

Experience of Lung Surgery in the COVID-19 Pandemic

Kubilay İnan¹, İlknur Aytekin Çelik², Nurettin Karaoğlanoğlu²

1 Ankara Bilkent City Hospital, Department of Thoracic Surgery

2 Yildirim Beyazıt University, Faculty of Medicine, Ankara Bilkent City Hospital, Department of Thoracic Surgery

ABSTRACT

Objective: During the pandemic, elective cases other than those requiring emergency thoracic surgery were postponed. Depending on the magnitude of the impact the pandemic posed on hospitals and clinics, there have been changes in the number and variety of cases of thoracic surgery. The intention behind conducting this study was to share the experiences gained by a thoracic surgery clinic during the pandemic period.

Methods: Altogether, 214 patients were included in the study. Patient data that were recorded included those on age, gender, lung pathology, duration of hospital stay, positivity for COVID-19, survival, and causes of death.

Results: Of the 214 patients operated on, 12 died during the postoperative period. Eight of these patients died due to their primary disease and one died due to gastrointestinal bleeding, whereas the remaining three patients died due to COVID-19 infection.

Conclusions: If opportunities and facilities favorable for the administration of surgical treatment are made available, surgical treatment services can be offered safely to all patients

Keywords: Lung cancer, covid-19, thoracic surgery

INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 is a viral agent that can cause a broad spectrum of clinical symptoms ranging from cold-like symptoms to acute respiratory distress syndrome. COVID-19 originated in Wuhan, China, and spread throughout the world in 2020. It was later declared a pandemic by the World Health Organization. In Turkey, the first case of COVID-19 was detected in March 2020. At the beginning of the COVID-19 pandemic, various recommendations were published concerning thoracic surgery services. Delays and alternative therapies were proposed even for lung cancer surgeries worldwide¹⁻⁵.

During the pandemic, elective cases other than those requiring emergency thoracic surgery were postponed. Depending on the magnitude of the impact the pandemic posed on hospitals and clinics, there have been changes in the number and variety of cases of thoracic surgery.

Similar surgical restrictions and delays were experienced in our clinic during the pandemic. During the pandemic when the number of cases escalated, elective cases other than emergency surgical procedures and surgical treatment of cancer patients were postponed. As the staff at our clinic became more experienced in handling the pandemic, the variety of patients and surgical

procedures increased and it was decided to resume surgeries in some elective cases.

This study therefore presents an evaluation of the thoracic surgeries performed at our clinic during the pandemic and their outcomes. The intention behind conducting this study was to share the experiences gained by a thoracic surgery clinic during the pandemic period.

METHODS

The cases of lung surgery operated during the pandemic at the Thoracic Surgery Clinic of Ankara Bilkent City Hospital were examined retrospectively. Ethical approval for this study was obtained from the ethics committee of Ankara Bilkent City Hospital (approval number E1-20-669). Altogether, 214 patients were included in the study. Patient data that were recorded included those on age, gender, lung pathology, duration of hospital stay, positivity for COVID-19, survival, and causes of death.

RESULTS

Overall, 214 patients were retrospectively examined in our study. Among all the patients, 63 (29.4%) were women and 151 (70.6%) were men. The patients had a mean age of 55.7 (12–82) years. Pathologies of the patients are shown in Table 1.

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Corresponding Author: Kubilay İnan **E-mail:** kubilay_nan@yahoo.co

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Table 1: Distribution of Pathologies

Pathology	Number of Patients
Lung Malignancies	133
Pulmoner Metastasis	15
Others	66
Solitary Fibrous Tumor	2
Sclerosing Pneumocytoma	2
Synovial Sarcoma	1
Sequestration	1
Parenchymal Cavity	1
Organizing Pneumonia	2
Necrotizing Granulomatous Reaction/ Granulomatous Inflammation	3
Malignant Mesenchymal Tumor	3
Chondromyxoid Tumor	1
Lung Hydatid Cyst	11
Interstitial Lung Disease	7
Spindle Cell Mesenchymal Neoplasia	1
Hemoptysis (4 arteriovenous malformations, 1 Bronchiectasis)	5
Hamartoma	7
Hemothorax (Penetrating Injury)	
Fibrosis	1
Destroyed Lung	1
Bulla	12
Bronchiectasis	4

In our study, 62.1% (n = 133) of the patients who underwent surgical operation had primary lung malignancy, 7% (n = 15) had pulmonary metastasis, while 30.9% (n = 66) were operated for conditions other than malignancies.

The mean duration of hospital stay of the patients was 15.64 days (1-45 days).

Of the 214 patients operated on, 12 died during the postoperative period. Eight of these patients died due to their primary disease and one died due to gastrointestinal bleeding, whereas the remaining three patients died due to COVID-19 infection.

Two of the three patients who died due to COVID-19 infection were infected postoperatively during their stay at the thoracic surgery service, while the one remaining patient was infected in the early period after discharge.

DISCUSSION

During the COVID-19 pandemic, thoracic surgery clinics around the world developed various guidelines recommending different operational programs. Elective cases were postponed and emergency cases and cancer patients were prioritized. Guidelines have been published in the United States and Europe to assist physicians in deciding the lung cancer treatment to be administered during the pandemic ^{1,6-8}.

Continuing thoracic oncological surgeries during the COVID-19 pandemic was found to be safe and feasible and it was not associated with an increased risk of postoperative complications or death ⁹. In our clinic, depending on the severity of the pandemic conditions and the conditions at our hospital, many cases with

lung pathologies requiring surgical treatment were operated during the pandemic. Emergency cases and malignancies were prioritized. The perioperative COVID-19 testing and the isolated inpatient rooms and intensive care units helped prevent any potential increase in the risk of postoperative complications or deaths.

As more experience was mastered in managing the thoracic surgery procedures during the COVID-19 pandemic, the number of patients operated and interventions in terms of various lung pathologies increased over time. In Europe and Canada, the risk associated with COVID-19 appeared to be elevated; as a result, the number of surgically intervened cases was minimized, particularly in the field of oncology. In a multicenter prospective study that included 731 patients, it was concluded that maintaining surgical oncological activity during the COVID-19 pandemic was safe and feasible with an extremely low rate of postoperative morbidity or mortality¹⁰. To ensure that all patients and pathologies are treated, our clinic applied triage in case of patients with lung pathology, primarily oncological and emergency patients. During the COVID-19 pandemic, hospitals gradually reduced the number of surgical procedures both to minimize disease transmission within the hospital and to protect the staff and available personal protective equipment and other resources needed for providing health-care services to patients with COVID-19. The same was noted in our hospital as well. While surgical procedures were initially performed only in prioritized cases, the rate of these procedures increased as more experience was mastered with the COVID-19 pandemic. Initially, patients to be operated were selected more rigorously. Even surgeries in patients with cancer were delayed. Depending on the inpatient and intensive care occupancy rates in our hospital due to the pandemic and the number of health-care staff available in COVID-19 clinics, our clinic decided to increase the number of patients to be operated whenever possible. It was also ensured that patients having non-malignant conditions who were supposed to receive surgical diagnosis/treatment received their treatment during this period, although it was not as early as in those patients with malignancies. During the pandemic, many recommendations were made regarding the preoperative period in patients with thoracic surgery^{1,2,11}. It is aimed to protect patients from contracting the COVID-19 infection perioperatively. Preoperative polymerase chain reaction (PCR) testing for COVID-19 and PCR testing in the presence of suspicious clinical manifestations were recommended¹². At our clinic, PCR testing for COVID-19 was performed both preoperatively in all patients and postoperatively in the presence of suspected clinical manifestation. Preoperative pulmonary function tests are considerably important in lung surgery. At the beginning of the pandemic, preoperative pulmonary function tests (PFTs) could not be performed at our hospital; the pulmonary function laboratory was in fact closed during this period. Other tests were employed to assess the respiratory performance of patients. Tests that were preferred included stair-climbing and 6-minute walk tests. Some studies have reported that the 6-minute walk test can correlate adequately with forced expiratory volume in 1 s and diffusing capacity of the lungs for carbon monoxide^{12,13}. During this period when bronchoscopy units were closed, bronchoscopies for endobronchial lesion screening

were performed in an operating room and only in selected patients whose PCR tests were negative. Overtime, during the pandemic, procedures, such as PFT, bronchoscopy, and preoperative echocardiography, were performed in patients whose PCR tests for COVID-19 were negative.

Among all the recommendations made, it was suggested that surgical treatment during the pandemic would pose a high risk to patients with locally advanced disease because they were predominantly of an advanced age and had comorbidities; therefore, non-surgical treatment methods should be applied to such patients¹⁴. We continued using the same approach as that previously applied to patients with locally advanced lung cancer at our clinic during the pandemic. Neoadjuvant treatments were administered in line with the oncological principles that were eventually established, and surgical treatment remained among the treatment procedures applied cautiously against the risk posed by the pandemic. To summarize, our clinical approach toward lung cancer has not changed during the pandemic and surgery was performed in patients who had a chance in surgery. In a study evaluating the safety of surgery during the pandemic, it was reported that all 93 patients operated for thoracic malignancies tested negative for COVID-19 in PCR tests conducted during the postoperative period¹⁵. Only 2 of the 214 patients in our study postoperatively tested positive for COVID-19 in PCR tests conducted during their hospital stay as inpatients. One of our patients contracted COVID-19 after discharge.

In our study, of the 12 patients who passed away, 3 died of COVID-19 infection. Two of these three patients were those who underwent surgery for lung cancer, whereas the remaining one patient was operated for non-malignant lung pathology.

CONCLUSION

Many reasons are involved in terms of difficulties experienced while applying surgical treatment methods during the pandemic. These include increased morbidity and mortality burden due to infection, difficulty in finding empty inpatient beds and intensive care unit beds in hospitals, and shortage of doctors and assisting staff.

If opportunities and facilities favorable for the administration of surgical treatment are made available, surgical treatment services can be offered safely to all patients, particularly to those with malignancies and emergency cases, provided that patients, relatives, doctors, and assisting health-care workers comply with all the measures in place during the pandemic.

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