

Editorial

The development of a new strategy in the management of bone and soft tissue tumors

YOSHIKI HAMADA

President of the 40th Annual Musculoskeletal Meeting of Japanese Orthopaedic Association
Department of Orthopaedic Surgery, Interdisciplinary Graduate School of Medicine and Engineering, University of Yamanashi,
1110 Shimokato, Chuo, Yamanashi 409-3898, Japan

Recent improvements in outcomes including survival prognosis and functional recovery for bone and soft tissue tumors have been remarkable. These improvements are due to advantageous adjuvant therapy that is the combined result of the development and administration protocols or plans for new anti-tumor medicines or new radiation therapy, and skillful surgical procedure consisting of complete excision based on a surgical staging system and reconstruction. Among these treatments, complete excision of the primary lesion is the most important for obtaining a good survival prognosis, because surgical treatment leads to greater efficacy of adjuvant therapy. Therefore, it would not be an exaggeration to say that surgical treatment plays a central role in the present treatment of bone and soft tissue tumors.

To surgically excise a primary lesion reliably, it is important to apply an adequate surgical margin based on accurate grading of the tumor's malignancy. Thus, it is necessary to utilize a surgical staging system. Recently, several surgical staging systems have been proposed; however, there is no consensus on which systems are clinically available.

During my 2 years (1980–82) abroad at the Department of Orthopedic Surgery at the University of Florida, I personally observed for the first time a systematic surgical treatment using a surgical staging system developed by William F. Enneking. I still remember that I was surprised at the difference in thinking between Japan and the United States regarding treatment. Upon returning to Japan, I introduced Enneking's surgical staging system to Japanese orthopedic surgeons. Many of my surgical cases have focused on this surgical staging system with a slightly reduced radical margin. From these experiences, I consider Enneking's surgical staging system to be the most clinically valid. Enneking's

system classifies tumors into 5 stages based on the grade of malignancy, invasive extension, and presence or absence of metastasis. Therefore, the first steps toward accurate application of the system are the correct diagnosis based on histopathological classification and the evaluation of the invasiveness.

To make a correct diagnosis, accurate understanding of imaging and histopathological findings is critical. Recently, many young orthopedic physicians tend to rely most on magnetic resonance imaging (MRI) findings when making a diagnosis of any disease or trauma case. However, for bone tumors, plain radiography is the most important diagnostic imaging. Although MRI and computed tomography (CT) are very useful in evaluating invasive extension, they contribute little to diagnosis. On the other hand, CT and MRI are important in the clinical diagnosis of soft tissue tumors. It is important for young orthopedic physicians to use the most suitable imaging for a disease or trauma. Particularly in cases with tumors, it is very important to select an appropriate examination method to obtain a correct diagnosis.

The first step toward making a correct diagnosis with histopathological findings is an adequate biopsy. There are two types of biopsy, needle and open. I performed the latter as a general rule. The accuracy of diagnosis is reported to be about 90% or more for needle biopsy. However, most of that 90% may be diagnosed by clinical and radiological findings, because mesenchymal malignant tumors have various histological features. I believe that needle biopsy may be useful for confirming the final diagnosis obtained by clinical and radiological findings in these cases. Thus, open biopsy is the general rule. When performing such a biopsy, one must send a small specimen of tumor tissue to the pathology department to obtain a pathological diagnosis with the frozen section. Even if it is difficult to obtain a diagnosis, one can confirm the inclusion of tumor tissue in the harvested specimens. At present, there is controversy re-

garding the usefulness of frozen sections. The question will be discussed in this scientific meeting, but I consider open biopsy and immediate pathological diagnosis with a frozen section extremely important in accurate histopathological diagnosis and in planning how to excise the lesions.

It is becoming more common to depend on radiologists and pathologists to perform a diagnosis based on imaging and histopathological data. It is commonly agreed that it is extremely important for each medical specialist to accurately interpret the data to make a correct diagnosis. The importance of cooperation among orthopedic surgeons, radiologists, and pathologists has always been emphasized. I believe that the central figure in this cooperation should be the orthopedic surgeon, who always bears responsibility for patient outcomes. Therefore, an orthopedic surgeon who may treat tumors must become knowledgeable in imaging and histopathology in order to better communicate with radiologists and pathologists, particularly to discuss a questionable diagnosis.

After diagnosis, whether to perform preoperative chemotherapy depends on the histological diagnosis and tumor site, but chemotherapy is necessary for most tumors from the aspect of reducing the primary tumor size and control of micrometastasis. However, the effectiveness of chemotherapy on each of the different histological types has not been fully demonstrated clinically. One reason for this situation is the rare occurrence of bone and soft tissue sarcoma compared with the occurrence of carcinoma, and another is the scarcity of data on the effectiveness of chemotherapy. To resolve this problem, a multicenter study is necessary, and its development is just beginning. The immediate establishment of this system is important to obtain better outcomes for bone and soft tissue sarcoma.

For planning the surgery, first an appropriate surgical margin must be determined; but at this stage, one must not think about the reconstruction after excision of the primary lesion for preserving the affected limb. As a

result of reliable excision of the primary lesion with an adequate surgical margin, a sound procedure for the reconstruction should be planned if preservation of the affected limb is possible. In some cases, amputation alone can ensure an adequate surgical margin. One must not forget that amputation is one surgical procedure in which functional reconstruction is possible using an artificial limb. In Japan, lifestyles are gradually becoming Westernized. Therefore, when amputation is compared with a limb salvage procedure that may create greater opportunity for postoperative infection or severe joint contracture, amputation may provide better quality of life (QOL). There have been reports that the survival prognosis is the same in cases with limb salvage procedure as in those with amputation. However, such reports have little clinical significance. An adequate surgical margin is important and leads to a better outcome, particularly survival prognosis. In cases in which a limb salvage procedure cannot achieve complete removal of the primary lesion with an adequate surgical margin, the orthopedic surgeon should recommend amputation.

In the 40th Annual Musculoskeletal Tumor Meeting of the Japanese Orthopaedic Association, symposium and panel discussions of the above-mentioned items have been planned. I hope that participation by many physicians and energetic discussions among them will lead to positive results for patients and their clinical outcomes.

The 40th Annual Musculoskeletal Tumor Meeting of the Japanese Orthopaedic Association will be held on July 12–13, 2007, at Kofu City, Yamanashi Prefecture. It is my great honor to have the opportunity to conduct that annual meeting.

Reference

1. Hamada Y. The treatment for malignant bone and soft tissue tumors. *Orthop Surg (Zasshi-Seikeigeka)* 1981;34:871 (in Japanese).