Unilesional mycosis fungoides treated with photodynamic therapy: A case report

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SUMMARY

Background: Mycosis fungoides, or cutaneous T-cell lymphoma (CTCL), is one of the most common skin lymphomas, with a chronic and lethal course. It is characterized by the expansion of CD4+ and CDw29+ immunophenotype T-cell clones lacking normal antigens. These altered T-lymphocytes are predominantly located in the skin, but some of them retain their ability to migrate and exit the skin through the lymphatics into the circulatory system.

Case report: We report on a 78-year-old man with an 8-year history of histologically verified Mycosis fungoides. Twenty-five years ago, the patient was incorrectly diagnosed with psoriasis vulgaris and received therapy with only slight effect. In 1999 the patient underwent full body actinotherapy (30 Gy) which resulted in complete remission of CTCL lesions on the skin. In October 2005 the patient presented at our department with a new partially infiltrated lesion 14 × 6 cm in his right groin. Because photochemotherapy and local therapy with corticosteroids had already been used without significant results, we opted for photodynamic therapy (PDT) with methyl aminolevulinate (MAL).

KEY WORDS

mycosis fungoides, MAL PDT, methyl-aminolevulinate

Introduction

The term Mycosis fungoides was first coined by Alibert in 1806. Mycosis fungoides, or cutaneous T-cell lymphoma (CTCL), is one of the most common skin lymphomas with a chronic and lethal course. The pathogenesis of Mycosis fungoides is unknown, although some authors have pointed to the association of the disease with a previous lymphotropic T-cell virus infection (HTLV I/II, V). It is characterized by the expansion of CD4+ and CDw29+ immunophenotype T-cell clones lacking normal antigens. These altered T-lymphocytes are primarily located in the skin, but some of them retain their ability to migrate and exit the skin through the lymphatics into the circulatory system. This process can take place even when only skin manifestations are apparent.

It has been shown that T and B leukemia/lymphoma cell lines are very sensitive to photodynamic therapy with aminolevulinic acid (ALA-PDT) when compared to

Table 1. Studies on the effectiveness of PDT in patients with unilesional Mycosis fungoides.

Reference	Patients (*n*)	Lesions (*n*)	Treatments (*n*)	Clinical clearance	Recurrence rate
Wolf et al. (8)	2	3	4–5	3/3	–
Ammann & Hunziker (9)	1	1	1	–	N/A
Leman et al. (10)	1	2	2	2/2	–
Markham et al. (11)	1	1	5	1/1	–
Edstrom (12)	5	6	2	4/6	N/A
Ebström (13)	10	12	2–11	7/12	–
Paech et al. (14)	1	2	2	2/2	–

physiological lymphocyte lines and their progenitors (1, 2). The reason for enhanced accumulation of protoporphyrine IX (PpIX) in malignantly altered lymphocytes may be related to greater precursor uptake (3) and retention and decreased activity of ferrochelatase (4). At the same time, the enhanced permeability of the abnormal stratum corneum overlying mycosis fungoides lesions can provide for an enhanced supply of ALA to underlying neoplastic cells (5). The overall results of trials using topical 20% ALA-PDT for Mycosis fungoides indicate that it is an effective and very well-tolerated method with a clearance rate that, in a number of studies, was close to 100% after one to five exposures (6, 7, 8, 9, 10, 11).

Case report

We report on a 78-year-old man with an 8-year history of histologically verified Mycosis fungoides. Twenty-five years ago, the patient was misdiagnosed as having psoriasis vulgaris and treated with only limited effect. In 1999 the patient underwent full body actinotherapy (30 Gy), which resulted in complete remission of CTCL skin lesions. In October 2005 the patient presented at our department with a new partially infiltrated bright red lesion of a slightly darker hue, 14 × 6 cm, on his right groin (Fig. 1). Skin biopsy revealed a dense lymphohistiocytic infiltrate in the upper dermis with some epidermotropism. Pautrier microabscesses were absent (Fig. 3). Because photochemotherapy and local therapy with corticosteroids had already been used without significant results, we opted for photodynamic therapy with MAL (methyl aminolevulinate).

We applied Metvix® cream in a 1 mm thick layer to the lesion, with a 0.5 cm border extending onto healthy skin. The lesion was then covered with an occlusion for 3 hours to enhance cream penetration. It is also important to protect the applied Metvix® cream from light so that the photoactive potential of the methyl aminolevulinate is not depleted (photobleaching).

After 3 hours the cream was rinsed off with saline and the lesion was exposed to UV light. Bright red fluorescence was visible in the infiltrated part of the lesion with slightly less visible patches scattered diffusely throughout the lesion. We then irradiated the lesion with 100 J/cm² using an Aktilite® lamp, which produces intense light in the 635 nm spectrum (red light). When the patient was seen 1 week later the lesion already showed signs of regression with hardly any signs of inflammation.

Seven days after the first MAL PDT treatment, the patient underwent a second session with 200 J/cm². 1 week after the second session the lesion was slightly ulcerated but after application of Fucidin® cream healed in a few days. One week later the patient underwent a third MAL PDT session with 100 J/cm2. Twenty-four hours after the third application of MAL PDT the lesion revealed only slight inflammation. Comparison of photodocumentation prior to therapy and after every session of MAL PDT showed definite signs of peripheral regression and a decrease in infiltration.

The patient was examined at our department 3 weeks after the third session of MAL PDT for clinical and histological verification of the efficacy of the therapeutic modality used. Clinically the lesion showed regression of infiltration and peripheral darkening with loss of sharp margins.

The final follow-up session was 16 months after the third session of MAL PDT. The lesion was photographed and skin samples were taken for histopathology (Fig. 2). No infiltration was observed and the treated lesion was only very slightly outlined by a light brown border. Histological examination showed a very mild inflammatory infiltrate around the capillaries in the papillary dermis (Fig. 4).

Discussion

Data on the treatment of Mycosis fungoides with topical MAL PDT have shown promising results in the past. Although unilesional Mycosis fungoides does not have the tendency to progress to systemic disease, it still must be treated. There have been multiple case reports and even studies that have proven the effec-

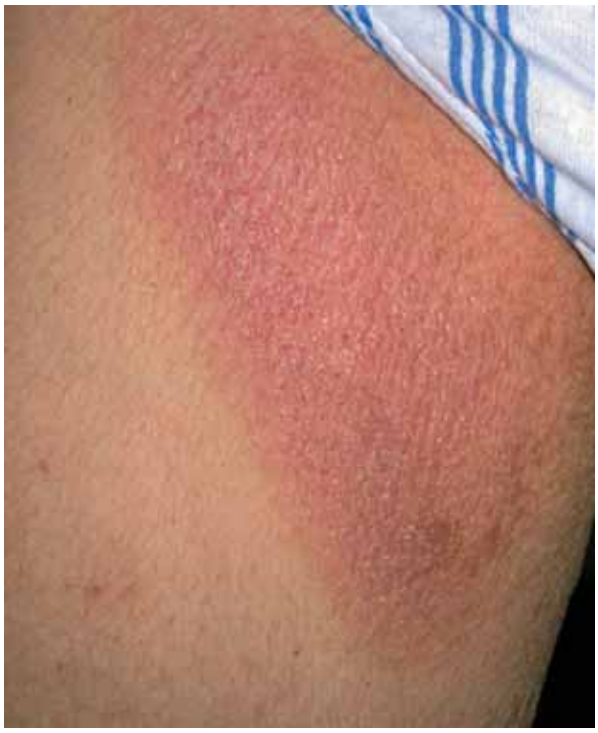

Figure 1. Solitary mycosis fungoides lesion before therapy with methyl aminolevulinate (MAL), photodynamic therapy (PDT).

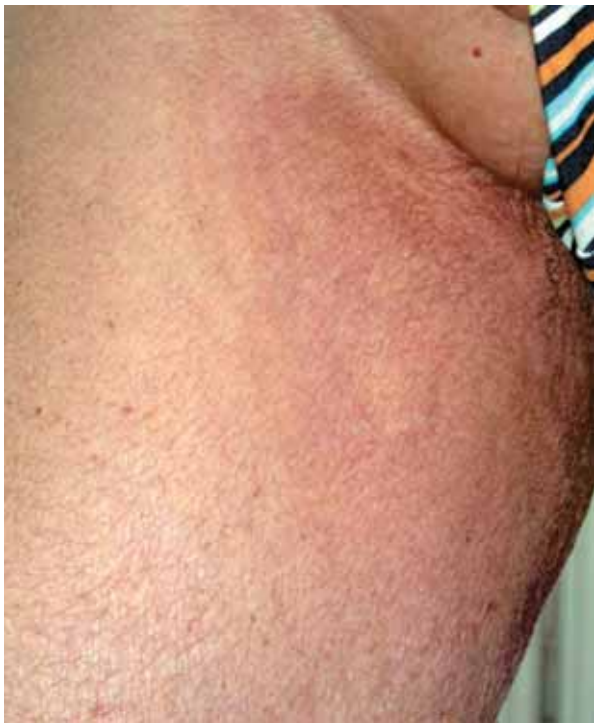

Figure 2. Mycosis fungoides lesion 16 months after third session of methyl aminolevulinate (MAL), photodynamic therapy (PDT).

tiveness of PDT in patients with unilesional Mycosis fungoides (Table 1) and the results of almost all of these were very promising concerning the outcome. It seems that photodynamic therapy has the potential to become a valid therapeutic modality in the treatment of cutaneous T-cell lymphomas in the future because non-ionizing radiation is used and only mild side effects are present. It should also be mentioned that the method is

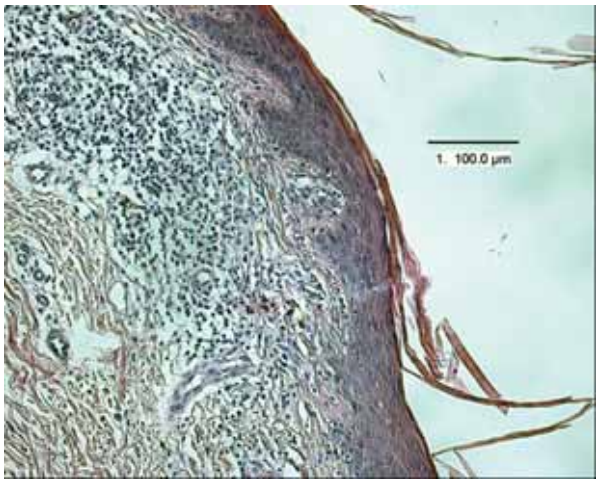

Figure 3. Histopathology before therapy.

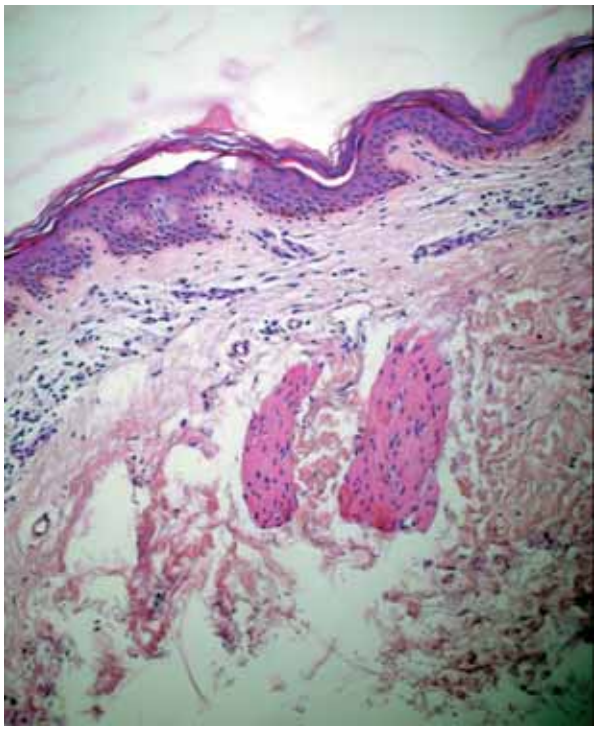

Figure 4. Histopathology 16 months after therapy.

relatively simple, which would allow the method to be applied even in dermatological ambulances. However, it is important to mention that even though the data justifying the use of PDT for unilesional Mycosis fungoides exist, we still do not have an established treatment protocol that describes the incubation time, dose, and number of cycles necessary to achieve complete response in a patient.

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