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Editorial

# Current status and future expectations in treatment of bone and soft tissue sarcoma

The 50th Annual Musculoskeletal Tumor Meeting of the Japanese Orthopaedic Association (JOA) will be held in Tokyo on July 13 and 14, 2017. It is a great honor for the Department of Orthopedics of Toho University to be hosting this traditional academic meeting. This meeting was initially held as a meeting of the Bone Tumor Study Group in 1968 and has been held as the Annual Musculoskeletal Tumor Meeting of the JOA since the 22nd meeting. The latest results from basic studies and work on pathology, radio diagnosis, and treatment of bone and soft tissue tumors have been presented at this meeting, and these presentations have made a major contribution to advances in diagnosis and treatment of these tumors.

Progress in multidisciplinary treatment of bone and soft tissue sarcoma has improved overall survival, and limb-salvage surgery based on a safety margin is now established. Surgical therapy includes conservation of the main nerves and blood vessels using in situ preparation method and imaging-assisted securing of surgical margins in regions with a complex morphology, such as the pelvis. Moreover, favorable retention of the function of the affected limb is now being attempted in reconstruction by combining tumor prosthesis with a recycled bone graft and plastic surgery. Carbon ion radiotherapy for unresectable bone and soft tissue sarcoma has been covered by national health insurance since April 2016, and this has increased the treatment options for local control of a pelvic tumor.

We have now entered a new era in which overall survival and treatment are considered in the context of long-term QOL. This includes maintenance of the function of the affected limb and reproductive function postoperatively, and measures against late complications. Support other than medical care may also be important for social life after completion of treatment, including employment, marriage, and childcare, but recognition and support by the community may still be insufficient. The number of young cancer survivors has recently increased and many of them want to have a child [1]. Yonemoto surveyed marriage, reproduction rate, and QOL in 46 long-term survivors of osteosarcoma, using their brothers as controls. There was no difference in the marriage rate, but the reproduction rate was 58.6% in patients, in contrast to 81.8% in controls [2]. On evaluation of QOL using SF36, the QOL of all patients were lower than the national standard for physical functioning, but were higher than national standards for other parameters, with no marked differences between limb salvage and amputation cases [3].

We also evaluated QOL using SF36 in 45 patients at 5 or more years after treatment of bone and soft tissue sarcoma in combination with limb salvage reconstruction. Physical function was lower than the national standard, but other parameters, such as mental health, were within the normal range, as found by Yonemoto. Treatment of bone and soft tissue sarcoma may have reached to an acceptable level in Japan, if limited to survivors after treatment. However, in our survey, patients treated with additional surgery after unplanned excision of soft tissue sarcoma had good physical function, but mental health was lower than the national standard. Unplanned excision of superficial soft tissue sarcoma by departments other than orthopedics has been a concern in Japan, since invasiveness increases in additional surgery for unplanned excision [4]. To solve this problem, the JOA formulated the Clinical Practice Guidelines for Diagnosis and Treatment of Soft Tissue Tumors, with the aim of providing basic knowledge on diagnosis, treatment and accessibility. These guidelines are intended for orthopedists and plastic and general surgeons involved in treatment of soft tissue tumors, and the second edition (2012) has been published. Guidelines in other countries include the NCCN soft tissue tumor guidelines (National Comprehensive Cancer Network Clinical Practice Guidelines in Oncology). In developed countries, it is recommended that general practitioners limit themselves to rapid diagnoses and refer patients to a specialized institution for treatment upon confirmation of diagnosis of sarcoma. The NCCN guidelines provide detailed information for oncologists, and the contents differ from those of guidelines aimed at providing basic knowledge for physicians who may be involved in treatment, such as the JOA clinical practice guidelines for soft tissue tumors.

To survey the current state of treatment of soft tissue tumors in Japan, we performed a questionnaire survey of utilization of the clinical practice guidelines for soft tissue tumors (2nd edition) in treatment of soft tissue tumors. It also requested information on biopsy and diagnostic methods for soft tissue tumors, surgical treatment, and experience of unplanned excision. The questionnaire was distributed to 83 bone and soft tissue tumor consultation facility of the JOA, 476 hospitals with orthopaedic specialists certified by the JOA, and 106 doctors certified in skin tumor surgery by the Japan Society of Plastic and Reconstructive Surgery.

Responses were obtained from 381 physicians (338 orthopedists and 48 plastic surgeons; response rate: 57%). The guidelines were possessed by individuals or the facility in 58% of responses (orthopedics: 60%, plastic surgery: 46%), and used or sometimes used by 54% of these respondents, and used very little or not at all by 46%.

More than 50% of plastic surgeons performed treatment of soft tissue tumors, and only 13% of them referred patients to orthopedists. Regarding diagnosis, 37% referred the MRI diagnosis to radiologists, 23% resected and pathologically examined tumors, and 23% performed biopsy to decide on a treatment strategy. Of the

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respondents, 83% stated that performance of treatment was made possible by referring to textbook on soft tissue tumors.

On the other hand, many orthopedists appropriately made a judgment on whether patients should be referred to an oncologist or treated at their facility, depending on the case. This may have been due to special training sessions and educational lectures on bone and soft tissue tumors in the medical specialty board of the JOA. This was implemented in 2002 and it has increased awareness of the importance of the initial diagnosis of bone and soft tissue tumors.

As to biopsy, the details of the guidelines were understood by 35% of orthopedists and 19% of plastic surgeons.

Regarding unplanned excision in the last 3 years, 58% of plastic surgeons had performed this procedure, but only 28% of orthopedists, including referred patients. 67 cases of unplanned excision were performed in orthopedics department, 54 cases in plastic surgery, 45 cases in dermatology, and 44 cases in general surgery [5].

These findings suggest that the clinical practice guidelines for soft tissue tumors are not sufficiently utilized at clinical sites, compared with guidelines for cancers in other fields, and that there is insufficient awareness of the recommendations. Therefore, there is a need to investigate utilization and dissemination of revised guidelines Inter-departmental activities among departments involved in treatment of soft tissue tumors, other than orthopedics, may also be necessary to increase understanding of diagnosis and treatment. Moreover, public awareness of bone and soft tissue sarcoma is poor, and more public activities may also be necessary to decrease the number of advanced-stage cases.

Another current task is the development of molecular targeted therapy for bone and soft tissue sarcoma. The results of new treatment with this type of drug have been frequently reported for cancers of other organs. For bone and soft tissue sarcoma, results of basic studies on pathology and treatment at the genetic level have been reported. However, there is a need for accumulation of cases and inter-departmental collaboration for development of molecular targeted drugs, since sarcoma is a rare cancer with a small number of cases and many types and pathologies at the genetic level.

This is the 50th anniversary of this meeting, and this year's meeting is entitled 'Our Footsteps over the last 50 Years and our Future Vision'. In addition to discussing accumulation of cases and inter-departmental collaboration for complete cure of sarcoma, we will discuss the important subjects described above, the current status of the safety margin in surgery, imaging diagnosis and imaging-assisted surgery, treatment plans that consider long-term QOL, and genetic studies, with the goal of establishing the future directions of studies and treatment. I hope that these discussions will advance the goals of appropriate diagnosis and uniform accessibility to treatment of sarcoma in Japan.

In addition, a joint meeting with the Bone and Soft Tissue Tumor Club of Japan is planned to facilitate participation by pathologists and radiologists. We are looking forward to participation by many members of the JOA and physicians of departments involved in diagnosis and treatment of sarcoma.

I am sure that we will see further development of this meeting in the future. We entrust the younger participants to make further progress with diagnosis and treatment, including genetic diagnosis, development of molecular-targeted drugs against sarcoma, reconstruction by regenerative medicine, and limited surgery combined with adjuvant therapy.

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