COVID-19 Pandemic and Otologic Surgery

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Abstract: All around world, the COVID-19 pandemic is accelerating, and any insight we can learn from our colleagues who have either encountered or are currently going through this will be used to protect our patients, our medical staff, and ourselves. No one knows to the best of our understanding whether or not COVID-19 includes the respiratory mucosal lining the middle ear and mastoid air cell system—but it seems probable they do. Since the rest of the airways are affected, and so is the nose and nasopharynx, it seems possible that the lining of the Eustachian tube, middle ear and mastoid air cell system would all be polluted. Viral particle aerosolization, which can occur otologic surgery using powered instruments and they remain in the air for at least 3 hours. Powered air purifying respirators are supplied even shorter than N95 masks, but strongly believed they are important for our team safety and protection. This mini review provides fundamental knowledge on otologic surgery feasibility in the COVID-19 pandemic from an objective perspective.

Key Words: Coronavirus infections, COVID-19, otologic surgery

A taxonomic designation Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) became the official way of referring to the 2019-ncov on 11 February 2020. The same day within a few hours the WHO officially named the disease COVID-19. 1 A lot of studies tested the presence of respiratory virus in the middle ear during acute diseases. Molecular methods were used in these studies to evaluate the presence of nucleic acids of human rhinoviruses (types A, B, and C), respiratory syncytial viruses (types A and B), bocavirus, adenovirus, enterovirus, influenza viruses (types A, B, and C), parainfluenza viruses (types 1, 2, 3, 4A, and 4B), human metapneumovirus, polyomaviruses (KI and WU), and coronaviruses (229E, HKU1, NL63, OC43 but not COVID-19), in the middle ear. Such viruses are connected to respiratory mucosa, and can either populate the otic structures by direct mucosal spread or viremia. 2,3

CLINICAL AND RESEARCH EFFECTS

To the best of our understanding, no one knows whether or not COVID-19 includes the respiratory mucosal lining the middle ear and mastoid air cell system—but it seems probable. Since the rest of the airways are affected, as is the nose and nasopharynx, it seems possible that the lining of the Eustachian tube, middle ear and mastoid air cell system would all be polluted. Drilling through the mastoid produces droplets and aerosols in critical clouds, which may risk infecting others in the operating room atmosphere if virus is present. Caution is needed as polluted mists harbor viable virus for several hours, particularly in enclosed spaces. 1,2,4

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In an ear surgery operation, there only needs to be a single surgeon in the room and all visitors should be removed. This is critical for reducing possible exposures, but also for restricting the use of personal protective equipment (PPE) (eg, N95 masks and face screens). For students, we suggest making a recording video of the surgery to share with trainees as time permits. It may be important that infections be recorded among operating room (OR) personnel following otologic surgery. Using powered instruments that produce droplet feathers. Viral particles are aerosolized, and occurred such as mastoid drilling. They remain in the air for at least 3 hours. 2,3 For these reasons I think we should consider mastoidectomy a high-risk operation.

It is necessary to conduct a preoperative screen for COVID-19 for any ear surgery and continue with surgery using normal PPE (face shields and N95) if negative. We cannot, of course, absolutely rule out early infections with undetectable viral loads or even false negative tests. If positive, surgery should be postponed until the illness has cleared. Hence the pre-procedure check as we believe suggested that it will have an effect on management. The information collection below is largely focused on personal contact with foreign colleagues documenting their individual experiences. More evidence is needed before long-term policies are set. Nonetheless, based on the information below, maintaining an abundance of caution be wise until we can gather more data so as not to make the same errors that were made elsewhere.

A Chinese neurosurgeon, serving in one of the hospitals in Wuhan, has informed that the first case with the most widespread infection in Wuhan was an endoscopic pituitary surgery. Almost all people who came in and out of the OR during that case became infected. Also it was shared that a significant number of doctors who died in China were ear nose and throat doctors, possibly due to the high viral shedding. That has now also been reported in the media. Based on the experience of the Chinese doctors in Wuhan, N95 masks were not adequate to monitor this spread. During these cases the spread was not managed until powered air purifying respirators (PAPRs) were used. It must also be clarified that twice, separated by 24 hours in between tests, really confirm negativity to COVID-19, based on the potential for false negative outcomes.

CONCLUSION

Until we know more, at this time we are only conducting urgent/emergent cases of otologic surgery. We will screen these patients for COVID-19 pre-operatively and continue where negative. We have also applied for full PAPRs for ourselves and all OR team members. This is requested either in cases where we cannot wait for test results or in cases that test positive but surgery still must continue. PAPR are in even shorter supply than N95 masks, but we strongly believe they are important for our team safety and protection. Conservation of this important resource is yet another justification to restrict such activities at this time to the bare minimum. Similarly in the ear clinic setting, visits should be restricted.

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