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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 had no history of dermatitis (a risk factor for developing disseminated disease). The patient’s hospital course was notable for continued evolution of his disease requiring vaccinia immune globulin (VIG) therapy.

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 postvaccinial nonviral folliculitis (PVNF).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 PVNF. However, sycosis vaccinatum is a localized form of autoinoculation, whereas PVNF 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 PVNF 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 inclusions called Guarnieri 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...
any VIG use should follow CDC recommendations for systemically ill patients with generalized vaccinia, progressive vaccinia, or eczema vaccinatum to reduce morbidity and mortality.3

Mark A. Braswell, BS
Matthew W. Morrissey, MD
Simon A. Ritchie, MD
Robert L. Reddick, MD
Todd T. Kobayashi, MD

Author Affiliations: Kansas City University of Medicine and Biosciences, Kansas City, Missouri (Braswell); San Antonio Uniformed Services Health Education Consortium, San Antonio, Texas (Morrissey, Ritchie, Kobayashi); Department of Pathology, University of Texas Health Science Center at San Antonio, San Antonio (Reddick).

Corresponding Author: Todd T. Kobayashi, MD, Dermatology Residency Program, San Antonio Uniformed Services Health Education Consortium, 2200 Bergquist Dr, 59th Medical Wing/SGO7D, Ste 1, JBSA Lackland Air Force Base, TX 78236-9908 (todd.kobayashi@us.af.mil).


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NOTABLE NOTES

Radium
Curie’s Perpetual Sunshine

Yusuf Anwar, BA; Eve J. Lowenstein, MD, PhD

“Not to worry,” their bosses told them. “If you swallow any radium, it’ll make your cheeks rosy.” The women at Radium Dial sometimes painted their teeth and faces and then turned off the lights for a laugh.1

In Orange, New Jersey, circa 1917, the US Radium Corp employed 70 women to manufacture radium-luminous watches for the military. The company coaxed physicians, dentists, and researchers to withhold their data regarding the negative sequela of radium exposure, namely, anemia, bone fractures, and “radium jaw.” When employees tried to fight back, a slander campaign involving syphilis was initiated to discredit the women’s reputations. One of the employees, Grace Fryer, after 2 years of searching, found a lawyer willing to take her case. She organized “The Radium Girls,” a coalition of 5 women testifying in the lawsuit. A settlement was reached in 1928; the affected employees each received $10 000 in reparations and lifelong health care support. The incredulous story of the Radium Girls echoed the fervor surrounding the use of radium during the 20th century.1

In 1898, radium chloride was extracted from uranium ores by Marie and Pierre Curie. Marie Curie died of aplastic anemia in 1934. It was later discovered that radium replaces calcium in bones and emits alpha particles during decay, leading to cellular mutations and eventually cancer. “Radium therapy” was endorsed by the American Medical Association (1900-1930) to treat arthritis, stomach ailments, and cancer. In the early 1920s, radium was the most valuable substance on Earth, valued at $120 000 per gram.2

In 1918, Bailey Radium Laboratories developed Radithor, advertised as “Perpetual Sunshine.” This product was triple-distilled water with about 1 μCi of radium 226. It claimed to “cure stomach cancer, mental illness, and restore sexual vigor and vitality.” It was only when Eben Byers, an American industrialist, died of radium poisoning that safety concerns came to the forefront of public awareness. The Wall Street Journal headlines read, “The Radium Water Worked Fine Until His Jaw Came Off.” Other radium-based products included radium bread baked in what is now the Czech Republic, radium chocolate in Germany, and radium-based skincare products (Figure). Children played with “atomic energy” toy kits in the 1950s, while men sought radium-based suppositories to restore sexual vitality.3

The initially dubious history of radium illustrates a recurring theme in medicine and history. What was originally seen as a breakthrough and accepted by all in a mass of hysteria and pandemonium led to later questioning and disbelief. It is important to carry this lesson forward so that we may look at today’s breakthroughs and try to anticipate or foresee such consequences as early as possible.

Author Affiliations: SUNY Downstate College of Medicine, Brooklyn, New York (Anwar); Department of Dermatology, SUNY Downstate College of Medicine, Brooklyn, New York (Lowenstein).

Corresponding Author: Yusuf Anwar, BA, SUNY Downstate College of Medicine, 450 Clarkson Ave, Brooklyn, NY 11203 (yusuf.anwar@downstate.edu).

Additional Information: Mr Anwar is a third-year medical student.