



ORIGINAL ARTICLE

Management of extremity malignant fibrous histiocytoma: A 10-year experience



Kun-Han Chen ^a, Ting-Mao Chou ^a, Shyh-Jou Shieh ^{a,b,*}

^a Division of Plastic and Reconstructive Surgery, Department of Surgery, National Cheng Kung University Medical College and Hospital, Tainan, Taiwan

^b International Research Center for Wound Repair and Regeneration (IWRR), National Cheng Kung University, Tainan, Taiwan

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KEYWORDS

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resection margin;
soft-tissue sarcoma

Summary *Background:* Malignant fibrous histiocytoma (MFH) is a common soft-tissue sarcoma in adults, which commonly affects the extremities, trunk, head, and neck. Of these regions, the extremities are more often affected. However, only a few studies have specifically investigated the clinical behavior and prognosis of this malignancy, especially in East Asian populations.

Aims and objectives: We collected data on MFH cases for a period of 10 years and present our experience here in treating patients with extremity MFH.

Materials and methods: This study was a retrospective analysis of patients with extremity MFH treated in the Department of Plastic Surgery at National Cheng Kung University Hospital between January 2004 and December 2013. Data on patient profiles, surgical resection, radiotherapy, and chemotherapy were all reviewed. The patients were followed up regarding their local recurrences and survivals.

Results: Thirteen patients (6 men and 7 women) were enrolled in this study. The mean age of the patients was 57.9 years (range, 33–82 years). The sizes of the clinical tumors ranged from 1.7 to 15 cm in a maximal linear dimension (mean, 7.3 cm), and 76.9% of the tumors developed in the lower extremities. The average follow-up time was 63.5 months. One patient received limb amputation, and 12 patients were treated with limb salvage including marginal or wide excisions. Adjuvant radiotherapy was performed in 10 patients whose tumor sizes exceeded 5 cm or who exhibited inadequate excision or recurrence. Chemotherapy was performed in six patients who exhibited a distant metastasis or vessel invasion. The local and distant

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* Corresponding author. Professor and Attending Plastic Surgeon, Division of Plastic and Reconstructive Surgery, Department of Surgery, National Cheng Kung University Medical College and Hospital, Number 138, Sheng-Li Road, Tainan 70403, Taiwan; Director, International Research Center for Wound Repair and Regeneration (IWRR), National Cheng Kung University, Number 1, University Road, Tainan 701, Taiwan.

E-mail address: sjshieh@mail.ncku.edu.tw (S.-J. Shieh).

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recurrence rates were 53.8% and 30.8%, respectively. A total of 42.9% of patients with local recurrence developed distant metastases. The surgical margin was the only significant factor of local disease control, and distant metastasis was the only factor relevant to the overall survival (OS).

Conclusion: An adequate resection margin during treatment for the primary MFH tumor achieves optimal results for local disease control. It influences the OS rate, because local-recurrence-related distant metastasis is significantly associated with high mortality.

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1. Introduction

Malignant fibrous histiocytoma (MFH) is a pleomorphic sarcoma originally described by Ozzello et al¹ in 1963 and O'Brien and Stout² in 1964. It is one of the most common soft-tissue sarcomas among adults, with a peak incidence between 60 and 70 years of age.³ It has been determined to exhibit large, high-grade, and biological aggressiveness. Most MFHs occur in the extremities (49% in the lower and 19% in the upper extremities), followed by the trunk and retroperitoneum.³ MFH has been categorized into storiform-pleomorphic, myxoid, giant-cell, and inflammatory types.⁴ The tumors involving extremities frequently present as a painless and enlarging mass over a period of months.⁵ By contrast, patients with retroperitoneal tumors can exhibit constitutional symptoms, including anorexia, weight loss, fever, and malaise.³ A multidisciplinary team is necessary to manage malignant soft-tissue tumors, and extremity MFH is the most common type that plastic surgeons treat.

In this study, we retrospectively analyzed the factors influencing tumor recurrence and survival rates of patients treated for extremity MFH.

2. Materials and methods

We retrospectively analyzed all patients with MFH who were treated in the Department of Plastic Surgery at National Cheng Kung University Hospital between January 2004 and December 2013. The histological diagnosis was confirmed by the Department of Pathology at our institution. We excluded all tumors of the retroperitoneum as well those of the head and neck because of their distinct behaviors and unfavorable outcomes. In each case, the extent of the tumor was determined using computed tomography or magnetic resonance imaging. All the patients underwent chest radiography or computed tomography to exclude any pulmonary metastases. The sizes of the tumors were determined based on the maximal dimension measured in the pathology specimen. Local disease-free survival (LDFS) was defined as the time interval from the definite surgical treatment to the detection of a recurrent tumor. Overall survival (OS) was defined as the length of time, from either the date of diagnosis or the start of treatment for MFH, that patients remained alive. The end point of this study was reached when patients died or at the final follow-up date (including contact by telephone).

All patients underwent surgical ablation of their tumors. Three types of tumor resection were performed: (1) radical

resection, including amputation or removal up to the adjacent normal fascia plane or the boundary of the adjacent healthy tissue, (2) wide resection, involving complete removal of the gross tumor with at least a 1–2-cm margin to the adjacent normal tissue, and (3) marginal resection, involving the removal of the gross tumor with no attempt to remove normal tissue. The patients were followed up regarding their local recurrences and survivals. The patients without regular treatment in our institution were excluded from this review. All patients were treated by tumor reexcision if local MFHs recurred. The dosage applied by radiation oncologists in the postoperative radiation therapy was 50–70 Gy. Adjuvant chemotherapy was performed by oncologists adopting a doxorubicin-based regimen.

Clinical and pathologic factors, including age, sex, tumor location, tumor size, excision method, and adjuvant therapy (radiotherapy and chemotherapy), were reviewed and analyzed regarding their influence on the outcome. For data analysis, the age was categorized into the <50-year-old and \geq 50-year-old groups, when the tumor was first diagnosed. The tumor size was categorized into groups of <5, 5–10, and >10 cm, according to the largest dimension. All statistical analyses were performed using a statistical software package (PASW for Windows, version 18.0; SPSS Inc, Chicago, IL, USA). Differences of categorical variables were compared with those of Cox regression analysis. Levels of significance were expressed as *p* values. Actuarial curves for survival and local control were calculated using the Kaplan–Meier method.

3. Results

Thirteen patients (7 women and 6 men) were included in this study. The mean age of the patients was 57.9 years (33–82 years). The sizes of the clinical tumors ranged from 1.7 to 15 cm in a maximal linear dimension with a mean of 7.3 cm, and 76.9% of tumors occurred in the lower extremities. These lower-extremity tumor sites included the thigh in five cases (50%), the knee in three cases (30%), and the lower leg in two cases (20%). One case with femoral condyle and major vessel involvement received above-knee amputation with a safe margin wider than 5 cm. Two patients with intramuscular MFH received compartmentectomy (Table 1). These three cases (23.1%) were included in the radical excision group. Three patients (23.1%) received a marginal resection and seven patients (53.4%) received a wide excision. All surgical margins were negative for malignant cells. Adjuvant radiotherapy was arranged in only five cases, and

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