CASE REPORT

Acral erosive mycosis fungoides: successful treatment with localised radiotherapy

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SUMMARY

Mycosis fungoides encompasses a wide range of variants with differing clinical and histopathological findings, clinical courses and methods of treatment. Two patients were referred to MD Anderson Cancer Center for the evaluation of treatment-refractory palmoplantar dermatoses suggestive of a rare variant of mycosis fungoides—mycosis fungoides palmaris et plantaris (MFPP). Both patients eventually had progressive and ulcerative cutaneous disease extending beyond acral regions that showed remarkable response to local radiation therapy. Although most documented cases of MFPP show an indolent course, one must be aware of the possibility of development of severe cutaneous disease in patients initially presenting with palmoplantar involvement. Local radiotherapy is a safe and effective palliative treatment option for MFPP and cutaneous disease refractory to systemic treatment.

BACKGROUND

Mycosis fungoides (MF) is the most common subtype of a heterogeneous group of neoplasms known as cutaneous T-cell lymphomas. MF has numerous clinicopathological variants with differing clinical courses, prognoses and methods of treatment. We present two patients with similarly atypical presentations of MF and their successful treatment with local radiation therapy.

CASE PRESENTATION

Two patients were referred to MD Anderson Cancer Center (MDACC) for the evaluation and treatment of suspected MF, diagnosed after long histories of palmoplantar dermatoses refractory to multiple treatments. Initial presentation was limited to the palms and soles; however, both patients experienced rapid cutaneous disease progression beyond acral regions.

Case 1

In 2000, a 65-year-old white man noticed pruritic, erythematous, scaly skin on his left palm and left plantar foot. In November of 2005, he presented to a dermatologist and was noted to have clear fluid-filled bullae on his left palm with erythema, scaling and fissures. He was diagnosed with palmoplantar psoriasis and treated with 0.05% clobetasol ointment and oral acitretin without improvement. Oral acitretin was discontinued after 4 months due to extreme dryness and pruritis. Further treatment with oral methotrexate, cyclosporine, psoralen plus UV-A (PUVA) and narrow-band UV-B also proved to be ineffective. In December 2006, a biopsy

specimen of his left thenar wrist showed diffuse dermal and focal epidermal infiltration of atypical lymphocytes forming Pautrier's microabscesses. Immunohistochemistry revealed strong CD3 and CD4 positivity and no CD8-positive cells in the epidermis. Colloidal iron stains showed follicular mucinosis.

The patient was referred for evaluation at MDACC in January 2007. Physical examination revealed erosion of the left palm with multiple-deroofed pustules (figure 1A) and severe keratoderma with fissures on the soles of his feet. Wound cultures initially grew normal skin flora, but upon follow-up visits it revealed *Staphylococcus*. Fungal smears and cultures were negative. Review of the patient presentation, histology and immunohistochemistry profiles supported the diagnosis of MFPP. A total body positron emission tomography/CT (PET/CT) evaluation and peripheral blood flow cytometry revealed no extracutaneous involvement, stage IA.

Case 2

In 2007, a 71-year-old white man developed an extremely pruritic, eczematous rash on his hands,

Figure 1 (A) Case 1 prior to treatment: erosion of the left palm with multiple deroofed pustules. (B) Case 1, 2 months after focal radiotherapy: shows complete remission of the lesions on his left palm.

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Figure 2 (A) Case 2 prior to treatment: erythematous crusted patches on the left arm and left dorsal hand; diffuse erythema and erosion with serosanguineous and pus exudates on the right forearm, dorsal hand and webspaces. (B) Case 2, 2 months after focal radiotherapy: shows complete remission of lesions on his hands.

treated with 0.05% clobetasol ointment and bleach baths. By October 2010, the rash had progressed to his forearms, right medial thigh and penis with blisters, ulceration, severe pain and swelling. Biopsy specimens taken from the right medial thigh and left arm were suggestive of MF. The patient was referred to MDACC for evaluation and treatment in February 2011. Cutaneous exam revealed scaly erythematous plaques covering his left arm and left dorsal hand (figure 2A). The right forearm, dorsal hand and web spaces were deeply erythematous with diffuse erosions with serosanguineous and pus exudate (figure 2A). One pustule was found on the right medial thumb. Eroded erythematous patches were present on the right medial thigh, left popliteal fossa and right side of the penis. The palms were diffusely erythematous with mild scale and deep-seated eczematous vesicles. Total body surface area affected was 10.7%. Review of the biopsy specimen from the left arm revealed a dense infiltrate of small and large atypical lymphocytes with epidermotropism, increased mitotic figures and extensive epidermal ulceration and necrosis. The majority of cells were CD3+, some CD4+, rare CD8+ and few scattered clusters of intermediate to large cells were CD30+. Flow cytometry of the blood and full-body PET/CT were negative for extracutaneous involvement. The findings were consistent with MF stage IIB with increased large cells. Bacterial cultures of the right hand and right medial thigh grew methicillin-resistant *Staphylococcus aureus* and Group B *Streptococcus*. Fungal smears and cultures were negative.

TREATMENT

Case 1

The left hand and both soles were treated with radiation therapy in multiple daily fractions delivered using electron beams. A tissue equivalent compensator (bolus) of 1 cm was applied over the whole treatment field. After the completion of radiation therapy, there was a complete response with clearance of the lesions of the left hand with only mild keratoderma remaining in the soles (figure 1B). Dermatitis developed in his left hand secondary to radiation that subsequently healed with topical moisturisers and a course of levofloxacin.

During the patient's long course of disease, multiple systemic antineoplastic therapies including oral bexarotene, pegylated liposomal doxorubicin, sapcitabine, gemcitabine and pralatrexate were tried without improvement or with the development of new lesions. The patient's body surface area involvement grew to 23.5%. In spring 2008, the patient underwent an 8-week course of total skin electron beam (TSEB) therapy (blocking areas treated previously with radiotherapy) delivered according to the Stanford technique with boosts to the underdosed areas. Unfortunately, his response to TSEB lasted only for 1 month

with appearance of new lesions. Involved field radiation was delivered to the right axilla, left forearm, right elbow, right and left groin, left posterior knee and left posterior thigh with remission. His left hand, right anterior leg, right lateral buttock and right posterior leg were also treated with good result.

In 2009, despite the enrolment in clinical studies of oral lenalidomide 10 mg and anti-CCR4 monoclonal antibody, he continued to develop new lesions. Some lesions were extremely painful, ulcerated and necrotic, leading to two hospitalisations for pain control and treatment of infection (*Corynebacterium*, *S aureus*, *Enterococcus*). Local low-dose radiation using electron beams in various doses were applied to multiple localised areas, with the last dose given in March 2010, resulted in reducing body surface area involvement of the disease to 0.5%. The patient reported thinning of skin, fat and extensive telangiectasia of the forearms as well as hand cramping and paresthesias secondary to radiation. Since June 2010, the patient has been receiving extracorporeal photophoresis treatments every 6–8 weeks and achieved complete remission from January to July 2011. A few new lesions have appeared from time to time, but resolved with topical clobetasol 0.05% and imiquimod.

Case 2

The patient was admitted for intravenous antibiotics, radiation and pain control. The patient's arms had a contracture at the wrists and elbows that limited the unfolding of the skin and therefore electron beam could not be used; instead, we used photon-beam therapy with an open field to include the circumference of the skin. At the completion of radiation therapy in February 2011, he experienced complete remission of the lesions on his arms, except for an area of sanctuary on his right dorsal hand due to setup limitations caused by his joint contractures (figure 2B). In view of the positive response to radiation therapy, in April 2011 new lesions including right dorsal hand, right antecubital region, left posterior knee and perineum were treated with appositional electron-beam therapy. The patient continued to have good clinical response to radiotherapy, even to lower doses, which led to the use of radiation therapy to other areas including a 4.5×4.5 cm ulcerated tumour on the left scalp, a tumour on the left elbow and an impetiginised patch on his left thumb. The patient tolerated the radiation treatments well. The patient has maintained complete remission for 3 months.

DISCUSSION

MF belongs to a heterogeneous group of non-Hodgkin's lymphomas and itself has a diverse range of clinicopathological presentations. 'Classical' MF presents as diffuse dry, pruritic and scaly patches that can resemble eczema in sun-protected areas such as the lower trunk, buttocks and breasts. The course of 'classical' MF is typically indolent, and most patients experience slow progression with good prognosis. Early stages of MF are usually responsive to topical steroid treatment. Our two patients, in contrast, both had predominant acral involvement and long-standing histories of treatment-refractory palmoplantar dermatoses prior to being diagnosed with MF. This presentation occurs with a rare variant of MF known as mycosis fungoides palmaris et plantaris (MFPP). MFPP lesions are limited to, initially present on, or predominantly involve the palms and soles.¹ Affecting 0.6% of MF patients, MFPP typically follows an indolent course, and remains stage IA, limited to regions of initial presentation, but has been reported to extend to the face, limbs and trunk.^{1–3} There have been no reported cases of extracutaneous involvement.^{1–3}

Lesions of MFPP display a wide range of clinical presentations including hyperkeratotic plaques,^{4,5} verrucous plaques or nodules,⁶ scaly erythematous plaques,^{5,7} vesiculopustular lesions^{8,9} and fissured, eroded or ulcerated plaques.^{10,11} In many cases, such as ours, its resemblance to more common palmo-plantar dermatoses leads to misdiagnosis and delay in treatment.¹² Clinicians should be vigilant in cases of palmo-plantar dermatoses that occur in patients with no history of atopy, present with atypical involvement such as the dorsal hand or wrist, or are refractory to common treatment. A biopsy should be obtained in these cases. Classic MF findings are diagnostic and monoclonal rearrangements of T-cell receptor γ gene in lesional tissue by PCR can aid in differentiating MFPP from inflammatory dermatoses.² As the histopathology was diagnostic in our patients, we did not perform PCR of the biopsy specimen.

Although our patients never had evidence of extracutaneous involvement, unlike most cases of MFPP, they progressed to stage IIB, developing tumours and ulcerations refractory to systemic treatment. Both of our patients required hospitalisation for pain and infection control, and had an evidence of bacterial secondary infection with multiple positive bacterial cultures of ulcerations although fungal cultures remained negative. Our cases suggest that although most cases of MFPP do remain localised to palms and soles, it appears that a more generalised involvement may develop causing significant morbidity. Since most cases of MFPP in literature are documented in case reports or case series, there may not be adequate follow-up on all patients to determine the ultimate course of the disease. Furthermore, treatment with immunosuppressant drugs, as in Case 1, may contribute to progression of disease. Poonawalla *et al*¹¹ described a patient with necrotising acral MF that began on the hands and feet and progressed to an exophytic ulcerated mass of his lower lip who died of infection and complications from chemotherapy within 3 months of initial presentation. Although many other factors were involved in the case described by Poonawalla *et al*, it is important to keep in mind the possibility of aggressive cutaneous disease and poor response to treatment in patients with palmo-plantar involvement.

In literature, MFPP has shown good response to multiple treatment modalities including topical nitrogen mustard,^{1,4,5} phototherapy (UV-B, UV-A),² photochemotherapy (PUVA, acitretin plus PUVA),² topical PUVA,¹² radiotherapy,¹ systemic methotrexate,² excimer (308 nm) laser,⁶ carbon dioxide laser⁷ and surgical excision.¹ Due to the rarity of the disease, there are no data comparing the efficacies of the available therapies. For our patients, because of poor-response to systemic therapies and rapidly progressing ulcerations, we decided to initiate localised radiation therapy.

Radiation therapy is a very effective method of treatment for MF due to the radiosensitivity of neoplastic T cells. TSEB is likely the most effective single skin-directed agent for patients with cutaneous disease, including stage IIB tumour disease. However, complications of TSEB are sometimes severe and most patients treated with TSEB will experience disease recurrence.¹³ Localised radiation therapy has mainly been studied and proven to be effective in the treatment of unilesional MF and stage IA disease.^{14–16} The clinical response and risk of recurrence are related to the total dosage of radiation delivered. Retrospective studies by Cotter *et al* and Wilson *et al* demonstrated that a total tumour dose of at least 20–30 Gy is necessary for local tumour control, although, in clinical practice, some patients can respond to doses as low as 10–12 Gy as was the case in both of our patients and also documented in the literature.¹⁷

Both of our patients showed remarkable response to localised electron-beam radiation with clearing of the initial lesion within 2 months of initiation of therapy, while other topical and systemic therapies proved to be unsuccessful. Distant new lesions appeared, but all recurrent lesions were particularly responsive to radiation. Both patients tolerated the therapy well with few acute complications, namely dermatitis, and few long-term complications including hand cramping, paresthesias, skin atrophy and telangiectasias. These side effects occurred at the sites that received more than one course of radiation to the distal extremities.

There are two key considerations regarding the use of radiation. First, since MF is a radiosensitive tumour and local radiation is used for the purpose of palliation, it is important to consider the long-term side effects of treatment and to use the lowest possible dose to achieve a complete response. Second, the field and dose of radiation has to be delivered with the anticipation that the patient will likely return with multiple other lesions, some distant and mostly adjacent if not at the same treated site. Being mindful of using small-field and low-dose treatments will decrease the risk of long-term side effects.

The successful use of localised radiotherapy in both our patients supports that it is an important agent in the treatment of the limited cutaneous lesions in MFPP or stage IA disease. Furthermore, our results suggest that localised radiotherapy is a suitable alternative in treating tumour, ulcerated or more generalised disease in patients refractory to other systemic and topical treatments.

Learning points

- It is important to consider a diagnosis of mycosis fungoides palmaris et plantaris (MFPP) in long-standing cases of hand and foot eczema and psoriasis that are unresponsive to standard therapies or have atypical areas of involvement.
- Although MFPP is typically an indolent disease, it is important to be conscious of the possibility of rapid progression and poor response to treatment in patients with initial palmo-plantar disease.
- It is also important to consider localised radiation as a safe and effective palliative therapy for MFPP and refractory cutaneous disease.
- Recurrence distant to, near, or in the treated site should be anticipated.
- The lowest possible dose and smallest treatment field required to achieve a complete response should be used to decrease the risk of long-term side effects.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- 1 Resnik KS, Kantor GR, Lessin SR, *et al*. Mycosis fungoides palmaris et plantaris. *Arch Dermatol* 1995;131:1052–6.
- 2 Kim ST, Jeon YS, Sim HJ, *et al*. Clinicopathologic features and T-cell receptor gene rearrangement findings of mycosis fungoides palmaris et plantaris. *J Am Acad Dermatol* 2006;54:466–71.
- 3 Kazakov DV, Burg G, Kempf W. Clinicopathologic spectrum of mycosis fungoides. *JEADV* 2004;18:397–415.

- 4 Stasko T, Vander Ploeg DE, De Villez RL. Hyperkeratotic mycosis fungoides restricted to palms. *J Am Acad Dermatol* 1982;7:792–6.
- 5 Sandwich JT, Davis LS. Mycosis fungoides palmaris et plantaris. *Arch Dermatol* 1996;132:971.
- 6 Jin SP, Jeon YK, Cho KH, et al. Excimer laser therapy (308 nm) for mycosis fungoides palmaris et plantaris: a skin-directed and anatomically feasible treatment. *Br J Dermatol* 2010;163:651–3.
- 7 Goldberg DJ, Stampien TM, Schwartz RA. Mycosis fungoides palmaris et plantaris: successful treatment with the carbon dioxide laser. *Br J Dermatol* 1994;136:617–19.
- 8 Lund KA, Parker CM, Norins AL, et al. Vesicular cutaneous T cell lymphoma presenting with gangrene. *J Am Acad Dermatol* 1990;23:1169–1171.
- 9 Toritsugi M, Satoh T, Higuchi T, et al. A vesiculopustular variant of mycosis fungoides palmaris et plantaris masquerading as palmoplantar pustulosis with nail involvement. *J Am Acad Dermatol* 2004;51:139–41.
- 10 Sheehan-Dare RA, Goodfield MJ, Williamson DM, et al. Ulceration of the palms and soles: an unusual feature of cutaneous T-cell lymphoma. *Acta Derm Venereol* 1990;70:523–5.
- 11 Poonawalla T, Jones D, Hagemester F, et al. Acral necrotizing mycosis fungoides. *Clin Lymphoma Myeloma* 2005;6:146–8.
- 12 Spieth K, Grundmann-Kollmann M, Runne U, et al. Mycosis-fungoides-type cutaneous T cell lymphoma of the hands and soles: a variant causing delay in diagnosis and adequate treatment of patient with palmoplantar eczema. *Dermatology* 2002;205:239–44.
- 13 Hoppe RT. Mycosis fungoides: radiation therapy. *Dermatol Ther* 2003;16:347–54.
- 14 Cotter GW, Baglan RJ, Wasserman TH, et al. Palliative radiation treatment of cutaneous mycosis fungoides—a dose response. *Int J Radiat Oncol Biol Phys* 1983;9:1477–80.
- 15 Wilson LD, Kacinski BM, Jones GW. Local superficial radiotherapy in the management of minimal stage IA cutaneous T-cell lymphoma (mycosis fungoides). *Int J Radiat Oncol Bio Phys* 1998;40:109–15.
- 16 Micaily B, Miyamoto C, Kantor G, et al. Radiotherapy for unilesional mycosis fungoides. *Int J Radiat Oncol Biol Phys* 1998;42:361–4.
- 17 Harrison C, Young J, Navi D, et al. Revisiting low-dose total skin electron beam therapy in mycosis fungoides. *Int J Radiat Oncol Bio Phys* 2011;81:e651–7.

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