

SHORT COMMUNICATION: MANAGEMENT OF RADIOLOGICAL CLINICS DURING THE TIME OF MONKEYPOX

SHORT COMMUNICATION: MANEJO DAS CLÍNICAS RADIOLÓGICAS EM ÉPOCA DE VARÍOLA DOS MACACOS

SHORT COMMUNICATION: GESTIÓN DE CLÍNICAS RADIOLÓGICAS EN LA ÉPOCA DE LA VIRUELA DEL SIMIO



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ABSTRACT: The world is again witnessing a disease caused by viruses that can infect animals and humans. Close contact, such as in dental care, is a central disease transmission mechanism. Thus, having an impact in all areas of health, we highlight in this text the look and care in front of dental and radiological clinics. This brief communication aims to orient dental surgeons and radiology professionals about the forms of protection and biosafety in patient care. Some recommendations have been made to avoid the spread of monkeypox in radiology clinics. Clinics must continue with the care and disinfection process started since the pandemic by COVID-19. Likely, the recommendations in this document could be used not only in periods of new disease discovery or pandemic but also in periods considered of no concern.

KEYWORDS: Monkeypox. Dentistry. Monkeypox virus. Radiology.

RESUMO: O mundo está novamente testemunhando uma doença causada por um grupo de vírus que pode contaminar animais e humanos. Contato próximo, como em atendimentos odontológicos, são grandes mecanismos de transmissão da doença. Dessa forma, tendo impacto em todas as áreas da saúde, destacamos neste texto, o olhar e os cuidados frente às clínicas odontológicas e radiológicas. O objetivo dessa breve comunicação, é orientar os cirurgiões dentistas e os profissionais da área de radiologia sobre as formas de proteção e biossegurança no atendimento dos pacientes. Foram elaboradas algumas recomendações para evitar a disseminação da varíola dos macacos nas clínicas radiológicas. É importante que as clínicas continuem com o cuidado e processo de desinfecção iniciado desde a pandemia por COVID-19. Provavelmente, as recomendações contidas neste documento poderão ser utilizadas não apenas nos períodos de descoberta de novas doenças ou pandêmico, mas também em períodos considerados não preocupantes.

PALAVRAS-CHAVE: Monkeypox. Odontologia. Vírus da varíola dos macacos. Radiologia.

RESUMEN: El mundo vuelve a ser testigo de una enfermedad causada por un grupo de virus que pueden contaminar a animales y humanos. El contacto cercano, como en las clínicas dentales, son los principales mecanismos de transmisión de la enfermedad. Así, teniendo impacto en todas las áreas de la salud, destacamos en este texto, la mirada y el cuidado frente a las clínicas dentales y radiológicas. El objetivo de esta breve comunicación es orientar a los cirujanos dentistas y profesionales de la radiología sobre las formas de protección y bioseguridad en la atención a los pacientes. Se han elaborado algunas recomendaciones para evitar la propagación de la viruela del mono en las clínicas radiológicas. Es importante que las clínicas continúen con el proceso de cuidado y desinfección iniciado desde la pandemia por COVID-19. Probablemente, las recomendaciones contenidas en este documento puedan ser utilizadas no sólo en periodos de descubrimiento de nuevas enfermedades o pandemias, sino también en periodos considerados no preocupantes.

PALABRAS CLAVE: Monkeypox. Odontología. Virus de la viruela del mono. Radiología.

Yet another global threat to public health: monkeypox is emerging in several countries. The world is again witnessing a disease caused by viruses that can infect animals and humans (BEZERRA-SANTOS *et al.*, 2021). Currently, zoonotic viruses pose a major threat affecting global health, including not only coronaviruses, such as monkeypox. Amid the pandemic of COVID-19, the increased reporting of monkeypox virus infection in humans spreading to many countries outside of Africa is a major cause of concern for the WHO (World Health Organization). The WHO Director-General declared on July 23, 2022, that the monkeypox outbreak in several countries is a public health emergency of international concern (PHEIC). Declaring a PHEIC constitutes the highest global public health alert level under the International Health Regulations and can improve global coordination, cooperation, and solidarity. Thus, with the impact generated in all areas of health, we highlight in this text the look and care in dental and radiology clinics.

The first case of monkeypox was detected in an animal. The first human case was reported when the virus was identified in a child in Congo (DRC) in 1970. The first human cases were among the Zaire of the Democratic Republic of the Congo, Wisconsin-borne cases were established in 1970, and the discovery of public health cases was first recognized in 1958. Monkeypox virus belongs to the genus Orthopoxvirus and is a member of the family Poxviridae. Monkeypox is a double-stranded DNA virus of the Poxviridae family that also includes the smallpox virus, the causative agent of smallpox.

Transmission of smallpox to humans occurs primarily through contact with body fluids, skin lesions, or respiratory droplets from directly infected animals or indirectly through contaminated fomites, a strain of viral circulation in animal populations, and the range of species that may harbor the virus has not been fully established, although several lines of evidence point to rodents as major potential reservoirs. (BERTHET *et al.*, 2021) (MARIEN *et al.*, 2021). There is previous evidence of contamination of the disease after touching contaminated objects. Objects, surfaces, and tissues can be contaminated with the smallpox virus; the virus survives on some surfaces for some time under certain conditions.

Monkeypox spreads through close contact with someone who has a monkeypox rash, as well as close contact such in dental care, talking, breathing, or singing near each other, which can generate short-range droplets or aerosols; skin-to-skin (such as touching or vaginal/anal sex); mouth-to-mouth (such as kissing); or mouth-to-skin contact (such as oral sex or kissing on the skin). Possible mechanisms of airborne transmission for smallpox are not well elucidated, and ongoing studies are ongoing.

The clinical manifestations of monkeypox resemble those of smallpox, including nonspecific clinical features. Symptoms such as fever, chills, myalgia, headache, lethargy, and lymphadenopathy followed by vesicopustular eruption have already been identified during the 2022 outbreak, with an incubation period ranging from 5 to 21 days, although the incubation period for this current outbreak has not been established, its often-long incubation period suggests that the initial exposure events may have occurred in early April 2022. The rash can affect the face, palms of the hands, soles of the feet, groin, genital and anal region. It can also be found in the mouth, throat, anus or vagina, or eyes. Sores on the skin start flat, then fill with fluid before forming a crust, drying out, and falling off, with a new layer of skin forming underneath.

The differential diagnosis of monkeypox includes a variety of infections, such as Rickettsia akari pox, smallpox, measles, chickenpox and syphilis, and others, depending on local epidemiology. A definitive diagnosis of monkeypox can only be established by laboratory testing. Therefore, the World Health Organization (WHO) recommends that the optimal samples for diagnosis include a direct sampling of lesions: swabs of exudate from vesicular lesions or crusts stored in dry, sterile, non-viral transport medium and cold test tube.

Although there is no specific treatment or vaccine for smallpox, cross-immunity with smallpox vaccination may offer some protection in human populations. (RIMOIN *et al.*, 2010). Complications of monkeypox include secondary skin infections, pneumonia, confusion, and eye problems. However, the lethality rate of smallpox ranges from 1 to 10% (BERTHET *et al.*, 2021).

The dental and radiology clinics have been readapting since the return with post-covid care. Therefore, the authors elaborated on the following steps to avoid the spread of monkeypox in radiology clinics based on the biosafety recommendations against COVID-19 (CARMELO *et al.*, 2020).

- Daily check of the self-reported health status of dental professionals in the clinic, focusing on fever, headache, muscle aches, back pain, prostration, swollen lymph nodes, and rash.

- Initial screening by telephone or other means of communication to ensure that the patient has not experienced any symptoms of fever, chills, myalgia, headache, lethargy, and lymphadenopathy followed by a vesicopustular eruption in the past few days; that the patient has not made any international travel or come into contact with people who have made

international travel; and that the patient has not come into contact with anyone who has experienced any symptoms in the past three weeks.

- Should check each patient's temperature as soon as they enter the clinic. A non-contact forehead thermometer is recommended for screening. The temperature should always be below 37.3 degree.

- Dental care should be spaced, with a minimum of 30 minutes between one patient and another to allow hygiene and no contact between patients.

- It is important to emphasize that newspapers, magazines, and decorative objects must be removed from the waiting room, in addition to removing drinking fountains where the tip of the patient's mouth comes close to the water spout, preferably using disposable cups.

When acquiring radiographic and tomographic images, professionals and patients must take the following measures:

- Professionals: Professionals should wash their hands before putting on personal protective equipment (PPE), after the procedure, and after sanitizing and disinfecting the exam room. The team (technicians, assistants, and dentists) should wear PPE, including masks, gloves, goggles, face shields, waterproof protective caps, or disposable lab coats and shoe covers.

- Patients: Patients should wash their hands upon entering the clinic for dental care and avoid touching objects, face, or clothing.

Before starting image acquisition, especially when using intraoral techniques, we recommend administering a hydrogen peroxide solution to the patient for 30 seconds (1 part hydrogen peroxide to 1 part water) and then applying a 0.12% chlorhexidine solution. The patient should use a disposable cup instead of a spittoon.

- Clinical environment: The entire dental care environment should be sanitized and disinfected after the patient leaves: spotlights, chairs, equipment, and surfaces with soap and water and common household disinfectants or a bleach product.

In addition, should clean common areas such as floors, doorknobs, chairs, tables, and restrooms four times a day to reduce the risk of transmission.

We recommend covering X-ray machine cylinders, X-ray positioners, bite and chin blocks, X-ray film, X-ray image plates, sensors, reflectors, headrests, and dental chair controls with a plastic film (PVC) or plastic bag.)

Should change these from patient to patient. For example, x-ray beam handles and triggers should only be used if the professional wear protective gloves.

It should be sanitized with a wipe of 0.5% to 1% sodium hypochlorite solution or 70% alcohol (with vigorous rubbing) between patients to disinfect the lead apron and thyroid shield.

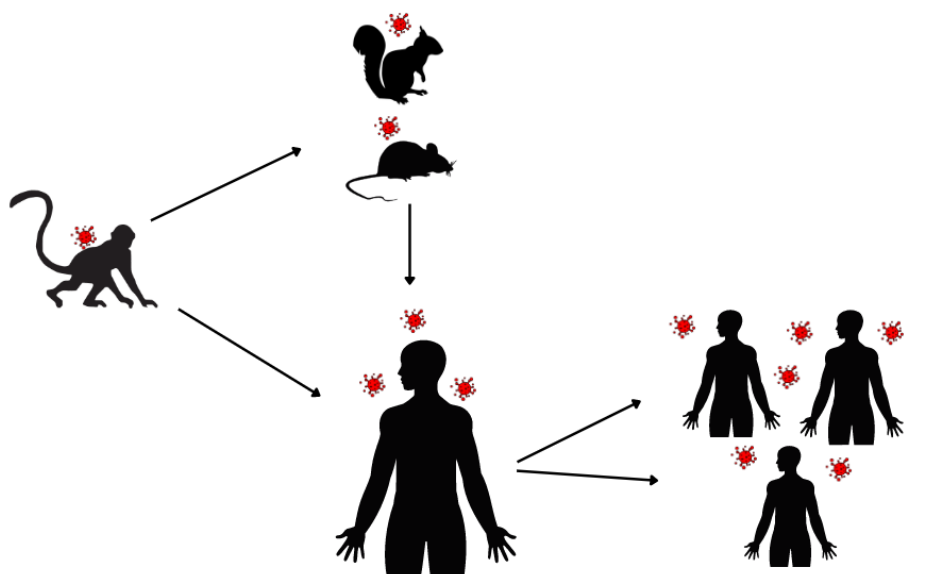
The choice of imaging exams and examination procedures are also important, as described below:

Extraoral radiographs or cone beam computed tomography (CBCT) should be preferred to avoid the vomiting or coughing reflexes caused by intraoral radiographs. When intraoral radiographs are indispensable, they should use a double shielding barrier to avoid perforation and cross-contamination. We recommend using a disposable surgical apron worn over a waterproof coat, both tied at the back. After the exam, clean the head with 0.5% to 1% sodium hypochlorite solution or 70% alcohol. At the end of the shift, the surgical apron must be discarded. It is important to emphasize that when disinfecting the environment and the impervious apron, professionals must use rubber gloves for heavy cleaning.

It is important to note that digital images have higher quality resolution than printed images and are more favorable regarding environmental sustainability and flexibility in sending and transmitting images. In addition, printed images increase the risk of disease transmission. Therefore, radiology clinics should make diagnoses remotely, and patients and dentists requesting exams should access them online. Thus, teams should understand the routes of transmission and should be aware of and informed about the strictest precautions to prevent smallpox transmission from monkeys to other patients and within the community.

It is concluded that monkeypox has emerged in several countries with many confirmed cases, posing a global public health threat. Found a link between air travel and the international spread of infectious diseases, including the spread of monkeypox. You can clean objects and surfaces with soap, water, common household disinfectants, or a bleach product to kill the monkeypox virus. Clinics must continue the care and disinfection process since the pandemic by COVID-19. That professionals understand the disease flow and can identify possible symptoms for the necessary data to be performed.

Figure 1 – Schematic diagram illustrating how monkeypox virus is transmitted



Source: Elaborated by the authors

REFERENCES

BERTHET, N. *et al.* Genomic history of human monkey pox infections in the Central African Republic between 2001 and 2018. **Scientific Reports**, v. 11, 13085, 2021. DOI: 10.1038/s41598-021-92315-8. Available: <https://www.nature.com/articles/s41598-021-92315-8>. Access: 10 Dec. 2022.

BEZERRA-SANTOS, M. A. *et al.* Illegal wildlife trade: a gateway to zoonotic infectious diseases. **Trends Parasitol**, v. 37, n. 3, p. 181-184, 2021. DOI: 10.1016/j.pt.2020.12.005. Available: <https://pubmed.ncbi.nlm.nih.gov/33454218/>. Access: 10 Dec. 2022.

CARMELO, J. C. *et al.* Impact of COVID-19 on the daily routine of radiology clinics. **Imaging Sci Dent.**, v. 50, n. 3, p. 261-263, 2020. DOI: 10.5624/isd.2020.50.3.261. Available: <https://pubmed.ncbi.nlm.nih.gov/33005584/>. Access: 10 Dec. 2022.

MARIEN, J. *et al.* **Monkeypox viruses circulate in distantly-related small mammal species in the Democratic Republic of the Congo.** 2021. PREPRINT. DOI: 10.21203/rs.3.rs-414280/v1. Available: <https://www.researchsquare.com/article/rs-414280/v1>. Access: 10 Dec. 2022.

RIMOIN, A. W. *et al.* Major increase in human monkeypox incidence 30 years after smallpox vaccination campaigns cease in the Democratic Republic of Congo. **PNAS**, v. 107, n. 37, p. 16262-16267, 2010. DOI: 10.1073/pnas.1005769107. Available: <https://www.pnas.org/doi/full/10.1073/pnas.1005769107>. Access: 10 Dec. 2022.

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