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CLINICAL IMAGE

Acute Budd-Chiari syndrome with thrombotic thrombocytopenia after BNT162b2 mRNA vaccination

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A 34-year-old female visited the clinic with increased abdominal circumference and pitting oedema of the lower extremities for 3 weeks. Liver enzymes were within the normal range on the laboratory examinations several months ago. She was not receiving oral contraceptives or hormone replacement. Importantly, she received the first dose of the BNT162b2 mRNA vaccination 6 weeks prior. Initial laboratory findings revealed an aspartate transaminase of 835 U/L, alanine transaminase of 454 U/L, platelet count of 57 000/μl, and D-dimer of 11.53 mg/L fibrinogen equivalent units (FEU); reference value, 0.80 mg/L FEU. The pregnancy test result was negative. Test results for protein C and protein S levels were normal and factor V Leiden mutation was not present. Screening tests for anti-phospholipid antibody and anti-cardiolipin antibody were negative. Molecular testing for JAK2 and calreticulin showed negative results. Contrast-enhanced abdominal CT scan revealed poor liver enhancement, abruptly collapsed hepatic veins without membranous structure, decreased portal vein flow without collateral vessels or splenomegaly, and concomitant ascites (Figure 1A). Pulmonary thromboembolism was noted in the right inferior pulmonary artery without any specific symptoms. Hepatic venography identified only small branches of the venous outflow as 'spiderweb appearance' (Figure 1B). Liver biopsy demonstrated dilated sinusoids with extensive perisinusoidal hepatocyte dropout (Figure 1C). Masson Trichrome staining demonstrated no fibrosis in the portal tract and perisinusoidal area (Figure 1D). Collectively, these findings suggested Budd-Chiari syndrome (BCS) which occurred relatively recently. For the treatment, intravenous immunoglobulin and direct oral anticoagulants were given to the patient. One month later, thrombocytopenia disappeared and venous flow in Doppler ultrasonography showed markedly restored.

BCS is defined as the obstruction of hepatic venous outflow, and clinical findings develop rapidly over a few weeks in the acute form, with ascites and possible liver injury without collateral veins.[1] Diagnosis of vaccine-induced thrombosis with thrombocytopenia (VITT) is considered definite when meeting all the following criteria and probable when one is missing: onset of symptoms 5–30 days after the vaccination, presence of thrombosis, thrombocytopenia, elevated D-dimer level, and positive anti-PF4.[2] Our patient can be diagnosed as a probable VITT case because anti-PF4 was not tested. VITT has been reported after vaccination against SARS-CoV-2 with vaccines, mainly, adenoviral vector-based vaccines.[3] Very recently, a case of BCS after ChAdOx1 nCoV-19 adenoviral vaccination was reported.[4] However, increased risks of VITT were also observed after the first dose of the mRNA vaccines.[5,6] Here, we present the first case of acute BCS with thrombotic thrombocytopenia after BNT162b2 mRNA vaccination.

CONFLICT OF INTEREST

All authors disclose no conflicts.

Abbreviations: BCS, Budd-Chiari syndrome.

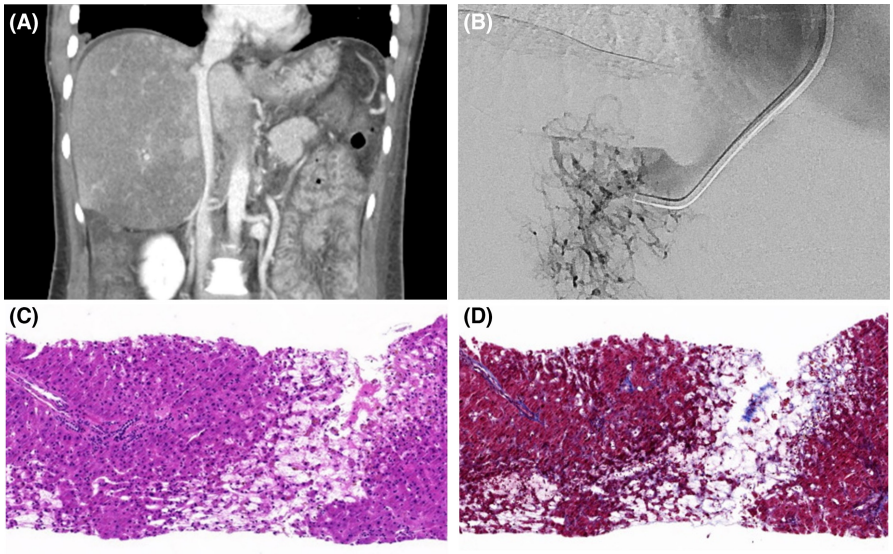

FIGURE 1 (A) Contrast-enhanced abdominal CT scan shows abruptly collapsed hepatic veins without membranous structure, decreased portal vein flow without collateral vessels or splenomegaly, and concomitant ascites. (B) Hepatic venography identified only small branches of the venous outflow as 'spiderweb appearance.' (C) Liver biopsy demonstrated dilated sinusoids with extensive perisinusoidal hepatocyte dropout. (D) Masson Trichrome staining demonstrated no fibrosis in the portal tract and perisinusoidal area, suggesting the venous outflow obstruction which occurred relatively recently

INSTITUTIONAL REVIEW BOARD STATEMENT

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board of the Catholic University of Korea (KC21ZISI0941).

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