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Case Study

Radiotherapy for histiocytic sarcoma: a case report

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Abstract

Background: Histiocystic sarcoma is a rare, but aggressive tumour that often involves extranodal sites. Histiocystic sarcoma is recognised by the World Health Organization as one of six subtypes of dendritic cell neoplasms. Diagnosis is difficult due to overlapping immunohistochemistry with other dendritic cell neoplasms. The optimal roles for chemotherapy, radiotherapy and surgery in the treatment of histiocytic sarcoma remain unknown.

Methods: We report a case of a patient with histiocytic sarcoma diagnosed after excisional biopsy and immunohistochemistry testing.

Results: The patient underwent external beam radiation therapy (EBRT). After 18 Gray (Gy), the 8 cm lesion had regressed to ~5 cm in diameter. The treatments were continued to a total dose of 45 Gy with the lesion regressing to less than a centimeter by the end of treatment. Local control was maintained but the patient died of acute myelogenous leukemia 5 months after her treatment.

Conclusions: This case suggests that histicytic sarcomas can be controlled locally with EBRT.

Keywords: dendritic cell; histiocytic sarcoma; lymphoma; radiation; S100 protein

INTRODUCTION

The World Health Organization (WHO) recognises histiocytic sarcoma as one of six subtypes of dendritic lineage neoplasms which also include: follicular dendritic cell sarcoma, interdigitating cell sarcoma, Langerhans cell sarcoma, Langerhans cell histiocytosis, and dendritic cell sarcoma not otherwise specified.[1] Previously, this entity, along with several T- and B-cell non-Hodgkin's lymphomas, was termed a 'true histiocytic lymphoma'. That term is no longer used as no other member of the group met qualifications for both histiocytic and lymphomatous designation.[2,3] Despite the new nomenclature, histiocytic sarcoma remains very difficult to diagnose due to overlapping immunohistochemistry with the other dendritic cell neoplasms.

In general, histiocytic sarcoma is a rare but aggressive tumour that often spreads to extranodal sites.[4] Consequently, optimal roles for chemotherapy, radiotherapy and surgery remain unknown.

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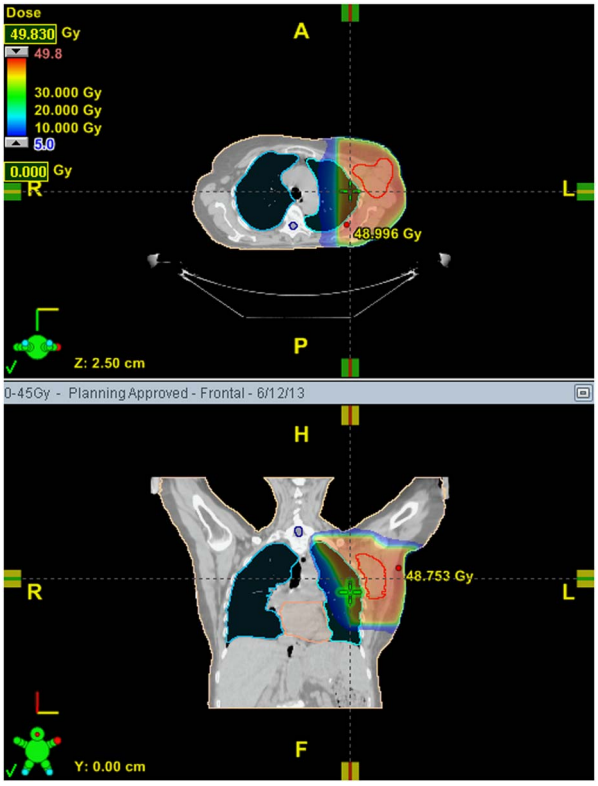

Figure 1. Gross tumour volume (GTV) contours and dose cloud distribution for 45 Gy 3D-conformal radiation treatment of a left axillary histiocytic sarcoma.

The following report discusses a single case of histiocytic sarcoma in an elderly woman treated with external beam radiotherapy (EBRT) alone followed by a discussion of the relevant literature.

CLINICAL HISTORY

A 79-year-old woman was diagnosed with stage IIIa follicular-type non-Hodgkin's Lymphoma in 2008 from a left-sided cervical lymph node biopsy. The patient was observed without active treatment.

In 2013, the patient noted a painful, enlarging mass in the left axilla along with night sweats. Pathologic examination of an excisional biopsy initially reported a granulocytic sarcoma. The lesion stained positive for CD4, CD68, CD33 and partially for CD163, all of which are common markers for both granulocytic and histiocytic sarcomas. However, a pathology review performed at the National Cancer Institute with additional immunohistochemistry testing revealed S-100 and CD1a positivity in the periphery of the lesion, and the patients bone marrow biopsy failed to support a myeloid etiology. Thus, a diagnosis of histiocytic sarcoma was favoured. A positron emission tomography scan was then performed, and the left axillary basin revealed grossly enlarged and intensely hypermetabolic lymph nodes with active diffuse inflammatory stranding involving the entire left axilla. The largest of these left axillary nodes had a photopenic center consistent with necrosis, and the most metabolically avid left axillary lymph node had a standard uptake value of 11.

The patient denied pain but noted continued growth in the biopsied area of her left axilla. On exam, diffuse 1–3 cm adenopathy was palpated in the cervical, supraclavicular and inguinal regions, and one ~8 cm mass was evident beneath a well-healed excisional biopsy incision in her left axilla. The lesion was not tender or fixed.

Radiation therapy to her biopsy-proven histiocytic sarcoma with 1·8 Gy fractions with re-evaluation after 10 treatments was planned. The gross tumour volume and dose cloud distribution can be seen in the image provided. After these initial ten treatments, the patient's 8 cm lesion had regressed to ~5 cm in diameter so treatments were continued. After 45 Gy, the lesion had resolved and her only acute adverse effect was a mild radiation dermatitis that resolved within 4 weeks. The subsequent PET scan showed resolution of her left axillary disease. However, the scan also showed progression of her other mildly avid lymphoma lesions. Subsequent work-up showed a new diagnosis of acute myelogenous leukemia. The patient died 5 months later from disseminated leukemia.

DISCUSSION

This case not only reinforces that histiocytic sarcomas are difficult to diagnose but more importantly evidences that EBRT to 45 Gy can provide local control of this disease.

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Table 1. *Radiation therapy for histiocytic sarcoma*

Author	Patients (*n*)	Treatment modality	RT dose/fractionation	Results	Notes
Buonocore, et al.[7]	1	EBRT	45 Gy in 25 fractions	All lesions treated with radiation showed complete response Patient regained ability to ambulate as well as bladder control	Failure to respond to initial LCH therapy Radiation therapy also used to treat pulmonary metastases
Mainardi, et al.[9]	1	Chemotherapy + PBSCT followed by partial resection + adjuvant RT	36 Gy in 20 fractions	No evidence of disease 27 months after therapy	Nasopharyngeal mass reduced to 46% of initial volume after chemotherapy
Vos, et al.[5]	5	Chemotherapy ± EBRT or Surgery	Not reported	OS = 20% One stage I patient remained without evidence of disease 2–15-month survival in remaining four patients	17-year survivor had resection of disease involving the palate One patient receiving EBRT was nonresponsive to radiation or chemotherapy Poor survival was seen with tumours ≥3·5 cm
Hornick, et al.[8]	14	Adjuvant RT or adjuvant chemotherapy	Not reported	DOD = 0 versus 14·3% LR = 0 versus 28·6%	One of four patients treated with adjuvant RT had distant spread to the lungs, excised surgically Three of seven patients treated with adjuvant chemotherapy experienced distal lymph node spread
Almefty, et al.[6]	1	Surgical debulking/ drainage + EBRT	60 Gy in 30 fractions to lesion of left parietal lobe 15 Gy in three fractions to contralateral deposits	MRI after RT showed masses had grown substantially and additional deposits had arisen DOD 126 days after initial presentation	Purulent drainage on craniotomy led to cerebritis diagnosis initially

Abbreviations: RT, radiation therapy; EBRT, external beam radiation therapy; LCH, Langerhans cell histiocytosis; PBSCT, peripheral blood stem cell transplant; OS, overall survival; DOD, dead of disease; LR, local recurrence.

A number of cases of histiocytic sarcomas have been reported with varying approaches to therapy, including surgery with and without adjuvant EBRT, chemotherapy, and several combination and salvage treatments, yet the outcomes in the vast majority of these patients proved to be poor response or recurrence (local or distant) with little evidence suggesting a survival benefit.[5,6]

Our finding that EBRT can provide excellent local control is supported by other reports detailed in the table provided.[5–9] We reference a report by Buonocore, et al. that describes a 3-year-old child who developed a neurogenic bladder from a histiocytic sarcoma involving his fourth lumbar vertebral body. EBRT to 45 Gy in 1·8 Gy fractions was used to reduce the mass and alleviate the patient's symptoms. A separate thoracic spine lesion and two pulmonary metastases were later treated with an additional 45 Gy with a complete response.[7]

Adjuvant radiation therapy has also been used successfully to treat histocytic sarcoma. Hornick, et al. analysed 14 cases treated surgically of which four received adjuvant radiation therapy. Local recurrences and mortality were found in patients receiving no adjuvant therapy or adjuvant chemotherapy alone, but the three patients not lost to follow-up after adjuvant radiation (median follow-up = 26 months) remained without evidence of disease.[8]

Chemotherapy regimens have been attempted. Yoshida et al. report on a patient who presented with disseminated intravascular clotting and was found to have bone marrow invasion of large cells classified immunohistochemically as histiocytic sarcoma. Treatment with intravenous heparin and six cycles of modified cyclophosophamide, doxorubicin, vincristine, etoposide, prednisone, and filgastrum (CHOEP-14) chemotherapy, caused resolution of pancytopenia after ten days. The patient remained without evidence of disease at her 22-month follow-up.[10]

CONCLUSIONS

Our experience at Roswell Park Cancer Institute, along with several experiences within the limited literature, speaks to the efficacy of radiation therapy in achieving local control. Diagnosis remains difficult and often controversial. Optimal systemic therapies are not yet known.

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