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Hemorrhagic stroke due to leukostasis in pediatric mixed-phenotype acute leukemia

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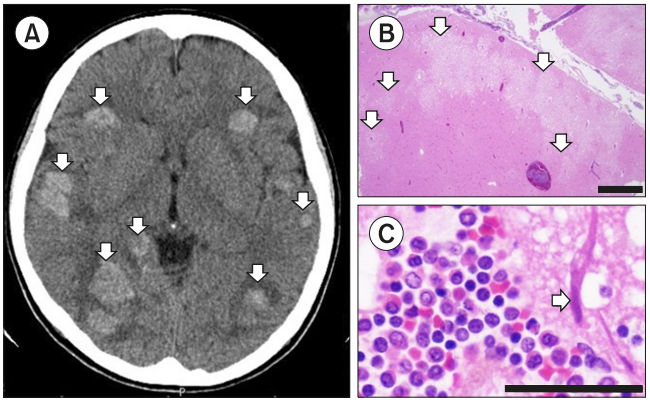

A 13-year-old Japanese boy presented to our emergency room with disturbed consciousness following a 3-day history of fever and headache. He presented with hyperleukocytosis (white cell count, 480×10^9/L; 82.4% blasts), anemia (hemoglobin concentration, 4.4 g/dL), thrombocytopenia (64×10^9/L), and impending tumor lysis syndrome with consumptive coagulopathy. Head computed tomography (CT) showed multiple intracranial hemorrhages involving the brainstem (**A**, white arrows). Thus, a diagnosis of mixed-phenotype acute leukemia with T-lymphoid and myeloid lineage markers was made within 12 hours after admission, and chemotherapy was immediately initiated. Despite intensive therapy, he died on day 4 after admission because of multiple hemorrhages and intracranial hypertension. With written informed consent from the patient's parents, a postmortem examination of the brain was performed. Histopathological study showed multiple hemorrhages, numerous large leukemic blasts in the microvessel lumens, and cerebral tissue ischemic changes (**B, C**, white arrows, hematoxylin and eosin staining); however, there was no evidence of monosomy 7 or minor *bcr-abl* fusion. These findings indicated that the rapidly proliferating blasts in leukostasis led to hyperviscosity, cerebral infarction, and subsequent hemorrhage accompanied by coagulopathy. Therefore, hemorrhagic stroke with hyperleukocytosis in teenagers is an initial presentation of aggressive leukemia.