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COVID-19 & the General Surgical Department - Measures to reduce spread of SARS-COV-2 among Surgeons

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Introduction

The end of 2019 was marked by the emergence of a novel coronavirus[1], now termed as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). SARS-CoV-2 causes the coronavirus disease (COVID-19). Since then, COVID-19 has spread globally to more than 190 countries and was declared a pandemic by the World Health Organisation (WHO) on 11 March 2020[2].

Surgical care is a key component of any health system. However, during a global pandemic, it is imperative that the surgical workforce will need to adapt[3]. Elective operations should be postponed, and measures need to be implemented in order to reduce the risk of healthcare worker (HCW) transmission. Since the first imported case of COVID-19 in January 2020, our department has rapidly put in place stringent measures to prevent HCW transmission. Despite having seen and surgically managed confirmed COVID-19 patients, we do not have any instances of HCW transmission so far. It is important to prevent the spread of COVID-19 within a department, not only for the personal health of our colleagues, but also for essential surgical services preservation to ensure that the department remains functional to carry out our duties, as well as maintain department morale. We outline the measures we have taken to reduce the possibility of spread of SARS-COV-2 within our department.

Manpower secondment to COVID-19 screening centre

The 2003 Severe Acute Respiratory Syndrome (SARS) outbreak left an indelible impact on Singapore, with 238 people infected and 33 deaths[4]. Since then, Singapore has implemented a series of multi-agency measures to improve our country's pandemic preparedness efforts[4]. The National Centre for Infectious Diseases (NCID) was opened in September 2019, and is adjacent to Tan Tock Seng Hospital (TTSH), one of the largest acute hospitals in Singapore. NCID is a 330-bed purpose-built facility, and also consists of a screening centre, isolation wards, radiology facilities, operating theatres, and a laboratory[5]. NCID is currently the front-line hospital for the screening and management of COVID-19 patients in Singapore.

As a tertiary hospital linked to the NCID, it is our hospital's duty to support NCID in times of national crisis or an epidemic. Both medical and surgical departments have been deploying manpower to augment NCID's efforts in the COVID-19 pandemic. Our surgical department has been sending 25% of our deployable manpower to NCID at any one point in time. These teams are seconded to NCID for 10-day rotations to boost the screening centre manpower. All NCID personnel are in full tier 2 personal protective equipment (PPE) during shifts, inclusive of cap, goggles, N95 mask, gown and gloves. The screening centre also functions as a full-fledged Emergency Department as some patients may have symptoms of both COVID-19 and also a concurrent medical or surgical presentation and diagnosis.

Managing surgical workload and subspecialty teams

In order to cope with the decrease in manpower as outlined above, our department has instituted a 40% decrease in outpatient clinic visits – patients are triaged and appointments postponed accordingly. We have also postponed 40% of our non-urgent elective surgical cases. Ongoing elective surgical cases are limited to life, limb and organ-preserving operations – e.g. malignancies, limb salvage and aortic aneurysm surgery.

Our general surgery department comprises of 8 different subspecialty teams: colorectal, upper gastrointestinal, trauma, breast and endocrine, hepatobiliary, vascular, thoracic and plastics surgery. Each subspecialty team works closely for daily work (ward rounds, clinics, surgeries). In order to ensure continuity of our surgical services in the unfortunate event of HCW COVID-19 transmission, each subspecialty team is divided into 2 or more sub-teams. These sub-teams function separately and do not come into contact with one another. This ensures that emergency and essential elective surgery can still go on even if one sub-team is infected or quarantined.

Inter-hospital rotation of surgical residents has also been halted to reduce the chance of cross-hospital interaction and potential transmission of COVID-19 between HCWs.

Protocols for Surgery

Patients undergoing essential elective surgery are screened on arrival to the hospital for fever, upper respiratory tract (URTI) symptoms and contact/travel history. Patients with symptoms will be turned away from surgery and sent to the emergency department for further investigations.

Full tier 2 personal protective equipment (PPE) is mandatory for HCWs involved in potentially aerosolizing procedures such as intubation. For all surgeries, the anaesthesia team intubates all patients in full PPE, while the surgical team waits outside the operating theatre (OT) for 3 minutes before entering. The 3 minute rule is based on the air recycle rate of 25 to 30 cycles per hour in our OT. Essential elective surgery for non-suspect cases are performed in a conventional OT with positive pressure ventilation.

Emergency surgery for confirmed COVID-19 patients or suspect cases are performed in a dedicated operating theatre in NCID. Operations done on COVID-19 patients are performed with full PPE and N95 mask, or powered air-purifying respirator (PAPR) in aerosolizing procedures. Surgical teams are kept to minimal numbers and are consultant-led in order to minimize exposure. Most operations can be performed in full PPE and N95 masks, but our experience suggests that PAPR may be more ideal for prolonged surgery beyond 3 hours as it is more comfortable for the surgeon resulting in less fatigue.

Similar protocols were adopted for endoscopy in view of the possibility of faecal-oral transmission of the virus, and potential shedding of SARS-COV-2 in the faeces[6].

Measures taken to deal with COVID-19 patients in the ward

All patients will be screened on admission for risk factors such as fever, URTI and contact/travel history. Patients deemed to be high risk for COVID-19, and patients with a possible pneumonia on chest X-ray will be admitted to an isolation ward. All other patients will be admitted to the general ward.

All HCWs are mandated to wear a surgical mask when in contact with patients, such as in clinics and during rounds in the general ward. With increasing rates of community transmission of SARS-CoV-2, and the wide range of clinical severity and presentation, it is inevitable that COVID-19 patients may slip through the admission safety net and get admitted to a general ward (non-isolated) prior to diagnosis. In such situations, rapid diagnosis and isolation is imperative to break potential chains of transmission. All HCWs have been issued a Real-time Location System (RTLS) tag for contact-tracing. Upon confirmation of COVID-19, all HCWs in contact with the patient and not in full PPE protection will be swabbed and sent on home quarantine until the swabs are negative.

Reducing non-essential gatherings and chance of inadvertent infection

All non-essential department meetings such as journal clubs and educational plenaries have been cancelled. Important clinical decision-making meetings (e.g. tumour boards, mortality and morbidity discussions) have been continued either on electronic platforms such as Zoom, or in small groups with social distancing observed (sitting 1-2 metres apart), albeit with everyone wearing a surgical mask. Social gatherings greater than 10 people have also been discouraged.

With the announcement of the first case of COVID-19 in Singapore, we had also taken the difficult decision to freeze all non-essential overseas travel for surgeons which include planned holidays, workshops and conferences to reduce the risk of inadvertent importation of COVID-19.

Care for our HCWs

Working on the frontlines of the COVID-19 pandemic can be both physically and emotionally draining, especially when there is no end in sight. Senior staff including chiefs of service and heads of department have also been leading by example by volunteering for stints in the NCID screening centre. Our department has allowed staff to take short 3-day breaks to rest and recharge. However, staff on breaks must not travel overseas and need to remain contactable and recallable in the event of surge of COVID-19 patients, or having to return to cover staff who have fallen unwell in the line of duty. Unwell surgeons are also given mandatory time off to recuperate at home.

Conclusion

Many of the above measures were adopted from lessons learnt during the 2003 SARS outbreak. These measures were put into place very early on during the current outbreak.

The COVID-19 pandemic is expected to be long drawn. Our surgical workforce needs to be flexible and ready to adapt to an ever-evolving situation. Maintaining the health and morale of our HCWs is of utmost priority, so that we can continue to care for our patients. To date we have not had any instances of HCW transmission. We hope that we will continue to keep our HCW safe with the measures implemented. However, in the unfortunate scenario of a HCW transmission, we believe our measures will allow early identification and quick eradication of further transmission.

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