Vulvar mpox lesions in a heterosexual cisgender woman with molecular biology and electron microscopy findings: case report

Lesões de mpox em vulva de mulher cis heterosexual com achados de biologia molecular e microscopia eletrônica: relato de caso

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ABSTRACT

Introduction: Mpox, an emerging viral zoonosis, caused a global outbreak in 2022, exhibiting patterns of interpersonal transmission distinct from those observed in previous outbreaks. While the initial focus was on transmission among men who have sex with men, the occurrence and clinical characteristics of mpox in women remain poorly understood. **Objective:** To describe a case of vulvar lesions in a heterosexual cisgender woman diagnosed with mpox. **Methods:** This is the case of a heterosexual cisgender woman with vulvar lesions confirmed as mpox, who was treated at the Sexually Transmitted Diseases Sector of the Fluminense Federal University. **Results:** A 29-year-old cisgender heterosexual woman presented with vulvar lesions confirmed as mpox. The patient reported a history of attending crowded places in the period before the onset of lesions. Diagnostic confirmation was achieved by molecular biology (real-time polymerase chain reaction) and electron microscopy. **Conclusion:** This case highlights the importance of considering mpox in the differential diagnosis of genital lesions in women and reinforces the need for a comprehensive approach to the surveillance and understanding of the disease's epidemiology across diverse populations.

Keywords: Mpox. Monkeypox. Women. Vulvar lesions. Molecular diagnosis. Electron microscopy. Sexually transmitted diseases.

RESUMO

Introdução: A mpox, uma zoonose viral emergente, causou um surto global em 2022, apresentando padrões de transmissão interpessoal distintos dos observados em surtos anteriores. Embora inicialmente o foco tenha sido a transmissão entre homens que fazem sexo com homens, a ocorrência e as características clínicas da mpox em mulheres são pouco compreendidas**. Objetivo:** Descrever caso de lesões em vulva de mulher cis heterossexual com diagnóstico de mpox. **Métodos:** Trata-se do caso de uma mulher cisgênero e heterossexual com lesões vulvares confirmadas como mpox, que foi tratada no Setor de Doenças Sexualmente Transmissíveis da Universidade Federal Fluminense. **Resultados:** Uma mulher cisgênero e heterossexual de 29 anos apresentou lesões vulvares confirmadas como mpox. A paciente referiu histórico de frequência a locais com aglomeração no período anterior ao surgimento das lesões. A confirmação diagnóstica foi por biologia molecular (reação em cadeia da polimerase em tempo real) e microscopia eletrônica. **Conclusão:** Este caso destaca a importância de considerar a mpox no diagnóstico diferencial de lesões genitais em mulheres e reforça a necessidade de uma abordagem abrangente na vigilância e compreensão da epidemiologia da doença em diversas populações.

Palavras-chave: Mpox. Monkeypox. Mulheres. Úlcera genital. Diagnóstico molecular. Microscopia eletrônica. Infecções sexualmente transmissíveis.

INTRODUCTION

Mpox, formerly called monkeypox, emerged in 2022 as a global public health concern[1]. Initially, mpox was considered a zoonosis endemic to regions of Central and West Africa, caused by a double-stranded deoxyribonucleic acid (dsDNA) orthopoxvirus that codes for 181 proteins[2], belonging to the *Poxviridae* family, with sporadic transmission to humans. However, the global outbreak in 2022–2023 demonstrated a capacity for more efficient interpersonal spread, though not exclusively, among men who have sex with men in non-endemic populations[3,4].

Although initial attention focused on transmission in male populations, specifically men who have sex with men, leading to an early association of the disease with this population, transmission to other groups, including heterosexual women, as well as its occurrence, and clinical characteristics in women, remain less understood, representing a significant gap in epidemiological and clinical knowledge[5,6]. In Brazil, female incidence account for 8% of total cases. Recent studies reveal that women present a clinical profile and transmission pattern that demand specific attention for epidemiological surveillance, diagnosis, and clinical management[7].

In women, vulvar lesions tend to be painful and may be confused with other sexually transmitted diseases, such as genital herpes and syphilis, making clinical diagnosis difficult without laboratory support[8]. This has been documented, underscoring the importance of a comprehensive approach to surveillance and diagnosis[9].

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Mpox in women represents a crucial and underreported aspect of the disease's epidemiology.

It is necessary to explore the characteristics of mpox, addressing risk factors, routes of transmission, and clinical presentation. The manifestations can vary but generally include fever, lymphadenopathy, headache, myalgia, and a characteristic skin rash that evolves through different stages: macules, papules, vesicles, pustules, and crusts[10]. This rash frequently affects the genital region, especially in women, where the lesions may mimic other sexually transmitted diseases[10,11].

In addition to sexual contact, other routes of transmission, such as exposure to contaminated fomites and close contact in community settings, are suggested by recent case reports and series, highlighting the complexity of prevention and the challenges for epidemiological control of the disease in different groups[9,12]. The presence of painful genital lesions in women, associated with systemic symptoms and relevant social impact, emphasizes the necessity of specific protocols for diagnosis, treatment, and follow-up for this population.

The gold standard for diagnosis is the detection of viral DNA by real-time polymerase chain reaction (RT-PCR), which offers high sensitivity and specificity and is essential for disease monitoring[13]. However, in atypical clinical contexts or when rapid confirmation is necessary, electron microscopy allows for the direct identification of viral particles in the clinical sample, demonstrating typical monkeypox virus (MPXV) morphological characteristics — oval, icosahedral particles, with lipid envelopes, measuring between 200–400 nm, and a biconcave core[14,15].

OBJECTIVE

The objective is to present the case of a woman diagnosed with mpox, highlighting the clinical characteristics and the importance of early identification to interrupt the chain of transmission. This article follows the CARE Guidelines for clinical case reports[16]. Although genital lesions are a frequent symptom of mpox, especially in men who have sex with men, this report emphasizes the occurrence in a cisgender woman, expanding the understanding of the disease's clinical presentation and drawing attention to the need for surveillance in different populations within healthcare services[17].

METHODS

This is the case of a woman attended and followed up at the outpatient clinic of the Sector of Sexually Transmitted Diseases, affiliated with the Department of Microbiology and Parasitology of the Biomedical Institute, Valonguinho Campus, of Fluminense Federal University (Universidade Federal Fluminense – UFF), in the municipality of Niterói, state of Rio de Janeiro (RJ), Brazil. The patient was diagnosed with mpox at the beginning of the local disease outbreak, and this report is part of the first documented clinical records in this region. The approach involved detailed collection of clinical data, confirmatory laboratory tests, and clinical follow-up throughout the evolution of the condition.

CASE REPORT

The patient, a 29-year-old white, cisgender, heterosexual female (sex at birth), residing in São Gonçalo (RJ), sought medical attention on August 22, 2022. She had incomplete high school education, was in a fixed but occasionally non-exclusive relationship for five years, started sexual activity at age 14, used condoms inconsistently, and had a history of treatment for human papillomavirus infection. In the month preceding the appearance of the lesions, she reported frequenting various crowded places, such as motels and parties.

She was referred by a private physician with a suspicion of genital herpes that had been evolving for one week. She complained of fever, odynophagia, and genital pain, and three days later, a small sore, a type of pustule, appeared after genital shaving.

More lesions subsequently appeared and worsened, affecting several areas of the vulva. On clinical examination, well-demarcated and umbilical ulcers were found, along with pustular lesions extending to the perianal region (consented photos were taken). Material was collected from the genital ulcers for a Seegene Allplex PCR panel at a private laboratory, which confirmed the presence of herpes simplex virus (HSV) type 1. RT-PCR for the detection of viral DNA was also performed on a lesion scraping by Lacen-RJ (State Central Public Health Laboratory), confirming MPXV infection. Electron microscopy was also performed on the lesion scraping at the Institute of Biology of UFF, and the findings were compatible with MPXV (**Figures 1, 2 and 3**). Material was collected from the patient's underwear for RT-PCR testing (private laboratory). The patient received appropriate guidance, and the case concluded with resolution within one month. The sexual partner showed no signs of mpox or any other sexually transmitted infection. Rapid tests for Hepatitis B and C, human immunodeficiency virus (HIV), and syphilis were non-reactive in both individuals. These tests were repeated after 40 days, and they remained negative.

DISCUSSION

This case report describes the occurrence of mpox in a cisgender woman, highlighting the importance of considering this infection in the differential diagnosis of genital lesions, even in populations seemingly less affected by the initial outbreak. The initial clinical

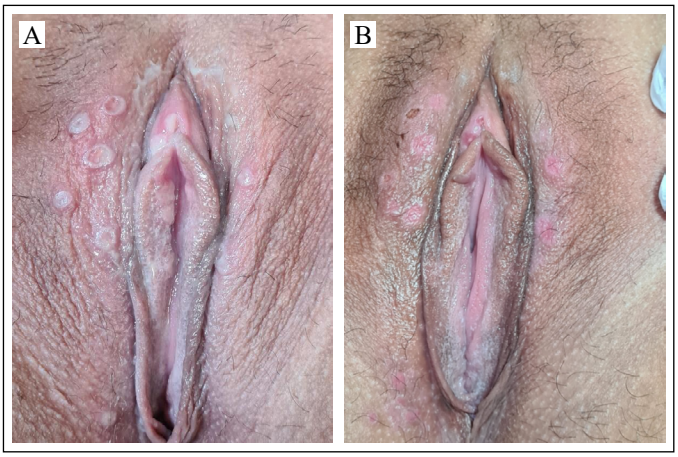


Figure 1. (A) Umbilicated lesions, papules, pustules, and well-demarcated ulcers, distributed across several areas of the vulva, extending to the perianal region; (B) Ulcers in resolution (after symptomatic treatment, control ten days later; patient still experiencing pain).

presentation, with fever, odynophagia (sore throat), and genital lesions that could mimic other sexually transmitted diseases, such as genital herpes (confirmed by the detection of HSV-1), underscores the necessity of a comprehensive etiological investigation.

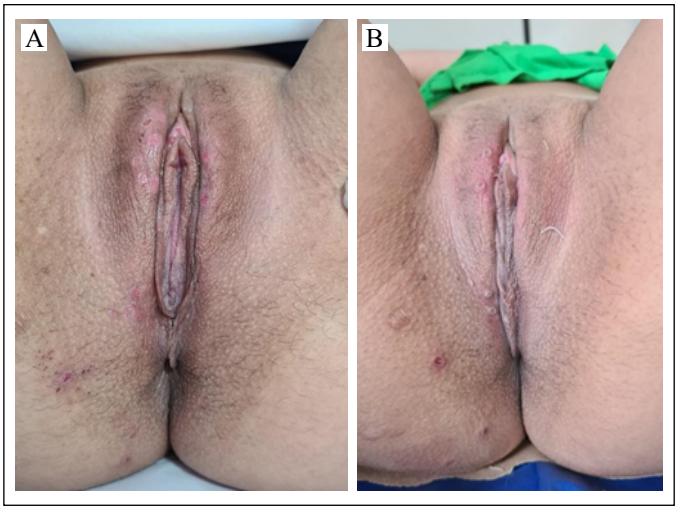


Figure 2. (A-B) the images demonstrate the typical clinical evolution of mpox lesions on the skin, assessed 30 days after onset.

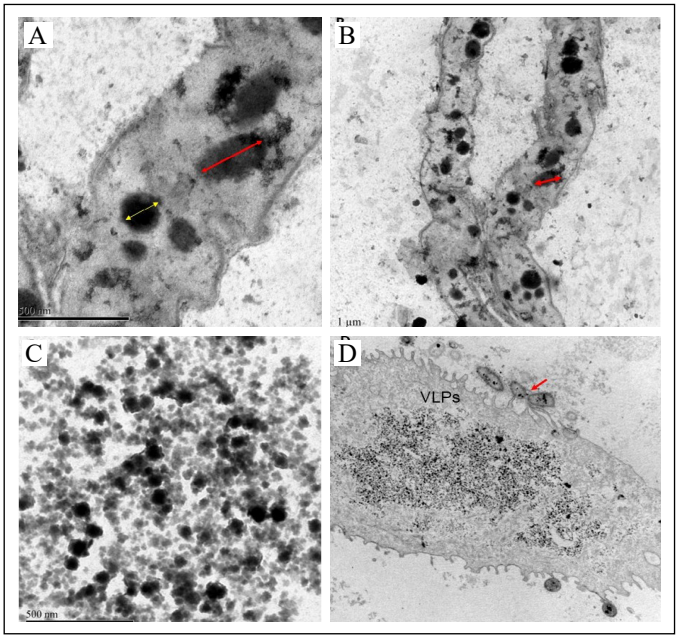


Figure 3. (A–B) Considering that MPXV measures between 200–400 nm and has a complex oval icosahedral shape, it can stated that this image shows an epithelial cell (A) or a strand of epithelial cells (B) with the presence of virus-like particles (VLPs) consistent with the characteristics of MPXV (orange arrow), as well as VLPs that may correspond to MPXV in a transverse position or to HIV, which is approximately 80–140 nm (yellow arrow); (C) Presence of a high quantity of leukocytes in the anal region. Since many of these cells range between 60–80 nm, there is a high chance of this being a robust, already chronic infiltrate, rich in lymphocytes and characteristic of viral infections; (D) VLPs consistent with the characteristics of MPXV, close to an epithelial cell (orange arrow).

The patient's history of frequenting motels and crowded parties in the month before the lesions appeared suggests a possible non-exclusively sexual route of transmission. Although intimate sexual contact was identified as the main route of transmission in the 2022 outbreak[18], the possibility of transmission via contaminated fomites in shared environments, such as those mentioned by the patient, has been raised by various authors[14,15].The absence of symptoms in the fixed sexual partner strengthens this hypothesis in this specific case.

The definitive diagnosis was established by the detection of MPXV DNA via RT-PCR and confirmed by the morphological findings compatible with the virus through electron microscopy. The use of both techniques demonstrates the robustness of the diagnosis in this case and the importance of different laboratory approaches in identifying mpox.

The use of electron microscopy proved valuable for confirming the viral infection, enabling the ultrastructural visualization of MPXV, showing oval icosahedral particles varying between 200–400 nm, an aspect considered pathognomonic of poxviruses[14,15]. This tool contributes to diagnostic confirmation in laboratory settings with greater complexity, serving as an important resource, especially in contexts of co-infection or atypical clinical forms.

The data indicate that, although the female group is less represented in the global outbreak, this may reflect prevalent transmission patterns but does not exclude the susceptibility and risk of infection in this population. In quantitative terms, the clinical and epidemiological manifestations in women demonstrate the need for a personalized approach, including protocols that consider the anatomophysiological and medico-psychosocial peculiarities of affected women. The location of the lesions in the vulvar region, as in this case, reinforces the importance of a detailed clinical evaluation in both sexes.

Strengths

The article's strengths include the robust laboratory diagnosis, utilizing both RT-PCR and electron microscopy, which increases the accuracy and reliability of MPXV identification. The use of diverse laboratory methodologies demonstrates technical capability and contributes to the improvement of diagnostic protocols.

Another strong point is the novelty of the report within the Brazilian context, bringing a relevant contribution by expanding clinical and epidemiological understanding and highlighting the need for a differential approach to genital lesions in women. This serves as an alert for the inclusion of mpox in the differential diagnosis and for the enhancement of surveillance protocols in healthcare services.

The case report presented here is among several cases from a Ph.D. thesis presented and approved at the Institute of Biology of UFF[19].

Limitations

The fact that this is an isolated case report of mpox in a cisgender woman limits the generalizability of the findings and does not allow for broad epidemiological inferences or more robust analyses of risk factors. Furthermore, the scarcity of similar reports in the literature makes it difficult to compare clinical manifestations, routes of transmission, and treatment response, highlighting the need for

studies with a larger number of cases to strengthen the knowledge about mpox in women.

CONCLUSION

This case report of mpox in a cisgender woman with vulvar lesions, confirmed by molecular biology and electron microscopy, demonstrates a relevant clinical spectrum with a higher frequency of genitourinary involvement, and contributes to the growing understanding of mpox epidemiology beyond the populations initially most affected, although it remains less prevalent than in men.

The possible transmission via fomites, suggested by the patient's history and the absence of infection in her partner, reinforces the necessity of considering non-sexual routes of transmission. Electron microscopy stands out as an effective complementary diagnostic tool, adding certainty and precision in atypical cases and for infection confirmation.

We emphasize the importance of including mpox in the differential diagnosis of genital lesions in women and of adopting an inclusive public health approach that considers gender diversity in epidemiological surveillance, prevention, and health education. This approach should consider not only sexual transmission but also contact with fomites and high-risk environments.

This study was approved by the Research Ethics Committee of UFF (CAAE 56591822.9.0000.5243) as part of the genital ulcer project. The patient signed verbal and written informed consent form to participate. Written consent was also obtained for the scientific use of the images.

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Participation of each author

MRLP: Patient assistance, Collection of biological materials, Photography, Text writing, Text revision, General supervision, Project conceptualization.

WNCA: Bibliographical research, Text writing, Text revision, Image processing.

ICNPP: Text revision, General supervision, Project conceptualization.

CCCS: Text writing, Literature review, Text revision.

CSB: Literature review, Text revision, Image processing.

KR: Electron microscopy analysis of clinical samples, Text revision.

JJC: Electron microscopy analysis of clinical samples, Text revision.

RQV: Patient care, Collection of biological materials, Text revision.

CVLP: Patient care, Bibliographical review, Text revision.

PVLP: Patient care, Bibliographical review, Text revision.

CTMB: Monitoring of molecular biology analysis of clinical samples, Text revision.

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REFERENCES

1. Centers for Disease Control and Prevention. Monkeypox cases by age and gender, race/ethnicity, and symptoms [Internet]. 2022 [cited on 2024 Apr 12]. Available from: https://www.cdc.gov/poxvirus/monkeypox/response/2022/demographics.html
2. Karagoz A, Tombuloglu H, Alsaeed M, Tombuloglu G, AlRubaish AA, Mahmoud A, et al. Monkeypox (mpox) virus: classification, origin, transmission, genome organization, antiviral drugs, and molecular diagnosis. J Infect Public Health. 2023;16(4):531-41. https://doi.org/10.1016/j.jiph.2023.02.003
3. World Health Organization. Mpox [Internet]. Geneva: WHO; 2024 [cited on 2024 Apr 12]. Available from: https://www.who.int/news-room/fact-sheets/detail/mpox
4. Bunge EM, Hoet B, Chen L, Lienert F, Weidenthaler H, Baer LR, et al. The changing epidemiology of human monkeypox–a potential threat? A systematic review. PLoS Negl Trop Dis. 2022;16(2):e0010141. https://doi.org/10.1371/journal.pntd.0010141
5. Joshi MN, Vadher BK, Dudani AB. Mpox virus infection in women and outbreak sex disparities. Int J Infect Dis. 2024;124:123-8.
6. Pan American Health Organization. Epidemiological update of monkeypox in women. Washington: PAHO; 2022.
7. Pereira PLG, Flores ERM, Silva TPR, Faria APV, Ribeiro EEN, Sato APS, et al. Epidemiologia das notificações de monkeypox no estado de Minas Gerais, Brasil. Rev Bras Enferm. 2023;76(3):e20220598. https://doi.org/10.1590/0034-7167-2022-0598pt
8. Madewell ZJ, Charniga K, Masters NB, Asher J, Fahrenwald L, Still W, et al. Serial Interval and Incubation Period Estimates of Monkeypox Virus Infection in 12 Jurisdictions, United States, May-August 2022. Emerg Infect Dis. 2023;29(4):818-21. https://doi.org/10.3201/eid2904.221622
9. Patel A, Bilinska J, Tam JCH, Fontoura DS, Mason CY, Daunt A, et al. Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series. BMJ. 2022;378:e072410. https://doi.org/10.1136/bmj-2022-072410
10. Petersen E, Abubakar I, Ihekweazu C, Heymann D, Ntoumi F, Blumberg L, et al. Monkeypox–enhancing public health preparedness for an emerging lethal human zoonotic epidemic threat in the wake of the smallpox post-eradication era. Int J Infect Dis. 2019;78:78-84. https://doi.org/10.1016/j.ijid.2018.11.008
11. Thornhill JP, Barkati S, Walmsley S, Rockstroh J, Antinori A, Harrison LB, et al. Monkeypox virus infection in humans across 16 countries – April–June 2022;387(8):679-91. N Engl J Med. 2022;387(8):679-91. https://doi.org/10.1056/NEJMoa2207323
12. Alshamrani MM, El-Saed A, Al-Fayez S, AlAmeer K, Al Zunitan M, Abalkhail M, et al. Routes of transmission of mpox by virus clade and geographic distribution: a systematic review. J Infect Public Health. 2025;18(12):102985. https://doi.org/10.1016/j.jiph.2025.102985
13. Li Y, Olson VA, Laue T, Laker MT, Damon IK. Detection of monkeypox virus with real-time PCR assays. J Clin Virol. 2022;58(2):194-203. https://doi.org/10.1016/j.jcv.2006.03.012
14. Reed KD, Melski JW, Graham MB, Regnery RL, Sotir MJ, Wegner MV, et al. The detection of monkeypox in humans in the Western

Hemisphere. N Engl J Med. 2004;350(4):342-50. https://doi.org/10.1056/NEJMoa032299

15. Karagoz A, Tombuloglu H, Alsaeed M, Tombuloglu G, AlRubaish AA, Mahmoud A, et al. Monkeypox (mpox) virus: classification, origin, transmission, genome organization, antiviral drugs, and molecular diagnosis. J Infect Public Health. 2023;16(4):531-41. https://doi.org/10.1016/j.jiph.2023.02.003
16. Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D, et al. The CARE guidelines: consensus-based clinical case reporting guideline development. Glob Adv Health Med. 2013;2(5):38-43. https://doi.org/10.7453/gahmj.2013.008
17. Agência Nacional de Vigilância Sanitária. Nota técnica GVIMS/GGTES/ANVISA nº 03/2022. Orientações para prevenção e controle da monkeypox nos serviços de saúde [Internet]. Brasília: ANVISA; 2022 [cited on 2025 June 05]. Available from: https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicosdesaude/notas-tecnicas/2020/nota-tecnica-gvims-ggtes-anvisa-no-03-2022-orientacoes-para-prevencao-e-controle-da-monkeypox-nos-servicos-de-saude
18. Satapathy P, Khatib MN, Gaidhane S, Zahiruddin QS, Alrasheed HA, Al-Subaie MF, et al. Multi-organ clinical manifestations of Mpox: an umbrella review of systematic reviews. BMC Infect Dis. 2024;24:992. https://doi.org/10.1186/s12879-024-09884-y
19. Arze WNC. Mpox em pacientes atendidos no Setor de Doenças Sexualmente Transmissíveis da Universidade Federal Fluminense no município de Niterói, RJ, Brasil. [tese]. Niterói: Universidade Federal Fluminense; 2024.

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