 4.5 mg/dL.
- Urine analysis showed non-nephrotic range proteinuria and hematuria. Urine sediment showed muddy brown casts and isomorphic RBCs.

- Abdominal imaging revealed hepatosplenomegaly.
- Peripheral blood smear showed intracytoplasmic inclusions in neutrophils consistent with HGA (Figure 1) which was later confirmed with polymerase chain reaction.

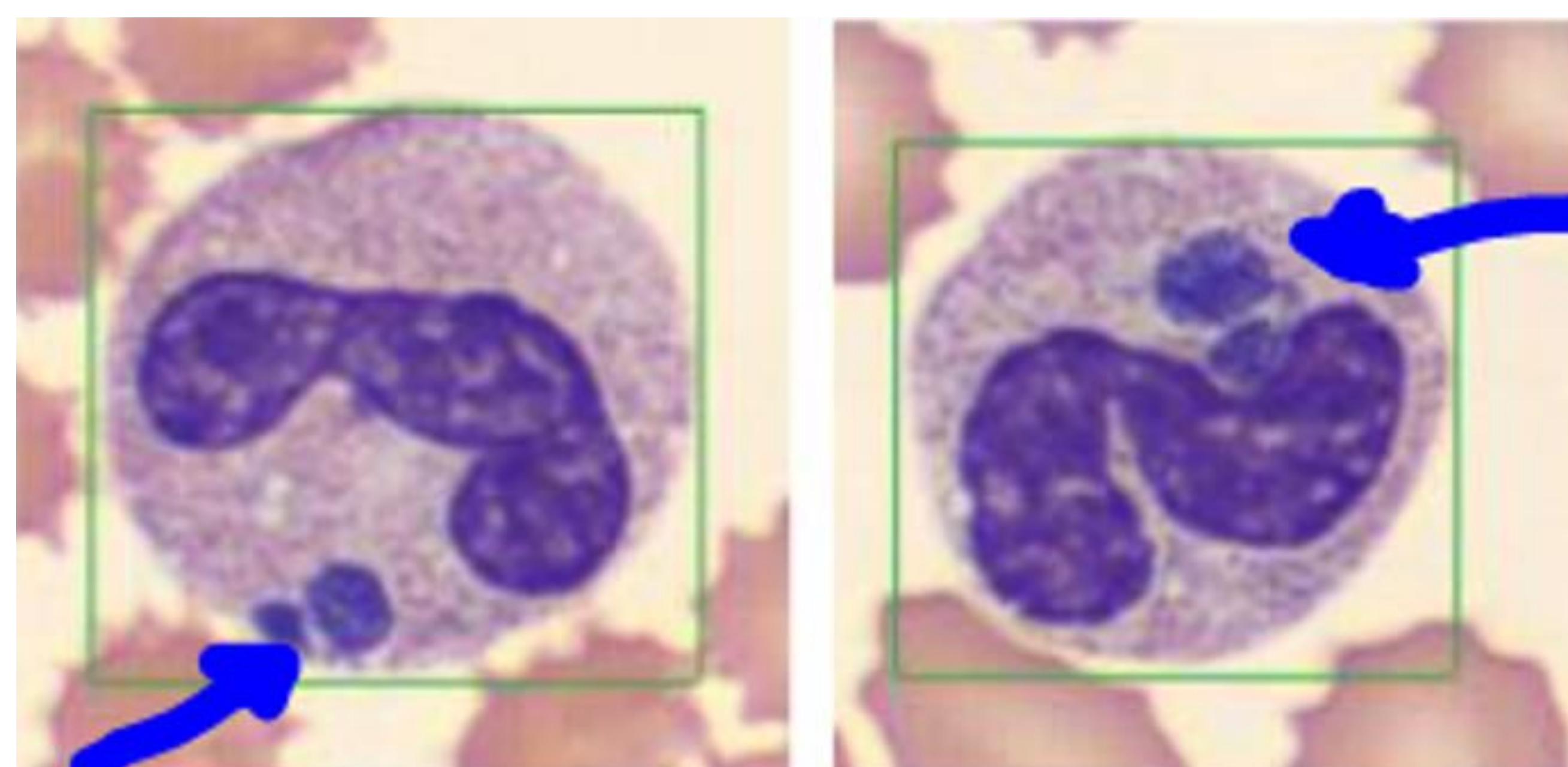


Figure 1: Blue arrows pointing towards intracytoplasmic inclusions in neutrophils

- Tick-borne illnesses work up including Lyme, Babesiosis and Ehrlichiosis came back negative.
- Patient was started on oral doxycycline.
- Despite fluid and diuretic challenges, the patient's creatinine and BUN worsened to 6.9 mg/dL and 106 mg/dL, respectively, on day 2.
- Subsequently, temporary hemodialysis was started. Blood cell counts improved significantly upon day 5 of doxycycline treatment.
- As AKI resolved completely, dialysis was stopped.
- The patient was discharged on oral doxycycline to complete a 14-day-course with close outpatient follow-up.

DISCUSSION

- While HGA is typically characterized by flu-like symptoms, significant complications can occur in certain cases.
- Patients usually become symptomatic 7-10 days after a tick bite.
- In our case, the patient was an avid outdoor person and had a history of Lyme disease.
- Acute tubular necrosis (ATN) is an uncommon but serious complication of HGA.
- In our case, the patient had a severe AKI secondary to ATN, as evidenced by granular casts on urine sediment examination, necessitating dialysis.
- The mechanism linking HGA and ATN remains unclear.
- The systemic inflammatory response triggered by the infection may lead to endothelial injury causing renal ischemia.
- Additionally, direct bacterial invasion or immune-mediated processes could possibly cause tubular injury.
- To our knowledge, this is the third case reported about an association between HGA and ATN.

CONCLUSION

- This case highlights the importance of considering tick-borne infections, such as HGA, in patients who present with ATN and pancytopenia.
- Prompt diagnosis and timely initiation of antibiotics can prevent mortality and significant morbidity.