Aim: Circulating tumor cells (CTCs) in peripheral blood are a useful prognostic factor and a tool for measuring the treatment effects in various carcinomas. We attempted to detect viable CTCs in the peripheral blood of sarcoma patients using a telomerase-specific viral agent. We then investigated whether there was a correlation between numbers of CTCs and other clinical features of sarcomas to determine whether these factors can be used as parameters of aggressiveness or prognosis.

Methods: Seventeen blood samples were obtained from 12 soft tissue sarcoma patients with soft tissue sarcoma of trunk or extremity before and/or after surgery. The samples were collected from 7 males and 5 females with an average age of 73 years. Four patients presented with myxofibrosarcoma, 2 with pleomorphic sarcoma, 2 with liposarcoma histology and others. Histological grades were assigned according to the French Federation of Cancer Centers Sarcoma Group (FNCLCC) system. One patient was diagnosed with grade 1, 2 with grade 2, and 9 with grade 3 sarcoma. The average duration of postoperative observation was 18.1 months (range: 3 to 40 months). Four patients developed a lung metastasis without local recurrence after surgery. We detected viable CTCs in the 7.5 ml blood samples after incubating them with a telomerase-specific, replication-selective, oncolytic adenoviral agent carrying the green fluorescent protein (GFP) gene (OBP-401). GFP-positive cells were counted under a fluorescence microscope.

Results: The average number of CTCs was 6.5 (range: 0-65). There was a significant difference in number of CTCs between the patients with grade 3 (average 7.2) and those with grade 1 and 2 (average 2.8) (p=0.045). A decrease in the number of postoperative CTCs compared to number of preoperative CTCs was significantly related to lung metastasis (p=0.046). The number of CTCs was not related to gender, age, tumor location, and tumor size.

Conclusions: A significant relationship emerged among the number of CTCs, histological grade, and occurrence of lung metastasis in patients with sarcoma. The detection of CTCs using OBP-401 may be useful for prognostic evaluation.

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