

## Review Article

# Guidelines for rhinology surgery in COVID-19 pandemic

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## ABSTRACT

COVID-19 disease was first identified in December 2019 in Wuhan, the capital of China's Hubei province. Amid the ongoing COVID-19 pandemic, India has witnessed a massive surge of coronavirus cases. This study reviews the measures to take by the clinicians involved in rhinology surgery in light of the recent COVID-19 pandemic. The current finding about COVID-19 infection and its relation with severe acute respiratory syndrome coronavirus 2 (SARS-CoV 2) virus is evaluated and possible safety measure guidelines to be taken while doing rhinology procedures is reviewed. The risk of coronavirus 2019 can be largely reduced by wearing personal protective equipment (PPE) kit with powered air purifying respirator, double gloves, eye protection, face shield, gown, shoe covers, limiting attendance to operation theatre, negative pressure room, using negative-pressure otolaryngology viral isolation drape (NOVID) system to cover the patient and proper removal of patient drape after operation. Additionally, low oscillation speeds of microdebrider with continuous suction is associated with low risk of aerosol transmission into the environment. Rhinology and endonasal surgeries are high risk procedures and should adhere to general guidelines set for high-risk procedures. If the proposed protocols are strictly maintained then the risk of getting infected by coronavirus is markedly reduced. In this current scenario it is mandatory to attend the emergent surgical cases with all possible precautions as mentioned and defer the rest of the cases till the pandemic gets over.

**Keywords:** SARS-CoV 2, COVID-19, Pandemic, Rhinology surgery

## INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the causative agent for coronavirus disease 2019 (COVID-19).<sup>1</sup> It causes respiratory tract infections the severity can be mild, like common cold and can be even lethal, like severe acute respiratory syndrome (SARS), middle east respiratory syndrome (MERS) and COVID-19. COVID-19 disease was first identified in December 2019 in Wuhan, the capital of China's Hubei province and its spreading like a pandemic.<sup>2,3</sup> The virus mainly spread by close contact via small droplets produced while coughing, sneezing and talking.<sup>4,5</sup> Bioaerosol transmission is possible while doing intubation,

tracheostomy and cardiopulmonary resuscitation. Fomite transmission is also possible.<sup>4</sup> The virus is most contagious when people are symptomatic; although spread is possible even before symptoms appear.<sup>4</sup> The incubation period is 5 to 6 days but may range from 2 to 14 days. The virus survives for hours to days on surfaces. The patient may be asymptomatic or present with flu like symptoms like fever, cough, sneezing, fatigue, shortness of breath. The disease may progress to pneumonia, multi-organ failure, and even death.<sup>8-11</sup> Amid the ongoing COVID-19 pandemic, India has witnessed a massive surge of coronavirus cases. Otolaryngologists and health care workers are at very high risk of COVID-19 infection, hence appropriate protective and hygiene measures are utmost importance.<sup>6,7</sup> The risks seem to be more high in the field of rhinology and

endoscopic endonasal surgery.<sup>12,13</sup> Genuine concerns are raised for nasal endoscopy and flexible laryngoscopic examination of patients in outpatient clinic and during surgery, as virus reside primarily in the nasal cavity and nasopharynx.

## METHODS

### Data sources

As a general dictum most rhinology procedures should be deferred in this COVID-19 pandemic. Only emergent cases need to be assessed. Protocols relating to otolaryngology practice were identified from webpages of otolaryngology societies such as American academy of otolaryngology-head and neck surgery and American head and neck society, European rhinologic society, French scientific societies: the French ear, nose and throat (ENT) society, French rhinology association, French ENT college, French ENT national union, and French national professional ENT council, centers for disease control and prevention (CDC), web of science, pubmed, Google scholar and various other literatures.<sup>14-16</sup>

### Protocol

Certain important recommendations to follow while undertaking patients needing rhinology surgery. These include: elective surgery patients like sinonasal, nasopharyngeal, oropharyngeal, laryngeal and tracheal surgery should be deferred, if surgery needs to be done, then the patient is tested for COVID-19 and it should be negative before proceeding for surgery; for acute cases specific PPE should be utilized; limited intervention should be undertaken in the clinic/rooms with appropriate protection; surgeries are deferred in all cases who are COVID-19 positive, anyone with recent history of travel, anyone with potential symptoms of COVID-19 or anyone with COVID-19 contacts; and advice should be given to all COVID-19 negative patients undergoing elective surgery to practice social distancing and hand hygiene between the time of testing until the time of surgery.

### Timing of surgery

When a patient comes for rhinology surgery, firstly the surgery is graded as: elective - these surgeries are preferably deferred till the COVID-19 pandemic gets over, urgent- surgeries that can be delayed for one month, and urgent - surgeries that need immediate surgical intervention.

### Place for surgery

Surgery should be performed in the operation theatre. The operating room should have negative pressure environment with high frequency air changes (25 per hour). Each operating room should have separate ventilating system with integrated high efficiency particulate air (HEPA) filter. Separate operating room

should be designated for COVID-19 suspected or positive patients.<sup>17</sup> There should be negative pressure isolation transfer cabin which to be used to transfer patients between the isolation ward and operation theatre. Those who are involved must wear level 3 protective medical equipment (BSL-3). Principles of clean area, contaminated pollution area and two buffer zones should be followed while entry and exit into the operating theatre. If negative pressure theatre not available then consider a normal theatre with closed doors during the procedure. Consider turning off laminar flow (if present).

### Staff preparation

All staff must wear personal protective equipment (PPE) like cap, powered air purifying respirator (PAPR), eye protection, face shield, fluid-repellent disposable surgical gown, double gloves, shoe cover.<sup>18-22</sup> If PAPR is not available then fit-tested filtering face piece 3 (FFP3 mask) or N95 mask is used with an additional fluid shield. All emergent cases need to follow standard COVID-19 protocol. In this COVID-19 protocol the patient COVID-19 status can be unknown or even positive, so proper protective measures like wearing PPE, PAPR, double gloves, eye protection, face shield, gown, and shoe cover), limit attendance to essential personnel and use negative pressure room are undertaken.<sup>18-22</sup> Anesthetist intubates the patient while surgical team waits outside the operation theatre post-intubation for 21 minutes.<sup>23</sup> After proper dressing, draping is done, transparent plastic drape is used to cover the patient to prevent viral spread from the nose, nasopharynx and endotracheal tube into the environment. A transparent plastic drape also called NOVID (negative-pressure otolaryngology viral isolation drape) is kept over lone star disposable ring retractor and is suspended by a Bookwalter retractor laparoscopic support set, this produces a tent and prevent the plastic drape to collapse on instruments while doing surgery. The transparent plastic drape forms a compact chamber.

In Indian scenario if the above mentioned NOVID is not available, then plain transparent plastic drape is used to cover the patient and the drape is placed on a disposable ring shaped material and a retractor is used to retract the whole unit, thus creating closed chamber. The end of the plastic drape is attached to patient bed by towel clips. Finally, smoke evacuation system is set up inside the tent to evacuate any smoke produced during the surgery.<sup>24</sup>

Alternative surgical approach like external paracanthal, paralateronasal, sublabial approach is preferred instead of endonasal approach. This will reduce the use of drill and microdebrider while doing surgery, thus minimizing the risk of aerosolization from tissue micro-fragments contaminated by the virus.<sup>26</sup> If endoscope, microdebrider or drilling is needed, then it's done through small fenestrations made on the transparent plastic drape to reduce aerosol reaching the environment and suction is also done through the caudal aspect of the transparent plastic drape.<sup>25</sup> After closure of surgical wound, first the

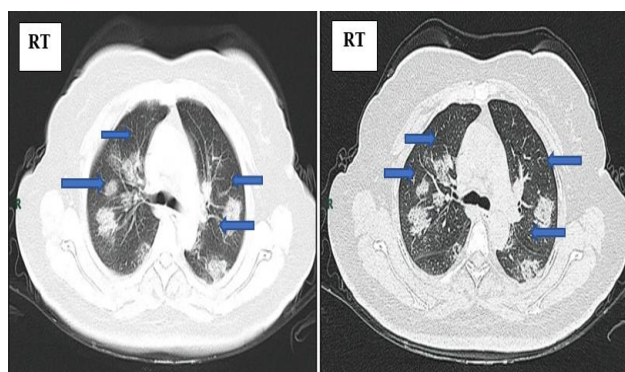
transparent plastic drape is removed and then the patient drape is carefully rolled and removed. Thereafter patient is cleaned and anesthetist extubates the patient while surgical team waits outside the operation theatre post-extubation for 21 minutes.

### ***In urgent cases***

The patient and family member are asked to self-quarantine till the surgery. Patient is contacted 5 days before the surgery and scheduled a date and time given for COVID-19 testing. 48 to 72 hours prior to surgery, nasopharyngeal swab is taken and send for real-time reverse transcription polymerase chain reaction (rRT-PCR) for COVID-19. If the initial test is negative, then the test is repeated within 24 hours prior to surgery and high-resolution computed tomography (HRCT) of chest done to exclude any false negative test result. HRCT chest positive findings included ground-glass opacity, local patchy shadowing, bilateral patchy shadowing or interstitial abnormalities.<sup>26</sup> If the tests are negative then standard COVID-19 protocol is followed. If the initial test is positive or the repeat test is positive, then it's better to defer the case and try alternative treatment. If the case cannot be deferred, then standard COVID-19 protocol is maintained while doing the operation.

### ***Elective routine***

Elective routine surgeries are preferable deferred till the COVID-19 pandemic gets over. If surgery is posted then same procedure is followed as urgent cases. If the initial test is positive or the repeat test is positive, then it's better to defer the case and try alternative treatment.



**Figure 2: HRCT of chest shows bilateral ground-glass opacity of lungs.**

### ***Proper disposal of equipment and decontamination of operation theatre***

After surgery is completed disposal of PPE kit need to be done according to local guidelines. After completion of surgery, the full anesthesia unit should be disinfected for two hours with 12% hydrogen peroxide present inside an anesthesia circuit sterilizer. Chlorine-containing disinfectant (2,000 mg/l) is used to clean the floor of

operation theatre and clean all the reusable medical equipment. Surgical instruments are soaked in 2,000 mg/l chlorine-containing disinfectant, and then sealed in a double-layer disposable waste bag and sent to the respective disinfection area. The air purification system of operation theatre is shut down after 30 min and then an ultra-low volume 20-30 ml/m of 3% hydrogen peroxide is used to fumigate the operation theatre (OT) for two hours, after which the negative pressure ventilation is turned on again.

## **RESULTS**

Significant aerosolization is produced while drilling or using microdebrider during surgery, thus proper precautions need to be taken while performing rhinology surgeries in emergent cases. COVID test is mandatory in urgent cases. Patient and family are asked to self-quarantine until surgery. If the COVID test is negative, then it is again repeated 24 hours before surgery along with HRCT chest to exclude false negative COVID-19 cases. If the COVID test is positive, the cases are deferred and alternative treatments are tried. The risk of coronavirus 2019 can be reduced by wearing PPE kit with PAPR, double gloves, eye protection, face shield, gown, shoe covers, limiting attendance to operation theatre, negative pressure room, using plain transparent plastic drape to cover the patient as described and after operation proper removal of patient drape. Additionally, low oscillation speeds of microdebrider with continuous suction is used to lower the risk of aerosol transmission into the environment.

## **DISCUSSION**

COVID-19 disease is now a pandemic and health care staff and ear, nose and throat (ENT) doctors are at high risk of getting infected. High rate of infection among otorhinolaryngologists demands safe guidelines for performing OPD endoscopies or other endonasal surgeries.<sup>27</sup>

Patel et al concluded that N95 masks are not enough to control the spread of coronavirus. PAPR is effective to control the infection. In the clinic setting N95 masks, face shields and gowns are effective for all nasal endoscopies.<sup>28</sup>

Workman et al concluded that the droplet particles are small in size and it travel for long distance, the use of PPE and N95 respirators is effective barrier in protecting healthcare professionals while doing outpatient clinic endoscopy. He also suggested that low oscillation speeds of microdebrider and its continuous suction is associated with low risk of aerosol transmission.<sup>13</sup>

Although surgical cases are deferred, crucial life threatening cases need to get operated. It is yet uncertain about the resolution of COVID-19 disease and when COVID-19 and serology testing will become more extensive, or when therapeutics and a vaccine will be

available. Thus, it's necessary to strictly follow guidelines, reducing the risk and safeguarding doctors and health care staff.

## CONCLUSION

Rhinology surgeries should adhere to general guidelines set for high-risk procedures. If the proposed protocols are strictly maintained then the risk of getting infected by coronavirus is greatly reduced. In this current scenario it is mandatory to treat emergent surgical cases with all possible precautions as mentioned and defer the rest of the cases till the pandemic gets over.

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