Acute Myocarditis After Discontinuation of Immune Checkpoint Inhibitor Therapy

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A 49-year-old woman (Patient 1) diagnosed with parotid gland cancer and a 36-year-old man (Patient 2) diagnosed with tongue cancer received pembrolizumab, a type of immune checkpoint inhibitor (ICI), every 3 weeks. Electrocardiograms and echocardiograms recorded during the treatment periods showed no abnormalities. Pembrolizumab was discontinued after 299 and 105 days of treatment because of poor efficacy, and cetuximab and paclitaxel were administered instead. Both patients experienced dyspnea on days 44 and 48, respectively, after the last dose of pembrolizumab.

Echocardiography conducted at the onset of symptoms revealed marked left ventricular wall thickening (Patient 1: 13 mm, Figure A; Patient 2: 14 mm, Figure E; Supplementary Movie) associated with pericardial effusion and preserved left ventricular systolic function. Electrocardiography showed low voltage in the limb leads in Patient 1, and ST elevations in V1–3 in Patient 2. Recent viral infections were ruled out; histopathological examination of right ventricular specimens showed mild interstitial edema associated with the infiltration of CD3-positive cells (Patient 1: Figure C,D; Patient 2: Figure G,H). Hence, both patients were diagnosed with acute heart failure due to myocarditis. They were intravenously administered 1,000 mg/day methylprednisolone for 3 days. Around 10 days later, the left ventricular wall thickening markedly improved (Patient 1: 8 mm, Figure B; Patient 2: 8 mm, Figure F; Supplementary Movie), and the patients recovered without needing oral prednisone or other targeted immunosuppressants.

The second-line anticancer drugs and the long half-life of pembrolizumab (27.3 days) possibly contributed to the myocarditis. Therefore, patients should be monitored for myocarditis even after the completion of ICI treatment or during subsequent treatment with other anticancer drugs.

Disclosures

None.

Reference


Supplementary Files

Supplementary Movie. Echocardiography of the patients. Please find supplementary file(s); http://dx.doi.org/10.1253/circj.CJ-22-0613

Figure. Echocardiographs showing left ventricular wall thickness before (A, E) and after treatment for myocarditis (B, F). Histopathology shows edematous change and lymphocytic infiltration (H&E: C,G; immunohistochemistry: D,H).