



Coincidence of plasma cell leukemia and COVID-19: a diagnostic pitfall

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Received: 22 March 2023 / Accepted: 28 March 2023 / Published online: 10 April 2023
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Abstract

We report the case of a 66-year-old man with a known history of IgD multiple myeloma (MM) which was admitted to hospital because of acute renal failure. Routine PCR testing on admission yielded a positive result for SARS-CoV-2 infection. Examination of the peripheral blood (PB) smear revealed 17% lymphoplasmacytoid cells and a few small plasma cells mimicking morphological changes frequently seen in viral diseases. However, flow cytometric examination showed 20% clonal lambda-restricted plasma cells being consistent with a diagnosis of secondary plasma cell leukemia. Circulating plasma cells as well as similar appearing lymphocyte subtypes such as plasmacytoid lymphocytes are frequently observed in infectious disorders such as COVID-19, so that the lymphocyte morphology in our patient's case could have been easily misinterpreted as typical COVID-19-induced changes. Our observation highlights the importance of incorporating clinical, morphological, and flow-cytometric data in distinguishing between reactive and neoplastic lymphocyte changes because misinterpretation may affect disease classification and, beyond that, clinical decision-making, which may have serious consequences for patients.

Keywords Lymphocyte morphology · Plasma cell leukemia · COVID-19

A 66-year-old man with a known history of IgD multiple myeloma (MM) was admitted to hospital because of acute renal failure. Routine PCR testing on admission yielded a positive result for SARS-CoV-2 infection. Initial laboratory evaluation showed a plasma creatinine level of 7.23 mg/dL, leukocytosis with a white blood cell count of $14.6 \times 10^9/L$, and anemia with a hemoglobin of 74 g/L. In serum protein electrophoresis, an M-spike in the gamma fraction was observed, and serum immunofixation confirmed the monoclonal IgD/lambda gammopathy. Examination of the peripheral blood (PB) smear revealed 17% lymphoplasmacytoid cells and a few small plasma cells mimicking morphological

changes frequently seen in viral diseases (Fig. 1). Flow cytometric examination showed 20% clonal lambda-restricted plasma cells being consistent with a diagnosis of secondary plasma cell leukemia.

Circulating plasma cells as well as similar appearing lymphocyte subtypes such as plasmacytoid lymphocytes are frequently observed in infectious disorders such as COVID-19 [1, 2]. In a recently published literature review on the PB cell morphology in patients with COVID-19, it has been stated that almost all authors of previous studies on that topic, as in the current case, observed lymphoplasmacytoid cells with eccentric nuclei, plentiful and sometimes deep blue cytoplasm, and a perinuclear halo [2]. In light of these data, the lymphocyte morphology in our patient's case could have been easily misinterpreted as typical COVID-19-induced changes. Our observation highlights the importance of incorporating clinical, morphological, and flow-cytometric data in distinguishing between reactive and neoplastic lymphocyte changes because misinterpretation may affect disease classification and, beyond that, clinical decision-making, which may have serious consequences for patients.

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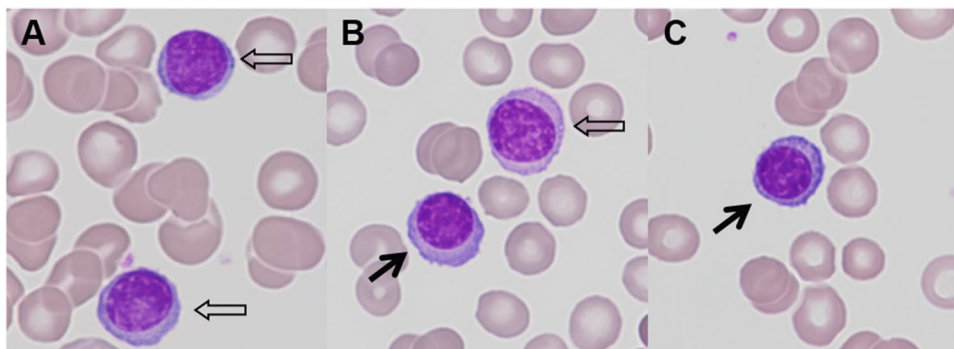
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Fig. 1 Peripheral blood smear showing **A, B** plasmacytoid lymphocytes (open arrow) and **B, C** plasma cells (filled arrow)



Funding Open access funding provided by Johannes Kepler University Linz. This study was not supported by any funding.

Declarations

Ethical approval For this type of study, formal consent is not required.

Informed consent For this type of study, informed consent is not required.

Consent for publication For this type of study, consent for publication is not required.

Conflict of interest The authors declare no competing interests.

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