Available online at www.sciencedirect.com

ScienceDirect

EJSO 40 (2014) 49–54

EJSO the Journal of Cancer Surgery

www.ejso.com

Favorable outcome after complete resection in elderly soft tissue sarcoma patients: Japanese Musculoskeletal Oncology Group study

Y. Yoneda [a], T. Kunisada [b,*], N. Naka [c], Y. Nishida [d], A. Kawai [e], T. Morii [f], K. Takeda [a], J. Hasei [a], Y. Yamakawa [a], T. Ozaki [a], Japanese Musculoskeletal Oncology Group

[a] *Department of Orthopaedic Surgery, Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences, Okayama, Japan*
[b] *Department of Medical Materials for Musculoskeletal Reconstruction, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama, Japan*
[c] *Department of Orthopaedic Surgery, Osaka University Graduate School of Medicine, Osaka, Japan*
[d] *Department of Orthopaedic Surgery, Nagoya University Graduate School and School of Medicine, Aichi, Japan*
[e] *Department of Orthopaedic Surgery, National Cancer Center Hospital, Tokyo, Japan*
[f] *Department of Orthopaedic Surgery, Kyorin University, Tokyo, Japan*

Accepted 1 September 2013
Available online 13 September 2013

Abstract

Background: The surgical management of soft tissue sarcoma (STS) in elderly patients has only been addressed in a few studies. The objective of the current study was to assess surgical outcomes in patients with STS aged 70 years and older and the association of older age with the survival after complete resection.

Methods: A retrospective analysis was conducted in 158 elderly patients with localized STS who visited 11 institutions participating in Japanese Musculoskeletal Oncology Group between 1995 and 2006 and were treated by surgical resection. Univariate and multivariate analyses were performed to identify prognostic factors.

Results: Median follow-up period was 38 months. Histologically high-grade tumors were detected in 71% of the patients. Wide resection with adequate margins was performed in 66% of the cases. Systemic chemotherapy was performed in only 5 patients. Univariate analysis identified histological grade and gender as statistically significant prognostic factors for sarcoma-specific survival. Multivariate analysis did not identify significant prognostic factors for sarcoma-specific survival, although high grade sarcoma emerged as a potentially significant prognostic factor ($P = 0.050$). Local recurrence was detected in 19% of the patients. Multivariate analysis of local recurrence-free survival showed that tumor site and surgical margins were statistically significant prognostic factors.

Conclusions: Older age was not identified as a prognostic factor for sarcoma-specific survival, which is not consistent with the findings of previous studies showing that older age was associated with decreased sarcoma-specific survival. Complete resection should be indicated and can lead to optimal treatment outcome for properly selected elderly patients.

Keywords: Elderly; Sarcoma; Soft tissue; Resection

Introduction

The proportion of the elderly population is rapidly increasing in developed countries, especially in Japan. Seventeen percent of Japanese citizens were 70 years and older in 2011, which is the highest percentage of elderly people in the world (Ministry of Internal Affairs and Communications, 2011). The incidence of soft tissue sarcoma (STS) in senior citizens is increasing,[1] although STS is a rare malignancy compared with other types of cancer, and it mainly affects younger adults aged between 40 and 60 years.[2] Complete resection can be a curative option for STS, and surgery is often combined with radiotherapy and/or systemic chemotherapy, especially in the treatment of advanced STS. However, in elderly patients, factors

* Corresponding author. Department of Medical Materials for Musculoskeletal Reconstruction, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, 2-5-1 Shikata-cho, Kita-ku, Okayama 700-8558, Japan. Tel.: +81 86 2357273; fax: +81 86 2239727.
E-mail address: toshi-kunisada@umin.ac.jp (T. Kunisada).

0748-7983/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.ejso.2013.09.004

such as decreased performance status and significant comorbidities often determine the choice of a more conservative and less aggressive treatment strategy for STS. Although two large studies, that examined the treatment of elderly patients with STS in the US, were recently published,[1,3] few studies have reported on the surgical outcome and prognostic factors following complete resection in elderly patients with STS.[2,4,5]

Older age was identified as a significant independent adverse prognostic factor in the two studies conducted in the US, and this trend was suggested to be the result of undertreatment in this select population.[1,3] We sought to explore similar issues regarding the treatment outcome of elderly patients with STS. A retrospective multi-center study was conducted by the Japanese Musculoskeletal Oncology Group (JMOG) to evaluate surgical outcomes in patients with STS aged 70 years and older and to establish the prognostic impact of various clinical characteristics, especially to assess the association of older age with the survival after complete resection of STS within the elderly population.

Patients and methods

Patients' selection

We collected 289 consecutive patients aged 70 years and older, with STS in the extremities or trunk, those patients visited 11 institutions regarded as regional comprehensive sarcoma centers in Japan that participated in JMOG between January 1995 and August 2006. The last date of follow up for the current study was October 2007. The inclusion criteria were patients with localized STS who underwent surgical resection and were followed-up postoperatively for a minimum of 12 months. The following patients were excluded: 59 patients who were treated non-surgically or received palliative surgery because of poor health status, concomitant medical problems, and/or distant multiple metastasis at initial diagnosis which could not sustain surgical treatment with complete resection, 46 relapse-free survivors followed for less than 12 months after resection, 12 patients with distant metastasis before resection, and 14 patients with incomplete data. Therefore, 158 patients were eligible for enrollment in the study, and studied these patients to establish the prognostic impact of various clinical characteristics according to REMARK (Reporting Recommendations for Tumor Marker Prognostic Studies) guideline.[6]

Prognostic factors for survival

The demographic and treatment characteristics analyzed as potential prognostic factors were as follows: 1) gender, 2) age at initial presentation ($<$80 years, $\geq$80 years), 3) tumor location (upper extremity, lower extremity, trunk), 4) previous insufficient resection, 5) tumor size ($<$10 cm, $\geq$10 cm), 6) tumor depth (superficial, deep), 7) histological type, 8) histological grade, 9) surgical margin, 10) chemotherapy, and 11) radiotherapy. With respect to tumor location, the trunk included neck, axilla, shoulder, gluteal region and groin. Tumor size was estimated from the largest diameter of the tumor measured using magnetic resonance imaging (MRI), and if not available, computed tomography (CT) or analysis of excised specimens. Histological type was categorized as malignant fibrous histiocytoma (MFH), liposarcoma, and other types. Histological grade was categorized as either low or high grade based on the pathology report. The Federation Nationale des Centres de Lutte Contre le Cancer (FNCLCC) grading system[7,8] was mainly applied and grades 2 and 3 were considered high grade. Surgical margins were classified into 2 groups, adequate and inadequate margins according to the Evaluation Method for Surgical Margins designated by the Japanese Orthopedic Association.[9] Briefly, adequate surgical margin was defined as at least 2 cm wide margin (normal cuff of at least 1 cm around reactive zone of the tumor), and inadequate margin as intralesional, marginal or 1 cm wide margin (normal cuff of less than 1 cm). Performance status (PS) was assessed by the Eastern Cooperative Oncology Group (ECOG) PS scale.[10]

Treatment strategy

Patients received multimodality treatment, which included surgery, chemotherapy, and radiotherapy. Wide resection of the primary tumor with adequate margins[9] was attempted whenever possible; inadequate surgical margins were acceptable when preserving critical organs such as nerves and vessels. If necessary, amputation or disarticulation was considered to achieve adequate surgical margins. Although there was no defined indication of radiotherapy to all patients because of the multicenter study, patients who were at high risk of local recurrence following limb sparing surgery, which each surgeon estimated, were often treated with radiotherapy. Radiotherapy was most commonly conducted postoperatively to patients with inadequate surgical margin assessed in resected specimen. Different chemotherapy regimens were applied, partly because many different hospitals were involved.

Follow-up

We generally follow up the patient at regular intervals of 3 months with local examination and chest radiographs or CT for first 2 years after treatment, every 6 months for third to fifth year, and yearly thereafter. MRI scan is also conducted to supplement local examination for detection of local recurrence every 6 months for first 3 years after treatment.

Statistical analysis

The follow-up period was regarded as the time from surgical resection to the last follow-up. An actuarial survival