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Timing of Surgery in Iraqi Patients with COVID-19 Infection

Mohammed Rashied Salih, Ghadhfan Abdulmajeed Saeed* and Aymen Abdulkareem Othman Alrawi

Abu-Graib General Hospital, Baghdad Alkarkh Health Directorate, Ministry of Health/Environment, Baghdad, Iraq

Abstract

Patients with perioperative COVID-19 infection are at high risk of death and complications postoperatively. Now day, COVID-19 infection in Iraq accounted 1,696,390 cases with 19,087 deaths. A national, single, and observational study that included patients with COVID-19 infection undergoing any type of surgery in Abu-Graib General Hospital, Baghdad Iraq during period from 19 March 2020 to 30 April 2021. Time from the diagnosis of COVID-19 infection to day of surgery was collected as a categorical factor divided into: (a) 0-3 weeks; (b) 4-6 weeks; (c) >6 weeks. Age; sex; American Society of Anesthesiologists (ASA) physical status; cardiac comorbidities; respiratory comorbidities; indication for surgery; surgery grade; and surgical types were documented. A total of 378 patient were included with mean age was 47.89±16.03 years. Females were more than males (65.87% > 34.13%). Approximately, 76.72% of patients belonged within ASA I-II, whereas 23.28% were ASA III-IV. About 19.05% of patients suffered from cardiac comorbidities. 266/378 of patients complained from respiratory comorbidities. Surgery indicated in 35.45% benign conditions, 27.5% obstetrics, 7.65% oncological surgery, and 29.4% traumatic operations. Major operations documented in 205/378 patients. Emergencies surgical intervention done in (176, 46.56%), whereas elective cases were 202/378 (53.44%). In total at operation timing, 80(21.16%) patients had a preoperative COVID-19 diagnosis. The time from COVID-19 diagnosis to surgery was 0–3 weeks in 98 patients (25.93%), 4-6 weeks in 115 patients (30.42%), and >6 weeks in 165 patients (43.65%). The overall postoperative mortality rate was 9.52% (36/378). In regard to PO cardiac complication, there was no significant association in relation to timing before surgery (p=0.08). However, the overall cardiac complication was 16.4%. Overall, 44.97% (170/378) of patients developed a PO pulmonary complication within period of follow-up. To our knowledge this is the first study to provide strong data regarding the optimal timing for surgery following COVID-19 infection in Iraq. The optimal timing of surgery after COVID-19 infection was more than 6 wks. We found that risks of PO morbidity and mortality are greatest if patients are operated within 6 wks of diagnosis of COVID-19 infection.

Keywords: COVID-19 Infection; Post-Surgery Timing; Cardiac and Respiratory Complications

Correspondence to: Ghadhfan Abdulmajeed Saeed, Abu-Graib General Hospital, Baghdad Alkarkh Health Directorate, Ministry of Health/Environment, Baghdad, Iraq; E-mail: medicalresearch64@yahoo.com

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Introduction

Patients with perioperative COVID-19 infection are at high risk of death and pulmonary complications post-surgery [1,2]. Most developing countries as Iraq are likely to have limited access to COVID-19 vaccines because of unwilling of peoples to vaccination [3]. Thus, preoperative COVID-19 infection will stay a challenge for the foreseeable future. Several studies suggest delaying surgery in patients who have experienced respiratory infection in the 4 weeks preceding surgery [4]. However, there is only limited evidence regarding the optimal timing of surgery following COVID-19 infection. A prospective cohort study on patients having surgical for cancer, found that surgery more than 4 weeks after a positive COVID-19 swab was associated with a lower risk of postoperative mortality than earlier surgery [5]. A study in Brazil documented that elective surgery was delayed following the preoperative diagnosis of asymptomatic COVID-19 infection, and the postoperative complication rates were comparable to patients without COVID-19 infection. However, the study did not assess the optimal duration of delay following COVID-19 diagnosis [6].

International clinical guidelines support post-ponding non-emergency surgery for patients with preoperative COVID-19 infection, but specific recommendations are conflicting, recommending delays ranging from 1 to 12 weeks [7-9].

The aim of this study was to determine the optimal timing of surgery following COVID-19 infection in Iraq.

Methods

Study Design and Setting

This was a national, single, and observational study that included patients with COVID-19 infection undergoing any type of surgery in Abu-Graib General Hospital, Baghdad Iraq during period from 19 March 2020 to 30 April 2021.

Procedures

Surgery was defined as any procedure that is routinely performed in an operating theatre by a surgeon. Participating hospitals included consecutive patients undergoing elective or emergency surgery for any

indication. Emergency surgery was defined as surgery on an unplanned admission, and elective surgery was defined as surgery on a planned admission [10].

Participants

Patients were classified as having preoperative SARSCoV-2 infection based on any one of the following criteria:

- Positive RT-PCR nasopharyngeal swab taken before surgery;
- Positive rapid Anti-g test performed before surgery;
- Chest computed tomography (CT) scan performed before surgery showing changes consistent with pneumonitis secondary to COVID-19 infection;
- Positive preoperative IgG or IgM Ab test.

Data Collection

Time from the diagnosis of COVID-19 infection to day of surgery was collected as a categorical factor divided into: (a) 0–3 wks; (b) 4–6 wks; (c) ≥ 7 wks.

The following data was collected for each patient: age; sex; American Society of Anesthesiologists (ASA) physical status (I-IV) [8]; cardiac comorbidities; respiratory comorbidities; indication for surgery (benign disease; oncology; obstetrics; trauma); surgery grade (major/minor); and surgical types (elective/emergency).

Ethics Approval

All authors declare they have no competing interests. The study was approved by the Abu-Graib General Hospital.

Statistical Analysis

We implemented standard descriptive statistics and data analysis using IBM SPSS Statistics Software (version 25). All p-values < 0.05 were considered statistically significant. Data are reported as means and standard deviations or medians and percentages of patients for categorical variables. For categorical variables, a chi-squared test was used to test for differences between groups.

Results

A total of 378 patient (all of them previously had history of COVID-19 infection) were included with mean age was 47.89±16.03 years. Most of patients aged between 41 to 60 years. Females were more than males (65.87% > 34.13%). Approximately, 76.72% of patients belonged within ASA I-II, whereas 23.28% were ASA III-IV. About 19.05% of patients suffered from cardiac comorbidities. 266/378 of patients complained from respiratory comorbidities. Surgery indicated in 35.45% benign conditions, 27.5% obstetrics, 7.65% oncological surgery, and 29.4% traumatic operations. Major operations documented in 205/378 patients, while minor was recorded in 173/378 patients. Emergencies surgical intervention done in (176, 46.56%), whereas elective cases were 202/378 (53.44%). In total at operation timing, 80 (21.16%) patients had a preoperative COVID-19 diagnosis (Table 1).

The time from COVID-19 diagnosis to surgery was 0-3 wks in 98 patients (25.93%) (including 80 cases were positive for COVID-19), 4-6 wks in 115 patients (30.42%), and >6 wks in 165 patients (43.65%) (Table 2).

The overall postoperative mortality rate was 9.52% (36/378). When stratified by time from COVID-19 diagnosis to surgery, postoperative mortality rates were as follows: 6.1% (32/98) 0-3 wks; 2.12% (8/115) 4-6 wks; and 1.32% (5/165) >6 wks, with high statistically significant differences (p<0.01). In regard to PO cardiac complication, there was no significant association in three period of timing before surgery (p=0.08). However, the overall cardiac complication was 16.4%. Overall, 44.97% (170/378) of patients developed a P. O. pulmonary complication within period of follow-up of one month (Table 3).

Table 1: Baseline characteristics of the study (n=378).

Variables		No.	%
Age (years) 47.89±16.03	**0-20**	24	6.35
	21-40	101	26.72
	41-60	154	40.74
	61-80	78	20.63
	>80	21	5.55
Gender	**Male**	129	34.13
	Female	249	65.87
ASA	**I-II**	290	76.72
	III-IV	88	23.28
Cardiac comorbidities	**Yes**	72	19.05
	No	306	80.95
Respiratory comorbidities	**Yes**	266	70.4
	No	112	29.6
Surgery indication	**Benign**	134	35.45
	Obstetrics	104	27.5
	Oncology	29	7.65
	Traumatic	111	29.4
Surgery grade	**Major**	205	54.23
	Minor	173	45.77
Surgery type	**Emergency**	176	46.56
	Elective	202	53.44
COVID-19	**Positive**	80	21.16
	Negative	298	78.84

Table 2: Preoperative COVID-19 infection by timing of diagnosis prior to surgery.

Timing (weeks)	No.	%
0-3	98	25.93
4-6	115	30.42
>6	165	43.65

Table 3: Mortality and complication in relation to timing of surgery.

Timing (weeks)	Mortality	Cardiac complication	Respiratory complication	No complication
0-3	23 (6.1)	12 (3.18)	53 (14.02)	0
4-6	8 (2.12)	28 (7.4)	52 (13.75)	17 (4.5)
>6	5 (1.32)	22 (5.82)	65 (17.2)	83 (22)
Total	36 (9.52)	62 (16.4)	170 (44.97)	100 (26.5)
P value*	<0.01	0.08	0.055	0.054

Discussion

This study found that patients operated within 6 weeks of COVID-19 diagnosis were at an increased risk of PO mortality and complications. These risks declined to baseline in patients who underwent surgery > 6 weeks after COVID-19 diagnosis. These findings might consistent across both low-risk (age < 70 years, ASA physical status I-II, minor surgery) and high-risk (age ≥ 70 years, ASA physical status III-IV, major surgery) sub-groups. Therefore, surgery should be delayed for at least 6 weeks following COVID-19 infection to reduce the risk of postoperative mortality and complications. In addition, we to those patients may get benefit from a further delay

until their COVID-19 infection resolve. Our findings that preoperative COVID-19 infection increases the risk of postoperative mortality and pulmonary complications is line with previous work [1,2].

The greater timing of this study compared with previous studies [5,6] has enabled > 6 wks to be determined as the optimal cut-off. Whilst cut-offs beyond 7 wks were not formally tested, they are unlikely to offer a significant advantage, since adjusted mortality rates for delay intervals ≥ 7 wks were broadly stable [1].

There is a backlog of tens of millions of elective operations that were cancelled during the early phase of the COVID-19 pandemic [11]. This study offers evidence to support the safe restarting of surgery in the context of a rapidly increasing number of people who have survived COVID-19. This study's findings should support informed shared decision-making by anesthetists, surgeons and patients. Decisions tailored for each patient, since the possible advantages of delaying surgery for at least 7 weeks following COVID-19 diagnosis that balanced against the potential risks of delay [12]. For some urgent surgical procedures, such as resection of advanced tumours [13,14], surgeons and patients may decide that the risks of delay are not justified. The timing of elective surgery after recovery from COVID-19 utilizes both symptom- and severity-based categories, which suggested wait times from the date of COVID-19 diagnosis to surgery are as follows: four wks for an asymptomatic patient or recovery from only mild, non-respiratory symptoms; six wks for a symptomatic patient (e.g., cough, dyspnea) who did not require hospitalization; 8-10 wks for a symptomatic patient who is DM, immunocompromised, or hospitalized and 12 wks for a patient who was admitted to an ICU due to COVID-19 infection [8].

Generally, all non-urgent procedures should be delayed until the patient has met criteria for discontinuing isolation and COVID-19 transmission precautions and has entered the recovery phase. Elective surgeries should be performed for patients who have recovered from COVID-19 infection only when the anesthesiologist and surgeon agree jointly to proceed [8].

Conclusion

To our knowledge this is the first study to provide strong data regarding the optimal timing for surgery following COVID-19 infection in Iraq. The optimal timing of surgery after COVID-19 infection was more than 6 wks. We found that risks of P. O. morbidity and mortality are greatest if patients are operated within 6 wks of diagnosis of COVID-19 infection. Our results suggest that, surgery should be delayed for at least 6 wks following COVID-19 infection, and patients with ongoing COVID-19 from diagnosis may get high benefit from further delay.

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Disclosure of Conflict of Interest

There was no conflict of interest to be declared.

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