

Isolation Through Rubber Dam to Prevent COVID-19 Exposure During Flapless Trans-Crestal Sinus Lift Procedures

Vittorio Checchi, DDS, PhD*
Luigi Generali, DDS
Paolo Generali, MD, DDS

In 2020, a highly infective new pathogen (SARS-CoV-2) spread from China to the whole globe, and became responsible for an acute respiratory syndrome, often asymptomatic but potentially lethal, named COVID-19. Airborne and direct contact contamination are the major infection pathways of SARS-CoV-2 and it has been shown that virus spread can also happen in absence of clinical symptoms. SARS-CoV-2 transmission during dental procedures can happen through inhalation of droplets from infected patients or direct contact with mucous membranes, oral fluids, and contaminated instruments. Sinus lift and implant surgeries often involve bleeding and exposure to oral fluids, and a rubber dam could be used to reduce direct contact and the amount of potentially infected aerosol. The aim of this short case presentation is to illustrate how the use of a rubber dam could be extremely useful in preventing COVID-19 exposure during flapless transcrestal sinus lift procedures.

Key Words: COVID-19, SARS-CoV-2, crossed infections, sinus lift, implant placement, flapless procedure, rubber dam

INTRODUCTION

In 2020, a new virus (SARS-CoV-2) spread from China to the globe, leading the World Health Organization to officially proclaim a pandemic status. This highly infective coronavirus is responsible for an acute respiratory syndrome, named COVID-19, often asymptomatic but potentially lethal.¹ Direct contact and airborne contamination are the major infection pathways of SARS-CoV-2.² Airborne contamination is due to aerosol released through cough, sneeze, or exhalation; direct infection instead is due to contact of eyes, nose, or mouth mucosa with contaminated surfaces.² It has also been shown that virus spread can occur in absence of clinical symptoms.² Dental practitioners represent the category with the highest diffusion of the contagion, due to exposure to blood and saliva and to droplet inhalation from infected individuals.¹

The aim of this case report is to show an expedient that could help in preventing COVID-19 exposure during a flapless transcrestal sinus lift.

MATERIALS AND METHODS

A 43-year-old male patient, systemically healthy, was referred due to pain localized to the first upper left premolar, elicited by chewing. In the previous 6 months, the patient underwent endodontic treatment and then endodontic surgery, without achieving pain resolution. Therefore, the patient asked for tooth

extraction and an implant-supported rehabilitation. One month after tooth extraction (Figure 1), under local anesthetic, a rubber dam (Dental Dam, Lonstroff AG) was placed, isolating the upper left sextant and arranging metal clamps (Dam clamps, KKD) on the second molar and on the lateral incisor (Figure 2). Through a flapless procedure, a dental implant (Nobel Active, Nobel Biocare), 11.5 mm long and 4.3 mm wide, was placed simultaneously to a transcrestal sinus lift procedure (Figure 3). Through an alternated clockwise-counterclockwise osseodensification drilling technique, autogenous bone was expanded and condensed underneath the sinus floor to elevate it (Figure 4).

In combination with a nonsteroidal analgesic, antibiotic therapy (amoxicillin with clavulanic acid) was administered at a loading dose of 2 g, followed by 2 g daily for 4 days. Post-surgical instructions included appropriate oral hygiene and a soft-food diet for 1 week, including twice-daily rinsing with a 0.2% chlorhexidine mouthwash.

RESULTS

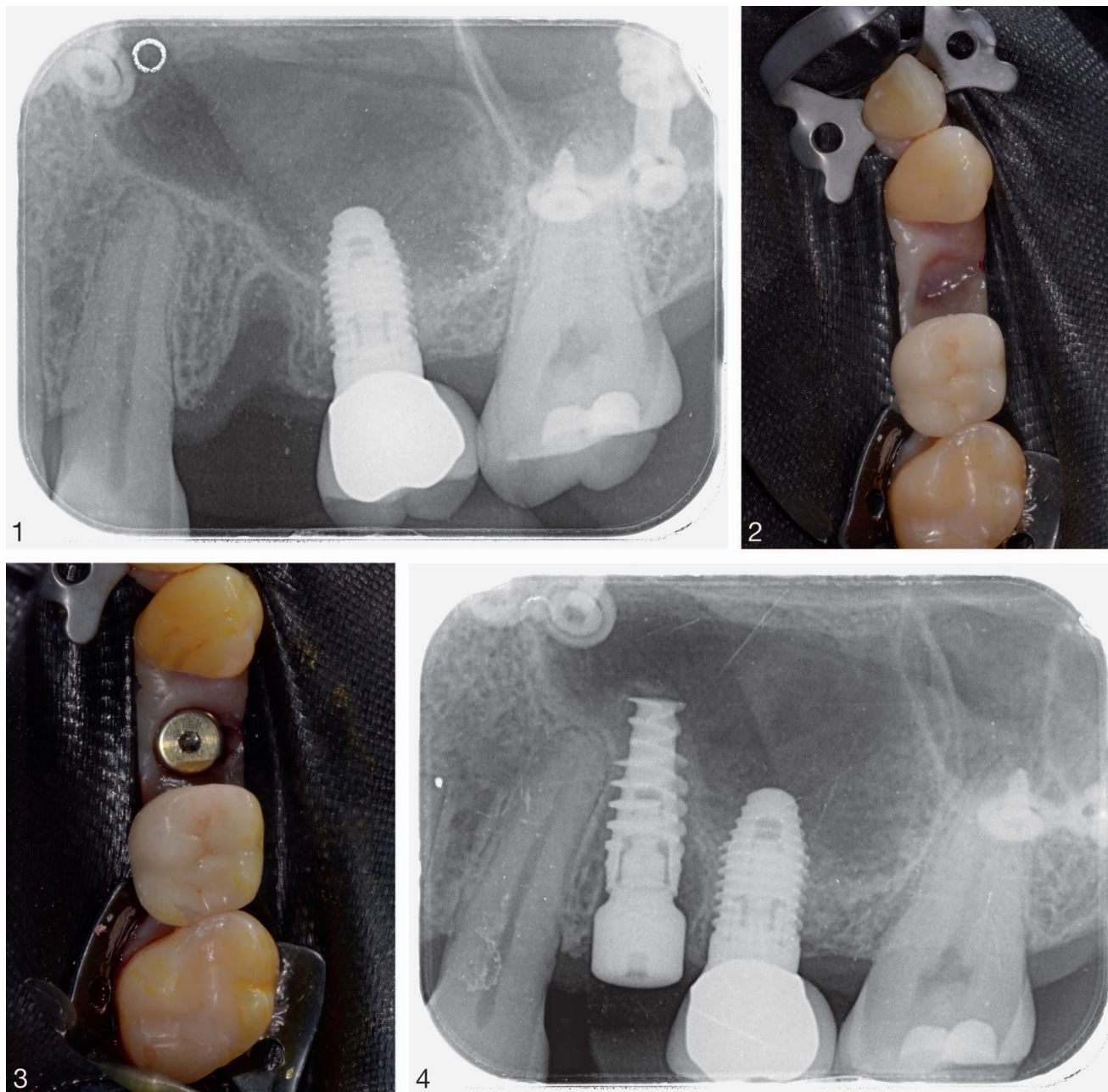
Healing was uneventful. At the 7-day follow-up visit, the patient reported no pain, swelling, nor bleeding. Prosthetic rehabilitation was planned after 3 months.

DISCUSSION

During the COVID-19 pandemic, great importance is given to the research of devices and procedures to reduce or eliminate potentially infected droplet spread into the environment. Dental practitioners daily are surrounded by infection transmission and the risk of contagion since the dental environment usually presents a dangerous setting, due to close contact with

Department of Surgery, Medicine, Dentistry and Morphological Sciences with Transplant Surgery, Oncology and Regenerative Medicine Relevance—Unit of Dentistry and Oral-Maxillo-Facial Surgery, University of Modena and Reggio Emilia, Modena, Italy.

* Corresponding author, e-mail: vittorio.checchi@unimore.it
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FIGURES 1–4. **FIGURE 1.** Radiographic view of the upper left sextant 1 month after extraction of the first upper left premolar. Bone plates and mini-screws are related to a previous orthognathic surgery performed 10 years ago. **FIGURE 2.** The rubber dam isolates the upper left sextant, arranging metal clamps on the second molar and on the lateral incisor. **FIGURE 3.** Through a flapless procedure, a dental implant is placed simultaneously to a transcrestal sinus lift procedure. **FIGURE 4.** Radiographic view of the implant placed after autogenous bone expansion and condensation underneath the elevated sinus floor.

patients’ oral cavity and to viral and bacterial aerosol originated by dental instruments.^{1,2} Different devices can be used during dental procedures to minimize the formation of potentially infected droplets, such as the use of antiretraction handpieces, high-speed ejectors, and rubber dams.²

To our knowledge, this is the first reported case with a rubber dam positioned prior to a flapless implant placement simultaneous to a transcrestal sinus lift.

The use of the rubber dam is quite common in restorative dentistry and endodontics, since it permits isolation from blood

and oral fluids and permits adequate adhesive procedures.³ In this clinical case, the use of a rubber dam allowed good field isolation and did not interfere negatively in approaching the surgical area. Moreover, the choice of a flapless surgical procedure enhanced visualization and decreased potentially contaminated blood spread.

Transcrestal sinus floor elevation, associated with implant placement, is a routine procedure that usually involves intra-surgical bleeding and exposure to oral fluids and blood.⁴ Moreover, certain transcrestal sinus lift procedures and implant

tunnel preparation are performed with a handpiece, producing a droplet spread made of contaminants, water, and air.

It has been shown that the use of a rubber dam is indicated to reduce significantly the amount of droplets containing saliva and/or blood, obtaining a 70% reduction of aerosol around the operatory field.⁵ Moreover, surgical field isolation through a dental dam and the use of high-speed ejectors may be able to reduce the amount of droplet particles and may also be able to produce an aerosol that is less contaminated. These aspects could become extremely useful in the prevention of airborne pathologies, such as COVID-19.

CONCLUSIONS

Within the limits of this single case report, the use of a rubber dam prior to a transcrestal sinus lift followed by implant placement could be a useful device to decrease aerosol spread and blood exposure. Since SARS-CoV-2 spread also occurs in the absence of clinical symptoms, all patients should be considered as potentially infected and the use of a rubber dam

during sinus lift and implant surgery seems to be an ideal aid for prevention of COVID-19 exposure.

NOTE

The authors declare that they have no conflict of interest.

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