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Monkeypox complicated with Fournier's gangrene: A case report

Monkeypox complicada con gangrena de Fournier: reporte de caso

Claudia Zaide García-Camacho[1a], Jesús Manuel Rodríguez-Guzmán[1b], Fátima del Rosario Peralta-Dzib[1c], Alis del Carmen Cornelio-Presenda[2d], David Alejandro Cabrera-Gaytán[3e]

Abstract

Background: Fournier's gangrene secondary to mpox has been scarcely documented in the literature. To provide a clinical-epidemiological description of a case of mpox complicated with Fournier's gangrene treated in a secondary hospital.
Clincal case: A 20-year-old male HIV infected with dermal lesions on the penis and penile and scrotal oedema developed Fournier's gangrene, for which he was hospitalized. Mpox was confirmed by the laboratory, and Ct values were issued on different days.
Conclusion: The clinical manifestations of acute onset dermal lesions and scrotal and penile oedema are relevant when associated with mpox.

Resumen

Introducción: la gangrena de Fournier secundaria a *mpox* se ha documentado escasamente en el mundo. Realizar la descripción clínica-epidemiológica de un caso de mpox complicada con gangrena de Fournier atendido en un hospital de segundo nivel.
Caso clínico: hombre de alrededor de los 20 años y portador de VIH, con lesiones dérmicas en pene, edema peneal y escrotal, que desarrolló gangrena de Fournier, por lo que se hospitalizó. Se confirmó *mpox* por laboratorio y se emitieron los valores de Ct en distintos días.
Conclusión: las manifestaciones clínicas de lesiones dérmicas, edema escrotal y peniano de inicio agudo son relevantes cuando están asociadas a mpox.

[1]Instituto Mexicano del Seguro Social, Hospital General de Zona No. 46, Servicio de Epidemiología. Villahermosa, Tabasco. México
[2]Instituto Mexicano del Seguro Social, Hospital General de Zona No. 46, Servicio de Medicina Interna. Villahermosa, Tabasco, México
[3]Instituto Mexicano del Seguro Social, Coordinación de Calidad de Insumos y Laboratorios Especializados. Ciudad de México, México

ORCID: 0009-0005-3962-6400[a], 0009-0006-2204-9130[b], 0009-0008-2478-5988[c], 0000-0002-6881-7303[d], 0000-0001-5314-4786[e]

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Correspondence to:
David Alejandro Cabrera Gaytán
david.cabrerag@imss.gob.mx
55 5747 3500, extensión 20201

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Introduction

Mpox has been considered a public health emergency of international concern (PHEIC) by the World Health Organization (WHO) due to the increase in cases on a global scale.[1] Since the beginning of the epidemic, cases have been reported in the six WHO regions; as of May 2, 2023, 87,301 confirmed cases and 130 deaths have been reported worldwide.[2]

The origin of this epidemic in 2022 arose with an imported case detected in the United Kingdom with a history of travel to Nigeria.[3] Subsequently, it spread through Europe with main involvement in Spain, Italy and Portugal, where vaccination and contact studies have been conducted.[4]

Upon arrival on the American continent, the expansion was rapid in the United States of America, and the highest fatality rates were registered in Cuba (12.5), Ecuador (0.56), Peru (0.53), Panama (0.45) and Mexico (0.35).[2] In Mexico, as of May 1, 2023, 6,776 probable cases have been identified, of which 4,010 are laboratory-confirmed, with 27 deaths. The cases are concentrated in men (97%), with 30 to 34 year-olds being the most affected, with an incidence rate of 10.2 per 100,000 inhabitants. Regarding the sexual orientation of the confirmed cases (n = 3,799), 48.4% were gay, and 30.1% were men who have sex with men (MSM). Regarding clinical management, 75.9% (3,044) of individuals with confirmed cases received outpatient management, and 24.1% were hospitalized due to risk factors.[2] Although the trend in Mexico is downwards, the Centers for Disease Control have issued a warning of the potential risk of increased cases of mpox during the summer holidays of 2023.[5] One case of mpox with Fournier's gangrene (FG) has been published,[6] as has one case that merited surgical resolution,[7] and a study confirmed that people living with HIV and immunosuppression (CD4 < 100 cells/mm^3) presented greater clinical severity.[8]

Mpox cases in Mexico can be identified through the epidemiological surveillance system using an operational definition; however, although cases can be identified, there are limitations in identifying clinical complications. Given this, the objective of this study was to provide a clinical and epidemiological description of a case of mpox complicated with FG treated in a secondary social security hospital in southern Mexico.[9]

Case report

A man, approximately 20 years old, homosexual, who began his active sexual life at 17 years of age, has had multiple partners, has received two doses of the vaccine against COVID-19, has smoked cannabis recreationally from the age of 17, and has smoked three cigarettes per month in the last four years. He was diagnosed with HIV in 2020 and started treatment with bictegravir, emtricitabine and tenofovir alafenamide. With intermittences in his antiretroviral treatment, in March 2022, he presented weight loss and a viral load of 7,000 copies/mL, and he restarted treatment with a decrease in viral load to 129 copies/mL in June 2022. He has a history of syphilis (February 2022), which was treated with penicillin G.

Day 0 began with the presence of vesicular lesions in the genital area (figure 1). On day 1, he noticed an increase in the size of the lesions as well as a generalized macular and papular type rash with a predominant cephalo-caudal distribution in the anterior and posterior thorax, excluding the palms and soles, as well as the presence of unquantified night fever. Subsequently, with the presence of pustules in the right inguinal region, at least two primary lesions, which ulcerated with defined edges and a clean centre, and pustules in the perineal and scrotal region, which evolved into painful ulcers that developed into abscesses, he decided to seek medical treatment and was diagnosed with genital herpes and prescribed paracetamol and provided general care (figure 2). On day 6, he required medical attention and was prescribed oral paracetamol and diclofenac plus local warm water compresses. Given the persistence of his discomfort, he went to the Family Medicine Unit, where he was suspected of having mpox; the lesions were swabbed

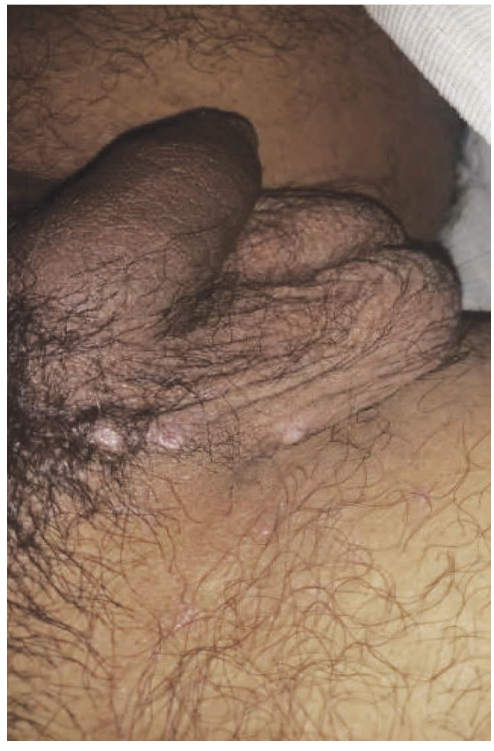

Figure 1 Dermal lesions at the base of the penis and scrotum (day 0)

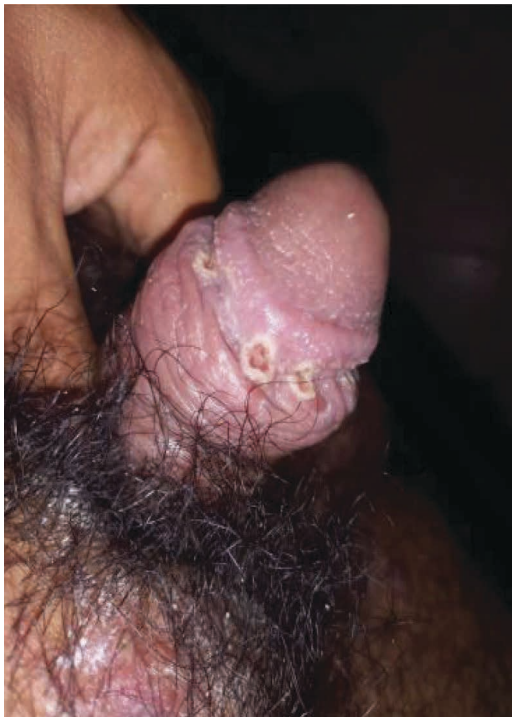

Figure 2 Multiple erosive lesions in the balanopreputial sulcus and crest of the corona and foreskin and shaft oedema (day 2)

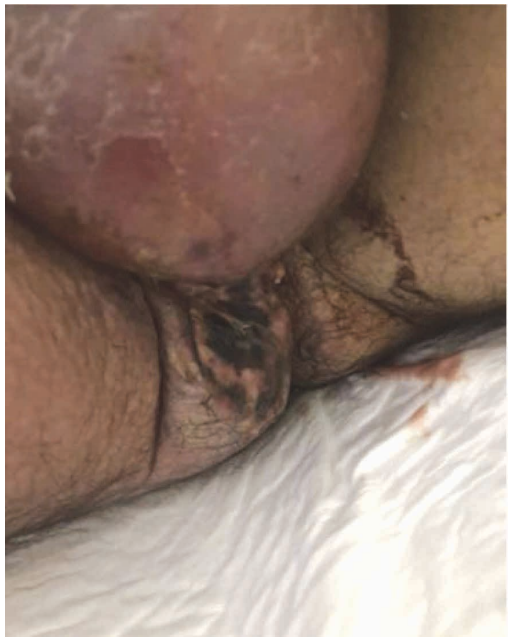

Figure 3 Scrotal oedema, ulceration and anal necrosis (day **8)**

to obtain samples, and he was prescribed oral paracetamol, diclofenac and acyclovir. The following day, during the night, inflammation occurred in the perineal, scrotal and foreskin areas, for which he decided to seek care at a hospital on day 8. Upon admission, he presented genital pain, fever and suppurative ulcers on the glans, preputial and perineal groove (figure 3). The results of the physical examination were as follows: 15-point Glasgow alert status, hydrocele, glans lesions, with yellowish discharge and the presence of folliculitis in the pubis, and ulcers in the perineum with necrotic tissue accompanied by serosanguinous and purulent discharge; on palpation, the patient reported pain, with oedema, erythema and hyperthermia. The patient was diagnosed with FG and soft tissue infection. Laboratory tests revealed leukocytosis and neutrophilia (table I).

Ultrasound revealed an acute inflammatory process of soft tissues in the bilateral inguinal scrotal region and a cyst of the head of the epididymis. Interconsultation was requested from Epidemiology, Internal Medicine and General Surgery. The initial treatment included meropenem, intravenous metronidazole, tramadol, ketorolac and paracetamol. The patient was evaluated by Urology, who reported an ulcerative lesion with a scab on the pubis, incomplete retraction of the penis due to pain and inflammation, no lesions in the middle raphe, a hyperaemic scrotum with increased volume and no necrotic tissue, and a perineal region with necrotic tissue that required debridement. Therefore, antibiotic therapy was added and carbapenem, aminoglycoside, nitroimidazole, bictegravir, emtricitabine, and tenofovir alafenamide were stopped. During his stay, he denied dysuria, haematuria, and haematochezia, and he was managed with surgical scrubbing without complications or adverse events.

Given the suspicion of mpox, Epidemiology reported the case and collected exudate from dermal lesions, e.g., a scab on the upper limb and two pustules on the lower limbs, which were sent to the Central Laboratory of Epidemiology in Mexico City. The day after receiving the samples, the laboratory confirmed a positive result (clade II) by real-time qPCR (table II). The patient was not treated with tecovirimat.

On the 22nd day, the patient was discharged and referred to the Hospital of the Ministry of Health where plastic surgery was performed to reconstruct the testicle and thigh, with a long hospital stay; he was discharged at the end of January of the following year.

Infection control measures included Epidemiology through an isolated room with standard precautions and by contact. An exclusive physician was assigned to clean the dermal lesions. On the 20th day of evolution, despite these measures, an in-hospital mpox infection was suspected in a 22-year-old doctor. In the presence of general nonspecific symptoms experienced by the intern, pharyngeal exudate was collected, and the sample was negative for mpox by qPCR (Ct 22.33). Home isolation was recommended until the laboratory result was obtained. The doctor returned to her activities in the hos-

Table I Main clinical laboratory findings

Parameter/day	Day 6	Day 7	Day 8	Day 9	Day 13	Day 17	Day 20	Day 21
Glucose (mg/dL)	118	73	69	57	82		99	
Urea (mg/dL)	64.25	42.83	32.12	17.13	23.56		25.7	
Creatinine (mg/dL)	1.29	0.92	0.81	0.46	0.70		0.87	
BUN (mg/dL)	30	20	15	8	11		0.87	
Leukocytes (cells/microlitre)	21.75	18.08	14.97	9.10	12.71	8.41	4.12	
Lymphocytes #	1.6	2.22	2.81	1.93	2.42	2.40	2.51	
Haemoglobin (g/dL)	12.92	11.64	10.59	7.57	9.59	11.97	12.31	
Haematocrit (%)	39.87	35.29	32.68	22.70	29.88	37.01	38.46	
Neutrophils (%)	19.04	14.69				5.09	1.01	
Platelets (cells/microlitre)	163,000	163,000	170,000	142,000	234,000	486,300	672,000	
Procalcitonin (ng/mL)				0.10		0.02		
IgG anti-cytomegalovirus antibodies (IU/mL)				475				
Rubella IgG antibodies (IU/mL)				43.40				
Toxoplasma IgG antibodies (IU/mL)				0.10				
Cytomegalovirus IgM antibodies				0.76				
Rubella IgM antibodies (IU/mL)				0.16				
Toxoplasma IgM antibodies (IU/mL)				0.11				
Hepatitis B HBsAg				0.22				
Anti-HCV antibodies				0.22				
VDRL				+ (8)				
Rapid Test for the qualitative detection of SARS-CoV-2 antigen								Negative

Table II qPCR laboratory results by sample type

Evolution day	Sample type	Result	Ct	Clade/Ct
Day 8	Pustule skin lesions	Positive	34.91	West Africa 33.43
Day 14	Pustule skin lesions	Positive	25.80	West Africa 21.21
Day 14	Scabbing skin lesions	Positive	22.80	West Africa 16.32

pital without further issues. Regarding contacts, the doctor reported that her partner presented genital dermal lesions and was diagnosed with genital herpes.

Discussion

This report provides a clinical description of a laboratory-confirmed case of mpox complicated by FG and HIV treated in a social security hospital in Mexico. FG is a fulminant form of infective necrotising fascitis of the perineal, genital, or perianal regions, which commonly affects men.[10,11] Previous reports have indicated that most cases of FG occur in individuals over 50 years[10] and that severity and lethality are associated with diabetes mellitus, alcoholism, HIV infection, trauma, genitourinary infections and states of immunosuppression.[11] In 2022-2023, there was a predominance of mpox in young men, but mpox has also manifest in humans with different activities and behaviours[6,12] and in companion animals,[13] highlighting the change in epidemiology and the challenge of differential diagnosis.

The patient in this case study was admitted to the hospital was due to pain and the extent of the lesions in the perineum and anal areas, which is consistent with a series of mpox cases[12] for which the two main hospitalization conditions were rectal-anal pain and aggregate superinfection of the soft tissues. Likewise, the patient presented scrotal and penile oedema, which has been previously documented in young men[14] (table III).

The transmission mechanism in this case was sexual,

Table III Similar clinical cases reported in the literature

Country	Year	Sex	Age	Brief description of the case.
UK	2022	Man	47	History of HIV (viral load <200 copies/mL on antiretroviral therapy, CD4 count 755 cells/µL), was referred for review with extensive genital lesions, penile swelling, and purulent penile discharge; clinical suspicion of Fournier's gangrene. Available: https://www.bmj.com/content/378/bmj-2022-072410
USA	2023	Man	33	HIV who contracted Mpox who developed a large painful genital ulcer with overlying eschar. He required surgical debridement of the penile ulcer followed by scrotoplasty. Available: https://doi.org/10.1016/j.eucr.2023.102438
USA	2023	Man	27	Tender induration over the scrotum, penile shaft, pubis, and perineum in association with mild erythema and without crepitus or fluctuance; right coronal sulcus with black crusted papule and penile and scrotum edema. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9854266/

as has been reported in 95% of cases worldwide.[12] Transmission in humans is relevant because the virus has been detected in semen, although with low Cq values.[15,16]

In Mexico, in the general population, ulcerative lesions can be painful (16%) and bleed (4.6%), and in people with HIV, these percentages increase to 17.1% and 5.0%, respectively.[2] Most of the clinical data correspond to injuries, fever, headache and lymphadenopathy. Therefore, the care of single or confluent lesions, as well as ulcers, involves outpatient management and educating patients about their handling and identification of warning signs and infection.

One important aspect is the Ct values of the qPCR results; the longer the evolution, the higher was the viral load in the lesions, but the laboratory blood values indicated improvement, with reactive thrombosis on day 20 after the onset of the clinical picture. In this sense, one of the limitations is the absence of biomarkers such as C-reactive protein, ferritin and procalcitonin. Another limitation was the lack of testing for another sexually transmitted infection or bacterial infection in the lesions. The patient had HIV and reported intermittence in management with antiretroviral therapy with detectable viral loads. CD4 values were not assessed; importantly, patients with HIV/mpox with a low CD4 cell count are at an increased risk of necrotic complications.[8] According to the Mexican casuistry, more than half of individuals with confirmed cases of mpox have HIV (57.9%). Also an histopathological analyses was not done. Coinfection events of mpox and SARS-CoV-2 have also been reported,[17] as well as penile complications with SARS-CoV-2;[18] In the present case, a rapid test was performed to identify SARS-CoV-2 and it was non-reactive.

The WHO has declared that mpox is no longer a PHEIC. However, there are unknowns about the disease in relation to the routes of transmission and complications;[19] therefore, more cases complicated with FG need to be reported. Likewise, other complications have been documented during the current epidemic: superinfected skin lesions including paronychia and genital cellulitis, severe anal and gastrointestinal symptoms, angina with dysphagia, and ocular involvement.[20]

Among the strengths of this study are that laboratory surveillance of this pathology is standardized throughout the national territory; additionally, there were different Ct values for clinical samples at different times, data that have not been provided in previously published case reports. As Moreno Matson said "*it is necessary to keep expanding the data on different clinical presentations of this new human disease to establish a direct relationship between penile necrosis and MPXV infection*."[21]

Conclusions

Finally, given the range of the acute onset of clinical manifestations (dermal lesions and scrotal and penile oedema), it is important to consider mpox in populations at risk and to be aware of atypical presentations to ensure diagnostic precision.

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