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*Case Report*

# Successful Treatment of Early-Stage Mycosis Fungoides With Topical PUVA in Adult Patient: Case Report

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## Abstract

Mycosis fungoides is fairly common type of cutaneous T-cell lymphoma with prolonged indolent course. Early-stage MF patch/plaque stage disease (T1/T2) can be treated safely and effectively by Phototherapy. Systemic PUVA and Narrowband UVB widely used with considerable result in MF. Topical PUVA is rarely considered as a phototherapy line in MF. We represent in our patient complete clearance of MF plaque after topical PUVA phototherapy without relapse.

**Keywords:** MF; CTCL; Phototherapy; PUVA; Adult Patient

## Introduction

Mycosis Fungoides (MF) is the most common form of cutaneous T-cell lymphoma. The incidence of Cutaneous T-Cell Lymphomas (CTCL) has been increasing in recent years [1]. MF represents approximately 75% of primary CTCL which are T-cell derived [2]. The precise etiology of MF is still unknown, even epidemiological studies have failed to identify any environmental or virally associated risk factors for most CTCL subtypes, except for HTLV-1 infection in adult T-cell leukemia/ lymphoma [3]. Recent studies have suggested that medications like hydrochlorothiazide may induce an antigen-driven T-cell lymphoproliferation or dyscrasia [4]. Phototherapy is one of helpful therapies in early-stage MF especially narrowband UVB which has demonstrated efficacy in patients with patch/plaque stage disease (T1/T2) [5,6]. Another alternative phototherapy is PUVA (8-methoxypsoralen plus ultraviolet A), which is recommended by National comprehensive cancer in thick plaques MF [7].

## History of the Case

A gentleman of 45-year-old previously healthy presented in 2015 to our center with 35×20 cm scaly hyperpigmented patch in the right side of anterior chest for six years. A new lesion one month ago over right gluteal area was developed. It was hyperpigmented scaly skin patch about 15× 10 cm. MF was highly suspected, so skin biopsy was taken from the chest lesion (and it confirmed the clinical suspicion of MF) (Fig. 1).

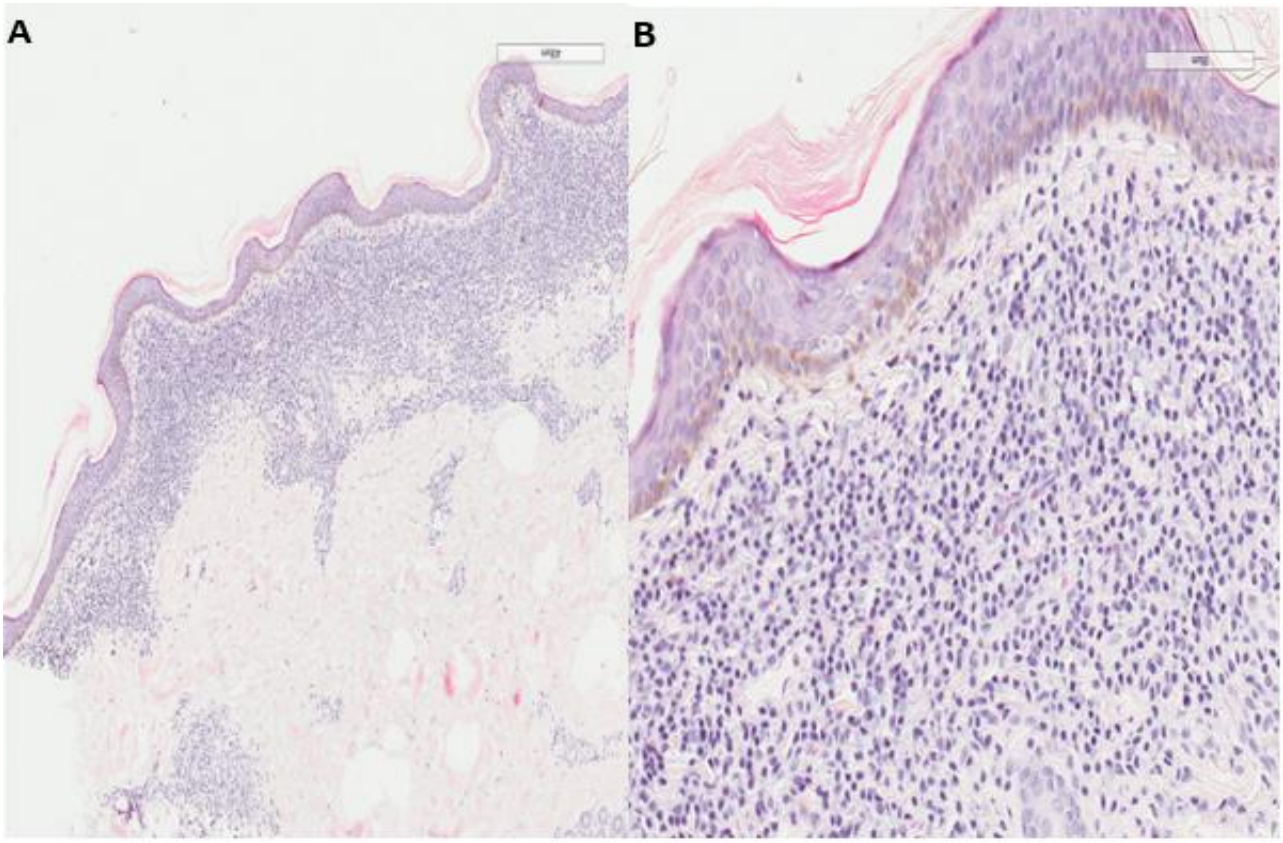


**Figure 1:** A: H&E showed: epidermal thinning with loss of the rete ridges, epidermotropism and lichenoid infiltration of the upper dermis with lymphocytic infiltration having large nuclei; B: A higher power of same findings.

A full workup including CT scan was done for staging of MF and there were not any visceral or lymph nodes involvement, the patient's disease was staged as IA, according to the TNMB staging of MF/SS [8]. The patient was started on phototherapy NBUVB three sessions weekly (total 70 sittings) in addition to topical emollients and steroids, for six months. The starting dose of NBUVB was 345 millijoule, as a minimum erythema dose and increase 10% every session three times per week (if no adverse effects). The total cumulative dose of NBUVB was 83.874 joule, that result of completely clearance of gluteal patch. In contrary the chest lesion did not improve and exacerbated to become more thickened plaque. The patient was shifted to oral PUVA, as it is more effective. Minimum phototoxic erythema dose was requested before starting PUVA, but it gave no response, so it was repeated after 5 weeks and oral PUVA was started 3 times weekly. After seven sessions of oral PUVA of total 40 joule/ $cm^2$, the chest lesion increased in size with new multiple nodular infiltrations (Fig. 2).

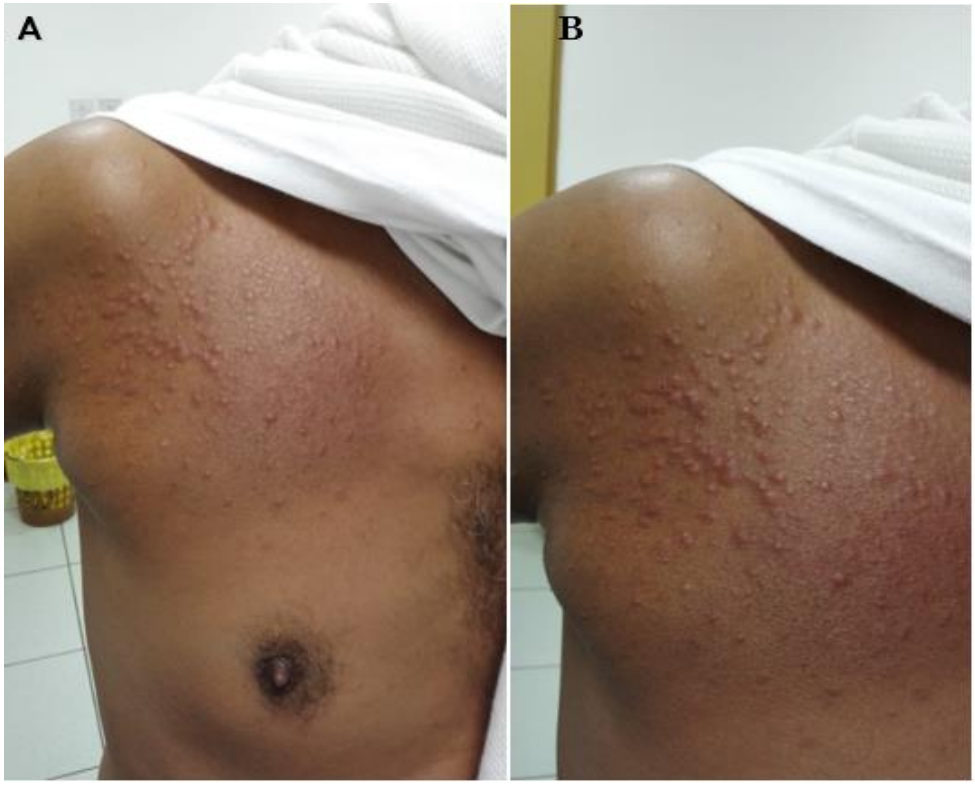


**Figure 2:** A: The patch lesion over chest became worsen after oral PUVA; B: Closer view to same lesion.

A new biopsy was done, which showed more extensive epidermotropism and cellular infiltration, with also thickened collagen bundles (Fig. 3). Immunohistochemical staining was done (Fig. 4) for CD markers and showed negative CD20, CD30 and CD 7, while positive pan staining for CD3 and CD4 and focal staining for CD8 specific pattern for MF Image. The second biopsy confirmed the persistence and progression of MF lesion, as it became plaque rather than patch with nodular infiltration.

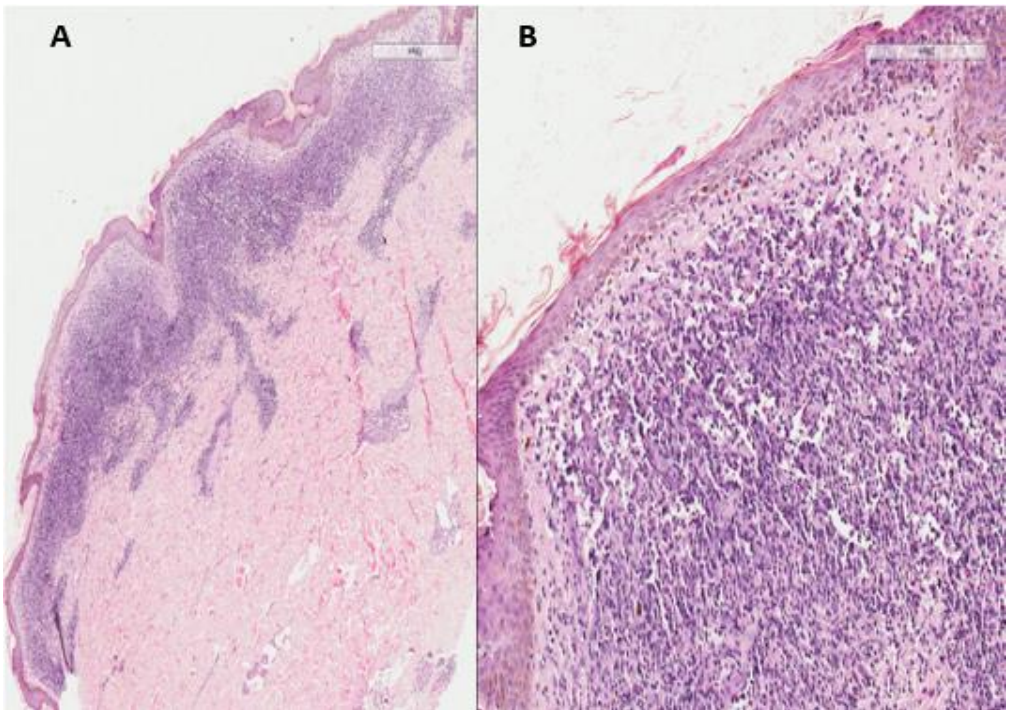


**Figure 3:** A: H&E showed more extensive epidermotropism and cellular infiltration, with also thickened collagen bundles; B: Showed higher magnification of same findings.

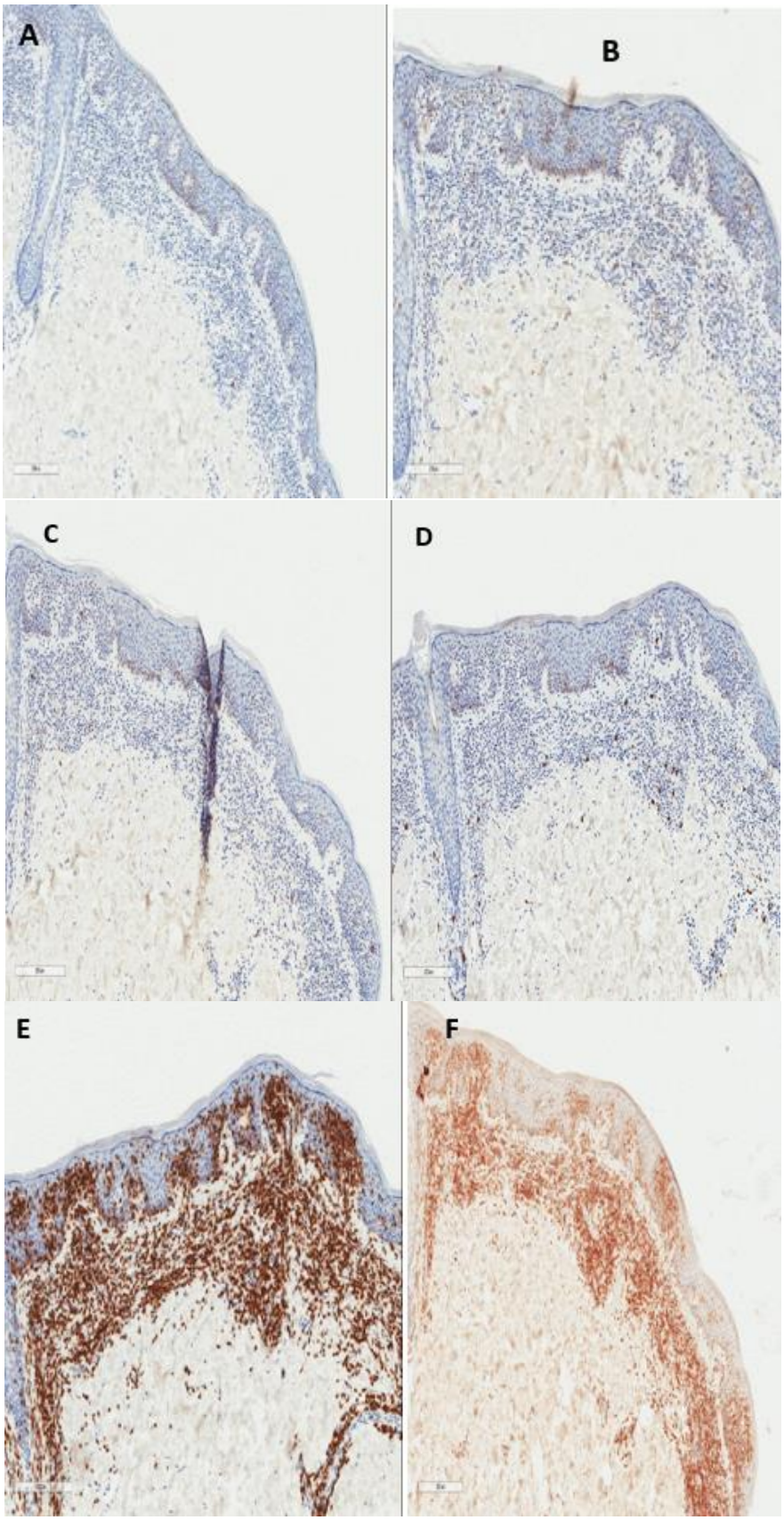


**Figure 4:** A,B: Negative immunostaining for CD2O and CD30; C: CD7 negative; D: CD8 negative with focal positivity; E,F: Positive for CD3 andCD4.

Topical PUVA was an option which is rarely used for mycosis fungoides [15]. Our patient started on topical UVA three times a week. Topical psoralens (methoxsalen solution 0.1%) was administered 60 minutes before the session Ultraviolet A phototherapy (315-400 nm) was started with 0.5 J/cm$^2$ and was increased by 0.5 J/cm$^2$ every third day until 10.5 J/cm$^2$ was reached (Fig. 5). Total 96 sessions, the cumulative dose was 660 J/cm$^2$ in the affected area while the remaining skin was covered. Regular clinical follow-up for patient showed a complete remission for 2 years, without any recurrence in same site neither in other skin sites. Patient has electronic file and came for other dermatology complain (pityriasis versicolor) this year 2023, examination for skin which is completely free. The patient if free for 8 years till now.

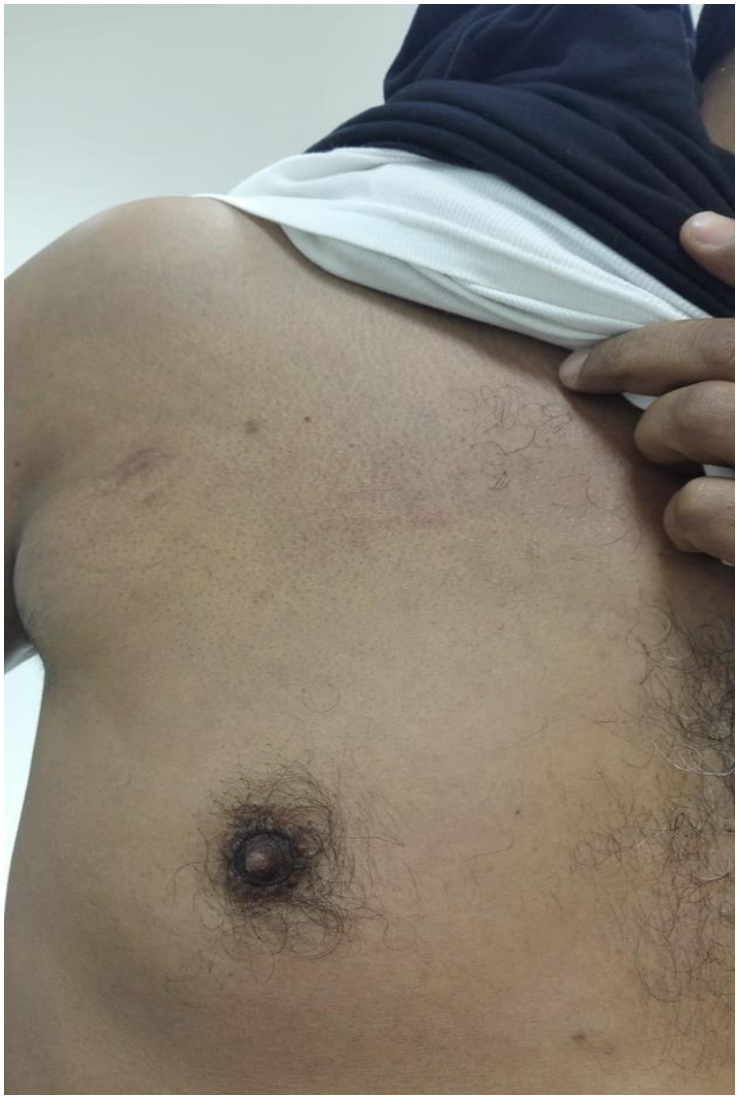

**Figure 5:** Complete clearance of MF plaque lesion after topical PUVA.

**Discussion**

MF is a primary cutaneous lymphoma, a variant of heterogeneous group of extra-nodal non-Hodgkin lymphomas started primarily in the skin. Non-Hodgkin lymphomas are mainly T-cell derived [9]. The incidence CTCL has been increasing and is currently, even in children and young adults specially the histopathologic variant MF [10]. The malignant lymphocytes in MF/SS are usually CD3+CD4+ and CD8-, but frequently lose the expression of other pan-T-cell antigens. Therefore, demonstration of a significant population of CD4+ cells lacking CD2, CD5 and/or CD7 expression is highly specific (specificity >90%) for MF in most reported series [11]. Phototherapy is one of selective therapies in early-stage MF, either NBUVB, or oral PUVA. Narrow band UVB is used in early-stage patch and plaque MF, in other hand PUVA in skin of color MF patients has demonstrated efficacy in many retrospective and prospective studies [12-14]. Both phototherapy types have a significant efficacy in early-stage MF. NBUVB is widely used because it has limited local skin effect low potential carcinogenic role [16]. Phototherapy PUVA exerts a

systemic action, unfortunately might have adverse potential carcinogenic effect this might be an explanation which had happened in our patient of exacerbation of his MF chest plaque over chest after given him systemic PUVA [17]. It induces neoplastic T lymphocyte death by forming singlet oxygen and directly damaging DNA [18]. Our patient is early-stage MF at time of presentation (stage IA). Patient was stared on NBUVB which is considered effective and safe options in early-stage MF [5,6]. The patch lesion over gluteal lesion completely cleared. The other patch lesion over the shoulder unfortunately did not improve and became worse as it progressed to a plaque (stage IA). Patient shifted to oral PUVA, that it is more effective and recommended in MF in adult, the shoulder plaque increase in size and infiltrated by multiple nodular lesions [19-21]. Topical PUVA was our last option for this patient with excellent outcome and complete clear of shoulder plaque which was resistant to NB-UVB and progress in systemic PUVA. Topical PUVA it is uncommonly used in MF and mostly tried in children in cases report study [22]. Although phototherapy is mainstay therapy in early-stage MF with efficacy and safety in most of patients, it is reported the contrary in retrospective review [23]. Progression of MF resumed to UV-induced p53 mutations in advanced MF suggest that phototherapy may contribute to disease progression [24]. Topical PUVA is good alternative optional phototherapy in case of non-tolerated or contraindicated systemic PUVA as in children or patients with hepatic impairment, or in patients rarely show paradoxical unexplained response as in our case.

**Limitation of Study**

Prephototherapy treatment photography had not taken for patient as he had refused at that time to take one for gluteal area.

**Conflict of Interest**

The authors have no conflict of interest to declare.

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