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Effects of Surgical Delay Due to COVID-19 on Women Requiring Emergency Gynaecological Surgery

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ABSTRACT

In response to the coronavirus-19 (COVID-19) pandemic, the McGill University Health Centre introduced protocols to protect health care workers during emergency surgeries. These included waiting for a COVID-19 test result or waiting 20 minutes after aerosol-inducing procedures before proceeding with surgery. The following brief communication describes the impact of surgical delay on the outcomes of 3 emergency gynaecologic procedures: dilatation and curettage, laparoscopic salpingectomy, and laparoscopic cystectomy and detorsion. Our results show that delays associated with COVID-19 protocols did not negatively impact patients undergoing these surgeries.

RÉSUMÉ

En réponse à la pandémie de maladie à coronavirus-19 (COVID-19), le Centre universitaire de santé McGill a mis en place des protocoles pour protéger les travailleurs de la santé durant les interventions chirurgicales d'urgence. Les mesures impliquaient d'attendre le résultat du dépistage de la COVID-19 ou d'attendre 20 minutes après une intervention générant des aérosols avant de réaliser toute intervention chirurgicale. Cette brève décrit les effets du report de l'intervention sur les issues de trois interventions gynécologiques d'urgence : dilatation-curetage; salpingectomie laparoscopique; et détorsion et kystectomie laparoscopiques. Nos résultats montrent que le temps d'attente associé aux protocoles de COVID-19 n'a pas eu d'effet négatif sur les patientes opérées.

Keywords: COVID-19; time-to-treatment; outcomes assessment; gynecological surgery; emergency surgery

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INTRODUCTION

On March 11, 2020, the novel coronavirus disease 2019 (COVID-19) pandemic was declared.[1] At the McGill University Health Centre (MUHC), protocols were introduced to mitigate the propagation of the virus during emergency surgical interventions.[2] A minimum of 6–8 hours was required to obtain a nasopharyngeal COVID-19 test result, leading to a delay in proceeding to surgery. Alternatively, patients needing immediate procedures did not have to wait for the swab result. Instead, the surgical team donned full personal protective equipment (PPE) and waited 20 minutes after intubation and extubation. Our objective is to understand whether the implementation of these safety protocols affected the outcomes of women requiring emergency gynaecological surgeries at the MUHC. To our knowledge, other Canadian hospitals have not published their adapted surgical protocols and the related outcomes.

METHODS

A retrospective cohort study was conducted using data retrieved from chart review of patients who underwent emergency dilatation and curettage (D&C) for retained

products of conception, laparoscopic salpingectomy for ectopic pregnancy, and laparoscopic cystectomy and detorsion for ovarian torsion. This study, number 2021-6894, was approved by the MUHC Research Ethics Board.

Study Population

Procedures performed from October 2019 to August 2020 at the MUHC were included. As of February 28, 2020, patients were screened for symptoms of COVID-19, contact with sick individuals, and recent travel. No patients in our cohort were considered at risk. Mandatory COVID-19 testing for patients undergoing surgery was implemented on March 25, 2020. The pre-COVID and COVID groups comprised 64 emergency gynaecological procedures done before and 46 after implementation of mandatory testing, respectively. A 20-minute delay was instituted after aerosolizing procedures for most cases without a COVID-19 test result. The records did not specify whether the operating room staff were wearing full PPE.

Physicians booked cases as one of four possible categories. A category 1 case has the highest level of acuity and is to be performed immediately. Category 2, 3, and 4 cases are to be performed within 4 hours, within 12 hours, and within greater than 12 hours, respectively. Procedures from the last three categories are placed on a waiting list according to the time at which they were booked. We did not have access to information about the non-gynaecological emergency procedures booked during the study period.

One case with missing information and three outliers were excluded. Two of these outliers were booked for non-urgent D&C from outpatient clinics. The third outlier was a possible ovarian torsion with a time to operating room of 18 hours owing to resolved pain.

Statistical Analysis

The following data were recorded: age, American Society of Anesthesiologists class, booking category, diagnosis, procedure, type of anesthesia, COVID-19 test result, and need to wait at least 20 minutes after an aerosolizing procedure. Outcomes studied included time to and length of surgery, hemorrhage, blood transfusion, intensive care unit (ICU) admission, and mortality.

Statistical significance was evaluated with chi-square, *t* test, and Mann-Whitney *U* test analyses using the SPSS software. *P* values of <0.05 indicated statistical signficance. Using the Shapiro-Wilk test, normal distribution was confirmed for the age variable. Time to operating room and procedure time variables were found to be non-normally distributed.

RESULTS

A total of 37 cases were in the pre-COVID group and 31 cases in the COVID group. Both groups were similar in age, American Society of Anesthesiologists class, type of anesthesia received, and booking category for all three surgeries (Table 1). No patient tested positive for COVID-19. There were no admissions to the ICU and no deaths.

For patients who underwent a D&C, there was no statistically significant difference between the two groups for most of the outcomes studied (Table 2). The median procedure time was, however, shorter for the pre-COVID group compared with the COVID group (7 min vs. 15 min; $P = 0.02$). Only 1 patient in the COVID group experienced blood loss of >500 mL and required a blood transfusion. Twelve of 17 patients had to wait for a COVID-19 test result before undergoing surgery. In the remaining 5 patients, intubation was not required, thus avoiding the minimal 20-minute delay before the start of the procedure.

Patients in the pre-COVID group who underwent a laparoscopic salpingectomy also had a significantly shorter surgery time (57 vs. 106 min; $P = 0.04$). Time to start the surgery and number of cases with hemorrhage or blood transfusion were otherwise similar (Table 2). Of the 10 patients in the COVID group, two waited for a COVID-19 test result before surgery. These were the only 2 patients who did not have a diagnosis of ruptured ectopic pregnancy. Neither had blood loss >500 mL or required blood transfusion. Of the patients who did not wait for a COVID-19 test result before surgery, all but two had at least a 20-minute delay after intubation and extubation.

The delay before surgery and time to completion of laparoscopic cystectomies and detorsions in the pre-COVID and COVID groups were similar. None of these patients had any of the adverse outcomes studied (Table 2). Two of the 4 patients needed to wait to learn their COVID-19 status before surgery. For the remaining 2 patients, the protocol requiring a 20-minute delay after intubation and extubation was respected.

DISCUSSION

Our study demonstrates that surgical delays while awaiting COVID-19 test results in urgent gynaecological surgeries do not significantly worsen patient outcomes. The lack of a statistically significant difference in the time to intervention and booking category between the groups is the most likely reason. Another explanation is that our study might have been underpowered, given the small size of our cohort.

Table 1. Age, ASA class, and anaesthesia used for patients who underwent emergency dilatation and curettage, laparoscopic salpingectomy, or laparoscopic detorsion

	Procedure; % of patients[a]								
	Dilatation and curettage			Laparoscopic salpingectomy			Laparoscopic detorsion		
	Pre-COVID; n = 12	COVID; n = 17	*P* value	Pre-COVID; n = 18	COVID; n = 10	*P* value	Pre-COVID; n = 7	COVID; n = 4	*P* value
Mean age, y	35	34	0.67	31	33	0.48	30	36	0.42
ASA class			0.32			0.42			0.73
1	50	59		30	30		43	50	
2	50	29		65	50		43	50	
3	0	12		2	20		0	0	
4	0	0		0	0		14	0	
Anaesthesia			0.95			—			—
General anaesthesia	17	18		100	100		100	100	
Spinal anaesthesia	8	12		0	0		0	0	
IV sedation	75	71		0	0		0	0	
Booking category			0.61			0.82			0.90
1	0	6		44	40		29	25	
2	42	35		56	60		71	75	
3	33	47		0	0		0	0	
4	25	11		0	0		0	0	

[a] Unless otherwise specified.

ASA: American Society of Anesthesiologists; COVID: coronavirus disease; IV: intravenous.

Table 2. Time to surgery, procedure time, and adverse outcomes for patients who underwent emergency dilatation and curettage, laparoscopic salpingectomy, or laparoscopic detorsion

	Procedure; % of patients[a]								
	Dilatation and curettage			Laparoscopic salpingectomy			Laparoscopic detorsion		
	Pre-COVID; n = 12	COVID; n = 17	*P* value	Pre-COVID; n = 18	COVID; n = 10	*P* value	Pre-COVID; n = 7	COVID; n = 4	*P* value
Median (range) time to OR, min	346 (1069)	511 (1162)	0.42	131 (421)	130 (420)	0.76	130 (376)	114 (248)	0.93
Median (range) procedure time, min	7 (46)	15 (62)	0.02	57 (108)	106 (116)	0.04	122 (144)	113 (76)	0.79
Hemorrhage	0	6	0.39	50	70	0.3	0	0	—
Blood transfusion	0	6	0.39	28	30	0.77	0	0	—
ICU admission	0	0	—	0	0	—	0	0	—

[a] Unless otherwise specified.

COVID: coronavirus disease; ICU: intensive care unit; OR: operating room.

Rates of ICU admissions for retained products of conception, ectopic pregnancies, and ovarian torsions are very low. Although significant blood loss and need for blood transfusion might be more commonly associated with ruptured ectopic pregnancies, the incidence of these outcomes is generally low for retained products of conception and ovarian torsions. It is well known that small study populations will fail to reject a null hypothesis. Despite this limitation, the procedure times for D&C and laparoscopic salpingectomies were shorter in the pre-COVID group.

Many have suggested general methods to reduce the transmission of COVID-19 during emergency surgeries that are similar to those of our institution. These include the use of a screening questionnaire, testing for the virus before surgery, and donning of full PPE in case of immediate need for surgery. A rapid chest x-ray or chest computed tomography has also been suggested.[3,4] However, a national guideline has yet to be established, and Canadian institutions have not shared their specific COVID-19 surgical protocols.

The most important limitation of our study is the small sample size. The lack of statistically significant differences in the outcomes between the two groups could be due to the study being underpowered. Furthermore, our study population could have been too small to detect rare adverse outcomes.

Owing to the nature of emergency surgeries, limited hospital resources, and lack of access to some data, it is difficult to ascertain whether surgical delays were caused by unknown COVID-19 status or for other reasons, such as surgeries with higher priorities. In addition, the data were obtained within a single tertiary care institution. Thus, the findings cannot be generalized to all institutions.

CONCLUSION

Our study demonstrates that there was no significant increase in morbidity in patients who required emergency gynaecological surgeries but first waited for a COVID-19 test result. Our findings encourage health care professionals to wait for COVID-19 test results in these women. For patients who require immediate lifesaving surgical interventions and have unknown COVID-19 status, appropriate precautions should be undertaken by the medical team. Studies with a larger patient population would be required to confirm our results and allow the generalization of our conclusions.

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