

Carbon Ion Radiotherapy For Bone And Soft Tissue Sarcoma And Its Histological Findings

Katsuhiko Hayashi, Norio Yamamoto, Toshiharu Shirai, Akihiko Takeuchi, Hiroaki Kimura, Shinji Miwa, Hiroyuki Inatani, Yu Aoki, Takashi Higuchi, Kensaku Abe, Hiroyuki Tsuchiya

Department of Orthopaedics

Graduate School of Medical Science, Kanazawa University

13-1 Takara-machi, Kanazawa 920-8641, Japan

The efficacy of carbon ion radiotherapy (CIRT) for bone and soft tissue sarcoma has been reported recently. Most of the reports are of radiological assessments, and histological analysis after CIRT remains unclear. In this study, we report the clinical outcomes and histological findings of patients treated with CIRT.

Seventeen patients (8 men and 9 women, average age, 52.3 years) were diagnosed in our hospital with 5 osteosarcomas, 5 chordomas and 7 other sarcomas. Tumor locations were the sacrum (n=9), the ilium (n=4) and the other trunk (n=6). Six patients had received standard chemotherapy beforehand. Because the anatomical constraints posed difficulties for surgery, CIRT was selected as local therapy and performed at Gunma University or the National Institute of Radiological Sciences in Chiba, Japan. The mean duration of follow-up was 22.1 months; 14 patients were alive, and 3 patients died of lung metastasis. Four patients showed local recurrence as a mildly increasing mass. Needle biopsy was performed a total of 10 times, for an average of 13.1 months (range, 2 to 30 months) after CIRT in 6 patients. Viable tumor cells or atypical cells were found in 8 of 10 specimens; however, only 2 cases showed a recurrent mass on radiological examinations. The other 6 cases had stable disease. This may be due to observation of dying cells or radiation-induced deformed cells. CIRT was safe and provided good local control for unresectable bone and soft tissue sarcoma. Histological evaluation after CIRT should be done carefully.