

# Endoscopic ear surgery during COVID-19 pandemic

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### SUMMARY

**Similar to other surgical fraternities, endoscopic ear surgery (EES) faced great challenges during the COVID-19 pandemic. Many elective operations involving EES needed to be postponed, resulting in accumulated cases. Throughout one year during COVID-19, Hospital Sultan Ismail, Johor, Malaysia continued to perform various EES procedures. Although EES is an aerosol-generating procedure, it has become evidence that this minimally-invasive surgical approach offers lesser bony drilling and shorter operative time as compared to open mastoidectomy. Thus, this reduced the risk of viral transmission to the surgeons and operating staffs.**

### INTRODUCTION

No one ever imagined that the entire world would engage in a dramatic transformation because of the coronavirus disease 2019 (COVID-19) pandemic. This pandemic has spread rapidly all over the world, ever since it was first reported in Wuhan City, Hubei Province of China in November 2019. Most countries had to be put into lockdown, resulting in the restriction of most social activities, with the hope of containing the rate of transmission. In Malaysia, the movement control order (MCO) was first enforced from 18th March 2020 to 3rd May 2020. As the number of COVID-19 cases increased, a second MCO was reinforced on January 2021, followed by a third MCO on May 2021.

The medical faced and is facing the greatest challenge due to such a tremendous outbreak. Hospital facilities including beds and medical equipment had to be used for the purpose of screening and managing COVID-19 cases. Some wards were converted into dedicated COVID-19 units. Besides, the Intensive Care Unit received an increased number of COVID-19 patients who required mechanical ventilation. Medical staff from the level of paramedics, medical officers and specialists were deployed to assist the COVID-19 screening centres and the designated wards for positive cases.<sup>1</sup> As a result, there was a shortage of medical staff, which affected the flow of work at clinics, wards and operation theatres. Anaesthesiology teams also need to reschedule the duties of their staff, because of the demanding critical care services. Therefore, the number of operations, especially elective surgeries, were interrupted in response to the COVID-19 outbreak.

### Impact of COVID-19 towards EES

Endoscopic ear surgery (EES) is an evolving otologic procedure that has gained popularity in recent years. Many

otologic procedures including external ear, middle ear and lateral skull base pathologies are now feasible with the use of endoscope via the transcanal route. Similar to other surgical fraternities, EES was largely affected during the current COVID-19 period. During this unprecedented situation, many elective operations had to be postponed. Specific precautions were re-enforced to ensure the safety of all medical staff involved during operations.

In comparison to rhinology and head and neck procedures, otologic cases are perhaps the least to requiring prompt surgical intervention.<sup>2</sup> Nevertheless, concerns have arisen about whether EES is an aerosol-generating procedure, as the operation involves the middle ear cavity, since this area is lined by the respiratory epithelium, which is interconnected to the nasopharynx through the Eustachian tube. Thus, any ear surgery has potential of viral transmission. A recent study revealed the presence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the middle ear and in the mastoid in 2 out of 3 autopsies of positive COVID-19 patients. The absence of this virus in one of the autopsies was likely due to duration heterogeneity when the sample was taken.<sup>3</sup>

### Restructuring EES during COVID-19

Hospital Sultan Ismail (HSI), Johor, Malaysia serves as an Otologic Centre that receives referrals from several district hospitals. EES started in HSI since 2014, and it has become one of the leading otologic centres that performs EES in Malaysia. During this pandemic, several adjustments were implemented. Due to inadequate staffing following deployment to COVID-19 centres, anaesthetists had cut down the number of elective operations in response to preparation for the surge in critically-ill COVID-19 cases. With regard to emergency operations requiring EES, procedures continue to be carried out with stringent precautions.

The Department of Otorhinolaryngology of HSI created a guideline to restructure EES during this period. The cases that necessitate EES were reclassified into emergency operations, elective operations which cannot be deferred, and elective operations which can be deferred by prioritising on a case-by-case basis, depending on the availability of elective surgery allocations. Any postponement needed to be informed to the patients via phone calls with justifications, and to be documented in the medical records of patients.

Similar to other surgical fraternities, all cases subjected for EES underwent COVID-19 swab testing. As for the elective cases, patients were contacted a few days prior to their hospital admission, to ensure that they are free of any

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**Table I: Lists of EES performed at our institution throughout one-year COVID-19 pandemic (March 2020 till February 2021)**

Types of EES	Pathology	Number of procedures, n (%)
External ear: • Endoscopic canaloplasty and mastoidectomy	Canal cholesteatoma	1 (4.8)
Middle ear: • Transcanal endoscopic atticoantrostomy/ mastoidectomy	Middle ear cholesteatoma	8 (38.1)
• Endoscopic myringoplasty/ tympanoplasty	Perforated tympanic membrane	3 (14.3)
• Myringotomy and ventilation tube insertion	Middle ear effusion	4 (19.0)
• Ossiculoplasty	Ossicular discontinuity	1 (4.8)
• Endoscopic biopsy	Middle ear tumour	2 (9.5)
• Transcanal endoscopic facial nerve decompression	Traumatic facial nerve paresis	1 (4.8)
Lateral skull base: • Infrapromontorial approach excision of tumour	Intracanalicular vestibular schwannoma	1 (4.8)

**Fig. 1:** Setting up of endoscopic ear surgery during COVID-19 pandemic.

symptoms such as fever, sore throat, difficulty in breathing or anosmia. Our department established a temporary quarantine area for nasopharyngeal swab RTK-Ag COVID-19 testing for all new admissions. In negative COVID-19 swab testing, appropriate PPE during the operation is highly recommended, as EES is considered to be an aerosol-generating procedure. The surgeons, scrub nurses and anaesthetists were well-equipped with surgical masks and face shields (Figure 1). In fact, the usage of face shield was easier during EES procedure than while using the microscope. One year into the pandemic, despite the delay and deferment of the elective surgeries, we managed to perform 21 EES procedures that included external ear, middle ear and lateral skull base pathologies, with the stringent safety protocols shown in Table I. Most of the procedures involved middle ear diseases (90.5%) that required bone drilling or curetting.

It is pertinent that otologic procedures involve drilling of the bone. The implementation of protective measures while using a high-speed drill can protect surgeons from bone debris containment.<sup>4</sup> A chisel is an option to reduce the bone debris load produced by a high-speed drill.<sup>5</sup> In contrast to open mastoidectomy, EES offers a minimally-invasive

technique that requires less bone drilling with usage of a low-speed drill. Besides, it has been reported that the bony droplet formation following an endoscopic procedure is significantly reduced compared to open mastoidectomy.<sup>6</sup> Although there is no study comparing the safety of EES with open mastoidectomy with regards to COVID-19 transmission, EES should be a prioritised choice for any otologic surgeries during this pandemic based on aforementioned evidence.<sup>7</sup>

The literature available on EES reports that endoscopic tympanoplasty shortens the operating time as compared to the microscopic approach.<sup>8</sup> In contrast to the conventional postauricular approach, EES also offers a shorter hospital stay postoperatively, and no external scars.<sup>9</sup> These factors are in favour with practices of any otologic surgeries during this pandemic, as it reduces the duration of exposure in the operation theatre, thus minimising the risk of spreading the infection.<sup>10</sup> Restriction in a number of attendees in the operating theatre is highly encouraged to control the spreading of the disease. Trainee doctors are not recommended to join the surgery physically, to minimise the crowd in the operating theatre. A video recording of the EES allows continuous learning opportunities for the trainees.

**Practice of EES aftermath**

Although the timing for any surgery is still controversial, a new strategy is mandated to overcome such a situation. It must be remembered that cholesteatoma can progressively worsen and patients might present with acute life-threatening complications. Further, delaying the operation might impose anxiety to both the patients and the surgeons.<sup>11</sup> Otolologists are advised to continuously implement safety and protective measures during EES, even in negatively-tested patients for COVID-19, since there remains to be a risk of false-negative results. The discovery of a vaccine towards COVID-19 gives the world more hope in combating this pandemic. Similarly, it brings to light for EES in the near future in the otology field.

**CONCLUSION**

To date, the world is still struggling in battling COVID-19 infections. COVID-19 invariably left a significant mark in the practice of EES, especially among otologists, during this outbreak. Despite all these challenges, the practice in EES needs to move on, as this procedure has evolved rapidly just before the COVID-19 era. Based on our experience, the practice of EES during COVID-19 pandemic is preferable as compared to open postauricular mastoidectomy in view of lesser bony drilling, reduce operating time and shorter hospital stay. It is of utmost importance for the surgeons to choose the appropriate surgical technique with least viral exposure during this pandemic.

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