Journal of Hematopathology (2020) 13:287–288
https://doi.org/10.1007/s12308-020-00411-x

IMAGES

Assessing for disease: recurrent mycosis fungoides or cutaneous granulomatous drug eruption after mogamulizumab therapy

Daniel S. Martig[1] · Alina G. Bridges[1,2] · William R. Macon[1]

Received: 27 July 2020 / Accepted: 5 August 2020 / Published online: 12 August 2020

Keywords Erythroderma · Mycosis fungoides · Mogamulizumab

A 72-year-old man, who had previously been diagnosed with mycosis fungoides (MF) and treated with mogamulizumab, presented for clinical follow-up and was found to have diffuse erythroderma associated with areas of poikiloderma (Fig. 1). A punch biopsy was performed to evaluate for recurrent MF.

Histologic sections of the biopsy showed a superficial dermal granulomatous reaction (Fig. 2a–c). Adjacent to the granulomatous reaction were atypical, small to intermediate-sized lymphocytes with irregular nuclei and angulated cytoplasmic borders. These cells were CD3-positive T cells (Fig. 2d) with co-expression of CD4 (Fig. 2e) and GATA3 (Fig. 2g) and no expression of CD7 (Fig. 2f), T-bet (Fig. 2h), or FOXP3 (Fig. 2i).

Mogamulizumab is a recently approved humanized anti-CCR4 monoclonal antibody, which causes cytotoxic effects against cells that express CCR4 on their cell membrane, including MF cells and T_H2/regulatory T cells. A recent study has shown that patients treated with mogamulizumab can develop a cutaneous granulomatous drug eruption (CGDE) and usually present with erythroderma [1]. Histologically, CGDE can mimic granulomatous MF.

Given the mechanism of this drug, immunohistochemical stains for T-bet, GATA-3, and FOXP3 become useful in discriminating granulomatous MF from mogamulizumab-associated CGDE. T-bet is a T-box transcription factor necessary for the development of T_H1 cells. GATA-3 is expressed on T_H2 cells, and this T cell type is seen in dermatoses and forms the predominant cell in late stage MF and in patients with erythrodermic MF and Sézary syndrome (SS) [2]. Accordingly, the neoplastic cells in tumor stage MF and SS are GATA-3-positive [3]. FOXP3 is strongly expressed by regulatory T cells and is positive in a significant majority of T cells in most dermatoses [3]. On the other hand, FOXP3-positive T cells comprised less than 10% of the total lymphocytes in the majority of MF biopsies examined in one study and did not exceed 25% in any of the specimens [4].

In the case presented, the atypical lymphoid infiltrate showed a CD3+/CD4+/CD7−/GATA3+/T-bet-/FOXP3- immunophenotype, which supported involvement by MF rather than a drug reaction or other cutaneous inflammatory T cell infiltrate.

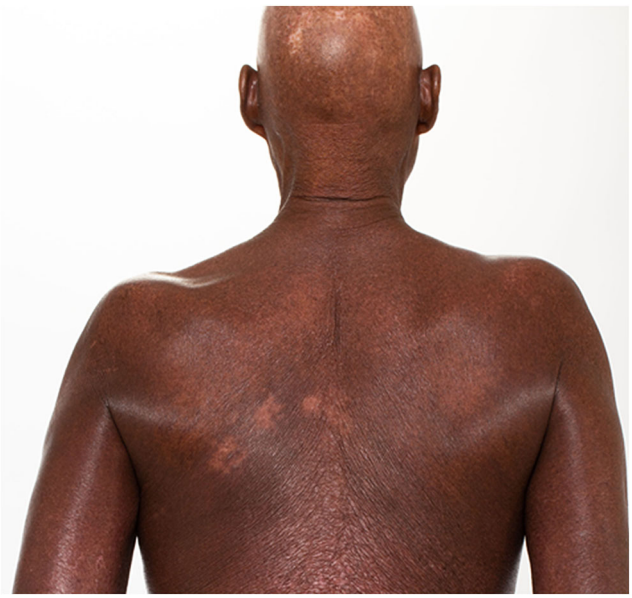

Fig. 1 A 72-year-old man previously treated for mycosis fungoides has developed diffuse erythroderma

✉ William R. Macon
macon.william@mayo.edu

[1] Department of Laboratory Medicine and Pathology, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, USA

[2] Department of Dermatology, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, USA

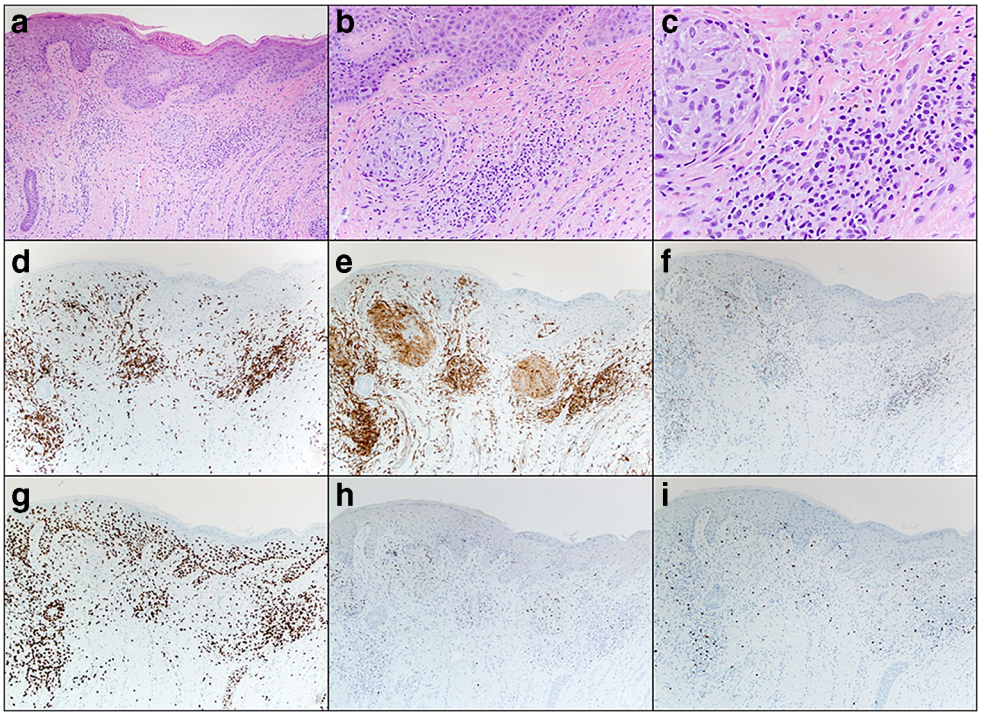

Fig. 2 Histologic sections of the skin biopsy (**a**-**c**) show a dermal granuloma and associated atypical small to intermediate-sized lymphocytes. Immunoperoxidase stains indicate the lymphocytes are CD3-positive T cells (**d**) that are CD4-positive (**e**), CD7-negative (**f**), GATA3-positive (**g**), T-betnegative (**h**), and mostly FOXP3-negative (**i**)

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Chen L, Carson KR, Staser KW, Mehta-Shah N, Schaffer A, Rosman IS, Musiek A (2019) Mogamulizumab-associated cutaneous granulomatous drug eruption mimicking mycosis fungoides but possibly indicating durable clinical response. JAMA Dermatol 155(8):968–971
2. Papadavid E, Economidou J, Psarra A, Kapsimali V, Mantzana V, Antoniou C, Limas K, Stratigos A, Stavrianeas N, Avgerinou G, Katsambas A (2003) The relevance of peripheral blood T-helper 1 and 2 cytokine pattern in the evaluation of patients with mycosis fungoides and Sézary syndrome. Br J Dermatol 148(4):709–718
3. Hsi AC, Lee SJ, Rosman IS, Carson KR, Kelley A, Viele V, Pang X, Musiek A, Scaffer A (2015) Expression of helper T cell master regulators in inflammatory dermatoses and primary cutaneous T-cell lymphomas: diagnostic implications. J Am Acad Dermatol 72(1):159–167
4. Fried I, Cerroni L (2012) FOXP3 in sequential biopsies of progressive mycosis fungoides. Am J Dermatopathol 34(3):263–265