

Review Article

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Impact of coronavirus disease 2019 on ENT clinical practice and training: the resident's perspective

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Abstract

Background. The arrival of the coronavirus disease 2019 pandemic disrupted life suddenly and forcefully, and healthcare systems around the world are still struggling to come to terms with it. This paper reviews the impact of the pandemic on ENT practice and training.

Methods. The present manuscript was developed as a narrative review to examine the role of otorhinolaryngologists in the management of the pandemic, and assess its impact on practice and training in the specialty.

Results. Otorhinolaryngologists handle secretions of organs implicated in disease transmission, leaving them particularly vulnerable even while performing simple procedures. Although the pandemic increased skill expectations, it simultaneously reduced learning opportunities for trainees. In addition, attention to emergencies has been delayed. Further, the suspension of elective procedures has affected patients with malignancies.

Conclusion. While planning service resumption, provisions need to be made for protective equipment and training; improving teleconsultation services will help provide sustainable care during further waves.

Introduction

In the last year, the coronavirus disease 2019 (Covid-19) pandemic has affected our social and professional lives at all levels and scales, bringing the entire world to a standstill. While healthcare workers across the globe have struggled to come to terms with increased demands on their skill-set, time and energy, the role of otorhinolaryngologists in particular has been under the radar.

It has been shown that the virus gains entry through the nose; its load is highest in the upper respiratory mucosa, and its presence results in loss of smell in many affected patients.¹ Further, highly aerosol-generating procedures have placed the already thin specialised healthcare force at further risk of exposure to infection. This not only brings otorhinolaryngologists into focus for their unique diagnostic ability, but also puts them directly into the line of fire, posing a significant risk while they are performing simple examinations and procedures.² The impact of the viral infection on the practice of ophthalmologists and otorhinolaryngologists was recognised and discussed early in the course of the pandemic.^{3–5}

In addition to healthcare delivery to patients and changes in the practice of otorhinolaryngologists, there has been a definite impact on the training of residents and young specialists. In India, nearly 20 in 1000 post-graduate seats are available for training in otorhinolaryngology out of a total of nearly 42 000 seats.⁶

The present article discusses the impact of the pandemic on ENT practice and healthcare seekers, and describes the unique challenges faced by doctors in training and in the resumption of routine services.

Impact on healthcare practice

The interruption of ENT practice may persist far beyond the pandemic itself as healthcare providers understand droplet and airborne infections transmitted through the respiratory tract in a new light. Several aspects of the care of Covid-19 patients uniquely involve otorhinolaryngologists, including specimen collection, intensive care and upper airway procedures.

Collection of coronavirus testing swabs

Detection of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) requires samples from mucosal surfaces and their secretions. The most accessible sites with acceptable accuracy are the nasopharynx and oropharynx.⁷ Although swab collection is

generally safe, with an approximately 0.026 per cent incidence of adverse events, preparation for complications was considered necessary, as nearly 5.1 million tests are conducted worldwide on a daily basis.⁸ The complications ranged from minor epistaxis to the broken-off tip of the swab as a nasal foreign body and cerebrospinal fluid leaks. Otorhinolaryngologists, being the most familiar with this region of the human anatomy, were uniquely placed to train other healthcare workers in the collection of specimens.

Intensive care procedures

The pandemic has seen a manifold rise in the need for airway procedures as the number of intubations and tracheostomies has increased dramatically. In addition to performing these procedures, otorhinolaryngologists are expected to render services in the critical care setting, which is not their area of expertise.

Upper aero-digestive tract procedures

Many authors have evaluated the risk of virus transmission to the carer during upper airway procedures, and have suggested tips and guidelines.^{9–13} Hand hygiene and full personal protective equipment (PPE), including mask, gloves, eye or face shield, and gown, are recommended while performing airway procedures in all patients.

The pandemic has affected the normal functioning of out-patient departments, and the number of endoscopies has been reduced to the minimum. Reports suggest a decrease of up to 91 per cent in out-patient endoscopic procedures.¹⁴ The highest viral load has been shown to be harboured by the upper respiratory tract, and even though ENT endoscopies are not aerosol-generating procedures in themselves, they can induce sneezing, coughing and gagging, resulting in aerosolisation.^{15–17}

Although different protocols during fibre-optic laryngoscopy have been proposed, no definitive measures to reduce infection have been found. Ramavat *et al.* have proposed a safe fibre-optic laryngoscopy technique using a novel, reusable and inexpensive modified face shield, created in-house, as shown in Figure 1.¹⁸

The Foundation for Head and Neck Oncology, a national society for head and neck cancer in India, has issued recommendations for diagnostic procedures and treatment modalities.¹⁹ Similarly, the Association of Otorhinolaryngologists of India has also issued advisories for upper aero-digestive tract procedures.^{20,21} Rhinologists have been advised to rely on imaging rather than frequent endoscopies for evaluation, and to use a special 'microscope drape method' to reduce aerosolisation when performing nose and anterior skull base surgical procedures.^{22,23}

Tracheostomy is a highly aerosol-generating mode, which exposes the surgeons performing the procedure as well as the healthcare workers involved in its care. The procedure for performing a tracheostomy and the indications for an elective tracheostomy have been revised. The recommendations by ENT UK for tracheostomy in Covid-19 patients are summarised in Table 1.²⁴ Open tracheostomy or percutaneous tracheostomy procedures were recommended, as per institutional resources, as Zhang *et al.* found no severe post-operative complications and no infection in healthcare workers associated with these procedures.²⁵



Fig. 1. Modified face shield for fibre-optic laryngoscopy.

Telemedicine for consultation and communication

Recommendations for telemedicine consultation have been put forward by the Government of India in order to reduce the risk of contact and spread of the virus, as well as ensuring easy access to care.^{21,26}

Pre-operative coronavirus testing

Pre-operative testing for Covid-19 was recommended in all patients, especially surgical patients.⁵ Urgent cases where testing could not be carried out were treated as high-risk procedures.³

Olfactory dysfunction as disease symptom

Olfactory dysfunction is a characteristic symptom of Covid-19, which can occur independently or in combination with other symptoms.^{27–29} Physicians managing patients should be aware that anosmia is an important symptom for early recognition of active disease as well as an important post-Covid-19 complication. Nearly 12 per cent of patients are reported to have persisting olfactory dysfunction even after six months of recovery from Covid-19.³⁰

Risk of mucormycosis

An increased risk of mucormycosis in patients with Covid-19 infection has resulted in an epidemic, particularly in India.^{31–33}

Table 1. Tracheostomy in Covid-19: ENT UK recommendations

Recommendations
Planning (days or weeks prior to procedure)
– PPE to be worn by all staff performing tracheostomy
– Arrange an isolation room or negative-pressure operating theatre
– Use of cuffed non-fenestrated tracheostomy tubes only
– Designate a core Covid-19 airway team
Preparation (on day of procedure)
– Ensure PPE & indication for performing tracheostomy
– Request full paralysis throughout to avoid cough
– Use of closed in-line suction
– Preferred use of surgical ties over diathermy to prevent plumes containing viral particles
Performance (once trachea is exposed)
– Inform anaesthetist of readiness to open trachea, & ensure complete paralysis
– Pre-oxygenate with positive end-expiratory pressure & then stop ventilation
– Clamp endotracheal tube & advance it beyond tracheal window
– Make a tracheal window, ensuring ETT cuff is not ruptured
– Deflation of ETT & withdrawal under vision
– Immediate insertion of cuffed non-fenestrated tracheostomy tube with mandatory connection of HMEs, followed by immediate inflation of tracheostomy tube cuff after insertion
– Confirm position by end-tidal CO ₂ only
– Secure tracheostomy tube with sutures &/or tape
– Inform anaesthetist of readiness to open trachea, & ensure complete paralysis
Post-procedure (ICU & beyond)
– Use of HME only (avoiding humidified oxygen)
– Use of only in-line closed-suction circuits
– Do not change dressings unless frank signs of infection
– Delay first tube-change to 7–10 days with full PPE. Use same sequence of pause in ventilation with flows off, before deflating cuff & inserting new tube. This should be followed by immediate cuff re-inflation & circuit reconnection
– Cuffed non-fenestrated tracheostomy tube to be used until patient confirmed to be Covid-19 negative
– Subsequent tube-change at 30-day intervals
– Consider trials of cuff deflation when patient is Covid-19 negative & shifted to Covid-19 negative ward

Covid-19 = coronavirus disease 2019; PPE = personal protective equipment; ETT = endotracheal tube; HME = heat & moisture exchanger; CO₂ = carbon dioxide; ICU = intensive care unit

Pre-existing diabetes mellitus and use of systemic corticosteroids have been identified in the majority of cases of mucormycosis.³⁴ Mucormycosis has significantly added to the healthcare burden of the population and the burden on otorhinolaryngologists. Co-existing acute respiratory distress syndrome and multi-organ dysfunction may prevent timely diagnostic imaging and testing.

Virus in unexpected tissues

It has been proposed that the expression of angiotensin converting enzyme-2, transmembrane serine protease-2 and

furin in the middle ear, mastoid tissues and Eustachian tube, as observed in mice, could well allow seeding of the SARS-CoV-2 virus in these tissues.³⁵ This suggests that otorhinolaryngologists also need to be cautious while performing ear procedures such as myringoplasty, as well as mastoidectomy, which involves the use of drills known to produce aerosols in high quantities.³⁶

Impact on residents' training

Limited clinical material

Medical training revolves largely around the practical acquisition of skills on the background of a knowledge base. During the current pandemic, with reduced patient interactions, young trainees have been put at a disadvantage. While they have learned how to manage the pandemic, they have not been able to satisfactorily acquire the requisite diagnostic and surgical skills in ENT examination and management. In order to accommodate the restrictions of the pandemic against a background of panic, only emergency surgical procedures and consultations have been considered. The need to maintain social distancing and the least possible exposure to the virus from carriers or asymptomatic patients meant the absence of regular ENT patients in hospitals and a decrease in routine examinations. This invariably led to a decrease in potential learning opportunities for students.

Limited exposure to available patients

In order to minimise contact and to use limited resources efficiently, the time spent on procedures was reduced, and these were often performed by more experienced specialists. As a result, students missed out on hands-on learning and observing procedures in person. A decrease in supervised examinations and less frequent bedside teaching also affected learning. This has resulted in lower confidence in the students, a greater possibility of errors in judgement, the loss of experience-driven techniques, and limited patient care. In addition, it was felt that incorrect sampling techniques for Covid-19 would pose a higher risk for iatrogenic injury and that accidents could result in cerebrospinal fluid leak in healthy patients. This prompted the posting of ENT residents to supervise or assist in sample collection in India and probably across the world.

Restricted surgical procedures

All elective surgical procedures had to be rescheduled or postponed because of the pandemic. While the postponing of procedures did not affect the survival outcomes of benign disorders, patients with locally aggressive and malignant diseases of the ear, nose, throat, head and neck regions have suffered a setback in terms of poor survival outcomes. There was widespread disruption of surgical procedures because of restricted patient movements during periods of lockdown. The consequent delay in surgical management is a clear cause for concern, especially regarding early stages of oral malignancies, potentially leading to an increase in the severity of disease stage, resulting in inoperability or poor surgical outcomes.

Even paediatric emergency procedures such as foreign bodies in the ear, nose or oesophagus were difficult. The result was that a simple case of a child who had swallowed a coin had to

travel a much longer distance for a procedure such as emergency oesophagoscopy, because hospitals were not in a suitable condition to accept such patients, as per protocol. Life-threatening emergencies requiring urgent interventions, such as foreign body obstructions of the bronchus, tracheostomy procedures for malignancies, head injuries, or bronchoscopy for airway foreign bodies, also presented an unforeseen dilemma. It was a struggle to find facilities providing emergency services for patients with unknown Covid-19 status. In addition, elective procedures such as paediatric difficult airway management and tracheostomies for prolonged intubation became difficult, and patients had to wait longer.

Resumption of services

As the pandemic settles, it will become important to formulate guidelines in order to resume services. Staff will need to be redeployed to their normal roles, making sure there is adequate staff to cover emergency stations. Triage services will become important, and wearing masks and protective equipment will become the norm.

Preventive measures taken during this period are broadly centred on the use of PPE. A face shield is one such PPE item that provides barrier protection to the facial area and related mucous membranes (eyes, nose and lips). Coupling it with a surgical or N95 mask, along with goggles, provides sufficient protection to carry out an out-patient procedure such as fibre-optic laryngoscopy. It has been recommended that video-nasal endoscopes be used to increase the distance between patient and clinician, and video recordings of findings can be used to minimise repetition. Prioritising surgical waiting lists in line with the national guidelines, as recommended in the UK, and use of the Medically Necessary, Time-Sensitive scoring system for procedures, as proposed by the American College of Surgeons, will also become important.³⁷

Physical consultations may need to be avoided unless the doctor feels that examining the patient is a must. In such a case, pre-booking of appointments is required to make sure a limited number of patients are seen with appropriate social distancing. Adequate electrical and internet services are required in hospitals to provide the facility for teleconsultation. Further, it may become important to reduce the length of hospital stay and limit the number of admissions to healthcare facilities. We will have to wait and see what course the pandemic takes and what is in store in the coming weeks.

Conclusion

While the disruption to human life and activity brought about by the Covid-19 pandemic is no longer a surprise, healthcare service delivery continues to bear the brunt. The impact on ENT practice requires special attention regarding practice guideline modifications; patients await elective procedures, while surgeons are hesitant, being particularly vulnerable in terms of exposure to upper airway secretions.

Otorhinolaryngologists occupy a unique role in the management of the current pandemic because of the pathophysiology and transmission of the virus, as young trainees struggle to find the balance between developing a sound theoretical base and acquiring a skilful surgical hand.

Competing interests. None declared

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