A DETERMINATION SYSTEM FOR CIRCULATING TUMOR CELLS (CTCs) USING GFP EXPRESSING TELOMERASE-SPECIFIC REPPLICATION-COMPETENT ADENOVIRUS IN BONE AND SOFT TISSUE SARCOMA

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Aim: The concept of circulating tumor cell (CTC) is of great interest recently in the field of cancer treatment. CTCs defined as cancer cells of solid tumor origin found in the peripheral blood, and have been detected in the patients with advanced cancer. However, CTCs have also been detected in patients with localized cancers, indicating the risk of progression to metastatic disease. Although many papers on CTCs have been published, there is no report on CTCs detected in patients with bone and soft tissue tumors. We analyzed CTCs in the peripheral blood of patients with sarcoma.

Methods: 7.5ml of blood was collected from the patients, and CTCs were assessed using TelomeScan (OBP-401), which GFP-expressing attenuated adenovirus-5 vector, in which the hTERT promoter regulates viral replication. A total of 22 patients with bone (6 osteosarcoma) and soft tissue sarcoma (4 myxofibrosarcoma, 4 liposarcoma, 3 DFSP, 2 synovial sarcoma, 3 others) patients were enrolled. GFP-expressing cells were labeled with anti-CD45 (a marker for blood cell), anti-vimentin antibody (a marker for mesenchymal cell) and DAPI stain (a marker for cell nucleus) 24 hours after the virus infection to ensure that cells labeled with GFP were indeed sarcoma cells.

Results: CTCs were detected in 11 of 22 sarcoma patients (4 osteosarcoma, 3 myxofibrosarcoma, 2 DFSP, 2 others). Average number of CTCs was 3.5 cells per 7.5ml. 3 patients with positive CTC showed negative CTC after sarcoma resection, and 4 patients with positive CTC showed negative CTC after chemotherapy. 5 of 22 patients developed lung metastasis, 4 of those showed positive CTC at diagnosis.

Conclusions: CTCs were detected in 50% of patients with bone and soft tissue sarcoma in our series. CTC detection using TelomeScan has been reported only in patients with cancer. We identified that the detection system using TelomeScan can be a new approach to visualize live human CTCs from bone and soft tissue sarcoma, and that CTC can be also a biomarker for bone and soft tissue sarcoma.

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