SKIN

BRIEF ARTICLE

Eccrine Poromatosis Following Lymphoma Treatment: A Case Report and Literature Review

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ABSTRACT

Eccrine poromas are benign tumors that arise from the eccrine sweat ducts, commonly presenting as solitary lesions. Eccrine poromatosis, the sudden eruption of multiple eccrine poromas, is a rare phenomenon that generally occurs in immunosuppressed patients at any time after receiving treatment for malignancy. We report a case of eccrine poromatosis in a 79-year-old male patient with a previous history of recurrent T-cell lymphoma. Over the course of his disease, he was treated with polychemotherapy, radiation, and a definitive bone marrow transplant. The patient presented to the dermatology clinic 18 years after his initial diagnosis with a new onset of pruritic papules on the neck and chest. Histologic evaluation revealed all lesions to be eccrine poromas. This is the longest reported time interval between initial diagnosis of a primary malignancy and development of eccrine poromatosis. There is no evidence at this time to suggest that appearance of such lesions is indicative of cancer recurrence; therefore, there is no indication for further oncologic evaluation.

INTRODUCTION

Eccrine poromas, benign adnexal neoplasms of the eccrine sweat ducts, arise gradually as isolated lesions on the palms or soles, where sweat glands are highly concentrated. Tumors manifest clinically as tender or asymptomatic, erythematous papules or nodules.[1] On histological examination, eccrine poromas are characterized by a well-circumscribed, uniform proliferation of glycogen-rich cuboidal cells with abundant eosinophilic cytoplasm and scattered ducts, extending into the dermis.[2] Rarely, patients present with a sudden eruption of multiple poromas, a phenomenon known as poromatosis. While the pathogenesis is unclear, cases of eccrine poromatosis are typically reported in immunocompromised patients who have received chemotherapy, radiation, or chronic immunosuppressive therapy following stem cell transplantation.[3-19] Occurrence of lesions has also been attributed to genetic predisposition, radiation-induced damage, or human papillomavirus, all contributing to impaired immunity.[4-8] Crops of lesions may appear shortly after the onset of therapy or years after completion. Herein, we present a case of eccrine poromatosis in a patient with a previous history of T-cell lymphoma, initially diagnosed 18 years prior to presentation and eventually achieving sustained remission after 4 years with a combination of chemotherapy, radiation, and salvage stem cell transplant.

CASE PRESENTATION

A 79-year-old Hispanic man presented with a several month history of 5 pruritic, dome-shaped, erythematous papules on the left

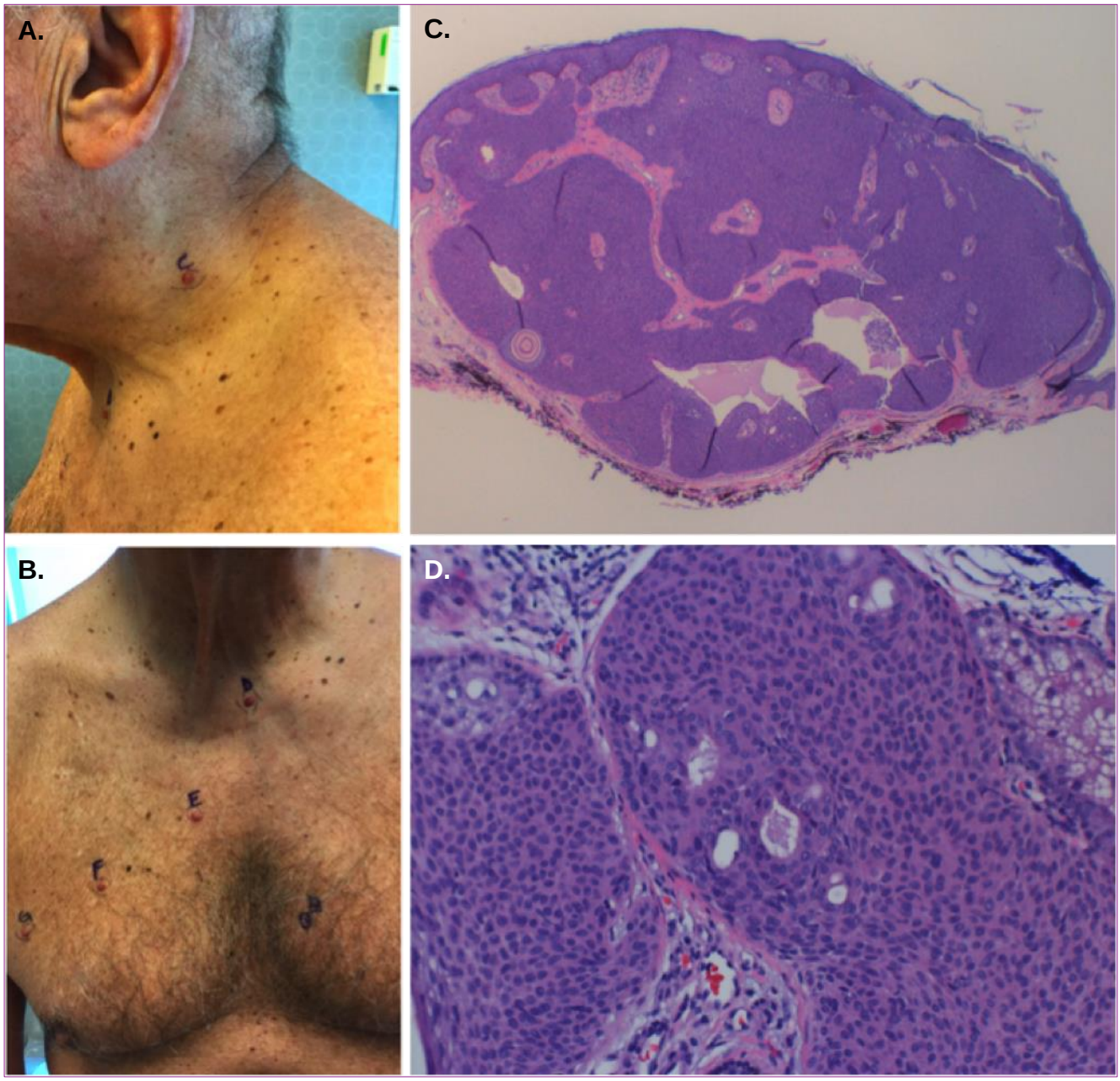

Figure 1. (A) Left neck with one erythematous papule. (B) Upper mid chest and right chest with 4 erythematous papules. (C) Broad anastomosing bands of monotonous epithelial cells with a broad connection to the epidermis. (H&E, 20X). (D) Basophilic epithelial nuclei and sweat ducts within the tumor. (H&E, 200x)

neck and right chest in a seatbelt distribution (Insert Figure 1). His previous medical history is significant for stage 1A T-cell lymphoma, diagnosed 18 years prior to presentation, for which he received 6 cycles of cyclophosphamide, doxorubicin, vincristine, and prednisone (CHOP). He relapsed for the first time 3 years later and was treated with radiation therapy, achieving complete remission. After a second recurrence 1 year later, he received 3 additional cycles of etoposide, methylprednisolone, cytarabine, and cisplatin (ESHAP). This was followed by a

sibling allogeneic stem cell transplant, for which he was conditioned with etoposide, prednisone, vincristine, cyclophosphamide, doxorubicin (EPOCH), and fludarabine. Post-transplant course was complicated by minor graft-versus-host disease (GVHD) of the skin. He has been in complete remission and has not required any immunosuppressive medications since then. All 5 lesions were treated with shave removal followed by electrodessication. Histology revealed thick anastomosing bands of monotonous epithelial cells, which had a broad connection to the epidermis and interspersed eccrine ducts (Figure 1). No further treatment was pursued. The patient has had no recurrence of the treated lesions nor development of any new poromas.

DISCUSSION

The simultaneous eruption of multiple eccrine poromas is an exceedingly rare phenomenon, and the exact etiology remains poorly understood. While the immunosuppressive effects of infection, pregnancy, and certain medications have been cited as potential catalysts for sudden development of multiple tumors, the first two reported patient cases of poromatosis did not include a previous history of immunosuppression or other predisposing risk factors.[7,18,20-23] Other cases have been attributed to systemic lupus erythematosus, requiring chronic immunosuppressive therapy, or predisposing genetic conditions, such as hidrotic ectodermal dysplasia.[24,25] Interestingly, in a canine patient, multiple eccrine poromas were found following amputation of a chronically inflamed paw, previously treated with laser surgery to correct a congenital anomaly.[26] Because poromas are benign, adnexal tumors that arise from the sweat gland duct, they may originate from either eccrine or apocrine lineages. While eccrine poromas comprise the vast majority of reported cases, apocrine poromas occur with less frequency. Clinically, both lesions present similarly as singular, flesh-colored papules on the acral surfaces; therefore, lesions must be differentiated histologically.[2] Unlike eccrine poromatosis, cases of multiple apocrine poromas have not been associated with a previous history of immunosuppression.[27,28] Overall, reports of eccrine poromatosis have demonstrated a strong association with lymphoproliferative malignancies treated with immunosuppressive therapies; however, their clinical course is unpredictable, as lesions may appear at any time.[3-19] Presently, the longest reported period of time between onset of malignancy and emergence of eccrine poromatosis is 16 years.[8] This patient presented 18 years after his original diagnosis with T cell lymphoma. To our knowledge, this is the longest interval between onset of a primary malignancy and emergence of eccrine poromatosis and the first case associated with non-cutaneous T cell lymphoma.

Out of 21 reported cases of eccrine poromatosis associated with malignancy, 7 patients were primarily diagnosed with acute myeloid leukemia, and 10 patients were diagnosed with a particular subtype of non-Hodgkin lymphoma (Table 1). Only one previously documented case has been associated with a neoplasm of T-cell origin.[3] In the first case of malignancy-associated eccrine poromatosis, Kurokawa et al. (2001) described a 72 year-old male with mycosis fungoides, the most common form of cutaneous T-cell lymphoma. The patient was treated with multiple courses of electron beam radiation therapy for recurrence of skin lesions, and 6 years after his initial diagnosis, the first eccrine poroma was excised and diagnosed. Rather than a single eruption of multiple lesions, the patient

Table 1. Reported Cases of Eccrine Poromatosis Associated with Malignancy

Reference	Patient Age & Gender	Associated Malignancy	Treatment Received	Interval between diagnosis and presentation	Comments
Kurokawa et al., 2001; Myazaki, Japan[3]	72 Male	Mycosis Fungoides	Electron Beam Radiation	6 Years	
Mahlberg et al., 2006; Philadelphia, PA[4]	42 Male	Acute Lymphocytic Leukemia (ALL)	Chemotherapy; Total Body Radiation; Allogeneic Bone Marrow Transplant	2 Years	Transplant complicated by graft-versus-host disease (GVHD)
Navi et al., 2008; Davis, CA,[5]	64 Male	Non-Hodgkin Lymphoma	Chemotherapy	Unknown	
Sherman et al., 2010; Oxford, United Kingdom[6]	32 Male	Acute Myeloid Leukemia (AML)	Chemotherapy; Total Body Radiation; Allogeneic Bone Marrow Transplant (2)	6 Years	Both transplants complicated by GVHD
Diamantis et al., 2011; Austin, TX[7]	53 Male	Mantle Cell Lymphoma	Allogeneic Stem Cell Transplant	5 Years	Transplant complicated by GVHD; Lesions positive for HPV
Fujii et al., 2012; Okayama, Japan[8]	66 Female	Chronic Lymphocytic Leukemia (CLL); B-Cell Follicular Lymphoma	Chemotherapy; Radiation	16 Years	
Fujii et al., 2012; Okayama, Japan[8]	62 Male	Malignant Fibrous Histiocytoma	Chemotherapy; Radiation	10 Years	
Fujii et al., 2012; Okayama, Japan[8]	59 Male	B-Cell Lymphoma	Chemotherapy	6 Months	
Fujii et al., 2012; Okayama, Japan[8]	72 Male	B-Cell Lymphoma	Chemotherapy	10 Years	
Nguyen et al., 2012; San Diego, CA[9]	25 Male	AML	Chemotherapy; Autologous Bone Marrow Transplant	11 Years	

Miura & Yamamoto 2013; Fukushima, Japan[10]	72 Female	Nasolacrimal Duct Adenocarcinoma	Radiation	Rapid onset after radiation therapy	
Garshick et al., 2014; New York, NY[11]	46 Male	AML	Chemotherapy; Autologous Stem Cell Transplant	Months	
Deckelbaum et al., 2014; Long Beach, CA[12]	73 Male	Testicular Lymphoma	Chemotherapy; Radiation	13 Years	
Mayo et al., 2015; Birmingham, AL[13]	43 Male	Mantle Cell Lymphoma	Chemotherapy; Autologous Stem Cell Transplant	4 Years	
Takahashi et al., 2015; Hokkaido, Japan[14]	63 Female	AML	Chemotherapy; Autologous Stem Cell Transplant	15 Years	
Aung et al., 2017; Houston, TX[15]	45 Male	AML	Chemotherapy; Allogeneic Stem Cell Transplant	3 Months	Transplant complicated by CMV infection; Lesions positive for HPV and MCPyV
Lim et al., 2018; London, United Kingdom[16]	63 Female	Breast Cancer	Chemotherapy; Radiation	6 Years	
Valdebran et al., 2018 Irvine, CA[17]	32 Female	Acute Promyelocytic Leukemia (APML)	Chemotherapy; Bone Marrow Transplant	7 Years	
Nguyen et al., 2019 Los Angeles, CA[18]	58 Male	Large B-Cell Lymphoma	Chemotherapy; Radiation	10 Years	
Nguyen et al., 2019 Los Angeles, CA[18]	72 Male	1) Mantle Cell Lymphoma 2) Prostate Cancer	1) Chemotherapy; Stem Cell Transplant 2) Radiation	10 Years	
Marsh et al, 2020 Columbus, O[19]	47 Female	AML	Chemotherapy; Total Body Radiation; Allogeneic Stem Cell Transplant	3 Years	Transplant complicated by GVHD

continued to develop 14 eccrine poromas in several different areas of chronically irradiated skin over the course of 12 years.[3] Primary malignancies associated with poromatosis were reportedly treated with various combinations of therapy, involving chemotherapy, radiotherapy, or stem cell transplantation. The correlation of poromatosis following the use of chemotherapeutic agents suggests that the accumulation of cytotoxic metabolites potentially alters the structural integrity of the sweat glands, facilitating synchronous occurrence of several eccrine poromas.[8] After cell damage or trauma occurs, cellular repair is initiated through remodeling and regeneration, creating increased potential for neoplastic transformation. Such changes occur gradually over time, leading to the delayed presentation of lesions.[19] Similarly, clusters of eccrine poromas have appeared in areas of irradiated skin or within pre-existing chronic radiation dermatitis, suggesting x-ray damage may also contribute to tumor development.[3,20]

In the initial treatment of the primary malignancies, only 3 previous cases of malignancy-associated poromatosis have involved the use of all 3 therapeutic modalities mentioned above.[7,15,19] In each case, the post-transplantation course was complicated by either graft-versus-host disease or cytomegalovirus infection.[7,15,19] This finding suggests a possible role of the immune response creating inflammatory damage to the sweat ducts, leading to emergence of eccrine poromatosis. Our patient presents a unique clinical course, as he was treated in a stepwise fashion. He initially received polychemotherapy, followed by radiation after his first relapse, and bone marrow transplant was used as salvage therapy after a second relapse. While multiple etiologies have been suggested, overall, immunosuppressed patients appear to be particularly vulnerable to formation of multiple eccrine poromas. At this time, there is no evidence in the literature to suggest poromatosis is a harbinger of malignancy recurrence or relapse. However, patients with a history of malignancy should continue to be cognizant of signs and symptoms of recurrence as directed by their oncologist.

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