Surgical management of malignant soft tissue tumours in patients aged 65 years or older

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ABSTRACT

Objective. With the aim to determine the most effective treatment for primary malignant musculoskeletal tumours in patients aged 65 years or older, we reviewed cases of low- and high-grade neoplasms, surgical margins, surgical methods, and the prognoses of elderly and aged patients at our institution.

Methods. Records of 25 patients aged 65 years or older who had malignant soft tissue tumours from December 1986 to February 1997 were reviewed. Low- and high-grade neoplasms accounted for 8 and 17 patients, respectively. 11 patients were aged 65 to 69 years, while 14 were 70 years or older. Surgical margins were wide in 19 cases, marginal in 4, and intralesional in 2. Reconstruction was done using 6 musculocutaneous flaps and/or 4 vessel grafts. As adjuvant therapy, radiotherapy was used in 5 cases and chemotherapy in 3. There was no recurrence in patients with wide surgical margins (determined on the basis of gross inspection of the excised tumour and the cut surface); but there was recurrence in 4 patients with marginal margins, and one patient with intralesional margin. Two patients with intralesional, 4 with marginal, and 2 with wide margins, died from recurrence at the primary site and metastasis, or from metastasis without recurrence at the primary site.

Results. Follow-up periods ranged from 4 months to 180 months (mean, 91.6 months). The overall 5-year survival rate was 79.6%; for low- and high-grade neoplasms, the figures were 100% and 69.7%, respectively; for those aged 65 to 69 years and in their 70’s or older, the figures were 90.9% and 70.1%, respectively.

Conclusion. For geriatric patients, wide surgical margins are required to manage both low- and high-grade neoplasms, in order to avoid multiple surgeries.

Key words: aged; reconstructive surgical procedures; sarcoma
INTRODUCTION

The ageing of the population in Japan has meant that the number of geriatric patients has been increasing and, consequently, metastatic carcinoma of the bone is being seen more frequently. As there are few published studies concerning malignant bone and soft tissue tumours in geriatric patients,1–5 there is a need to determine the most effective treatment for primary malignant musculoskeletal tumours in patients aged 65 years or older. In this study, we reviewed low- and high-grade neoplasms, surgical margins, surgical methods, and the prognoses of 25 such patients at our institution. We examined the type of surgical treatment given to patients aged 65 years or older who had primary malignant soft tissue tumours.

MATERIALS AND METHODS

We reviewed records of 25 patients (9 men and 16 women) aged 65 years or older, who had primary malignant soft tissue tumours from December 1986 to February 1997, and were treated at the Department of Orthopaedic Surgery, Nihon University, Tokyo, Japan (Table). The most common diagnosis was liposarcoma (n=7; including 5 low-grade recurrent cases), followed by leiomyosarcoma (n=6; including 2 high-grade recurrent cases) and malignant fibrous histiocytoma (MFH) [n=6; including 2 high-grade recurrent cases]. The tumours were most commonly located in the thigh (n=9), followed by the inguinal area (n=4), and the buttock (n=4). Tumours were also found in the forearm, leg, elbow, back, and foot.

Reconstruction performed included free-skin mesh grafts in 6 cases, a rectus abdominis musculocutaneous (MC)–flap in 2 cases, and a gluteus maximus MC–flap in 2 cases. A tensor fascia lata MC–flap was used for case 3, and an anterolateral MC–flap for case 6. There was one transfer of the tibialis posterior tendon for drop foot (case 12). The 4 patients with tumours in the inguinal area (cases 3, 4, 5, and 7) received vessel grafts; the patient in case 3 received bone graft as well. Preoperative radiotherapy was given to one patient, while postoperative radiotherapy was given to 4 patients. Chemotherapy was given to 3 patients. A patient received both radiotherapy and chemotherapy (case 20).

The histopathological grade was low in 8 patients and high in 17. The surgical margin was wide in 19 patients, marginal in 4, and intralesional in 2. Surgery for low-grade neoplasms was performed with a wide margin in 6 patients, marginal in one, and intralesional in one. In contrast, surgery for high-grade neoplasms was performed with wide margins in 13 patients, marginal in 3, and intralesional in one. The overall postoperative follow-up duration ranged from 4 months to 180 months (mean, 91.6 months); 2 patients died of other diseases during follow-up. Patients were divided into 2 groups: those aged 65 to 69 years (n=11) and those aged 70 years or older (n=14; including 2 who died of other diseases). A general surgeon, a vascular surgeon, and a plastic surgeon were in attendance as necessary for extraperitoneal, chest, or pelvic tumours.

RESULTS

Six of the patients with liposarcoma or recurrent liposarcoma remained symptom-free 72 to 116 months after surgery; one patient died of an unrelated disease at 72 months (case 12). The patient in case 2 had a recurrence after marginal excision. Three patients with leiomyosarcoma survived and remained symptom-free, while the other 3 patients died of lung or liver metastasis. Five patients with MFH or recurrent MFH survived and experienced no recurrence 93 to 180 months after wide excision, while one patient died of other disease at 44 months. Both the patients with malignant peripheral nerve sheath tumour and dermatofibrosarcoma protuberance survived with no recurrence.

Five (20%) patients had single or multiple recurrences. Four patients had recurrence after marginal excision, and one had recurrence after intralesional excision. This patient, and another patient who underwent hemipelvectomy, died of pulmonary metastasis. Three patients had 2 to 5 excisions each because recurrence occurred many times after excision, including a patient who had amputation after 4 excisions for recurrences (case 8). Two of these patients died.

Among the patients who had histopathological low-grade neoplasms, 6 who had wide margin excision experienced no recurrence. On the other hand, 13 wide margin excisions of the 17 high-grade neoplasms did not result in any recurrence, although 2 patients died of metastases at 4 and 60 months respectively. In contrast, the 3 (cases 6, 22, and 23) of 4 patients who had marginal margins experienced recurrence and subsequently died at 24, 83, and 60 months respectively; the patient in case 16, who had undergone surgery with an intralesional margin, experienced a relapse, and died at 25 months. Another 2 patients died of other diseases. Adjuvant therapy was not proven to be effective in any of these cases. There were no special complications, although necrosis of the femoral head after radiotherapy was observed.
The overall 5-year survival rate among the 25 patients was 79.6% (Fig. 1). The prognosis of low-grade (n=8) and high-grade neoplasms (n=17) were not changed using the Wilcoxon and Cox-Mantel method, being 100% and 69.7%, respectively in the 5-year survival rate, according to the Kaplan-Meier method (Fig. 2). The mortality rate was 18% (n=2) among those aged 65 to 69 years, and was 36% (n=5; including the 2 who died of other disease) among those aged 70 years or older. The 5-year survival rates of these 2 age-groups were 90.9% and 70.1%, respectively (Fig. 3).

![Figure 1](image-url) Survival rate of 25 patients with malignant soft tissue tumours.

### Table

#### Malignant soft tissue tumours in patients aged 65 years or older

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Age (years)/Sex</th>
<th>Histopathological diagnosis (grade)</th>
<th>Site (close-to organs)</th>
<th>Surgical margin</th>
<th>Reconstruction</th>
<th>Adjuvant therapy (dose)</th>
<th>Recurrence (treatment)</th>
<th>Follow-up (months)/Status</th>
<th>Site of metastasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>65/F</td>
<td>Recurrent leiomyosarcoma (high)</td>
<td>Back (muscle)</td>
<td>Wide</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>163/CDF*</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>65/M</td>
<td>Recurrent liposarcoma (low)</td>
<td>Mid-forearm (skin, muscle)</td>
<td>Marginal</td>
<td>Free skin graft</td>
<td>Nil</td>
<td>3 (excisions)</td>
<td>108/NED*</td>
<td>N/A</td>
</tr>
<tr>
<td>3</td>
<td>65/F</td>
<td>Recurrent liposarcoma (low)</td>
<td>Inguinal area (skin, muscle, vessels)</td>
<td>Wide</td>
<td>Tensor fascia lata</td>
<td>Nil</td>
<td>Nil</td>
<td>72/NED</td>
<td>N/A</td>
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<tr>
<td>4</td>
<td>65/F</td>
<td>Recurrent liposarcoma (low)</td>
<td>Inguinal area (skin, muscle, vessels)</td>
<td>Wide</td>
<td>Rectus abdominai</td>
<td>Nil</td>
<td>Preoperative RT* (48 Gy)</td>
<td>100/NED</td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td>67/F</td>
<td>MFH** (high)</td>
<td>Inguinal area (skin, muscle, vessels)</td>
<td>Wide</td>
<td>Prosthetic vessel</td>
<td>Nil</td>
<td>CT (CDDP 130 mg 3 courses, ADR 60 mg 3 courses)</td>
<td>93/CDF</td>
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<tr>
<td>6</td>
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<td>Proximal thigh (skin, muscle, bone, joint)</td>
<td>Marginal</td>
<td>Anterolateral</td>
<td>Nil</td>
<td>CT (CDDP 130 mg 3 courses, ADR 60 mg 3 courses)</td>
<td>24/DOD**</td>
<td>Lung</td>
</tr>
<tr>
<td>7</td>
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<td>MFH (high)</td>
<td>Inguinal area (skin, muscle, vessels)</td>
<td>Wide</td>
<td>Prosthetic vessel</td>
<td>Nil</td>
<td>Nil</td>
<td>103/CDF</td>
<td>N/A</td>
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<td>8</td>
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<td>Recurrent fibrosarcoma (low)</td>
<td>Forearm (skin, muscle)</td>
<td>Intraläsional</td>
<td>Free skin graft</td>
<td>Nil</td>
<td>5 (4 excision, one amputation)</td>
<td>162/DOD*</td>
<td>Lung</td>
</tr>
<tr>
<td>9</td>
<td>68/M</td>
<td>Leiomyosarcoma (high)</td>
<td>Mid-thigh (muscle)</td>
<td>Wide</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>132/CDF</td>
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<td>Recurrent MFH (high)</td>
<td>Elbow (skin, muscle)</td>
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<td>Free skin graft</td>
<td>Nil</td>
<td>Nil</td>
<td>116/NED</td>
<td>N/A</td>
</tr>
<tr>
<td>Case No.</td>
<td>Age (years)/ Sex</td>
<td>Histopathological diagnosis (grade)</td>
<td>Site (close-to organs)</td>
<td>Surgical margin</td>
<td>Reconstruction</td>
<td>Adjuvant therapy (dose)</td>
<td>Recurrence (treatment)</td>
<td>Follow-up (months)/ Status</td>
<td>Site of metastasis</td>
</tr>
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<tr>
<td>11</td>
<td>69/M</td>
<td>MPNST**(high)**</td>
<td>Buttock (skin, muscle)</td>
<td>Wide</td>
<td>Nil</td>
<td>RT (50 Gy)</td>
<td>Nil</td>
<td>75/CDF</td>
<td>N/A</td>
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<tr>
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<td>Mid-leg (muscle)</td>
<td>Wide</td>
<td>Tibialis posterior tendon transfer</td>
<td>Nil</td>
<td>Nil</td>
<td>72/DOD***</td>
<td>N/A</td>
</tr>
<tr>
<td>13</td>
<td>70/F</td>
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<td>Mid-thigh (skin, muscle)</td>
<td>Wide</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>116/NED</td>
<td>N/A</td>
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<tr>
<td>14</td>
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<td>Mid-thigh (muscle)</td>
<td>Wide</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>79/NED</td>
<td>N/A</td>
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<tr>
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<td>Recurrent liposarcoma (low)</td>
<td>Proximal thigh (skin, muscle)</td>
<td>Wide</td>
<td>Free skin graft</td>
<td>Nil</td>
<td>Nil</td>
<td>102/NED</td>
<td>N/A</td>
</tr>
<tr>
<td>16</td>
<td>71/F</td>
<td>Leiomysarcoma (high)</td>
<td>Buttock (skin, muscle, nerve, bone)</td>
<td>Intralesional</td>
<td>Gluteus maximus MC-flap</td>
<td>RT (40 Gy)</td>
<td>Nil</td>
<td>25/DOD Lung</td>
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<tr>
<td>17</td>
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<td>Leiomysarcoma (high)</td>
<td>Mid-thigh (muscle)</td>
<td>Wide</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>154/CDF</td>
<td>N/A</td>
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<tr>
<td>18</td>
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<td>Recurrent leiomysarcoma (high)</td>
<td>Proximal thigh (skin, muscle)</td>
<td>Wide</td>
<td>Rectus abdominis MC-flap</td>
<td>Nil</td>
<td>Nil</td>
<td>60/DOD Liver</td>
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</tr>
<tr>
<td>19</td>
<td>72/M</td>
<td>Recurrent MFH (high)</td>
<td>Mid-thigh (muscle)</td>
<td>Wide</td>
<td>Free skin graft</td>
<td>Nil</td>
<td>Nil</td>
<td>101/NED</td>
<td>N/A</td>
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<tr>
<td>20</td>
<td>72/F</td>
<td>Rhabdomyosarcoma (high)</td>
<td>Mid-thigh (muscle)</td>
<td>Wide</td>
<td>Nil</td>
<td>RT (50 Gy), CT (ADR 60 mg 2 courses, vincristine 1.0 mg 2 courses; cyclophosphamide 500 mg 2 courses)</td>
<td>Nil</td>
<td>4/DOD Lung</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>77/F</td>
<td>MFH (high)</td>
<td>Buttock (muscle)</td>
<td>Wide</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>180/CDF</td>
<td>N/A</td>
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<tr>
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<td>77/M</td>
<td>Leiomysarcoma (high)</td>
<td>Mid-leg (skin, muscle)</td>
<td>Marginal</td>
<td>Nil</td>
<td>Nil</td>
<td>2 (excision)</td>
<td>83/DOD Lung</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>79/F</td>
<td>Angiosarcoma (high)</td>
<td>Foot (muscle)</td>
<td>Marginal</td>
<td>Nil</td>
<td>RT (50 Gy)</td>
<td>1 (excision)</td>
<td>60/DOD Lung</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>81/M</td>
<td>MFH (high)</td>
<td>Arm (skin, muscle)</td>
<td>Wide</td>
<td>Free skin graft</td>
<td>Nil</td>
<td>Nil</td>
<td>44/DOD</td>
<td>N/A</td>
</tr>
<tr>
<td>25</td>
<td>88/F</td>
<td>DFSP**(low)**</td>
<td>Buttock (skin, muscle)</td>
<td>Wide</td>
<td>Gluteus maximus MC-flap</td>
<td>Nil</td>
<td>Nil</td>
<td>62/CDF</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* CDF continuous disease-free
† NED no evidence of disease
§ MC musculocutaneous
\( V \) artery
\( \) vein
\( \) RT radiotherapy
** MFH malignant fibrous histiocytoma
\( \) CT chemotherapy
\( \) CDDP cisplatin
\( \) ADR adriamycin
\* DOD died of the disease
** MPNST malignant peripheral nerve sheath tumour
*** DOO died of other disease
\( \) DFSP dermatofibrosarcoma protuberance

(Cont'd Table)
DISCUSSION

The World Health Organization has classified people aged 45 to 59 years as being middle aged, those 60 to 75 years as elderly, and those older than 75 years as the aged. Old patients have a poor prognosis for cancer, because of the decrease in immunological function.6–9 However, adjuvant therapy is useful for older cancer patients.10–13 The prognosis of malignant soft tissue tumours is better than that for bone tumours among aged patients, because malignant soft tissue tumours in low-grade neoplasms are more common than bone tumours.5 In this study, the tumour grade appeared to be more determining than the age of the patients. Wide excision and reconstruction were difficult in malignant soft tissue tumours of the pelvic or sacral area.4 Low-grade malignant soft tissue tumours of the subcutaneous area were treated with marginal excision. There were several recurrences among these cases; hence, wide excision and functional reconstruction are preferred. The rate of dermatofibrosarcoma protuberance was exceedingly low, although recurrence among geriatric patients should also be avoided. After wide excision, including that of skin, muscle, tendon, vessel, and bone, reconstruction can be done using a prosthetic joint replacement,14,15 an MC–flap for dead space, and functional repair using transfer or transplantation of the muscle with the nerve,16–25 along with a vascular graft26,27 and autograft bone graft or pasteurised bone graft.28,29 The 5-year survival rate of the elderly with malignant soft tissue tumours in our series was 79.6%, which was higher than that reported in other studies.7,15,25 Our results did not show a significant change in the 5-year survival rate among those aged 65 years or younger. It was shown that geriatric patients who underwent extensive surgery, could also have favourable results, without complications such as infections.

However, wide excision of the tumours and reconstructive surgery were useful, using various kinds of pedicle flaps and yielding the most favourable long-term results. For those patients who had the tumour excised marginally or intraleisionally, recurrence occurred in 2 of 8 patients with low-grade neoplasms, and 3 of 17 patients with high-grade neoplasms. The low-grade group achieved a much higher 5-year survival rate than did the high-grade group (100% versus 69.7%). Among patients aged 65 to 69 years, one died after marginal excision and one after intraleisional excision. The patient group of 65 to 69 years achieved a higher 5-year survival rate than did the group of 70 years or older (90.9% versus 70.1%).

CONCLUSION

Surgical treatment of malignant soft tissue tumours in old patients should be done using wide excision and preferably on relatively low-grade neoplasms. Both low- and high-grade neoplasms in older patients should also be excised completely to avoid multiple tumour surgeries.
REFERENCES


