

Skin-directed radiation therapy for palmoplantar pustulosis



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Palmoplantar pustulosis (PPP) is an often refractory and symptomatic dermatosis. Despite the often proportionally smaller involved percentage of body surface area, the disease can have a disproportionately negative impact on quality of life.¹ We recently used skin-directed radiation therapy (RT) for treatment of severe, refractory PPP.

Clinicians often use ultraviolet radiation therapy as first-line treatment of PPP. Although ionizing radiation (particularly Grenz ray irradiation) was extensively used for focal inflammatory dermatoses, recently its use has been largely abandoned. New techniques such as megavoltage beams (when appropriate) have provided an opportunity to use RT in patients with more extensive disease.

RT as treatment of PPP is rarely described and with varying efficacy.² A published report from our department, describing extensive, refractory dermatitis responding to RT, was the impetus to treat the patients described here.³ We describe 2 cases of refractory, symptomatically debilitating PPP with dramatic short-term response to RT.

CASE 1

A 44-year-old woman suffered from severe, refractory PPP with debilitating 10/10 pain limiting her ability to walk. Over 2 years, she had little relief from topical steroids, topical calcineurin inhibitors, calcipotriene, and systemic medications including apremilast, prednisone, methotrexate, cyclosporine, acitretin, and ustekinumab. She underwent RT to the hands and feet (18 Gy in 6 fractions, 3 Gy once weekly).

Abbreviations used:

PPP: palmoplantar pustulosis
 RT: skin-directed radiation therapy

She noted dramatic improvement after the first 2 treatments and was pain free after the fourth treatment. At 1-month follow-up, she reported no pain or difficulty walking (Fig 1). At 13-month follow-up, she reported complete clearance lasting 5 months after RT, followed by recurrence at the prior level of severity. The patient declined subsequent treatments because of inability to travel.

CASE 2

A 49-year-old woman presented with severe PPP for 10 years that limited her ability to ambulate. She was refractory to topical corticosteroids, salicylic acid, ultraviolet light therapy, and systemic medications (prednisone, methotrexate, infliximab, adalimumab, etanercept, ustekinumab, acitretin, apremilast, and ixekizumab). She underwent RT to the hands and feet (18 Gy in 6 fractions, 3 Gy once weekly) and experienced dramatic improvement within 3 treatments. Her ability to freely ambulate returned. Follow-up at 1 month showed continued improvement with decreased pain (1/10 compared to 10/10 before RT) (Fig 2). At 16-month follow-up, she reported sustained improvement with mild once-monthly flares controlled topically.

DISCUSSION

All treatments were well tolerated and all reported side effects were mild (fatigue, dry skin).

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Fig 1. Case 1, PPP. **A**, Before and **B**, after RT (18 Gy in 6 fractions, once weekly dosing).



Fig 2. Case 2, PPP. **A**, Before and **B**, after RT (18 Gy in 6 fractions, once weekly dosing).

Megavoltage beams were required in both cases to cover the entire extent of disease with adequate dose.

Phase 3 clinical trials found that superficial RT is well tolerated and is effective in the treatment of focal eczema.⁴⁻⁸ In one study, superficial x-rays were found to be more effective than x-rays.⁴ Technical advances, including the use of megavoltage⁹ and intensity-modulated RT³ have made it possible to use

RT for treatment in patients with more extensive disease. In our previous report we described the successful use of intensity-modulated RT in a patient with extensive dermatitis.³

Use of ionizing radiation for inflammatory conditions of the skin has been mostly abandoned in recent decades. Our experience shows that RT is a treatment option for severe, refractory PPP and some other inflammatory dermatoses, including extensive

multi-focal disease. The use of ionizing radiation therapy should be considered along with other forms of photon therapy, including ultraviolet A1 phototherapy and ultraviolet B phototherapy¹⁰ in the treatment of PPP. Radiation oncologists should consider this treatment to be within the scope of their practice and it should be considered within the standard of care for third-party coverage. Because of the risk of radiation-induced skin cancer, use should be reserved for patients with severe, symptomatic disease refractory to other treatments.

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