Rash in a U.S. Marine After Predeployment Vaccinations

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A 20-year-old U.S. Marine presented with a rash on his left upper arm. He reported getting a mild sunburn nine days earlier. Three days after the sunburn, he received routine vaccinations before overseas deployment. The vaccines included anthrax, hepatitis A and B, Japanese encephalitis virus, typhoid, and vaccinia virus (smallpox). He first noted a small, slightly erythematous, raised rash on his left upper deltoid area two days before presentation. Within 24 hours, the rash had become several times larger. The patient reported discomfort in the area. He did not have a fever or history of similar episodes.

On physical examination, the patient was comfortable and in no acute distress. His skin examination revealed a 5- × 2-cm erythematous plaque on the left upper lateral deltoid area that continued distally with an 8- × 4-cm area of coalescing umbilicated papules (Figure 1).

Question
Based on the patient’s history and physical examination findings, which one of the following is the most likely diagnosis?

- A. Eczema vaccinatum.
- B. Erythema multiforme.
- C. Molluscum contagiosum.
- D. Secondary bacterial infection.
- E. Vaccinia reaction.

See the following page for discussion.
After vaccination, patients may develop an extensive itchy skin with erythema, scaling, and lichenification. Eczema typically presents as dry, local skin and underlying soft tissue structures. Autoinoculation (accidental inoculation) typically occurs via transmission by the hands from the inoculation site to another area, typically the face. In a generalized vaccinia reaction, the lesions are papulovesicular and become pustules; they are typically extensive and can result in the destruction of local skin and underlying soft tissue structures. Vaccinia reaction occurs in patients who have a history of eczema. Eczema typically presents as dry, itchy skin with erythema, scaling, and lichenification. After vaccination, patients may develop an extensive vesiculopustular eruption, mostly in areas of active dermatitis. Lesions may appear umbilicated and in crops.

Erythema multiforme is a mucocutaneous hypersensitivity reaction resulting from infections or medications. It is classically characterized by target lesions that look like a bull’s eye. The target lesions erupt over 24 to 48 hours and remain for up to two weeks. Molluscum contagiosum is a viral infection that occurs in children and adults. In children, it spreads through close skin contact. In adults, it is typically sexually transmitted. It has umbilicated papules similar to a vaccinia reaction, but the appearance of the scab over the lesion would be unusual with molluscum contagiosum. A secondary bacterial infection arises after trauma or injury to the skin. The area develops an indurated skin lesion that is tender and warm to the touch. Systemic signs of infection might also be present. Common causes include streptococci and staphylococci.

**REFERENCES**