

Frictional hyperkeratotic hand dermatitis responding to Grenz ray therapy

Contact Dermatitis 2008; 58: 49–51

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Frictional hyperkeratotic hand dermatitis (FHHD) is an unusual form of chronic eczema relating to repeated frictional trauma. This form of hand eczema is often occupationally related and recalcitrant to therapy. We describe the case of FHHD in a 48-year-old dermatologic surgeon. The eruption was resistant to all topical and protective modalities, but responded completely to 6 sessions of Grenz ray treatment. No recurrence has been noted for over 4 years since completion of therapy. We suggest that Grenz ray treatment is a safe and effective option in treating this form of chronic hand dermatitis.

Key words: occupational, radiation, treatment.

Frictional hyperkeratotic hand dermatitis (FHHD) is an unusual localized form of chronic eczema (1, 2). It may represent a hybrid presentation of dermatitis with a multifactorial etiology. It is thought to be a cutaneous reaction to repetitive mechanical activities involving friction, trauma, vibration, and pressure (1, 2) and is often occupationally related (2, 3). The disorder can be associated with significant discomfort, including painful fissuring, and may require an alteration in work activities. We describe a novel case of FHHD which responded completely to treatment with Grenz ray therapy.

Case Report

A 48-year-old dermatologic surgeon gradually developed well-demarcated, linear hyperkeratosis along the articulating surfaces of his palms and fingers. The eruption was both

tender with pressure and pruritic and was worsened by occupational activities involving friction, particularly performing liposuction. He had noted the onset to correlate with an increase in liposuction procedures (to a peak of 2 per week), occurring in areas of the hands in direct contact with liposuction instruments; tender hyperkeratosis also developed at the sites where surgical instruments such as scalpel holders and needle drivers were held. The number of Mohs micrographic surgery cases he performed remained stable during this time. After development of the hand dermatitis, he also noted tender hyperkeratosis along the weight-bearing surfaces of his soles (Fig. 1). He was otherwise healthy and took no medications. Family history was negative for psoriasis. The condition did not respond to adequate trials of mid- to high-potency topical corticosteroids (including 6-week trials of triamcinolone, fluocinonide, and clobetasol ointments), as well as trials of topical tacrolimus, calcipotriene ointment, and bexarotene gel. He was also unresponsive to a 2-week course of prednisone (0.5 mg/kg). Substitution of latex gloves with multiple alternatives made no difference. Frequent application of bland emollient with use of cotton gloves provided marginal benefit. The condition was sufficiently painful that the subject was considering limiting his practice to only non-procedural dermatology.

Patch testing with an extended panel of 107 antigens, including the North American Contact Dermatitis standard antigens and additional

occupationally relevant allergens, was entirely negative. A diagnosis of FHHD was made. Treatment with Grenz ray at a weekly dose of 400 rads (4 Gy) was begun, with remarkable improvement noted after 3 weeks (Fig. 2). As the treatment required weekly flights to an office in another state (from South Dakota to Oregon), the subject purchased his own Grenz ray device (Fig. 3) and completed the 6-week treatment course in his own office. The disorder remitted fully and has not recurred during 48 months of follow-up, during which time only topical emollients have been applied. His number of Mohs cases has remained unchanged, though he now limits the number of liposuction procedures to 2 per month.

Discussion

FHHD is an unusual form of chronic hand eczema (1, 2). While hyperkeratotic hand dermatitis has been described in up to 2% of cases of hand eczema and is most commonly found in males aged 40–60 (4), the clear inciting factor of friction suggested the hybrid variant of FHHD in this case. Mechanically provoked psoriasis of the palms is well known, and frictional eczema (without hyperkeratosis) is not uncommon. Others have reported cases of a postal employee with palmar eczema induced by a rough tabletop and a bus driver with fingertip eczema caused by contact with tickets (5). Cases of frictional dermatitis have been recognized in workers handling



Fig. 1. Well-demarcated hyperkeratotic plaques along areas of friction on fingers, palms and sole.



Fig. 2. Improvement in hyperkeratosis after 3 weekly treatments with Grenz ray therapy. Further treatment resulted in complete remission.



Fig. 3. The Grenz ray device utilized in this case (X-cel X-ray Corp., Crystal Lake, IL, USA).

large quantities of pressure-sensitive carbonless paper; elimination of the trauma led to resolution within 2–3 weeks (6). The most important eliciting factors of FHHD reported in one study were repeated physical pressures of the palms during work or when in contact with oil or detergents (7). Conservative management includes identification and elimination of any potential contact allergens, aggressive moisturization, use of protective gloves, and application of topical agents including corticosteroids, calcineurin inhibitors, retinoids, and/or calcipotriene (1, 2). When these modalities fail, other measures must be considered.

Grenz rays (ultrasoft X-rays) are a form of superficial ionizing radiation in which applied energy is absorbed almost entirely by the epi-

dermis and papillary dermis (8). The limited penetration makes this modality safe and appropriate for superficial dermatoses, with minimal risk of subsequent carcinogenesis provided a maximum total dose (50 Gy per lifetime and area) is observed (9). Therapeutic regimens generally include 6 treatments at 1- to 3-week intervals with 2–4 Gy per treatment. One study of 24 patients with bilateral hand dermatitis, unilateral treatment with Grenz rays (3 Gy weekly for 6 weeks) showed significant improvement compared with placebo (10). However, other double-blind studies have shown Grenz rays to be similar to placebo (11) or inferior to conventional X-ray (12) for this indication. Other therapeutic options include phototherapy (psoralen ultraviolet A (PUVA), ultraviolet B (UVA)),

systemic immunosuppressant agents (corticosteroids, methotrexate, cyclosporine, and mycophenolate mofetil), oral retinoid agents, botulinum toxin, and iontophoresis (1, 2, 7).

In conclusion, we report an excellent therapeutic response of FHHD to a single course of Grenz ray therapy, with no recurrence for over 4 years after cessation of treatment. We consider this an effective and safe therapeutic option for recalcitrant cases of hand dermatitis.

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