

A Case of Breakthrough Mpox Infection after Immunization

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Introduction

Since May 2022, there has been a global outbreak of mpox with over 30,000 cases reported in the US since May 2023. This outbreak has disproportionately affected gay and bisexual men and gender diverse populations. Severe disease and death can occur in individuals with advanced HIV or other immunocompromising conditions. The JYNNEOS vaccine, a live-attenuated non-replicating vaccinia virus vaccine (MVA-BN), was FDA approved for administration as a 2-dose subcutaneous (SC) immunization series for smallpox and mpox prevention in adults at high risk for infection. Compared to SC immunizations, intradermal (ID) immunizations offer the potential ability to generate robust immune responses at significantly lower doses, thus aiding vaccine conservation efforts. In August 2022, the FDA issued an emergency use authorization for ID administration of the JYNNEOS vaccine to prevent mpox disease in persons at high risk for infection¹. Clinical trials evaluating vaccine efficacy and vaccine delivery method are limited.

Case Presentation

An adult male with virally suppressed HIV (CD4 count of 482/33%) on daily Biktarvy presented with one month of painful penile ulcerations, inguinal lymphadenopathy, and an evolving pustular body rash. In the month prior to admission, he was treated in the outpatient setting for pharyngeal gonorrhea, primary syphilis with IM benzathine penicillin, and purulent soft tissue infection with doxycycline followed by amoxicillin-clavulanate without improvement. He presented to the ED with worsening appearance of the penile lesion, urethral discharge, and mixed skin lesions including pustules on the extremities and ulcers on the face and genitalia. Work up was notable for an RPR titer of 1:64, negative gonorrhea and chlamydia NAAT testing, negative HSV-1, HSV-2, and varicella lesion testing, blood cultures no growth. While hospitalized he was treated for possible chancroid, HSV, and bacterial superinfection with ceftriaxone, doxycycline, and valacyclovir. Test results for mpox lesion-based PCR returned positive after hospital discharge, and he was treated with 14 days of tecovirimat. He received the JYNNEOS vaccine series for mpox intradermally >6 months prior to admission.

Discussion

The diagnosis of mpox should be suspected in individuals with symptoms consistent with mpox and epidemiologic risk factors, regardless of immunization history. Clinicians should maintain a high index of suspicion for mpox when evaluating genital ulcers and other mucocutaneous lesions in sexually active individuals. Diagnosis and treatment in the case were delayed. Intradermal vaccination with JYNNEOS offers a cost-effective public health strategy to potentially generate similar immune responses at lower doses, thus promoting vaccine conservation during a global outbreak². Studies evaluating vaccine effectiveness of JYNNEOS to prevent mpox disease have demonstrated 86% efficacy after 2 doses, regardless of route of administration or immunocompromise status, however, breakthrough cases have been reported³. Further clinical trials are needed to determine if route of vaccine administration affects vaccine efficacy.

References

1. JYNNEOS (Smallpox and Monkeypox Vaccine, Live, Non- replicating) suspension for subcutaneous injection, suspension for intradermal injection Original EUA Authorized Date:8/2022 Most Recent EUA. (2022). <https://www.fda.gov/media/160774/download>
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3. Dalton AF, Diallo AO, Chard AN, et al. Estimated Effectiveness of JYNNEOS Vaccine in Preventing Mpox: A Multijurisdictional Case-Control Study – United States, August 19, 2022- March 31, 2023. *MMWR Morb Mortal Wkly Rep* 2023, 72:553-558.