DERMATOLOGY PRACTICAL & CONCEPTUAL
www.derm101.com

Mycosis fungoides in a 15-year-old adolescent

Sarah Estelmann[1], Anna Neuberger[1], Ferdinand Toberer[1], Christine Fink[1], Alexander Enk[1], Holger A. Haenssle[1]

1 Department of Dermatology, Venereology, and Allergology; University Medical Center, Ruprecht-Karls University, Heidelberg, Germany

Key words: mycosis fungoides, childhood, adolescent

Citation: Estelmann S, Neuberger A, Toberer F, Fink C, Enk A, Haenssle HA. Mycosis fungoides in a 15-year-old adolescent. *Dermatol Pract Concept.* 2018;8(2):123-125. DOI: https://doi.org/10.5826/dpc.0802a10

Received: November 12, 2017; **Accepted:** December 12, 2017; **Published:** April 30, 2018

Funding: None.

Competing interests: The authors have no conflicts of interest to disclose.

All authors have contributed significantly to this publication.

Corresponding author: Holger A. Haenssle, MD, Department of Dermatology, Venereology and Allergology, University Medical Center, Ruprecht-Karls University, Im Neuenheimer Feld 440, 69120 Heidelberg, Germany. Tel. +49-6221-56-39555; Fax. +49-6221-56-7771. Email: Holger.Haenssle@med.uni-heidelberg.de

Mycosis fungoides (MF), the most frequent primary cutaneous lymphoma, belongs to the group of extranodal non-Hodgkin lymphomas with a mean age at onset of >40 years [1]. The manifestation of MF in children is rare and has only been studied by a number of case series [2].

We report on a 15-year-old female adolescent presenting with pruritic eczematous lesions of the neck and trunk that had persisted for one year (Figure 1A). Clinical examination revealed erythematous, oval-shaped to polycyclic, eczematous macules and plaques with a cigarette paper-like cutaneous atrophy and moderate scaling (Figure 1A-D). The histopathological as well as immunohistochemical investigations included stains for hematoxylin-eosin, CD3, CD4, CD5, CD8, CD20, and CD30, which showed a dense infiltrate of mainly CD3 and CD4 positive atypical lymphocytes with epidermal exocytosis forming Pautrier's microabscesses (Figure 1E-G). Expression of CD5 as a marker of potential loss of differentiation was retained. Expectedly, flow cytometry analysis of peripheral blood cells showed results within normal limits (36% CD3-positive lymphocytes, CD4:CD8 ratio of 1.5). At the molecular level, a T-cell-receptor (TCR) gene rearrangement analysis from lesional skin showed two monoclonal gene rearrangements, agreeing well with the clinical and histopathological diagnosis of stage IA MF. A topical treatment with 0.1% mometasone furoate cream was initiated and achieved a partial response at the time of the first follow-up examination (6-week interval).

MF is the most common primary cutaneous T-cell lymphoma. However, in children and adolescents MF is very rare with an incidence of 0.05 new cases per year per 100,000 [3]. While in adults the female to male ratio was reported to be 1:2, Nanda et al described a 1:1 ratio in children and adolescents [4]. The difficulties in diagnosing early stage MF in children arise from the multitude of differential diagnoses with similar clinical morphology but much higher incidences in this specific age group. In MF three stages may be differentiated clinically. The patch stage presents with eczematous skin lesions, moderate desquamation, cutaneous atrophy, and predilection for non-sun-exposed skin areas [5]. In children such lesions are often erroneously diagnosed as (atopic) eczema, dermatophyte infection, or early onset psoriasis vulgaris [2]. Therefore, diagnosis is often delayed until the patches evolve into infiltrative plaques (plaque stage) or tumors (tumor stage), with all three types of skin patholo-

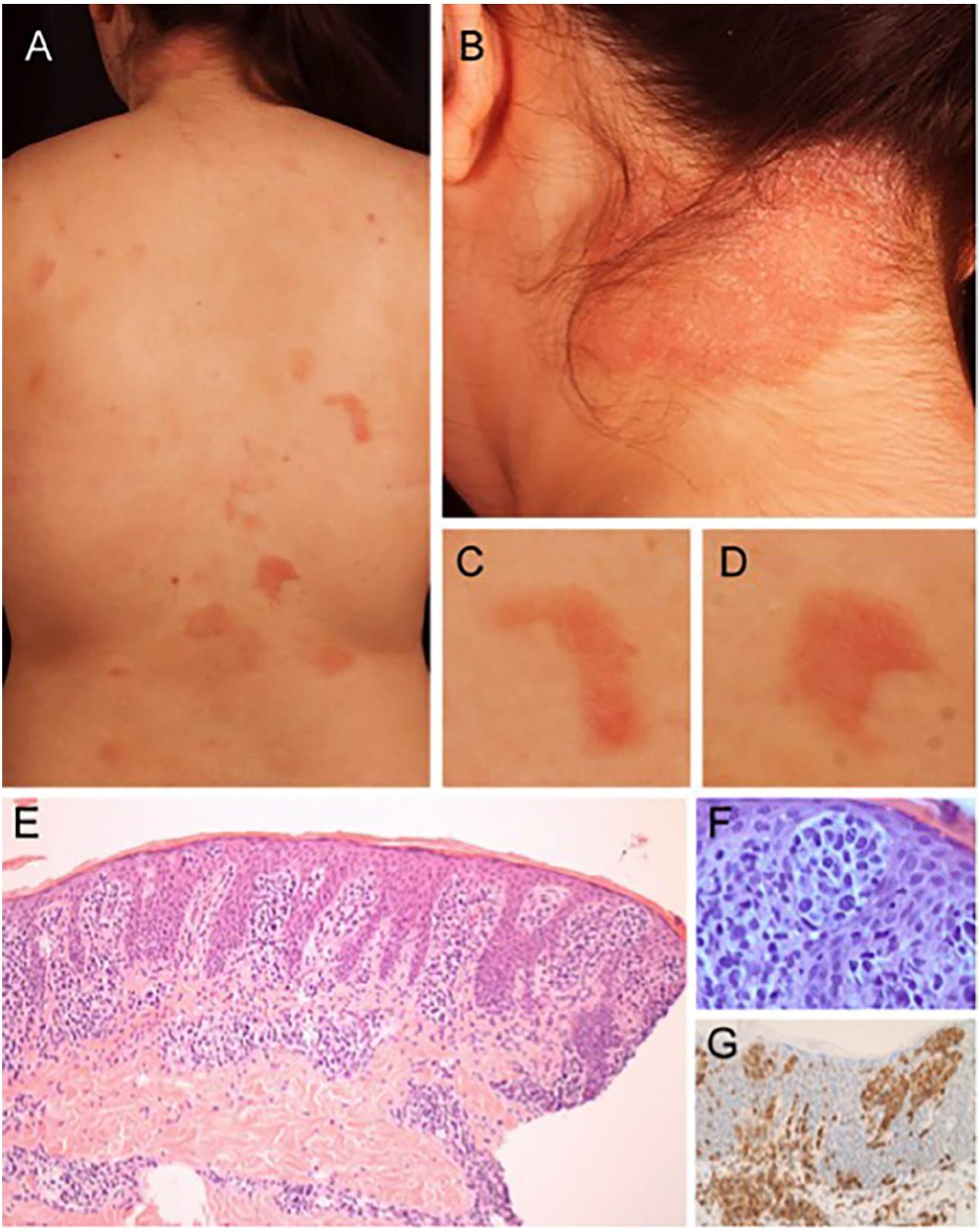

Figure 1. Clinical images and histopathological examination of patches and plaques in a 15-year-old girl with mycosis fungoides. The overview image shows disseminated, bizarrely shaped, erythematous lesions on the back (**A**). Close-up images reveal more infiltrated erythematous plaques with scaling (**B**) and patches with epidermal atrophy, sharply demarcated borders and moderate scaling (**C, D**). Hematoxylin and eosin staining (**E**) reveals psoriasiform epidermal hyperplasia and a superficial band-like lymphocytic infiltrate. Some of the atypical lymphocytes are present within the epidermis (original magnification x 100). At higher magnification typical Pautrier microabscesses show atypical lymphocytes with hyperchromatic and irregular nuclei (**F**, original magnification x 630). Immunostaining shows positivity for CD3 marker in epidermotropic, intraepidermal T lymphocytes (**G**, original magnification x 200). [Copyright: ©2018 Estelmann et al.]

gies possibly existing simultaneously [6]. In contrast to most adult cases of MF that show a predominance of CD4-positive pathologic T-cells, many pediatric cases (approximately 50%) are characterized by CD8-positive epidermotropic infiltrates [2]. While a number of relevant molecular mechanisms for the manifestation of MF were reported [5] the exact pathogenesis of MF remains unknown.

Many of the affected children are diagnosed at early stages of the disease (stage IA: 50%, stage IB: 47%) [7,8]; however, a mean time interval from first symptoms until a final diagnosis of five years was reported [8]. The prognosis of MF in children and adolescents is more favorable than in adults, with 5-year and 10-year survival rates of 95% and 93%, respectively [3,8]. Skin lesions of the patient presented as erythematous macules and plaques. In contrast, other authors described a high frequency of hypopigmented MF lesions in children often associated with a predominance of CD8-positive atypical T-cells [8] and a non-Caucasian skin phenotype [4]. The literature is somewhat discordant in terms of TCR clonality when assessed in skin biopsies. While Wain et al [8] described monoclonality of TCR genes in 26 of 34 cases (76.5%), Ceppi et al [9] reported of only 3 out of 14 cases (21.4%). There are no specific guidelines for the therapy of juvenile MF. Recommendations for first-line treatment of MF stages IA, IB, and IIA are either emollients plus observation only or, as used in our case, topical corticosteroids. In refractory cases, topical corticosteroids may be combined with phototherapy (broadband/narrowband ultraviolet B [UVB], psoralen and ultraviolet A [PUVA])[1]. Most authors prefer narrowband UVB to broadband UVB or PUVA because of its decreased carcinogenic potential and less side effects [1,10]. As for any phototherapy in children, it should be kept in mind that MF is a chronic disease with slow progression. Repeated phototherapies along the course of the disease may eventually add up to a relevant increase of the risk of UV-induced skin cancers [3].

References

1. Trautinger F, Eder J, Assaf C, et al. European Organisation for Research and Treatment of Cancer consensus recommendations for the treatment of mycosis fungoides/Sézary syndrome—Update 2017. *Eur J Cancer.* 2017;77:57-74.
2. Boulos S, Vaid R, Aladily TN, Ivan DS, Talpur R, Duvic M. Clinical presentation, immunopathology, and treatment of juvenile-onset mycosis fungoides: a case series of 34 patients. *J Am Acad Dermatol.* 2014;71(6):1117-1126.
3. Ai WZ, Keegan TH, Press DJ, et al. Outcomes after diagnosis of mycosis fungoides and Sézary syndrome before 30 years of age: a population-based study. *JAMA Dermatol.* 2014;150(7):709-715.
4. Nanda A, Al-Ajmi H. Mycosis fungoides in children and adolescents. *Expert Rev Dermatol.* 2013;8(3):309-320.
5. Girardi M, Heald PW, Wilson LD. The pathogenesis of mycosis fungoides. *N Engl J Med.* 2004;350(19):1978-1988.
6. Jawed SI, Myskowski PL, Horwitz S, Moskowitz A, Querfeld C. Primary cutaneous T-cell lymphoma (mycosis fungoides and Sézary syndrome): part I. Diagnosis: clinical and histopathologic features and new molecular and biologic markers. *J Am Acad Dermatol.* 2014;70(2):205-216.
7. Stadler R, Assaf C, Klemke CD, et al. Brief S2k guidelines—cutaneous lymphomas. *J Dtsch Dermatol Ges.* 2013;11 Suppl 3:19-30.
8. Wain EM, Orchard GE, Whittaker SJ, Spittle MF, Russell-Jones R.. Outcome in 34 patients with juvenile-onset mycosis fungoides: a clinical, immunophenotypic, and molecular study. *Cancer.* 2003;98(10):2282-2290.
9. Ceppi F, Pope E, Ngan B, et al. Primary cutaneous lymphomas in children and adolescents. *Pediatr Blood Cancer.* 2016;63(11):1886-1894.
10. Laws PM, Shear NH, Pope E. Childhood mycosis fungoides: experience of 28 patients and response to phototherapy. *Pediatr Dermatol.* 2014;31(4):459-464.