Optimal Timing of Elective Surgery after Covid 19 Infection

Muhammad Alam[1], Dr. Haider Ali[2*], Dr. Siddique Ahmad[3], Dr. Sarwat Noreen[4]

[1]Associate Professor Deptt of General Surgery Hayatabad Medical Complex Peshawar Pakistan
[2,3,4]Specialist Registrar Deptt of General Surgery Hayatabad Medical Complex Peshawar Pakistan
*Corresponding Author

Received:- 02 October 2022/ Revised:- 11 October 2022/ Accepted: 18 October 2022/ Published: 31-10-2022

Abstract—

Introduction: *Scheduling surgeries and management of surgical emergencies have been revolutionized by the outbreak of the novel coronavirus disease (COVID-19). The aim of this study was to determine the optimum timing of elective surgery for patients after COVID-19 infection in order to operate the deserving patients and avoid future burden on the health care facility and staff.*

Material and Methods: *A total of 636 patients were included in this prospective cohort study, which was conducted at General Surgical Department, Hayatabad Medical Complex, Peshawar, Khyber Pakhtunkhwa from January to December 2021. The cohort included 162 patients in the per0-COVID-19, 202 patients in the early post COVID-19 and 272 patients in the late post COVID-19 period.*

Results: *The primary outcome measure was status of post-operative complications and 30-day postoperative mortality in patients stratified over period of post-operative infection. Majority of patients were males (58%) with oncological indicators (16.67%) as the major reasons and Cholecystectomy (17%) was the major surgery. Similarly, diabetes was the major co-morbodity (13%) noted in the cohort. The period before surgery significantly affected the outcome and minimum post-operative complications were noted in the late post COVID-19 group. Respiratory system complications, oxygen therapy and pneumonia were significantly more in the peri-COVID-19 group. Consequently, maximum days of hospitalization (7) and 30 days post operative mortality (9.2%) was noted in the peri COVID-19 group.*

Conclusion: *It is concluded from this study to delay the surgery to more than 7 weeks after COVID-19 infection, where possible.*

Keywords— Corona, Pulmonary Disease, Surgery, Transmission, Virus.

I. INTRODUCTION

The first outbreak of the novel coronavirus disease (COVID-19) caused by the SARS Coronavirus 2 (SARS-CoV-2) occurred in Wuhan province, China, in December 2019. The novel virus quickly spread to the other provinces of China as well as rest of the world and on March 11, 2020, the World Health Organization (WHO) announced the new coronavirus disease 2019 (COVID-19) a global pandemic, declaring the outbreak an international emergency. The pandemic caused a major disarray of routine hospital services globally which has led to a reduction in the elective surgeries in better interest of the patients and general public; preserving personal protective equipment; reducing in-hospital viral transmission and preserving ward and ICU facilities for the needed patients along with reducing burden on health care providers (1) . A large number of patients have been already affected by the COVID-19 pandemic and the number is increasing even further day by day. These patients require, either currently or will require elective surgeries in the future. Due to the disease affecting multi-organ system with increased post-operative complications, careful pre-operative evaluation of the patient and optimum timing for elective surgery is required in order to have good post-operative results and improved quality of life. With approximately half of SARS-CoV-2-infected patients undergoing surgery experiencing postoperative pulmonary complications such as pneumonia, respiratory failure, arrhythmias, pulmonary embolism (PE), and deep venous thrombosis (DVT), evidence points to a 19.1% 30-day mortality in elective (planned) surgical patients and a 26.0% 30-day mortality in emergency surgical patients (2, 3). The

National Health Services (NHS) recently published recommendations outlining aftercare for COVID-19 patients due to potential respiratory problems include bronchiectasis, pulmonary vascular disease, fibrotic lung disease, and persistent cough (4). Another study performed in China showed clinical sequelae in 39% patients affected by COVID 19 (5).

Delaying time-sensitive elective surgeries, such as cancer or transplant surgery, may result in unnecessary morbidity and mortality, as well as an increased burden on health-care workers in the future. The initial pandemic surge caused an estimated 28 million procedures to be postponed in just 12 weeks (1). Patients with benign but potentially disabling conditions are likely to be prioritised based on clinical urgency, resulting in delayed care. This will result in a decline in population health, productivity, and a significant society cost (6, 7). Surgery that after SARS-CoV-2 infection should be scheduled based on the severity of the initial infection, the presence of COVID-19 symptoms, co-morbid conditions, functional status, clinical importance, and risk of disease development. Planning surgery while a patient may be contagious is not a good idea for the safety of the personnel, other patients and the public (8).

The goal of our study was to determine the optimal timing of elective surgery for patients with COVID-19 infection who are either asymptomatic or whose symptoms have resolved after infection by measuring morbidity and mortality up to 30 days after surgery, in order to operate upon the deserving patients and avoid future burden on the health care facility and staff.

II. MATERIALS AND METHODS

This prospective cohort study was conducted in General Surgical Department of Hayatabad Medical Complex, Peshawar, Khyber Pakhtunkhwa (one of the busiest tertiary care hospital in the province with over 1200 beds) over a period of 1 year from January 2021 to December 2021. A total of 636 patients were included in the study after approval from the ethical committee and taking informed consent from the patients. After receiving patients, detailed history was taken, all the previous record perused, and thorough physical examination was performed. Patients were classified as having pre-operative COVID-19 infection if they met any of the following criteria:

a) Positive COVID-19 RT-PCR (nasopharyngeal swab);

b) Positive COVID-19-rapid antigen test;

c) Before surgery, a chest computed tomography (CT) scan revealed changes consistent with pneumonitis attributable to COVID-19 infection;

d) Clinical diagnosis made before surgery (with negative RT-PCR swab results).

Time from the diagnosis of COVID-19 infection to day of surgery was collected and divided into 3 categories based upon the information taken from the previous studies (even if patients reports were obtained post operatively), 1–4 weeks (Peri-COVID-19 group); 5-7 weeks (Early post-COVID-19 group)and ≥ 7 weeks (Late post-COVID-19 group).

2.1 Inclusion Criteria

1) Patient with positive history of previous COVID-19 infection regardless of their asymptomatic or symptomatic status during infection but whose symptoms have by now resolved.

2) Age range 15 and above.

3) Both gender.

4) Only elective surgeries.

5) Patient with previous vaccination (irrespective of completion of vaccinations and time interval of vaccination till surgery)**.**

2.2 Exclusion Criteria

1) Patient with current signs and symptoms of COVID-19 infection; positive COVID-19 PCR or Rapid Antigen; Radiological finding on CT Scan supporting COVID-19 infection.

2) Patient with COVID-19 infection in post-operative period.

3) ASA grade IV and above.

4) Emergency, trauma and cancer related surgeries.

2.3 Pre-Operative Patient Work Up

Pre operatively patients were thoroughly assessed by taking complete history and doing physical examination. All necessary baseline laboratory investigations along with Chest X-ray done for all patients; Co-morbid patients (diabetes, hypertension, ischemic heart disease etc.) were further evaluated and consultation with respective specialty done in accordance with the hospital protocol. Peripheral saturation SpO_2 of all patients noted preoperatively and all those patients with underlying chronic lung disease were excluded from the study. For each patient, the following additional information was gathered: age, gender, ASA status, Revised Cardiac Risk Index, type of surgery and any chronic lung disease (Asthma, chronic obstructive pulmonary disease).

III. RESULTS

A total of 636 patients meeting the inclusion criteria were operated on elective surgery list. Among these patients, 162 patients (25.47%) were operated within 4 weeks after confirmed COVID 19 infection (Peri-COVID group), 202 patients (31.76%) were operated after 5-7 weeks of COVID-19 infection and 272 patients (42.76%) were operated after more than 7 weeks of COVID-19 infection (Table – 1). Furthermore, 369 patient (58%) were males with age ranging from 22 to 65 years (mean = 43.5 y) and 267 (42%) were female with age ranging from 18 to 66 years (mean = 42.0 y) . Overall, 106 patient (16.67%) were operated for oncological and 530 (83.4%) for benign conditions. Majority of the surgeries were major (549; 86 %) and performed under general anesthesia (515; 80.1%).

The most common surgical procedure performed was cholecystectomy (108; 17%) and hernia (78; 12.3%; Table – 2). Co-morbidities were noted in 189 patients (29.71%) whereas 23 (3.6%) patients were having multiple co-morbidities. The most common single co-morbidity associated was diabetes, noted in 83 (13%) patients, hypertension in 70 (11%) patients and chronic lung disease in 13 (2%) patients (Table – 3).

Among all patients the Peri COVID-19 group had more complications as compared to “Early Post-Covid-19 group” and “Late post Covid-19 groups”. Old age patients were having more complications due to various single/multiple co-morbidities, high ASA (III) and low compliance as compared to younger patients. Overall the respiratory system was affected the most due to the following complications; Respiratory failure(11.2%), Pneumonia (9.2%), overall 17.2% patients in the Peri-Covid 19 group required oxygen therapy with 4.9% of patients developing ARDS and ultimately underwent mechanical ventilation. The 30 days post-operative outcomes for all 3 groups are given in Table – 4.

IV. DISCUSSION

Large number of patients will undergo surgeries in the future having COVID-9 infection, and previous studies have shown an increased 30 days post operative morbidity and mortality for patient who had COVID-19 infection mainly affecting the respiratory system along with other body systems (3, 4, 5, 9). The patients underwent various types of elective surgeries comprising both major and minor surgeries performed for oncological and non-oncological diseases through open and laparoscopic technique. Patients operated close to the time of infection were having more complications mainly affecting the respiratory system including pneumonia, respiratory failure, ARDS and increased oxygen requirement. Patients in the peri-COVID-19 group had an increased risk of post-operative complications, though these complications were less severe than in the early post-COVID-19 group. Least post operative complications were noted in the late post-COVID-19 group. The exact mechanism underlying the increased post operative complications are still under evaluation but a combined effect by tissue damage caused by surgery, anesthesia, mechanical ventilation and covid 19 have devastating effects on patient health and post operative mortality and morbidity[10].

V. CONCLUSION

Late post COVID-19 group were having least post-operative complications as compared to peri- and early post COVID-19 groups. Surgery conducted during or around the time of COVID-19 infection has, thus increased the risk of developing post-operative complications. As a consequence, patients operated during the per-COVID-19 period seemed to have the highest mortality. Based on our findings, we recommend that patients with recent COVID-19 infection who are candidates for elective surgery postpone their surgery for at least 7 weeks.

RECOMMENDATION

We recommend further studies with large number of patients, from different specialties and health care facilities. In future nearly all people will be vaccinated against covid-19 which may have profound impact on controlling post-Op complications.

REFERENCES

[1] Tabiri S, Collaborative C. Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery plans. 2020.

[2] Nepogodiev D, Bhangu A, Glasbey JC, Li E, Omar OM, Simoes JF, et al. Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study. The Lancet. 2020;396(10243):27-38.

[3] Deng JZ, Chan JS, Potter AL, Chen Y-W, Sandhu HS, Panda N, et al. The risk of postoperative complications after major elective surgery in active or resolved COVID-19 in the United States. Annals of surgery. 2022;275(2):242.

[4] Xiong Q, Xu M, Li J, Liu Y, Zhang J, Xu Y, et al. Clinical sequelae of COVID-19 survivors in Wuhan, China: a single-centre longitudinal study. Clinical Microbiology and Infection. 2021;27(1):89-95.

[5] Grass F, Behm KT, Duchalais E, Crippa J, Spears GM, Harmsen WS, et al. Impact of delay to surgery on survival in stage I-III colon cancer. European Journal of Surgical Oncology. 2020;46(3):455-61.

[6] Kompelli AR, Li H, Neskey DM. Impact of delay in treatment initiation on overall survival in laryngeal cancers. Otolaryngology–Head and Neck Surgery. 2019;160(4):651-7.

[7] El-Boghdadly K, Cook T, Goodacre T, Kua J, Blake L, Denmark S, et al. SARS-CoV-2 infection, COVID-19 and timing of elective surgery: a multidisciplinary consensus statement on behalf of the Association of Anaesthetists, the Centre for Peri-operative Care, the Federation of Surgical Specialty Associations, the Royal College of Anaesthetists and the Royal College of Surgeons of England. Anaesthesia. 2021;76(7):940-6.

[8] Doglietto F, Vezzoli M, Gheza F, Lussardi GL, Domenicucci M, Vecchiarelli L, et al. Factors associated with surgical mortality and complications among patients with and without coronavirus disease 2019 (COVID-19) in Italy. JAMA surgery. 2020;155(8):691-702.