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Thoracic Surgical Oncology: Maintaining a High-Volume Surgical Program During the COVID-19 Pandemic

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Thoracic surgical oncology is a time-sensitive, high-resource, complex surgical speciality to which coronavirus has posed a unique challenge. In response to the evolving situation in mainland Europe, our department rapidly established a coronavirus disease 2019–free site to maintain elective cancer surgery. This necessitated a strict admission pathway and perioperative patient management. It resulted in the maintenance of a high-volume, high-quality thoracic surgical oncology program with no coronavirus disease 2019–positive cases to date. Maintaining satisfactory training levels among surgical and anesthetic trainees has also been achieved. We suggest that this model could be adapted to local resource capabilities.

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The evolving coronavirus pandemic presented a unique challenge in thoracic surgical oncology because of the increased potential for aerosolization of coronavirus perioperatively. Consequently our department instituted an early transfer of all elective thoracic surgical oncology to a dedicated non–coronavirus disease 2019 (COVID-19) private hospital. This was facilitated by the extension of clinical indemnity by the Irish State to cover public patients in private institutions and agreement by the Irish Medical Council to enable doctors in training to work across hospital sites.

Technique

The designated private healthcare institution was an established high-volume cardiac surgical center; however it had limited experience in high-volume complex thoracic surgery. An intense training period for theater, critical care, and ward staff was undertaken before transfer of patients. This involved moving a team of 3 cardiothoracic surgeons, 3 cardiothoracic anesthetists, 2 cardiothoracic specialist registrars, 1 anesthetic specialist registrar, and 1 advanced nurse practitioner from their primary base hospital. In addition specific surgical equipment, in particular minimally invasive instruments and a video-assisted thoracoscopic surgery camera stack, were transferred.

To comply with strict public health measures, in-person preadmission patient assessments were limited. Consequently individual cases were discussed in a collaborative manner by the operating team to risk stratify cases. We instituted a strict admission pathway with the aim of establishing and maintaining a COVID-19–free environment. We developed our admission and COVID-19 screening pathways after discussion with colleagues locally and internationally and in conjunction with evolving guidance from national surgical and anesthetic societies.[1-3]

Patients listed for surgery were asked to self-isolate within their households for up to 14 days pending admission. Those who passed a screening questionnaire (symptom screen including anosmia, contact history, previous test for coronavirus, and recent travel history) were invited to come to the hospital for admission 2 days preoperatively. They were assessed by a consultant physician, and their temperature, white blood cell count, and C-reactive protein were reviewed. They underwent a screening computed tomography of the thorax, and if there were no findings suggestive of COVID-19 infection, the patient was admitted to a single room on the cardiothoracic ward.[1] A nasopharyngeal severe acute respiratory syndrome coronavirus 2 swab (polymerase chain reaction) was taken with a processing time of approximately 24 hours. Only patients with negative results for all tests proceeded to surgery. Staff were not screened and were only tested for coronavirus if symptomatic while self-isolating.

Intubation and extubation of all patients was performed in the operating room with the minimum

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necessary staff consisting of the anesthetist, anesthetic trainee, and anesthetic nurse. Because these were aerosol-generating procedures, all staff wore personal protective equipment including an FFP-2 mask and visor. Inhalational anesthesia was provided using a double-lumen endotracheal tube to facilitate lung isolation with placement confirmed using a disposable Ambu bronchoscope. Surgical bronchoscopic assessment was only undertaken in cases with potential for a sleeve resection. After deflation of the operative lung, a closed airway circuit was maintained for the duration of the procedure. The surgical team wore FFP-2 masks and surgical gowns. A single chest drain was placed for all cases attached to a Thopaz (Medela AG, Baar, Switzerland) electronic closed drainage system. The patients were managed throughout their stay in single rooms, including in the critical care area. Chest drains were removed within normal practice parameters by nursing staff wearing personal protective equipment and a surgical mask with visor. Patients were discharged via the traditional pathway.

Comment

We performed our first case on March 25, 2020, and to date have completed 56 cases in 50 calendar days using 1 theater 5 days per week. Case mix has been maintained and included video-assisted thoracoscopic surgery and/or robotic-assisted thoracic surgery lobectomy (n = 23, 41.0%), video-assisted thoracoscopic surgery sublobar lung resections (n = 6, 10.7%), open lobectomy/bilobectomy (n = 14, 25.0%), open sleeve resection (n = 3, 5.4%), open pneumonectomy (n = 1, 1.8%), mediastinal mass resection (open/robotic-assisted thoracic surgery, n = 3, 5.4%), and other procedures (n = 6, 10.7%). Overall morbidity and mortality have been stable with 5 readmissions to critical care, 4 of whom required invasive mechanical ventilation. Two patients were postponed because of pyrexia of unknown origin. There have been no COVID-19–positive cases to date. Maintaining satisfactory training levels among surgical and anesthetic trainees has also been achieved.

We believe this demonstrates that a safe and rapidly scaled "COVID-19–free" thoracic surgical oncology program can be instituted to optimize patient care during the coronavirus pandemic. A strict admission pathway is central. The operative risk profile can be adjusted as experience develops. An additional benefit has been the maintenance of training. We suggest that this model could be adapted to local resource capabilities.

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