red cell plasmodial forms as well as enables parasite quantification. Following performance specifications were determined for parasite detection: sensitivity (0.969230769), specificity (0.99383217). High correlation coefficients (0.9961) between automatically detected parasites and ground truth, on both image level and patient level, demonstrate the practicality of our method.
Conclusion: Deep learning enabled image analysis of peripheral blood smears is a promising alternative to manual identification and enumeration of red cell plasmodial forms with performance comparable to expert hematopathology reviewer.

Valproic Acid Induced Thrombocytopenia and Dysmegakaryopoiesis in a Pediatric Patient

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Introduction/Objective: Valproic acid is a branched short chain fatty acid derivative that is used primarily to treat epilepsy as well as mood disorders, certain types of headaches, and neuropathic pain. It is commonly prescribed in the pediatric population and has shown to be effective for refractory epilepsy with adequate seizure control. Serious side effects may be prominent if the medication is not kept at the therapeutic range. A wide variety of known hematologic problems can be encountered including but not limited to anemia, thrombocytopenia, and leukopenia.
Methods/Case Report: We present a case of a pediatric patient with a past medical history significant for history of seizure disorder and who presented to Jackson Memorial Hospital for intermittent fevers and multiple unexplained bruises for 3 weeks as well as fatigue and weakness.The patient was recently started on valproic acid. Complete blood count (CBC) was obtained and showed a platelet count of 23 x10(3)/mcL with WBC of 3.5 x10(3)/mcL and hemoglobin of 9.7 g/dL.Serum valproate concentration was critically high (154 mg/L). Trephine biopsy showed a normocellular marrow (60%) showing maturing trilineage hematopoiesis and scattered atypical megakaryopoiesis characterized by small forms that are seen in relatively loose interstitial clusters (Figure 1). The marrow aspirate smears were characterized by cellular spicules with dysmegakaryopoiesis including numerous small hypolobated forms with frequent forms showing separated nuclei (Figure 2, 3, and 4). Blasts did not appear increased, comprising overall 1% of marrow cellularity. Karyotype studies revealed a normal female karyotype, 46, XX. FISH studies using probes commonly detected in MDS were negative. Next generation sequencing was negative for AML specific mutations including GATA1 and GATA2 mutations.
Results (if a Case Study enter NA): N/A
Conclusion: This case report highlights the significant hematologic adverse effects of valproic acid, specifically pancytopenia with dysmegakaryopoiesis, raising the clinical suspicion of potential myelodysplastic syndrome. Critically high level of valproic acid (154 mg/L) and normalization of CBC after the stoppage of the medication strongly suggests that valproic acid can cause severe bone marrow suppression and specific morphologic atypia in the megakaryocytic lineage thus introducing a potential diagnostic pitfall. Because the CBC returned to normal, bone marrow biopsy was not repeated.

A Case Of Disseminated Histoplasmosis In A Patient With Sarcoidosis

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Introduction/Objective: Sarcoidosis is a syndrome of unknown cause that may manifest with clinical, radiographic and pathological findings similar to those seen with histoplasmosis. We present a case of disseminated histoplasmosis in an immunocompetent patient previously diagnosed with sarcoidosis.
Methods/Case Report: A 69-year-old obese male with a history of hypertension, diabetes mellitus and long-standing sarcoidosis was admitted to the hospital for several months of intermittent fevers and pancytopenia. His sarcoidosis was diagnosed 21 years prior, initially involving the lungs and eventually showing cardiac involvement, requiring a pacemaker. He had been treated with methotrexate and prednisone. His recent medical history was also significant for COVID-19 infection, diagnosed 3 months before admission. His fevers were initially attributed to sarcoidosis and his pancytopenia to methotrexate. However, his symptoms continued despite discontinuation of his medications, and further workup was initiated.
Computed tomography showed hepatomegaly, splenomegaly, and lymphadenopathy, concerning for a lymphoproliferative disorder. The patient underwent a bone marrow biopsy that showed noncaseating granulomas and microorganisms consistent with histoplasmosis on fungal stain. Bone marrow cultures were not possible as the marrow was inaspirable. The patient subsequently underwent a lymph node biopsy with both morphology and culture identifying histoplasmosis. Urine and serum histoplasma antigen also returned positive. The patient's overall clinical picture was consistent with disseminated histoplasmosis and he was administered intravenous Amphotericin B for 3 weeks followed by oral itraconazole for 1 year. One month follow-up after discharge showed significant improvement in the patient's condition.

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Results (if a Case Study enter NA): N/A
Conclusion: Sarcoidosis reduces T-cell activity, and treatment with steroids causes further immunosuppression and vulnerability for development of a disseminated infection. COVID-19 also presumably increases the predisposition to acquire bacterial or fungal co-infections. Clinicians and pathologists should be aware of the overlap in clinical, radiologic and pathological presentations of sarcoidosis and histoplasmosis to make the correct diagnosis and administer the appropriate treatment.

Outcome of patients with concurrent chronic lymphocytic leukemia and Hodgkin lymphoma

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Introduction/Objective: Concurrent diagnosis of chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL) and Hodgkin lymphoma (HL) is rare. CLL/SLL can rarely advance into Hodgkin-variant of Richter transformation, or there can be a simultaneous presence of separate CLL/SLL and HL from different clonal origins. Due to its rarity, the epidemiological features and outcome of concurrent CLL and HL are not well-known. Here we have used the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database to identify concurrent CLL/SLL and HL cases and analyzed overall and disease-specific survival across various epidemiological factors.
Methods/Case Report: We identified all patients diagnosed with CLL/SLL and HL between the period of 1975 to 2017. Next, we identified the patients with a simultaneous CLL/SLL and HL diagnosis by matching the patient identification number. Overall survival and disease-specific survival were calculated using Kaplan-Meier curves and Cox proportional hazards models.
Results (if a Case Study enter NA): We identified 166 cases with a concurrent diagnosis of CLL, and HL. 4 cases were excluded from analysis as the diagnosis of CLL and HL were not simultaneous. The age distribution of the patient showed a unimodal distribution, with most patients being diagnosed between the age of 50 and 79. 67% of patients were male, and 92% of patients were Caucasian. The majority of the CLL was diagnosed in bone marrow or lymph nodes, while almost all HL were diagnosed in lymph nodes. Both disease-specific and overall survival were worse for patients with the advanced age of diagnosis. Race or sex did not significantly affect patients' survival.
Conclusion: Our comprehensive review of clinical and epidemiological features of concurrent CLL and HL cases shows that the age of diagnosis is the most significant factor in determining the survival of these patients.

Blinatumomab resistant clone presenting as mixed phenotype myeloid sarcoma causing cord compression

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Introduction/Objective: Blinatumomab is a monoclonal antibody directed against CD19/CD3 utilized for the treatment of relapsed or refractory B-cell precursor acute lymphoblastic leukemia (ALL) and for the treatment of B-cell precursor ALL in first or second complete remission with minimal residual disease (MRD) ≥0.1%. Although Blinatumomab treatment has shown better overall survival, progression-free survival, and complete remission when compared to chemotherapy, most patients have a relapse and ultimately succumb to the disease. Interestingly, there are a number of cases reporting relapse in extramedullary places. The mechanisms for relapse in these unusual extramedullary sites are not well-understood. We herein report a case of a 20-year-old African American male with primary refractory Philadelphia-negative (Ph-) precursor B cell ALL with MLL rearrangement, who received treatment with Blinatumomab after achieving morphological remission with a pediatric-inspired regimen but found to be MRD +.
Methods/Case Report: A 20 year old African American male was found to have B cell precursor ALL. It was found to be Ph-. While initally receiving vincristine, prednisone, and aspariginase, the ALL proved to be refractory to treatment. Blinatumomab was used as second line therapy after the first failed remission. The patient remained with morphological response; however, remained MRD+ after three cycles of Blinatumomab. During the fourth cycle, the patient presented with back pain and lower extremity weakness. A spine MRI revealed an extradural mass in the thoracic spine causing cord compression. A thoracic laminectomy with partial removal of the mass, followed by radiation, was performed with improvement of symptoms. Pathology results of the extradural mass revealed a myeloid sarcoma with MLL rearrangement.
Results (if a Case Study enter NA): NA
Conclusion: This case report demonstrates how patients treated with blinatumomab can have relapse in unusual extramedullary places. The possibility of leukemia manifesting in extramedullary sites should always be kept in mind by clinicians treating patients with Blinatumomab. The mechanisms of resistance against Blinatumomab are not well- understood and need further elucidation.

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