Reversible Liver Steatosis Induced by Chemotherapy of Mixed-phenotype Acute Leukemia

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Picture 1.

A 49-year-old woman with mixed-phenotype acute leukemia received induction chemotherapy including cyclophosphamide (1,200 mg/m² on day 1), daunorubicin (60 mg/m² on days 1-3), vincristine (1.3 mg/m² on days 1, 8, 15 and 22), *Escherichia coli* L-asparaginase (5,000 U/m² on days 8, 10, 12, 14, 16, 18, 20 and 22), and prednisolone (60 mg/m² on days 1-14). Laboratory evaluation at diagnosis revealed a

marked elevation in liver enzyme levels (AST, 353 IU/L; ALT, 354 IU/L; and T-bil, 1.1 mg/dL), possibly due to hepatic involvement of leukemia. The liver enzyme levels improved; however, on day 19, after six injections of L-asparaginase, the liver enzyme levels suddenly re-elevated (AST, 191 IU/L; ALT, 184 IU/L; and T-Bil, 3.1 mg/dL). Computed tomography (CT) showed diffuse low attenuation

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Picture 2.

of the liver (Picture 1). Chemotherapy was discontinued and a liver biopsy revealed severe diffuse steatosis involving >90% of the hepatocytes (Picture 2). Induction chemotherapy was unsuccessful, and subsequent high-dose cytarabine was administered. The patient then underwent haploidentical reduced-intensity stem cell transplantation. She achieved complete chimerism and remission. The liver enzyme levels and the CT attenuation values of the liver also improved (Picture 1).

In the present case, all administered chemotherapeutic agents were candidates for potentially inducing severe steatosis. The increased incidence of L-asparaginase-induced liver dysfunction has been reported when L-asparaginase is used in combination with vincristine and prednisolone (1). The severity of hepatic damage caused by chemotherapy including L-asparaginase is unpredictable (2). It is difficult to

distinguish between leukemia infiltration of the liver and drug-induced hepatotoxicity. In this context, a liver biopsy is informative for the differential diagnosis.

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