Reflections and new developments within the COVID-19 pandemic

At the time of writing this, it has not even been two weeks since the release of our initial precautionary statement regarding endoscopic surgery and the increased risk we may be facing as otolaryngologists from COVID-19[1]. At that time there were still fewer than 5000 cases in the US, yet we felt a responsibility to share the warnings within personal communications we had begun to receive from colleagues around the world, with the wider otolaryngology and neurosurgery communities. Unfortunately, the COVID-19 pandemic has progressed in this short time to now infect over 1,000,000 individuals globally, resulting in over 58,000 deaths, and the US now leads the world in number of cases with over 277,000 patients affected.[2]

We soon heard back from otolaryngologists around the country and world about that information and the precautions recommended. Most were grateful they had some information, albeit only anecdote and no hard data, with which to begin discussions surrounding appropriate PPE (personal protective equipment) with their hospital administrators. All of us soon began to realize the truly limited number of N95 masks than currently available, let alone PAPRs (Powered Air Purifying Respirators), of which many institutions had only a handful.

We also heard from our colleagues in private practice, some understandably upset about the very real repercussions these anecdotes would have on their practices, actually small businesses, that could not simply hit the pause button and absorb financial loss as we in larger institutions were better able to. However, as the death toll rose around the country, and it became more apparent that otherwise healthy providers were not immune to this illness, we heard back from many of them, with better understanding of our initial intent to warn and protect, in spite of our lack of data.

We communicated with many who read a different version of the story in Chinese media, of the providers in China affected by the initial pituitary patient we mentioned in our statement. We dug deeper into more sources and began to understand the controversy surrounding the initial outbreak in Wuhan and the complexities and challenges of patient care at that time, and even now. We welcomed the Wuhan group to write their own *Letter to the Editor* in *Neurosurgery*, so their official accounting could be told.

We also realized that not everyone could view this preliminary precaution without panic, and some otolaryngologists have concluded that these precautionary measures mean we will never again be able to scope patients in our offices or operate on a sinus patient without full PPE.

We have a much more optimistic perspective

At the time of our initial *Letter*, the actual data consisted mainly of three points: our knowledge that the nose and nasopharynx are areas of high viral load and shedding[3], that endoscopic sinus and skull base procedures can include maneuvers that can aerosolize mucus particles, and that the aerosolized virus could stay in the air for up to three hours, if not longer.[4]

Over the last two weeks, our scientific community has rallied to this cause and put an amazing effort into addressing the needs of the crisis. Testing for COVID-19 is becoming more widely available across the country, with current tests at Stanford University[5], a real time RT-PCR for SARS-CoV-2 detection, returning within 24 hours, and a newer test from Abbott ready with results within 15 minutes[6].

The next issue to address is establishing a false negative rate, in light of limited PPE resources, so we can use them only when necessary. Although rates as high as 30% have been circulated in the media[7], these are highly dependent on the quality of the swab performed and the experience of the provider performing the swab. Rates for individual institutions may be much lower, with Stanford's test currently with a sensitivity of 96% and specificity approaching 100%.

In addition to more widespread testing, the next much needed resource is the N95 mask. While our institutions work to obtain what is needed, science has again come to our aid, with both Stanford engineers as well as the original inventor of the material used in the N95 mask concluding that re-use of these masks is possible and sterilization can be safely and effectively done with heat at 70C degrees.[8,9,10] Others have suggested use of elastomeric half-mask respirators as alternatives.[11] With regard to N95 versus PAPR use, we find ourselves still in need of more data, as some institutions tell their providers these are equivalent, in spite of some evidence of PAPR superiority.[12,13,14] And finally, to bring some data to the topic of aerosolization in endoscopic surgery, Bleier and colleagues have rapidly performed a study utilizing different instruments, including drill, microdebrider and hand instruments, showing the drill had significantly higher aerosolization effect,

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and allowing for better understanding of risk in these procedures.[15]

There is still much data that is needed, and there is still a long fight ahead to overcome this pandemic in the US and abroad. But we have overcome such things before. With increasingly available and more rapid testing, increasingly available PPE, and a vaccine on the horizon, we will soon adapt and normalize in our practices, just as we have done before.

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