described in the Japanese population, several PP cases have also been reported in Western countries and, recently, in the Middle East.2,3

The pathogenesis of PP is not completely clear. In addition to being associated with several factors including exogenous (physical trauma, friction) and hormonal (pregnancy, menstruation), PP has classically been reported in association with metabolic derangements, especially ketogenic states (dieting, fasting, diabetes mellitus).2-3 Actually, several studies have detected elevated urine and/or blood ketone levels in patients with PP.2-3 In such circumstances, it is believed that ketone bodies may distribute around blood vessels leading to perivascular inflammation or enter into cells modifying their intracytoplasmic processes. The inflammation is believed to be mainly mediated by neutrophils: PP usually responds well to medications with antineutrophil effect, such as dapsone and tetracyclines, which would support this neutrophil-mediated theory. A role for decreased insulin levels, which is reported to occur after bariatric surgery,4 has also been hypothesized as cause of PP.2

In addition to its effect in changing the course of many skin diseases such as psoriasis, bariatric surgery has been associated with several dermatoses including bowel-associated dermatosis–arthritis syndrome, nutritional deficiency dermatoses, and alopecia.5 However, PP has never been reported after bariatric surgery. Given that such surgery may easily replicate the metabolic disturbance associated with other ketogenic states such as dieting or fasting,5,6 we believe that the association between PP and bariatric surgery may be underdiagnosed or underreported.

In conclusion, to our knowledge, this report is the first to describe PP developing after bariatric surgery, adding PP to the cutaneous complications of such procedures. Increased awareness of this rare entity and this association is important because bariatric surgery is a common procedure nowadays, and the metabolic abnormalities accompanying it mimic those that occur with other ketogenic states.

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Approximately one-third of the patients showed regression of their lesions. Adverse events, most of which were mild to moderate, were observed in more than 80% of all patients. Cutaneous adverse events occurred in about half of the patients, which were categorized as rash, vitiligo, pruritus, and acneiform eruptions.

Our patient developed skin eruptions mimicking psoriasis, which has not been noted in previous reports to our knowledge. Psoriasis or psoriasiform eruption is well known to occur as a paradoxical reaction during biological therapies for severe psoriasis. This phenomenon is thought to be mediated by the increased production of interferons. Previous studies have demonstrated that blockade of the immune-checkpoint receptors, such as PD-1 and cytotoxic T-lymphocyte antigen-4, by its antibodies augmented the helper T cell type 1 (TH1) and TH17 cell activities, which might correlate with antitumor effect.

The occurrence of the psoriasiform eruptions and systemic illness temporally coincided with the regression of melanoma lesions, suggesting strong correlation with nivolumab's mechanism of action. Therefore, psoriasiform eruptions may be induced in cases of sufficient nivolumab antitumor efficacy. Further investigations are needed to clarify the relation between the cutaneous adverse events and antitumor activity of nivolumab.

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Sycosis Vaccinatum, a Type of Vaccinia Folliculitis

We present a case of vaccinia folliculitis that we term sycosis vaccinatum to correctly identify its etiology and scope of infection.

Report of a Case | A healthy, immunocompetent 30-year-old man undergoing basic military training presented with a 4-day history of a progressive vesiculopustular eruption of the anterior neck and chin. The patient denied symptoms of pruritus, burning, or fever at time of presentation. This patient had not received the smallpox vaccination, but he had engaged in simulated unarmed combat with individuals who had recently been vaccinated. Medical history was noncontributory, and the patient was not taking any medications.

Examination revealed more than 2 dozen monomorphic, broad-based folliculocentric pustules with central umbilication, overlying serum crust, and surrounding erythema and edema of the anterior neck, chin, and inferior cheeks (Figure 1). The patient was admitted to the hospital owing to the extensive disease burden and to protect his daughter, who had atopic dermatitis (a risk factor for developing disseminated disease). The patient’s hospital course was notable for continued development of new lesions, fevers to 39°C, progressive edema of the face, and anterior cervical lymphadenopathy. The continued evolution of his disease required vaccinia immune globulin (VIG) therapy.

A punch biopsy taken early in his hospital course demonstrated classic viral changes to the epidermis consisting of ballooning degeneration of keratinocytes with intracytoplasmic inclusions (Guarnieri bodies) and a brisk lymphocytic and neutrophilic infiltrate (Figure 2A and B). The presence of vaccinia virus was confirmed by polymerase chain reaction (PCR). Electron microscopy demonstrated viral particles typical of vaccinia present within the Guarnieri bodies (Figure 2C and D). Two weeks after initial presentation, pink depressed scars were present on the chin and jawline.

Discussion | We propose the term sycosis vaccinatum to describe the autoinoculation of vaccinia in the beard area with resulting viral folliculitis seen in the present case. To our knowledge, this reaction has not been discussed in the literature or reported to the vaccine adverse event reporting system (VAERS). In contrast to the term vaccinia folliculitis, sycosis vaccinatum describes the diagnosis and clinical presentation and avoids confusion with postvaccinal nonviral folliculitis (PVNVF).1,2

The course of sycosis vaccinatum parallels the progression at a primary vaccination site from vesiculopustule to crusted papule and ultimately to healing with a depressed scar. The timing of sycosis vaccinatum evolution is 7 to 10 days following vaccination, which is similar to that of PVNVF. However, sycosis vaccinatum is a localized form of autoinoculation, whereas PVNVF is a poorly understood idiosyncratic inflammatory or hypersensitivity response to vaccination.1,2

Findings of PCR, viral cultures, electron microscopy, immunohistochemical (IHC) analysis, and immunofluorescence (IF) studies are negative for the vaccinia virus in PVNVF but positive in sycosis vaccinatum.1,2 We confirmed sycosis vaccinatum by PCR, following the guidelines of the Centers for Disease Control and Prevention (CDC) for confirming a case of inadvertent autoinoculation.3 Histopathologic analysis in sycosis vaccinatum shows ballooning degeneration of keratinocytes within the epidermis with intracytoplasmic inclusion bodies.2 An acute inflammatory cell infiltrate composed of neutrophils and lymphocytes extending into the epidermis is also characteristic. Use of IHC analysis and IF studies can also identify the vaccinia virus.3 The preferred diagnostic test is PCR because it is more sensitive than culture and does not require expertise in processing or interpreting electron microscopic specimens.

Treatment for sycosis vaccinatum is primarily supportive, involving local wound care and measures taken to prevent further inoculation (cessation of shaving, covering of the wounds, and avoidance of contact with other people). Sycosis vaccinatum requires VIG therapy if systemic symptoms are present, and orthoimmunotherapy.

Figure 1. Sycosis Vaccinatum, Clinical Findings

Vesiculopustules with central umbilication in the beard area at time of presentation.