Medical Image of the Week: Spirochetemia

Figure 1. Spirochetes (encircled) in the peripheral blood smear.

A 64-year-old woman with hypertension, hypothyroidism and prior episode of pericarditis treated with steroids presents with complaints of generalized fatigue, fevers, rigors and body aches for 5 days. The patient recently was evaluated at an outside facility and was found to have normal routine labs and negative blood cultures. She was told that her symptoms were likely related to a viral illness. Further history taking revealed that the patient had recently been staying in a cabin located in the White Mountains of Arizona about one month prior. She was exposed to the outdoors but does not recall any insect bites and did not remove any ticks. The cabin was sprayed with insecticides prior to their arrival.

The patient was initially afebrile but exhibiting tachycardia, hypotension, and tachypnea. Repeat complete blood counts revealed Leukopenia ($WBC\ 2.9 \times 10^3/\text{microL}$) and profound thrombocytopenia ($PLT\ 32 \times 10^3/\text{microL}$). Patient was admitted to the hospital with repeat blood cultures and initiation of broad spectrum antibiotics. A peripheral blood smear was reviewed with the hematopathologist which revealed visible spirochetes on microscopy (Figure 1). She was started on oral doxycycline 100 mg twice daily. The stay was complicated by acute kidney injury, elevated transaminases, and rising lactate dehydrogenase. She also suffered worsening leukopenia ($WBC\ 9 \times 10^3/\text{micro}$) and thrombocytopenia ($18 \times 10^3/\text{micro/L}$) prior to a rising trend on hospital day 3. Patient responded appropriately to oral doxycycline therapy and at the time of

discharge her symptoms had significantly subdued. Thrombocytopenia and leukopenia had resolved along with her acute kidney injury and hepatocellular injury.

Serological testing for various *Borrelia* and *Rickettsial* spp. are still pending. Given this clinical scenario and geographic location of the exposure this patient most likely contracted *Borrelia hermsii* from the bite of a soft-bodied tick (*Ornithodoros hermsi*) leading to the development of tick-borne relapsing fever (TBRF) (1). Often patients who develop TBRF will not know they were been bitten by a tick as in this case. Taking a good history of potential exposure risks and geographic locations the patient traveled to will help clinicians narrow in on diagnosing TBRF. Doxycycline is the mainstay of therapy for the treatment of TBRF with often good clinical response and complete resolution of this arthropod-borne infection.

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Reference

1. Dworkin MS, Schwan TG, Anderson DE Jr, Borchardt SM. Tick-borne relapsing fever. Infect Dis Clin North Am. 2008 Sep;22(3):449-68. [\[CrossRef\]](#) [\[PubMed\]](#)