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# Oral manifestations of Monkeypox infection: clinical implications for dental diagnosis and management in emerging viral outbreaks in Brazil

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***REVISÃO DE LITERATURA***

**ABSTRACT**

**Introduction:** The reemergence of Monkeypox (Mpx) in 2022 represented a new challenge for global public health. Although previously confined to African regions, the international spread of the virus highlighted the need for a multidisciplinary response, including dentistry, due to the early oral manifestations of the disease.**Objective:** To discuss the oral manifestations of Mpx, emphasizing their clinical implications for dental diagnosis and management during viral outbreaks in Brazil.**Methods:** A narrative review of recent scientific literature was conducted, focusing on publications between 2012 and 2023, as well as documents from official organizations such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). Sources addressing virological, clinical, and dental aspects of Mpx were included.**Results:** Mpx presents four clinical phases, with the mucocutaneous eruption phase including painful oral ulcers, often among the first signs of infection. These manifestations may aid in early diagnosis. Dental management requires specific biosafety measures, careful screening, postponement of elective procedures, and local symptomatic treatment. The literature also emphasizes the importance of ethical and stigma-free care. **Conclusion:** The oral manifestations of Mpx are clinically relevant and can

contribute to early disease identification. Dentists should be prepared to recognize these lesions, adopt preventive measures, and provide safe, ethical, and humane care, strengthening the role of dentistry in health surveillance and the response to infectious outbreaks.

**Keywords:** Mpx; monkeypox; viral infections; oral manifestations; dentistry; biosafety; public health.

**RESUMO**

**Introdução:** A reemergência da Mpx (Monkeypox) em 2022 representou um novo desafio para a saúde pública global. Embora anteriormente restrita a regiões africanas, a disseminação internacional do vírus evidenciou a necessidade de uma resposta multiprofissional, incluindo a odontologia, devido às manifestações orais precoces da doença. **Objetivo:** Discutir as manifestações orais da mpx, destacando suas implicações clínicas para o diagnóstico e o manejo odontológico durante surtos virais no Brasil. **Métodos:** Foi realizada uma revisão narrativa da literatura científica recente, com foco em publicações entre 2012 e 2023, além de documentos de órgãos oficiais como a Organização Mundial da Saúde (OMS) e os Centers for Disease Control and Prevention (CDC). Foram incluídas fontes que abordam aspectos virológicos, clínicos e odontológicos da Mpx. **Resultados:** A Mpx apresenta quatro fases clínicas, sendo que a fase de erupção cutânea mucosa inclui úlceras orais dolorosas, frequentemente entre os primeiros sinais da infecção. Essas manifestações podem auxiliar no diagnóstico precoce. O manejo odontológico exige medidas específicas de biossegurança, triagem criteriosa, adiamento de procedimentos eletivos e tratamento sintomático local. A literatura também aponta a importância de um atendimento ético e livre de estigmas. **Conclusão:** As manifestações orais da Mpx são relevantes clinicamente e podem contribuir para a identificação precoce da doença. O cirurgião-dentista deve estar preparado para reconhecer essas lesões, adotar medidas de prevenção e oferecer um atendimento seguro, ético e humanizado, fortalecendo o papel da odontologia na vigilância em saúde e no enfrentamento de surtos infecciosos.

**Palavras-chave:** Mpx; monkeypox; infecções virais; manifestações orais; odontologia; biossegurança; saúde pública.

## INTRODUCTION

Throughout history, viral diseases such as the Spanish flu, measles, Ebola, AIDS, SARS, swine flu, and COVID-19 have caused devastating impacts on public health and society. In this context, human smallpox, caused by the Variola major virus, stands out as it was eradicated in 1980 thanks to a vaccination campaign coordinated by the World Health Organization (WHO, 1980). The eradication marked a milestone in medicine, being the only viral disease eliminated from the planet to date.

However, in 2022, a new public health emergency emerged with the spread of Monkeypox, now called mpox, a zoonosis caused by an orthopoxvirus similar to the smallpox virus. The virus was first identified in laboratory monkeys in 1958, but its main reservoirs are African rodents. The first human case was recorded in 1970 in the Democratic Republic of the Congo (Reynolds, 2012). In Brazil, the first confirmed case occurred in São Paulo in June 2022. To avoid stigma, the WHO changed the disease's name to mpox in November of the same year.

Transmission occurs through direct contact with infected individuals or contaminated surfaces. Pregnant women, young children, and immunosuppressed individuals are at higher risk of severe forms. Symptoms include fever, lymphadenopathy, pustular rash, and frequently oral manifestations such as ulcers on the tongue, palate, gums, and pharynx, which cause pain, dysphagia, and risk of secondary infections (CDC, 2022).

Treatment is symptomatic, focusing on pain control, hydration, and prevention of complications. This article aims to discuss the clinical presentation of mpox with an emphasis on its oral manifestations, contributing to the knowledge, prevention, and management of the disease.

## 2. LITERATURE REVIEW

### 2.1 Viral Cycle of Mpox

The Monkeypox virus belongs to the genus *Orthopoxvirus* of the family *Poxviridae*, sharing important genomic similarities with the smallpox virus (*Variola major*). It is a double-stranded DNA virus that, unlike most DNA viruses, completes its replication cycle entirely in the cytoplasm of the host cell (McCollum and Damon, 2014).

After contact with mucous membranes or damaged skin, the virus enters epithelial cells by fusion of the viral membrane with the cell membrane. Then:

- The viral genome is released into the cytoplasm;
- DNA replication and viral protein synthesis occur;
- An immature virion is assembled and transforms into a mature intracellular virion;
- The virus can be released in two ways: either by direct cell lysis or by budding through the membrane, acquiring an additional envelope.

The high replication capacity and efficient release favor local dissemination (skin and mucosa) and systemic spread, with particular tropism for epithelium and lymph nodes (Shafaati and Zandi, 2022).

### 2.2 Clinical Phases of Mpox Infection and Medical and Dental Recommendations

The Mpox infection follows a relatively well-defined clinical course, divided into phases:

#### 2.2.1 Incubation Period (6–13 days)

- Characteristics: asymptomatic period; initial viral replication at the entry sites and regional lymph nodes.
- Medical recommendations: Monitoring of close contacts and quarantine if necessary.
- Dental implications: Avoid elective dental procedures in individuals under monitoring or suspected exposure.

### 2.3 Prodromal Phase (1–5 days)

- Symptoms: high fever (>38.5°C), myalgia, severe headache, lymphadenopathy (distinguishing it from smallpox and chickenpox), fatigue.
- Medical recommendations: Fever control, oral hydration, rest.
- Dental implications: Dental care should be suspended; if emergency care is necessary, use full PPE (N95 mask, eye protection, impermeable gown) and rigorous screening.

### 2.4 Mucocutaneous Rash Phase (2–4 weeks)

- Symptoms: maculopapular rash evolving into pustules, crusts, and healing. Distribution is often centrifugal (face, extremities, mucosa).
- Oral manifestations: painful ulcers on the tongue, palate, buccal mucosa, gums, and oropharynx, which may be among the first clinical signs (Bungert et al., 2023).
- Medical recommendations: Analgesia (paracetamol or anti-inflammatory drugs), local care with oral antiseptics (0.12% chlorhexidine), topical anesthetics for oral lesions, and nutritional support.

Dental implications:

- Avoid aerosol-generating procedures.
- Treat only urgent/emergency cases with strict biosafety protocols.
- Recommend mouth rinses with mild antimicrobial agents for oral hygiene.
- Identify and report suspected cases.

### 2.5 Recovery Phase (3–6 weeks)

- Symptoms: progressive resolution of lesions, crust formation, and shedding without significant scarring.
- Medical recommendations: Follow-up to prevent secondary bacterial infections and guidance on skin/mucosa care.

- Dental implications: Evaluation of residual oral lesions. Resume dental care only after complete clinical resolution.

### 2.6 Considerations on Dental Management During Mpox Outbreaks

Given the transmission potential in healthcare settings, dentists should:

- Early recognize oral manifestations as diagnostic clues.
- Adopt strict screening protocols (questions about symptoms, suspected contacts).
- Use high-efficiency personal protective equipment.
- Prioritize minimally invasive procedures.
- In case of painful oral lesions, prescribe adjunct therapies to control pain and maintain nutrition/hydration.

Including Mpox in the differential diagnosis of ulcerated oral lesions, especially during outbreaks, is a prudent and necessary approach (Bungert et al., 2023; Thornhill et al., 2022).

## DISCUSSION

The literature review highlights the growing relevance of Mpox infection in the global public health context, especially after its reemergence in 2022. Although previously restricted to endemic regions in Africa, the international spread of the virus exposed vulnerabilities in epidemiological surveillance systems and underscored the importance of a multidisciplinary approach, including the role of the dental surgeon.

The viral cycle of *Orthopoxvirus*, with exclusively cytoplasmic replication and tropism for epithelium and lymph nodes, helps explain the characteristic mucocutaneous manifestations of the disease, including oral lesions. The virus's high replication and dissemination capacity reinforce its contagious potential, particularly in clinical settings such as dental offices.

The clinical phases of Mpox infection provide a useful guide for medical and dental management. The prodromal phase, marked by nonspecific symptoms, represents a significant diagnostic challenge as it can be confused with other common viral infections. Meanwhile, the eruption phase, characterized by ulcerated oral lesions, plays a central role in recognizing the disease in dental environments. Recent literature (Bungert et al., 2023; Thornhill et al., 2022) emphasizes that these often painful and early-onset lesions can be critical for identifying suspected cases even before cutaneous manifestations appear.

In this sense, it is essential that the dental surgeon is trained to recognize these manifestations and include them in the differential diagnosis of oral ulcers, especially during outbreak periods. Similarities with conditions such as herpes, aphthous stomatitis, or syphilis can complicate clinical identification, making detailed anamnesis and knowledge of the epidemiological profile of Mpox indispensable.

Recommendations for dental management during infection include suspension of elective care, strict use of PPE, and screening protocols, implying not only changes in clinical routines but also an ethical and responsible stance by the healthcare professional. The adoption of measures such as analgesia, use of mild oral antiseptics, and guidance on hygiene and nutrition significantly contributes to patient comfort and recovery.

Finally, the literature also points to an ethical and social challenge: the stigma associated with Mpox, especially when linked to specific groups, as initially observed. Therefore, the dental surgeon's role should also involve humane care, respect for privacy, and combating misinformation—essential aspects in any response to health emergencies.

In summary, Mpox infection reinforces the importance of vigilant, up-to-date dentistry integrated into the context of collective health. Early recognition of oral manifestations may represent a decisive contribution to diagnosis, appropriate management, and control of virus spread, especially in a country like Brazil with great population diversity and structural challenges in the health system.

## CONCLUSION

Mpox represents an emerging public health challenge that demands particular attention from dental professionals due to the oral manifestations that may appear in the early stages of infection. These lesions, often painful and among the first clinical signs, position the dentist as a key figure in the identification of suspected cases, especially during outbreaks.

Including Mpox in the differential diagnosis of oral ulcers, strictly adhering to biosafety protocols, and providing ethical, non-stigmatizing care are essential components of safe clinical management. Moreover, it is crucial that dentists are well-trained to recognize the signs of the disease and guide their patients with responsibility and empathy.

Thus, the expanded role of dentistry in epidemiological surveillance and in responding to public health emergencies is reinforced, highlighting the importance of an integrated, up-to-date, and socially responsible dental practice.

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