Chapter

Strategies for the Practice of Otolaryngology and Head and Neck Surgery during COVID-19 Pandemic

Juan Manuel Maza-Solano, Antonio Jiménez-Luna, Pablo Parente-Arias, Juan Carlos Amor-Dorado, Christian Calvo-Henriquez and Guillermo Plaza-Mayor

Abstract

The appearance of a new coronavirus disease called COVID-19 at the end of 2019 and its pandemic expansion in the world has changed the usual practice of medicine, and has had great impact in the field of Otorhinolaryngology and Head and Neck Surgery (OHNS). The aim of this document is to review the available evidence and propose strategies and recommendations for the medical-surgical practice of OHNS, which allow establishing the usual activity, adapting the safety and efficacy standards to the current pandemic situation. Therefore, it is required to identify and classify patients according to criteria of infectious-immunological status, and to establish recommendations for protection in consultations, hospitalization and the operating room, which avoid the transmission of the disease to other users and healthcare personnel, in the specific context of the development of our specialty. This document is the result of the collaboration of all the scientific commissions of Spanish OHNS society and therefore might help other OHNS to develop their work during COVID-19 pandemic.

Keywords: COVID-19, surgery, otolaryngology, practice, office

1. Introduction

The SARS CoV-2 disease (COVID-19) has caused millions of deaths worldwide since the pandemic status was declared by the World Health Organization (WHO) in March 2020 [1]. The SARS-CoV-2 virus, whose origin is suspected to be associated with bats or peanuts [2], is a single-stranded RNA-virus of the Coronaviridae family, closely related to the viruses responsible for severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). The main routes of entry of the virus are the mucosae of the oral and nasal cavities. Transmission occurs through direct contact from contaminated hands, fomites, or through airborne aerosols expelled when coughing, sneezing, screaming, singing, speaking, or breathing [3, 4]. The incubation period varies between 2 and 14 days (5.7 days on average) [5], after which the patient may be asymptomatic [6] or may manifest

symptoms including fever, dry cough, dyspnea, myalgia, fatigue, headache, diarrhea, general malaise, anosmia, hyposmia and dysgeusia. The disease course is usually limited, although it can progress to bilateral pneumonia, respiratory distress, and death. The fatality rate of the disease is estimated to be 0.68% [7] but highly dependent on age and concurrent risk factors [8].

One of the greatest difficulties in controlling the disease is the possibility of transmission of the etiological agent by asymptomatic and presymptomatic patients. Still, the transmissibility of COVID-19 likely correlates with the onset of symptoms, with the risk lower and the lowest in presymptomatic and asymptomatic patients, respectively [9].

Health workers represent a significant percentage of the general population infected [10]. Among physicians, otorhinolaryngologists and head and neck surgeons may be at an even greater risk as a result of their frequent proximity to the upper airway and the generation of bioaerosols in their procedures [11, 12]. In fact, the infection rate of Spanish otorhinolaryngologists rose to 16.5% during the first two waves [13]. As is such, the objective of this chapter is to provide a consensus on the management of head and neck patients during the COVID-19 era based on a compilation of the best evidence adapted to the risk of transmission [14, 15].

2. Diagnosis and screening of COVID-19 patients

2.1 Diagnosis

1. Presence of the virus

   a. Detection of viral RNA: Using reverse transcriptase and polymerase chain reaction (RT-PCR), the presence of specific genes of the SARS-CoV-2 virus is determined in samples from different areas of the airway. In patients with asymptomatic, presymptomatic, or mild forms of presentation, positive RT-PCR does not necessarily confirm nor disprove transmissiblity. RT qPCR, a subtype of RT-PCR, provides a quantitative estimate by means of fluorescence that increases proportionally to the amount of nucleic acid amplified. This test reports the viral load present in the sample by detecting a specified threshold in a certain number of cycles (Ct or cycle threshold) in RT-PCR [16, 17].

   b. Presence of virus antigens (S, M and E antigens) in airway secretions: While accessible, this test shows a high number of false negatives depending on the patient's current stage of the disease. This rapid viral antigen detection test may still be effective in symptomatic patients in the outpatient setting or in large population screenings. It is highly sensitive in patients with symptoms of disease and with less than 5 days of disease progression. Despite this high sensitivity, a negative test does not confirm an absence of disease especially if suspicious symptoms are present, at which point an RT-PCR test is recommended [18].

2. Detection of antibodies in serum: In severe COVID-19 patients at least 7 days since the onset of symptoms, the detection of IgM antibodies has been considered a sign of the patient's immune response [19]. Up to 20% of patients with mild forms of COVID-19 do not produce detectoble serum antibodies [17, 20]. Production of the longer-lasting IgG antibodies begin approximately 14 days after the onset of symptoms and may incur long-term immunity to disease. IgM or IgG antibodies may have some value in the diagnosis of patients with

negative RT-PCR results but with continued COVID-19 symptoms since the seroconversion of specific IgM and IgG antibodies have been detected as early as the 4th day after the onset of symptoms

The antibody study can be performed by:

a. Rapid antibody detection tests, which are based on immunochromatography (lateral flow technique) and have become popular as "rapid tests" for antibody detection [20]. The Spanish Society of Immunology recommends its use for epidemiological studies in high risk groups [21].

b. Laboratory tests to measure the level of antibodies, which use enzyme-linked immunosorbent assay (ELISA) or chemiluminescence assay (CLIA). They are quantitative tests (specifically, CLIA has a sensitivity of 1 pg./ml in serum), and have higher sensitivity and specificity. They are standardized and easily interpreted, but require specialized personnel to perform them [21].

2.2 Interpretation of the diagnostic tests

The gold standard in detecting viral infection is RT-PCR since its diagnostic precision is superior to the tests that detect the presence of the viral capsid antigens. SARS-CoV-2 antibody tests do not predict viral shedding and cannot be used to rule out risk of transmission. Rapid tests, both for antigens and antibodies, should be used for screening purposes only when (1) monitoring progression of a known positive case, or (2) when there is a very low suspicion of disease.

The presence of antibodies in COVID-19 patients should always be interpreted taking into account the result of the RT-PCR and the clinical phase of the disease. The levels of IgM and IgG antibodies could indicate host response to the virus [22].

Antibody seroprevalence levels of the general population – of those who have not suffered from the disease, or those who have only experienced its mild forms, – are needed in order to ascertain the significance of the antibodies, if the immune response is really protective, and how long this protection lasts [17].

2.3 Transmissibility and completion of isolation

The duration of transmissibility varies among patients with nondetectable, asymptomatic, mild, and severe symptoms. In general, there is evidence that virus transmission does not occur after the ninth asymptomatic day [23], although in severe cases, this point can be difficult to establish as residual symptoms may last longer.

In the general population, a negative RT-PCR is not considered sufficient to rule out transmissibility and the patient may require continued quarantine. The lack of replicable viral genetic material in the nasopharynx is a good indicator but not an absolute marker against transmissibility [24]. In asymptomatic patients isolated at home, the confinement may be terminated 10 days after a negative RT-PCR test. In symptomatic patients, the duration of the confinement should be 10 days from the resolution of symptoms including fever. Patients with severe or life-threatening symptoms may require an isolation duration of 21 days. The recommendations for healthcare personnel are different and at least one diagnostic test – either IgG or RT-PCR - should be performed prior to the end of the isolation period [15].

2.4 General screening of ENT patients who are candidates for surgery or invasive upper airway exploration

During the pandemic, head and neck clinicians should screen for active SARS-CoV-2 infection in all patients who are to undergo consultation, invasive examination, or ENT surgery. The choice of tests may vary according to the scale of coordinated response published by the region's healthcare governing body such as the Ministry of Health and Consumption and Social Welfare of the Government of Spain (MSCBS) [25].

Pre-operative screening should be performed by health or social-health personnel to all patients sufficiently in advance and, when possible, without face-to-face contact. The microbiological and immunological screening should entail RT-PCR ideally within 72 hours of procedure, followed by patient isolation to prevent subsequent infection. The screening should not be based on antigen testing [12].

Specific screening protocols depend on the specific alert scenario of the territory. In Spain, the following was recommended for the screening of active infections:

1. In Alert Level 2 or higher scenarios with unfavorable epidemiology, complete pre-surgical screening should be performed since both the patient and surgery are considered high risk (**Table 1**) (**Figure 1**).

2. If the epidemiology of the health area or territory is favorable (Alert Level 1), and with intermediate patient and surgery risks, RT-PCR could be replaced with "rapid" antigen testing (**Table 1**) (**Figure 2**).

3. If the epidemiology of the health area or territory is favorable (Alert Level 1), and with intermediate patient risk and low risk surgery, screening may be simplified (**Table 1**) (**Figure 2**).

In cases where surgery has been suspended, patients should be re-considered for surgery based on an asymptomatic period of at least 10 days. If symptoms or other suspicions persist, a repeat test should be undertaken within 72 hours prior to surgery. Both inpatients as well as outpatients scheduled for elective surgery should follow the same screening process and undergo repeat testing as indicated whether or not it was performed previously.

Additionally, patients with documented resolved infection in the last 3 months with an absence of symptoms and Alert Level 1 or lower epidemiology of the area likely do not require repeat RT-PCR testing. Nonetheless, the surgeon should review all risks and consider a delay of up to 4 weeks from the onset of symptoms [15].

The exact risks of treating vaccinated patients have not yet been well established. At this time, the authors recommend that all patients be treated with the same basic precautions afforded the non-immunized patients until further data becomes available.

2.5 Non-surgical protection measures for otolaryngologists and head and neck surgeons

The use of Personal Protective Equipment (PPE) should be mandatory regardless of the regional epidemiology until normality of care is reintroduced. Along with the basic precautions including appropriate work attire and disposable surgical masks, three degrees of precautions against airborne transmission have been defined [26] (**Table 2**).

Indicators		Estimate	Risk assessment				
			New normality	Low	Medium	High	Very high
BLOCK I: Evaluation of the transmission level.							
T1	Cumulative incidence of cases diagnosed in 14 days.	Confirmed cases (by diagnosis date) in 14 days *100,000/ number of inhabitants.	≤25	>25 to ≤50	>50 to ≤150	>150 to ≤250	>250
T1'	Cumulative incidence of cases diagnosed in 7 days.	Confirmed cases (by diagnosis date) in 7 days *100,000/ number of inhabitants.	≤10	>10 to ≤25	>25 to ≤75	>75 to ≤125	>125
T2	Cumulative incidence of cases aged ≥ 65 years diagnosed in 14 days.	Confirmed cases ≥ 65 years (by date of diagnosis) in 14 days *100,000/number of inhabitants > 65 years.	≤20	>20 to ≤50	>50 to ≤100	>100 to ≤150	>150
T2'	Cumulative incidence of cases aged ≥ 65 years diagnosed in 7 days.	Confirmed cases ≥ 65 years (by date of diagnosis) in 7 days *100,000/number of inhabitants ≥ 65 years.	≤10	>10 to ≤25	>25 to ≤50	>50 to ≤75	>75
T3	Global positivity of diagnostic tests for active infection (PDIA) per week.	N° of tests with a positive result in 7 days *100/N° of tests carried out in 7 days.	≤4%	>4% to ≤7%	>7% to ≤10%	>10% to ≤15%	>15%
T4	Percentage of cases with traceability.	N° of cases diagnosed with traceability *100/Total N° of confirmed cases diagnosed in the last 7 days.	>80%	≤80% to >65%	≤65% to >50	≤50% to >30%	≤30%
BLOCK II: Level of use of healthcare services due to COVID-19							
A1	Occupancy of hospital beds due to COVID-19 cases	N° of hospital beds occupied by COVID cases/Total hospital beds in operation.	≤2%	>2% to ≤5%	>5% to ≤10%	>10% to ≤15%	>15%
A2	Occupancy of critical care beds due to COVID-19 cases	N° of critical care beds occupied by COVID cases/Total N° of total critical care beds in operation.	≤5%	>5% to ≤10%	>10% to ≤15%	>15% to ≤25%	>25%

Table 1.
Indicators for risk assessment for COVID-19 [25]. Alert level 1: When at least two indicators from Block I and one from Block II are low; alert level 2: When at least two indicators from Block I and one from Block II are at medium level; alert level 3: When at least two indicators from Block I and one from Block II are at a high level; alert level 4: When at least two indicators from Block I and one from Block II are at a very high level.

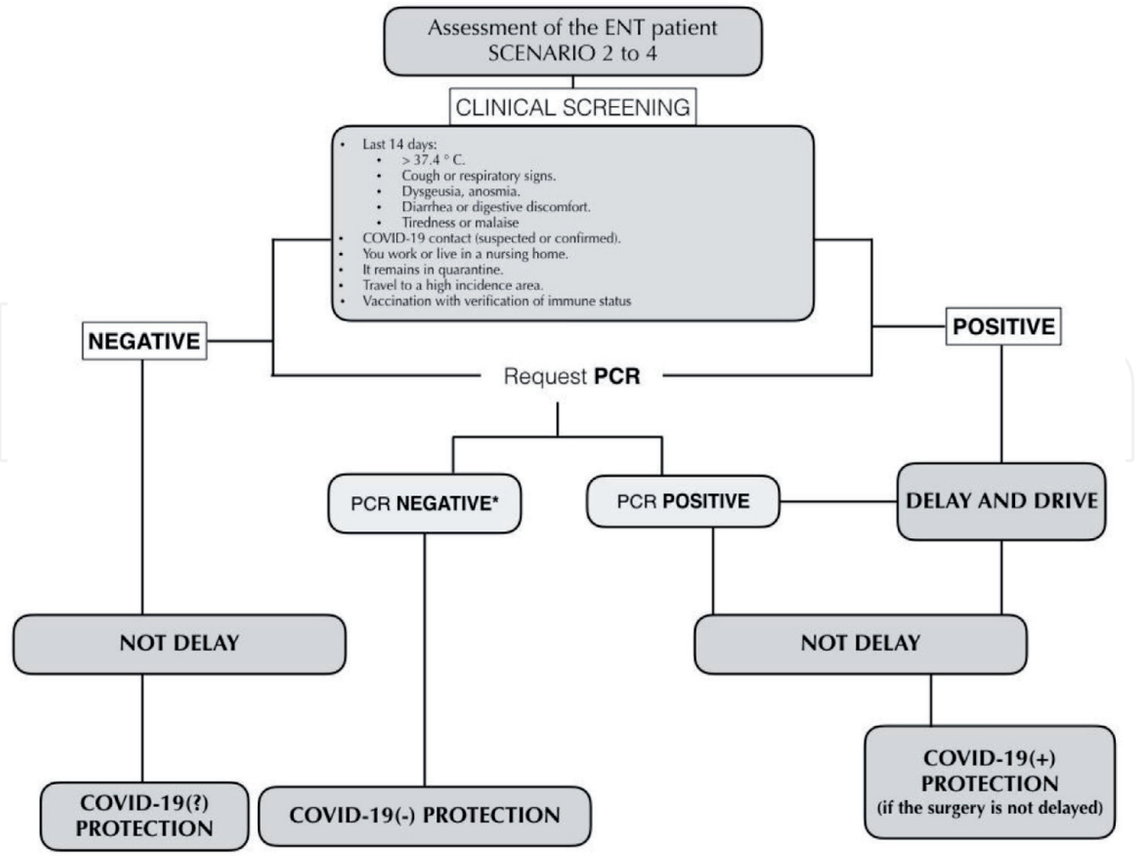

Figure 1.
Screening of the ENT patient at alert levels 2 or higher of the COVID-19 pandemic.

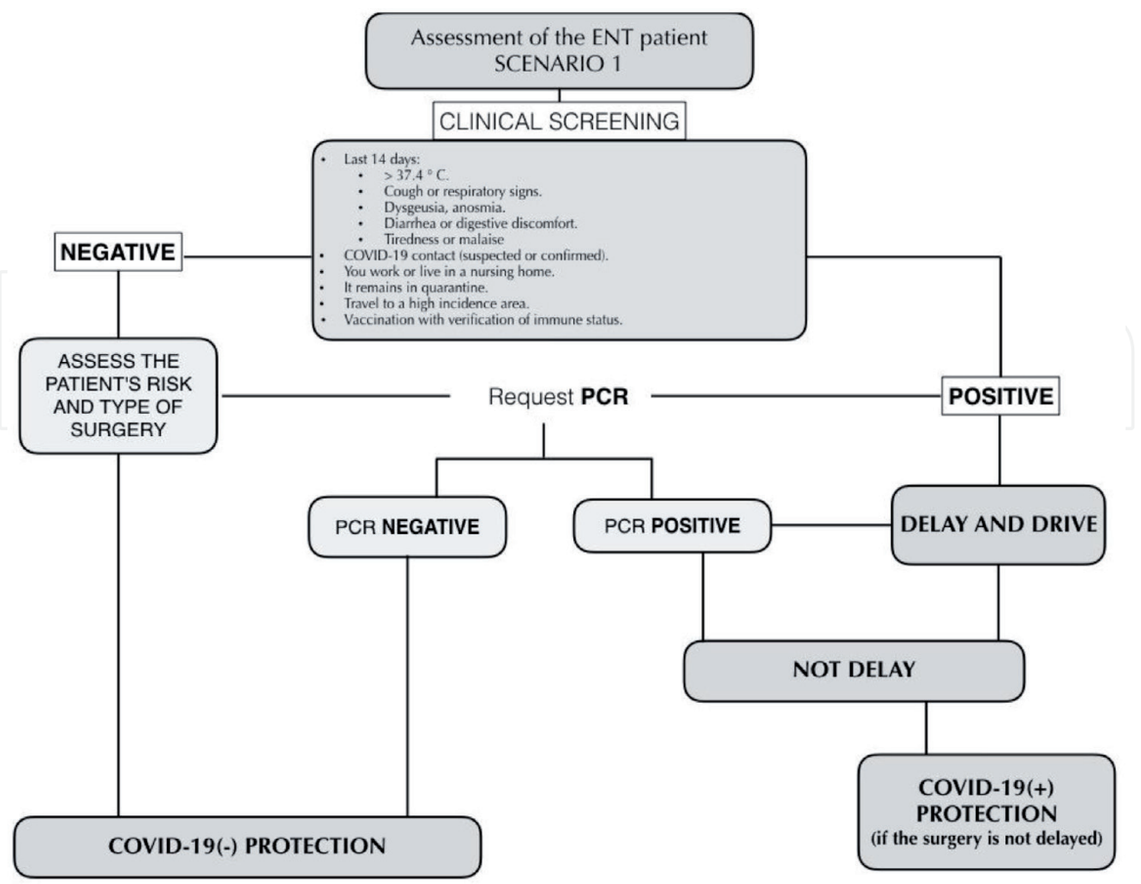

Figure 2.
Screening of the ENT patient at alert level 1 or lower during the COVID-19 pandemic.

	Grade 1	Grade 2	Grade 3
Workwear	Disposable medical uniform	Disposable medical uniform	Disposable medical uniform
Head protection	Waterproof medical cap	Waterproof medical cap	Waterproof medical cap
Mask	Surgical mask	N95/FFP2	FFP3
Protective coat	Not isolating	Isolation gown	Isolation gown
Gloves	Latex or equivalent.	Latex or equivalent	Latex or equivalent
Footwear	Not covered	Covered	Covered
Eye protection	—	Glasses. Screens	Glasses. Secreens
Motorized air purifying respirators	—	—	+

Table 2.
Individual precautions depending on the gradation of the risk of contagion [27].

In patients with hearing loss, tspecialized masks for lip reading can be used as long as there are no undo risks for the healthcare professional, such as the production of excess aerosols. [28, 29]. Hand washing and disinfection with hydroalcoholic gels should be conducted consistently based on WHO recommendations. [30, 31].

Relevant information regarding treatment policies should be accessible. Such information could be displayed either physically (posters, brochures, etc.) or online (websites and apps). They should include patient and provider expections such as the use of face-masks, social distancing, and hand hygiene [32], as well as infographics on loud verbalizations which could produce large amounts of projectile aerosols [33]. These spaces must be adapted with hydroalcoholic solution dispensers, waste containers with pedal-operated lid, as well as properly separated and indicated seats that help maintain a safe distance between people.

Waiting rooms should be modified so that patients are able to keep 2 meters between them (**Figure 3**). If the structure of the rooms make social distancing difficult, multiple waiting areas should be made available such that each area houses no more than three patients and companions.

Telemedicine is recommended whenever possible as it allows for safe consultation and helps prevent delays in care [34]. If the patient requires a face-to-face consultation, a prior clinical screening (preferably conducted remotely) is recommended. Again, waiting rooms should be modified so that patients can keep a distance 2 meters. Unnecessary fixtures and decorations should also be eliminated from the consultation area to facilitate movement of patients as well as medical equipment and to aid in subsequent disinfection [12, 26]. During consultation the door must remain closed with the air circulation for at least 15 minutes after each consult, especially at Alert Levels 2 or higher. HEPA (High Efficiency Particulate Air) filters, capable of filtering at least 99.97% of particles with a diameter greater than or equal to 0.3 μm in one cycle, should be utilized during disinfection of the consultation spaces [35].

The use of 0.5% povidone-iodine (PVP-I) in oral rinses and nasal drops could be used to decrease the local concentrations of the virus [36, 37], although there is no definite evidence that this measure reduces transmissibility and can lead to a false sense of security [38].

Specific precautionary measures have been outlined for non-surgical procedures in ENT in consultation and during hospital admission to the ward (**Table 3**).

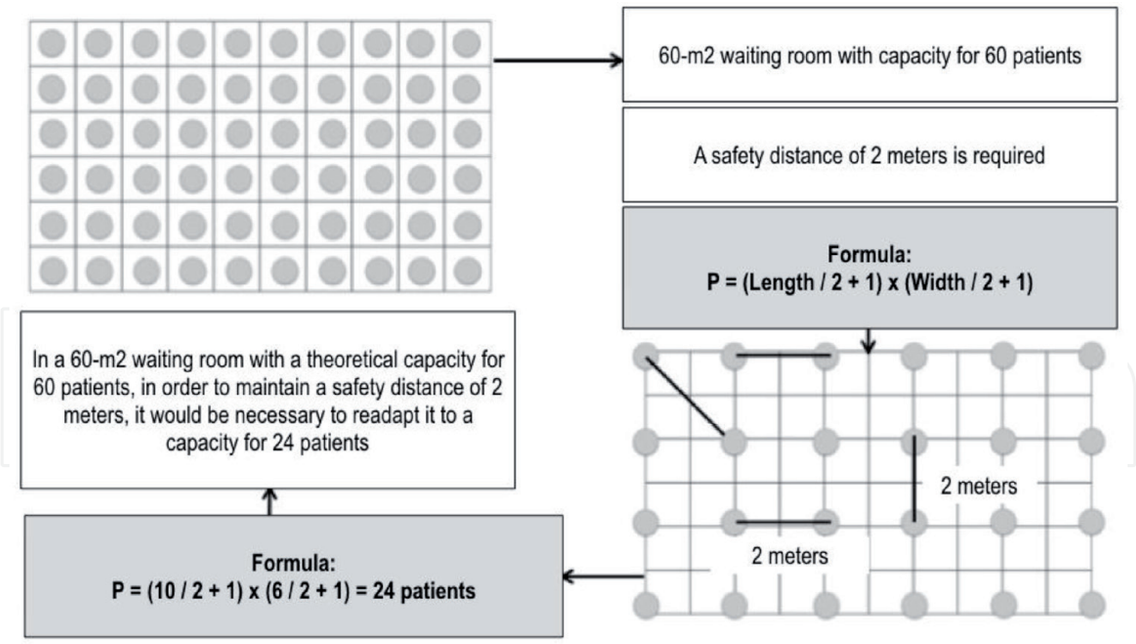

Figure 3.
Adaptation of the waiting room respecting a safety distance of 2 meters.

Audiometry tests are conducted in closed spaces that may be difficult to disinfect. Additional precautions must be taken during these examinations. Both the patient and the auxiliary personnel must each enter with a mask and should protect the surfaces they touch with proper hand hygiene and glove usage. The patient should be instructed to avoid touching surfaces other than the chair, and the tests themselves should be done via recording (**Table 4**).

Once the patient departs, the disposable materials must be disposed in their respective recepticles, and the contact surfaces disinfected using disposable antimicrobial cleaners. Many common cleaning and disinfection products are effective against coronaviruses, which can otherwise remain active on plastic and stainless steel surfaces for 2–3 days [50] and up to 9 days on other non-porous surfaces [35]. Among the most used cleaning agents are 0.1% sodium hypochlorite solution, hydroalcoholic solution, and ethanol solution (concentration of 62–71%) [43]. While direct investigations have not yet been conducted, studies in similar corononaviruses have suggested an effective eradication time after approximately 1 minute of contact [35].

Ultraviolet light (UV-C) may provide another method of sterilization even when used to decontaminate porous surfaces like masks [51]. In fact, the most efficient sterilization may entail a combination of both chemical and UV-C exposure [52]. The Spanish Society for Environmental Health (SESA) advises against the use of chlorine dioxide for atmospheric disinfection. Similarly, ozone disinfection requires a high concentration which poses risks of toxicity, requiring extended periods of evacuation.

3. Specific and transversal surgical measures

The prevention measures executed by the surgical team are carried out with the aim of protecting the team as well as the patient. The nasopharynx retains a relatively high viral load, and procedures in this area are associated with aerosolization and dissemination of viral particles particularly during the use of drills,

Procedure	Recommendation
Rigid or flexible endoscopy	• Use of tower with camera and screen to increase the distance between the patient and the examiner as much as possible.. • Prevent the patient from removing the mask, but have them lower it partially. As an alternative, the clinician may use a system that seals the nose during examination.(**Figure 4**) [12, 39]. • Avoid unnecessary endonasal manipulations. • Replace aerosol local anesthetics with those applied using cotton wicks or lenses [40, 41]. • Resorbable nasal packs should be used for acute or postsurgical epistaxis [11, 42]. • The removal of a nasal packing should be carried out after appropriate equipment measurements according to the classification of the patient (**Table 2**). • Disinfection with phenolic compounds, peracetic acid, or sodium hypochlorite is prudent. As an alternative, protective covers should be utilized [43].
Otomicroscope	• Disposable materials should be used whenever applicable. • Barriers should be placed between the microscope and the patient such as methacrylate screens adapted to the binocular or disposable plastic covers (**Figure 5**). • After examination, patient contact areas must be cleaned and disinfected [12, 44].
Vestibular tests	• General consultation and audiometry recommendations should be followed (**Table 4**).
Hearing Screening for Newborns	• Each screening should be conducted by personnel who do not work directly with COVID19 patients, especially if the mother is asymptomatic. • General patient PPEs should be utilized in all cases, and specific protections can be escalated according to the degree of contagion risk (**Table 2**). • The equipment must be decontaminated after each use. • There are some indications that children born during the COVID-19 pandemic should be retested at the conclusion of the pandemic [45].
Post-tracheostomy care	• In patients with confirmed infection, tracheostomy cuffs should remain inflated. In-line suction systems should be utilized and tracheostomy tube changes should be delayed until the RT-PCR becomes negative. [46, 47]. • High risk aerosol precautions should be followed even in asymptomatic patients.
CPAP or BiPAP devices for obstructive sleep apnea syndrome (OSA):	• Incomplete seals around the face may facilitate the risk of aerosol generation. • The use of helmet-type CPAP masks is recommended to reduce the risk of transmission [48, 49].

Table 3.
Specific precautionary measures during non-surgical procedures in ENT in consultation and during hospital admission to the ward.

microdebridators, and/or electric or ultrasonic scalpels [11, 48, 53–55]. All patients planned for aerodigestive tract surgery should be screened according to the Alert Level of the pandemic (**Figures 1** and **2**). A consent form detailing the risks and

	Contagious status and severity of hearing loss		
	COVID-19 (−)	COVID-19 (?) or COVID-19 (+)	
Technical and material indication		**Suspicion of sudden hearing loss**	**Without suspicion of sudden hearing loss**
Single act or delay audiometry	Perform audiometry on the spot (prior written or oral explanation facilitating the patient's lip reading)		
Use of soundproof booth	Yes	According to clinical criteria (will be noted in the HC if the cabin is not used)	
Protection of the patient's face, head and hands	Surgical mask	FFP2/KN95/N95, disposable cap, hand washing and gloves	Delay Treatment
Headphone protection	Protect the earpiece and vibrator with disposable material (preferably use single-use insert earphones)		
Positive response indication	Raising a hand, without using the push button		
Stimulation in speech audiometry	Use recording		
Cleaning after finishing the test	1) audiometer, 2) patient chair, 3) earpiece, 4) vibrator, 5) clean and air the cabin if used		

Table 4.
Carrying out audiometry; indications and protective measures for the clinician and the patient. COVID-19 (−): Case ruled out/COVID-19 (?): Probable or suspected case/COVID-19 (+): Confirmed case [12].

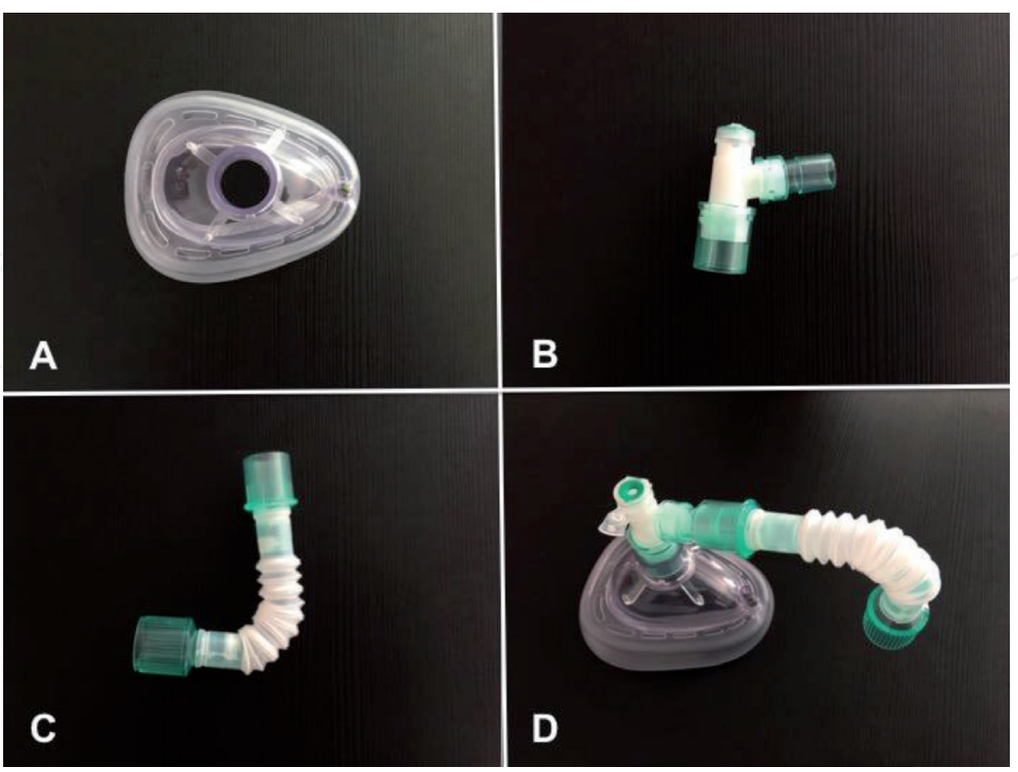

Figure 4.
Nasal fibroendoscopy examination system. (A) Anesthesia mask. (B) Connection piece with a valve used to introduce the nasofibrolaryngoscope. (C) Tubing to direct the patient's air away from the examiner. (D) Proper assembly.

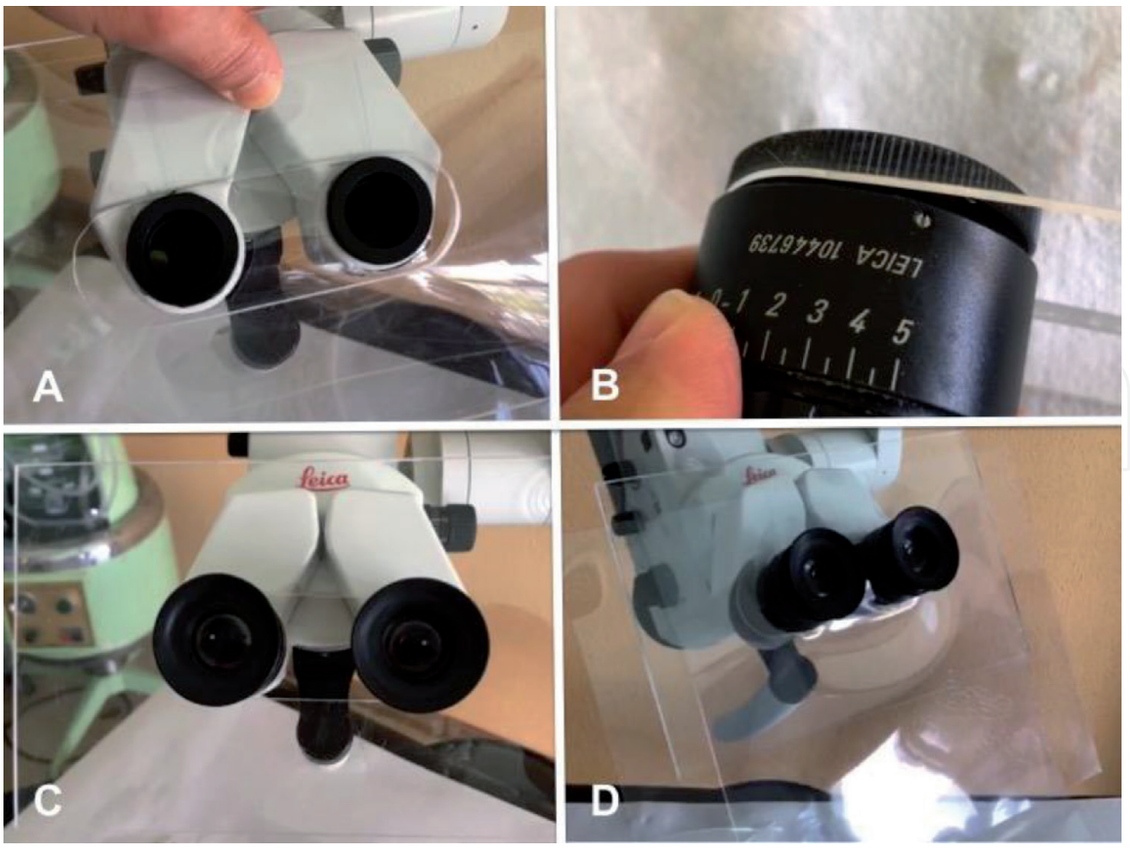

Figure 5.
Microscope examination system (A) Methacrylate screen adapted to the microscope after removing the eye pieces. (B) Adaptation of the eye pieces to the slotted screen that allows manipulation of the interpupillary distance. (C) Adaptation of the eye pieces to the microscope with the methacrylate screen in place. (D) Interposed and replaceable plastic screens to improve sealing.

protective measures should also be presented [56], During the Alert Level 4, all elective surgery should be postponed [57]. Considering the large numbers of asymptomatic COVID cases, all patients without evidence to the contrary should be assumed as positive for SARS-CoV-2 and the appropriate protective measures should be taken [57].

A negative pressure surgical environment is recommended via a high frequency of air cirulation (25 circuits per hour) that reduces the viral load inside the operating room [58]. The same operating room and non-disposable anesthesia equipment is recommended for all probable or confirmed COVID-19 patients [58, 59]. This includes urgent cases in which SARS-CoV-2 infection has not been ruled out. Likewise, during Alerts Level 2 or higher, the number of surgical team members should also be limited [41]. Endotracheal intubation and air-purifying respirators should be used at the time of induction [60] and the anesthesia must be sufficiently deep to avoid intraoperative awakening or coughing. The use of a closed suction system with an antiviral filter is recommended [61].

Aerosolized particles of less than 5 μm can remain in suspension for more than 3 hours, so the use of instruments that generate aerosols or particles in suspension (microdebriders, high-speed motors, electric or ultrasonic scalpels) should be avoided whenever possible [50].

Individual protection measures will be adapted according to the classification of the patient (**Table 5**). In the immediate postoperative period, and once an Alert Level 2 or higher is established, communication with the family members should be conducted electronically [72].

Surgical individual protection measures			
	Infectious status of the patient		
Anatomic area to protect	**COVID-19 (–)**	**COVID-19 (?)**	**COVID-19 (+)**
Feet	Work shoes (clogs) with disposable footwear	Work shoes (clogs) with double disposable gaiter	
Body (Trunk and extremities, except feet and hands)	Medical uniform + non-waterproof disposable surgical gown	Medical uniform + waterproof surgical gown	Medical uniform + impermeable seals between PPE components + waterproof surgical gown
Head (Scalp, pinna and external auditory canal)	Disposable surgical cap	Double sterile surgical cap	
Hands	Simple sterile surgical glove	Double sterile surgical glove	
Face and neck (Forehead, neck, periauricular region)	Face shield (optional)	Face shield	Full face protective helmet or powered air-purifying respirators
Eyes	Non-integral glasses	Integral glasses	Face shield + sealing goggles + impermeable covers for the forehead, neck, and chest
Respiratory (Mouth, nostrils and external auditory canal)	Surgical mask	FFP3	FFP3
Specific measures during surgical or invasive procedures in ENT (Alert levels 2 or higher)			
Airway management and diagnostic airway procedures (excluding tracheostomy) [62]	• Performed by the physician with the most experience in rapid sequence intubation techniques. • Disposable laryngoscopes and video laryngoscopes. • Avoid intubations with fiber optics. • Perform airway procedures for patients with suspected, probable, or positive COVID-19 status with endotracheal intubation. • Minimize spontaneous ventilation and repeated intubation/extubation.		
Tracheostomy	• Emergency tracheostomy confers a significant risk of aerosolization of the virus and should be proceeded with extreme caution [60]. • Delay elective tracheostomy, if possible, until the infected patient becomes negative. • COVID-19 (+) tracheostomy patients should be kept in a closed circuit with inline suction. • Delay cannula changes whenever possible until the infection resolves. If it is necessary to perform in a negative pressure room with HEPA filtration and an improved PPE, diver type, must be used for all personnel [46, 47].		

Surgical individual protection measures			
	Infectious status of the patient		
Anatomic area to protect	**COVID-19 (−)**	**COVID-19 (?)**	**COVID-19 (+)**
Oral cavity, oropharynx, nasal cavity and nasopharynx procedures	• Postpone elective procedures involving the nasal cavity, nasopharynx, oral cavity and oropharynx in suspected, probable or positive patients until negative [48]. • In order to avoid admissions for post-tonsillectomy bleeding, utilize techniques with lowest risks of postoperative complications including bleeding (intracapsular tonsillectomy) [45, 63].		
Otologic surgery	• As the presence of the virus in otitis media with effusion is not ruled out [64], procedures such as transtympanic drains should be avoided [45, 65]. • Mastoidectomy should be postponed whenever possible. If mastoidectomy is required, PPE should be worn and high-speed motors should be avoided [66].		
Endoscopic sinonasal surgery [67, 68]	• Avoid the use of microdebriders, high resolution motors, or surgical drills whenever possible. • In case it is not possible to delay an anterior skull base intervention in a COVID-19 (+) patient, a transcranial approach could be considered in order to avoid sinonasal surgery, which presents a much higher risk of virus aerosolization [69]. The degree of viral involvement inf brain tissue, although suspected [70], appears to be much lower that of sinonasal tissues. • Use resorbable tamponades postoperatively.		
Surgery of the head and neck, and of the deep cervical spaces [71, 72]	• Postpone surgical excision of benign neck masses during Alert levels 2 or higher. • Pediatric cases with solid head and neck tumors including thyroid cancer should be discussed in a multidisciplinary tumor Commission to decide the most appropriate treatment modality, taking into account the availability of local resources. • Head and neck cancer patients who require surgical treatment, who have been proposed for this purpose in the relevant Commission, will have priority over other non-cancer procedures, regardless of the Alert Level of the pandemic. • Whenever possible, medical treatment of infectious diseases should be attempted prior to surgical intervention.		

Table 5.
Professional protection measures in the operating room and during high risk procedures outside the operating room. COVID-19 (−): Case ruled out/ COVID-19 (?): Probable or suspected case/ COVID-19 (+): Confirmed case.

Author details

Juan Manuel Maza-Solano[1], Antonio Jiménez-Luna[2], Pablo Parente-Arias[3], Juan Carlos Amor-Dorado[4], Christian Calvo-Henriquez[5] and Guillermo Plaza-Mayor[6]*

1 Otolaryngology Department, Hospital Universitario Virgen Macarena, Hospital Quirónsalud Sagrado Corazón, Sevilla, Spain

2 Otolaryngology Department, Agencia Sanitaria Alto Guadalquivir (Hospital Valle del Guadiato y Hospital de Puente Genil), Hospital Quirónsalud de Córdoba, Córdoba, Spain

3 Otolaryngology Department, Hospital Universitario Lucus Augusti, Lugo, Spain

4 Otolaryngology Department, Hospital Can Misses, Ibiza, Spain

5 Otolaryngology Department, Hospital Universitario Santiago de Compostela, Coruña, Spain

6 Otolaryngology Department, Hospital Universitario de Fuenlabrada, Universidad Rey Juan Carlos, Madrid, Spain

*Address all correspondence to: guillermo.plaza@salud.madrid.org

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