umbilical endometriosis with pneumothorax associated with menses, emphasizing the importance of skin findings in the diagnosis of systemic disease.

Christen Mowad, MD,[a] *Cassondra Andreychik, BA,*[b] *and Timothy Murphy, MD*[a]

Geisinger Medical Center,[a] *Danville, and Commonwealth Medical School,*[b] *Scranton, Pennsylvania*

Funding sources: None.

Conflicts of interest: None declared.

Correspondence to: Christen Mowad, MD, 115 Woodbine Lane, Danville, PA 17822

E-mail: cmowad@geisinger.edu

REFERENCES

1. Bulun SE. Endometriosis. N Engl J Med 2010;360:268-79.
2. Elm MK, Twede JV, Turiansky GW. Primary cutaneous endometriosis of the umbilicus: a case report. Cutis 2008;81:124-6.
3. Eckford S, Westgate J. A cure for pneumothorax during menstruation. Lancet 1996;347:734.
4. Roberts LM, Redan J, Reich H. Extraperitoneal endometriosis with catamenial pneumothoraces: a review of the literature. JSLS 2003;7:371-5.
5. Papafragaki D, Concannon L. Catamenial pneumothorax: a case report and review of the literature. J Womens Health 2008;17:367-72.

http://dx.doi.org/10.1016/j.jaad.2014.02.024

Generalized granuloma annulare after varicella infection: Wolf isotopic response?

To the Editor: The etiopathogenesis of granuloma annulare (GA) is unknown, but a delayed-type hypersensitivity reaction to an unknown antigen has been hypothesized. Several inciting factors have been reported, including trauma, ultraviolet radiation, and viral infections.[1] Among the latter, GA developing at the site of previous herpes zoster (HZ) has frequently been reported in a Wolf isotopic response (WIR).[1-3] However, GA developing after varicella infection, to the best of our knowledge, has not been reported except in a single report of localized GA developing 6 weeks after uncomplicated varicella in a 4-year-old child.[4] Here we report generalized GA developing in previously healed lesions of varicella 2 months after infection clearance.

A 5-year-old girl presented with a 2-month history of an asymptomatic skin eruption on her trunk and extremities. This eruption was preceded by an uncomplicated varicella infection that occurred 2 months earlier and resolved spontaneously. The parents indicated that the new lesions may have arisen at the same sites of previous varicella lesions. The patient was otherwise healthy. Skin examination revealed multiple firm skin-colored papules on trunk and extremities, some of which were grouped in a "herpetiform" arrangement (Fig 1). Punch biopsy revealed a palisaded granulomatous dermatitis with focal collagen degeneration and mucin deposition (Fig 2). These features were diagnostic of generalized GA, which probably developed at the sites of previous varicella lesions. Systemic workup was negative. The parents elected not to treat, and the lesions resolved spontaneously in 11 months.

WIR is characterized by the development of a distinctive cutaneous disease at the site of another unrelated and healed disease after a variable period ranging from days to years.[1-5] All described cases have occurred after herpes simplex or zoster

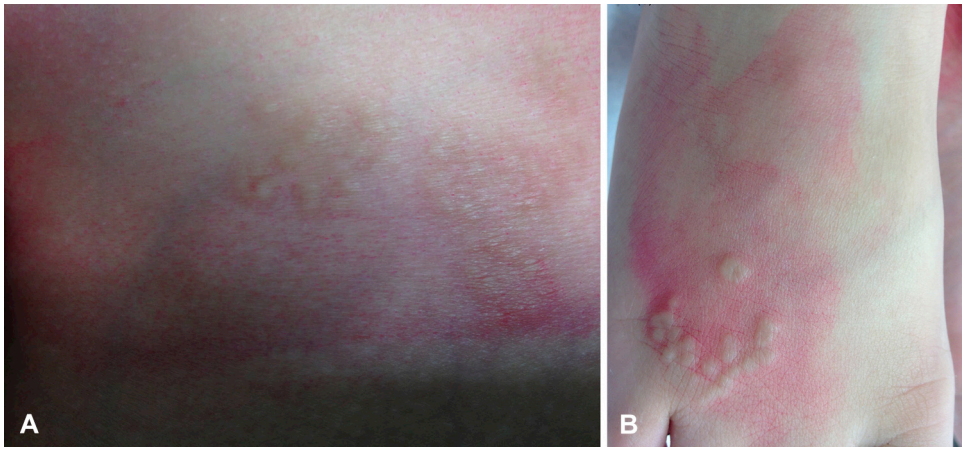

Fig 1. Granuloma annulare. Multiple firm skin-colored papules in a "herpetiform pattern" on the abdomen (**A**) and right foot (**B**). Note that the pink to red background is because of the use of aqueous solution of eosin 2% by the patient prior to presentation.

Open access under CC BY-NC-ND license.

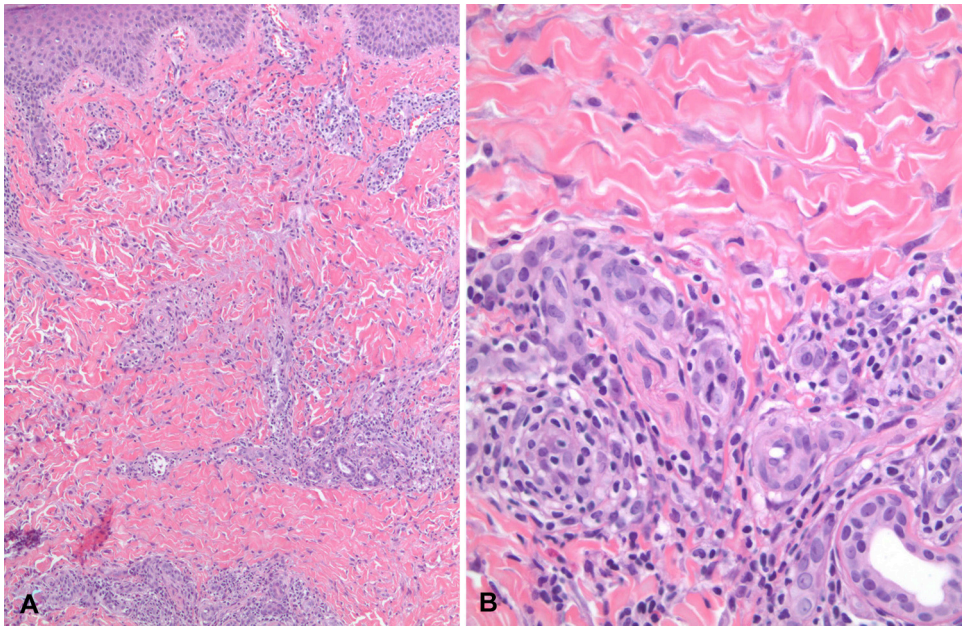

Fig 2. Granuloma annulare. Histopathology showed a palisaded granulomatous dermatitis with focal collagen degeneration and mucin deposition mainly in the upper dermis. Perineurovascular lymphohistiocytic infiltrate with multinucleated giant cells was also noted. (**A** and **B**, Hematoxylin-eosin stain; original magnifications: **A**, ×4; **B**, ×20.)

infections and usually manifest as granulomatous reactions including GA, sarcoidosis, foreign-body reactions, and infections. However, viral DNA in these reactions is rare and typically documented in cases in which the interval between the 2 diseases is short. Several hypotheses exist on WIR development following herpetic infection, including delayed-type hypersensitivity reaction to incompletely degraded viral envelope glycoproteins or virally induced neural alteration resulting in neuropeptide release that locally modulates immune and angiogenic responses. The latter hypothesis may even be the explanation why the WIR is seen more frequently in herpes zoster than varicella, because nerve damage is probably more pronounced in herpes zoster.

Our case is peculiar in that generalized GA occurred after varicella infection. In addition to occasional association with malignancies, generalized GA has been associated with viral infections, including hepatitis B and human immunodeficiency virus. Although a previous GA case that developed after varicella has been described, that case reported localized GA variant and the lesions did not affect sites of healed varicella lesions. In occurring shortly after varicella infection and most probably at the sites of healed varicella lesions as supported by the history and the "herpetiform" arrangement of the lesions, our case probably represents a generalized Wolf isotopic response. This is supported by the microscopic finding of perineurovascular lymphohistiocytic infiltrate with multinucleated giant cells in our case, which are features reported to be peculiar to post-herpetic GA.

Ossama Abbas, MD, and Mazen Kurban, MD

Dermatology Department, American University of Beirut Medical Center, Lebanon

Funding sources: None.

Conflicts of interest: None declared.

Correspondence to: Ossama Abbas, MD, American University of Beirut Medical Center, Department of Dermatology, Riad El Solh St, Beirut, Lebanon, PO Box 11-0236

E-mail: ossamaabbas2003@yahoo.com

REFERENCES

1. Thornsberry LA, English JC 3rd. Etiology, diagnosis, and therapeutic management of granuloma annulare: an update. Am J Clin Dermatol 2013;14:279-90.
2. Kapoor R, Piris A, Saavedra AP, Duncan LM, Nazarian RM. Wolf isotopic response manifesting as postherpetic granuloma annulare: a case series. Arch Pathol Lab Med 2013;137:255-8.
3. Ruocco E, Baroni A, Cutrì FT, Filioli FG. Granuloma annulare in a site of healed herpes zoster: Wolf's isotopic response. J Eur Acad Dermatol Venereol 2003;17:686-8.
4. Klein P, Levy RS. Granuloma annulare. Arch Dermatol 1984;120:578.

5. Barksdale SK, Perniciaro C, Halling KC, Strickler JG. Granuloma annulare in patients with malignant lymphoma: clinicopathologic study of thirteen new cases. J Am Acad Dermatol 1994;31:42-8.

http://dx.doi.org/10.1016/j.jaad.2014.02.032

Photo-induced Stevens-Johnson syndrome

To the Editor: A 19-year-old woman with no past medical history developed a phototoxic rash with progression to Stevens-Johnson Syndrome (SJS) due to ciprofloxacin therapy for a recent vaginal infection. The patient completed a 10-day course of ciprofloxacin and received a 1-time dose of fluconazole on the 10th day of treatment; she was on no other medications and no other risk factors for SJS were present. The day after treatment completion, a red rash concentrated on her chest developed. She complained of difficulty and painful swallowing, which prompted her to visit our emergency department (ED). No facial swelling was present, and she was discharged from the ED and given an oral prednisone taper, famotidine, and diphenhydramine. She took 60 mg prednisone for 2 days and 40 mg prednisone for 1 day; her rash progressed and became more severe. She again presented to the ED for evaluation of her worsening skin condition. On physical examination, the patient had well demarcated dusky violaceous patches confined to sun-exposed areas on her chest, back, arms, and legs, sparing her bikini swimsuit area and watch distribution, as well as other dependent surfaces not exposed to sunlight (Fig 1). Scattered vesiculation was present on her upper back, chest, and upper arms, sparing her face and ears; skin pain was present. She also had white vesicles and erosions on the lips and ulcers of the oral mucosa accompanied by erythematous patches within the labia. There were no target lesions, and palms and soles were not involved. The patient stated she had gone to the beach 2 days before development of the initial rash; she did not apply sunscreen. Skin biopsy showed intact stratum corneum with interface dermatitis and full thickness epidermal necrosis compatible with SJS (Fig 2). Prednisone 60 mg/day was started, and she completed a 7-day course without taper. Her skin lesions and associated pain improved, and skin sloughing occurred on less than 5% her body surface.

This case is characterized by two different patterns of adverse cutaneous drug reaction: phototoxicity and SJS, also known as photo-induced SJS. The observed reaction to ciprofloxacin was deemed phototoxic because the lesions appeared as an exaggerated burnlike rash in areas of sun-exposed skin, noticeably sparing areas protected from the sun. These lesions progressed to include dusky patches with vesiculation and desquamation consistent with photo-induced SJS. While multiple cases of photosensitivity,

Fig 1. Photo-induced Stevens-Johnson syndrome in a patient treated with ciprofloxacin. The rash spares her bikini swimsuit distribution.

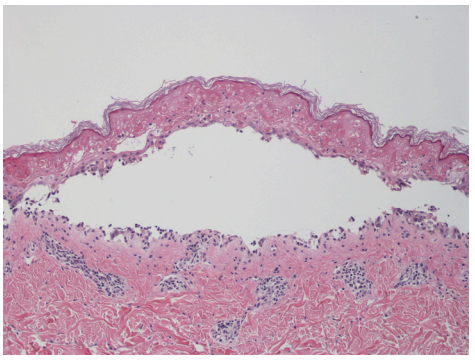

Fig 2. Photo-induced Stevens-Johnson syndrome in a patient treated with ciprofloxacin. Acute stratum corneum full-thickness necrosis of the epidermis and mild inflammatory infiltrate of lymphocytes. (Hematoxylin-eosin stain.)