

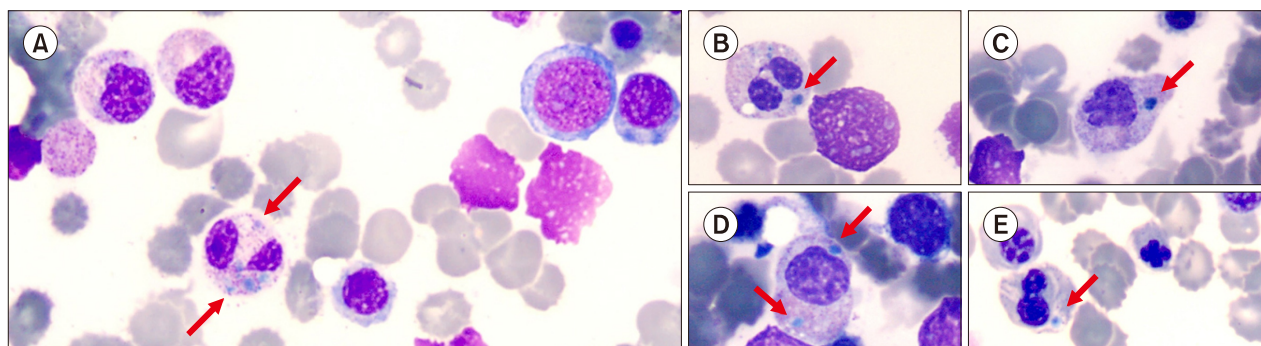
Green-blue intracytoplasmic inclusions in the bone marrow in severe COVID-19

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A 64-year-old man with the severe acute respiratory syndrome coronavirus 2 infection was on mechanical ventilation, with hypothermia. His laboratory findings showed increased ferritin (33,511 $\mu\text{g/L}$), lactate dehydrogenase (2,452 IU/L), aspartate transaminase (255 IU/L), alanine transaminase (64 IU/L), and d-dimer (18 mg/L) levels, but with normal lactate. The peripheral blood smear examination revealed multiple green-blue cytoplasmic inclusions (GBCIs) in neutrophils and monocytes and granulocytic dysplasia with inexplicable thrombocytopenia, 20 days after ICU admission. Bone marrow aspiration was performed to investigate the cause of thrombocytopenia and showed megakaryocytopenia, 3-lineage dysplasia, and GBCIs [not only in neutrophils (indicated by red arrows, **A**, **B**) and monocytes (red arrow, **C**), but also in reticular cells, myelocytes (red arrow, **D**), metamyelocytes, and, occasionally, in dyserythropoietic erythroblasts (red arrow, **E**)]. Two days later, the patient died of multiorgan failure. In peripheral blood smears, GBCIs in neutrophils and monocytes are related to lactic acidosis and phagocytosis of lipids due to liver necrosis, however, this is the first report of GBCIs in the bone marrow, in multiple cell lineages (with/without phagocytic potential) of a critically ill coronavirus disease patient, without signs of hepatic necrosis or lactic acidosis. The pathogenesis of GBCIs is unclear and may be complex.