

Resumption of the Treatment for Non-COVID-19 Gynecologic Patients after Lifting Lock down: Experiences from Wuhan

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Abstract

Background: To share our experiences of resumption of the treatment for gynecologic patients after lifting lockdown in a hotspot area of the Corona Virus Disease 2019 (COVID-19) pandemic.

Methods: The triage process used to resume the medical activities for gynecologic patients at the Wuhan Union Hospital after a 76-day lockdown of the city is described and its effectiveness to avoid COVID-19 nosocomial transmission is shown.

Results: The non-emergency patients are pre-triaged by contact history and body temperature at outpatient clinic and negative COVID-19 screening tests are required for an admission in the buffering rooms at the gynecologic department. The buffering lasts for at least three days for symptom monitoring and a second round of COVID-19 tests before they can be transferred to the regular gynecologic wards. For patients who need emergency surgery, the first screening should be completed at the quarantine wards after the surgery, followed by buffering at the gynecologic department. We received 19298 outpatient visits, admitted 326 patients, and performed 223 operations in the first two months after the lockdown was lifted, and no single COVID-19 case occurred in the hospitalized patients while the proportion of potentially high-risk patients with cancer and severe anemia were increased in comparison with the same period in 2019 and the latest two months before the lockdown.

Conclusions: We provide an effective triage system with buffering at two levels to guarantee safe and timely treatment for non-COVID-19 gynecologic patients in a post-lockdown phase.

Background

Since the end of 2019, the Corona Virus Disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has been spreading rapidly, affecting over one hundred countries around the world. The novel corona virus is highly contagious, and effective antiviral drugs are absent. Vaccines against COVID-19, which are considered as the most promising measure to contain the pandemic, are still under development [1]. Lockdown is an effective public health measure to eliminate the coronavirus infection or flatten the outbreak curve [2,3] and many countries significantly affected by the pandemic have been enforced to issue a stay-at-home order [4-6]. Unfortunately, a long-term lockdown could be associated with severe social problems, particularly economic recession. In some places, the lockdowns have been gradually lifted, and social activities are gingerly reopened. However, the pandemic still continues, and the lockdowns will leave lasting impacts on clinical practice.

Although social distancing of at least two meters is recommended to avoid the virus transmission between people amid COVID-19 pandemic, during treatment of gynecologic patients, close proximity of patient to gynecologist, particularly the direct contact of vaginal mucosa and secrets of patient for a few minutes in a gynecologic examination, is inevitable and increases the risk of SARS-CoV-2 transmission. There are several guidelines published to give recommendations on the safe gynecologic practice and the

treatment of gynecologic patients during the ongoing pandemic, focusing on the management of cancer patients [7-12]. When the outbreak peak is gone and the lockdown is lifted, the medical resources should be redirected to non-COVID-19 patients, while the threats of COVID-19 transmission still exist. In this context, an adapted triage strategy plays a central role.

Wuhan, China, the first epicenter of the COVID-19 pandemic, was totally shut down between January 23, 2020 and April 8, 2020. As one of the largest medical centers in middle-south China, Wuhan Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, was assigned to treat non-COVID-19 patients since February 26, 2020. Here, we share our triage process supporting the resumption of medical activities in a gynecologic department of a comprehensive hospital and outline the scenarios emerging at our gynecologic wards in the transitional period from lockdown to reopening of the city, which might offer important lessons for colleges who struggle to restart work after a COVID-19 lockdown.

Methods

The triage process used to triage non-COVID-19 gynecologic patients at the Department of Obstetrics and Gynecology, Wuhan Union Hospital after a 76-day lockdown of the city is described. To investigate its effectiveness to avoid COVID-19 nosocomial transmission, the resumption performance in the first two months immediately after the reopening (April and May 2020) was summarized. In addition, the characteristics of the inpatients in the gynecologic department running under the triage framework in April and May 2020 were retrospectively compared with the same period last year (April and May 2019) and the latest two months before the lockdown (October and November 2020).

Results

Triage and treatment of non-emergency patients

In the resumption period, all non-emergency patients undergo a screening for COVID-19 before being admitted. Before patients seeing their doctors in the outpatient clinic, they are primarily triaged by symptoms and epidemiologic history regarding COVID-19. Those asymptomatic women with no contact history are allowed to visit doctors, who are under defense level II. If patients need ambulatory surgery or hospitalization, they will be subjected to COVID-19 triple tests, i.e. nucleic acid test combined with chest computerized tomography (CT) scan and serologic test for specific antibodies to SARS-CoV-2, which take 4-6 hours. Only the patients without any positive results can be admitted, while those with confirmed or suspected COVID-19 are sent to designated outpatient clinics.

The gynecologic wards are under closed management, banning visits. After admission, patients live first in buffering wards for at least three days, which are single rooms physically separated from normal wards. During the buffering, a second COVID-19 triple-test is performed with a time interval of more than 24 hours to the previous test, and respiratory symptoms and body temperature are daily monitored.

Thereafter, if no positive finding is present, patients are transferred to regular wards for receiving further disease-related treatment. During hospitalization, emerging fever ($\geq 37.3^{\circ}\text{C}$ for three days or longer) or any respiratory syndromes are indications for a quarantine-in-place and a repeated screening program. In addition, the antibody test is repeated every seven days during hospitalization routinely (Figure 1).

As regard to elective surgery, a higher priority is given to patients with malignant tumors or benign diseases that significantly affect the quality of life, e.g. uterine submucous leiomyomas causing severe anemia, bulky pelvic tumors pressing the bladder or rectum, etc. Although there are recommendations on gynecological surgery and chemotherapy amid COVID-19 pandemic and debates about the COVID-19-related safety of open versus minimally invasive surgery [12-14], we do not change our surgery modalities or chemotherapy regimens because we have sufficient medical resources to provide standard care for patients and the evidence on the risk of SARS-CoV-2 transmission associated with surgery modalities is absent. Given that postponing chemotherapy may increase the risk of cancer progression, chemotherapies are administered as scheduled as possible. Moreover, adverse effects of chemotherapy such as myelosuppression and hepatic dysfunction are prevented as far as possible to decrease the possibility of additional hospital visits for diagnosis and treatment of such severe side effects.

Triage and treatment of emergency patients

For emergency gynecologic patients, by whom a waiting time of 4 hours or longer for intervention is allowed, a COVID-19 triple-test screening program is also required before surgery; for those who need extremely urgent surgery or have positive results of COVID-19 screening tests, emergency surgery should be conducted in specific negative-pressure surgery rooms. After finishing surgery, patients are sent to the quarantine wards set up by the hospital with "three areas and two passages", i.e. clean, semi-clean, and contaminated zones, and separated patient passage and medical staff passage, where they are treated as suspected COVID-19 patients. In the quarantine wards, a COVID-19 triple-test screening should be completed and patients by whom COVID-19 is excluded are transferred to the buffering rooms in the gynecologic wards (Figure 1). In case of confirmed infection, patients are transferred to designated hospitals for further treatment and the surgeons who performed the emergency surgery and the medical staff in operation rooms are informed.

Personal protection of medical staffs

It is mandatory for all medical staff to receive COVID-19 screening tests before coming back to work and report personal health status regarding fever and respiratory symptoms daily per a mobile phone app. The use of personal protective equipment is summarized in Table 1. Briefly, defense level I is recommended for low risk of exposure (gynecologic normal wards), and defense level II for moderate and high risk of exposure (outpatient department and gynecologic buffering rooms). The medical staffs who have contacted with confirmed or suspected individuals or COVID-19 symptoms are subjected to screening tests and required to undergo a 14-day medical surveillance.

Resumption performance

Under the triage framework described above, we received 19298 patient visits, admitted 326 patients, and performed 223 operations in the first two months after the lockdown is lifted (April and May 2020), less than 40% of that in the two months before the lockdown (October and November 2020) and the same period 2019 (April and May 2019, Table 2). Among them, 20121 patients received ambulatory COVID-19 screening, 95 underwent emergency surgery before completing screening, and 46 were transferred to designated hospitals because of confirmed or suspected infection. No single COVID-19 case occurred in the gynecologic department since reopening.

In the early phase of the resumption, cancer patients called for more efforts, especially those suffering from cancers that progress rapidly, such as ovarian cancers. The proportion of cancer patients in April and May 2020 (58.6%) was increased compared to the pre-lockdown period (October and November 2020, 50.0%) and the same period in 2019 (April and May 2019, 44.1%). Also, the percentage of cancer surgery was increased. Among the cancer patients, ovarian cancer became the most frequent disease, while the proportions of cervical cancer and endometrial cancer were decreased compared to the pre-COVID-19 periods (Table 2). The ovarian cancer patients with chemotherapy showed less myelosuppression (neutrophil count less than 1.5 G/L) in the post-lockdown cohort (16/47, 34.0%) compared to the pre-lockdown cohort (52/102, 51.0%) and the 2019 cohort (41/95, 43.2%), which may be due to the more frequent use of long-effective colony stimulating factor (PEG-rhG-CSF). However, there were more patients with leiomyoma or adenomyosis suffering from severe anemia in the post-lockdown cohort, that may be due to the postponed diagnosis and surgery and inadequate iron supplementation during the COVID-19 lockdown (Table 2).

Discussion

The battle against COVID-19 seems unlikely to end soon. It is evident that the safety of patients and medical staffs is the key to resume the treatment for non-COVID-19 gynecologic patients. We found that, in the early stage of the resumption, the demands on medical care of gynecologic patients that were suppressed during COVID-19 lockdown are released gradually after lockdown easing rather than explosively, which may be partially due to the persistent concerns among patients about getting contagions in hospital. However, in the gynecologic department, the proportion of patients with cancer and severe anemia was increased, who are potentially associated with an increased risk of severe COVID-19 [15,16], underlining the importance of an effective triage system for the non-COVID-19 gynecologic patients.

In the present study, we illustrated the workflow that we used to triage the gynecologic patients with or without a need for emergency surgery regarding to potential COVID-19. In our triage system, the hospital quarantine wards and the buffering rooms at gynecologic department are critical to cut off the transmission pathways of COVID-19 without delaying the required medical care for patients. Given the possible missed COVID-19 diagnosis in the primary screening conducted in the outpatient clinic or quarantine wards due to infection window period and false negative test results [17], the stay in buffering

rooms and the second round of screening tests are necessary to protect transmission as a secondary line of defense. In addition, emerging evidence shows asymptomatic SARS-CoV-2 infection

In the triage system we use, the screening tests include nucleic acid test, chest CT scan, and serologic testing for viral antibodies, which can be finished within 6 hours. Although the triage process costs medical resources and increases management burden, it minimizes the risk of nosocomial infections and reassures both patients and healthcare workers, laying the cornerstone for the resumption of medical treatment for non-COVID-19 patients. However, the use of this screening regimen demands adequate test capacity and relatively quick performance and might be unfeasible for settings with limited resources. In such cases, a simplified screening regimen with any available nucleic acid test and/or serum antibody test could be considered [18,19].

Conclusions

Given that the COVID-19 pandemic is a rapidly evolving situation in temporal and spatial context and the local healthcare systems can be disparate, there is no universal guideline appropriate for all. We provide a model of an effective triage system to avoid transmission and, at the same time, allow timely treatment for non-COVID-19 patients, which may be meaningful experiences in a setting with relatively sufficient test capacity and medical resources.

Abbreviations

COVID-19, Corona Virus Disease 2019

SARS-CoV-2, severe acute respiratory syndrome coronavirus 2

CT, computerized tomography

Declarations

Ethics approval and consent to participate: The study was approved by the Ethical Review Committee of the Union Hospital, Tongji Medical College, Huazhong University of Science and Technology. Written informed consent was waived.

Consent for publication: Not applicable.

Availability of data and materials: The datasets used during the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests.

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Author's contributions: LC contributes to concept design. LC, RG and WD are major contributors in writing the manuscript. JC, SY, and JG collected and interpreted the clinical data. JZ and ZW performed the statistical analysis. All authors read and approved the final manuscript.

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Tables

Table 1 Personal protective equipment for medical staff in the gynecologic department of Wuhan Union Hospital after lifting the lockdown in Wuhan.

Zones	Exposure Risk	Defense Measures	Defense Class
Normal wards	Low risk	White coat Disposable surgical cap Surgical mask	I
Normal outpatient and gynecologic buffering wards	Moderate risk	Protective suite ^a Disposable surgical cap Medical protective mask Protective goggles Disposable gloves	II
Gynecologic emergency	High risk	Protective suite ^a or protective coverall ^b Disposable surgical cap Medical protective mask Protective goggles Disposable gloves	II

a, AAMI PB70 level 1-3; b, AAMI PB70 level 4.

Table 2 Characteristics of inpatients before and after COVID-19 lockdown.

	Apr- May 2020	Oct - Nov 2019		Apr - May 2020	
	<i>N</i> (%)	<i>N</i> (%)	<i>P</i>	<i>N</i> (%)	<i>P</i>
Inpatients					
Number of patients	326	834		844	
Age, year (median, range)	48.5 (14-86)	47.0 (13-84)	0.012 ^a	47.0 (14-79)	0.024 ^a
Hospital stay, day (median, range)	10.0 (1-29)	9.0 (1-51)	<0.001 ^a	9.0 (1-14)	<0.001 ^a
Cancer patients	191 (58.6)	417 (50.0)	0.008 ^b	372 (44.1)	<0.001 ^b
Surgery					
Number of patients	223	622		606	
Age, year (median, range)	46.0 (14-84)	45.0 (17-80)	0.107 ^a	45.0 (16-79)	0.180 ^a
Cancer patients	101 (45.3)	244 (39.2)	0.114 ^b	194 (32.0)	<0.001 ^b
Comorbidities					
Severe anemia	4 (1.2)	1 (0.1)	0.010 ^b	2 (0.2)	0.034 ^b
Hypertension	36 (11.0)	80 (9.6)	0.459 ^b	88 (10.4)	0.759 ^b
Diabetes mellitus	11 (3.4)	37 (4.4)	0.414 ^b	38 (4.5)	0.388 ^b
Cancer patients					
Cervical cancer	42 (22.0)	159 (38.1)	<0.001 ^b	123 (33.1)	<0.001 ^b
Endometrial cancer	30 (15.7)	69 (16.5)		90 (24.2)	
Ovarian cancer	97 (50.8)	168 (40.3)		137 (36.8)	
Others	22 (11.5)	21 (5.0)		22 (5.9)	

P, compared to the Apr-May 2020 cohort; a, Mann-Whitney U test.; b, Chi-square test.

Figures

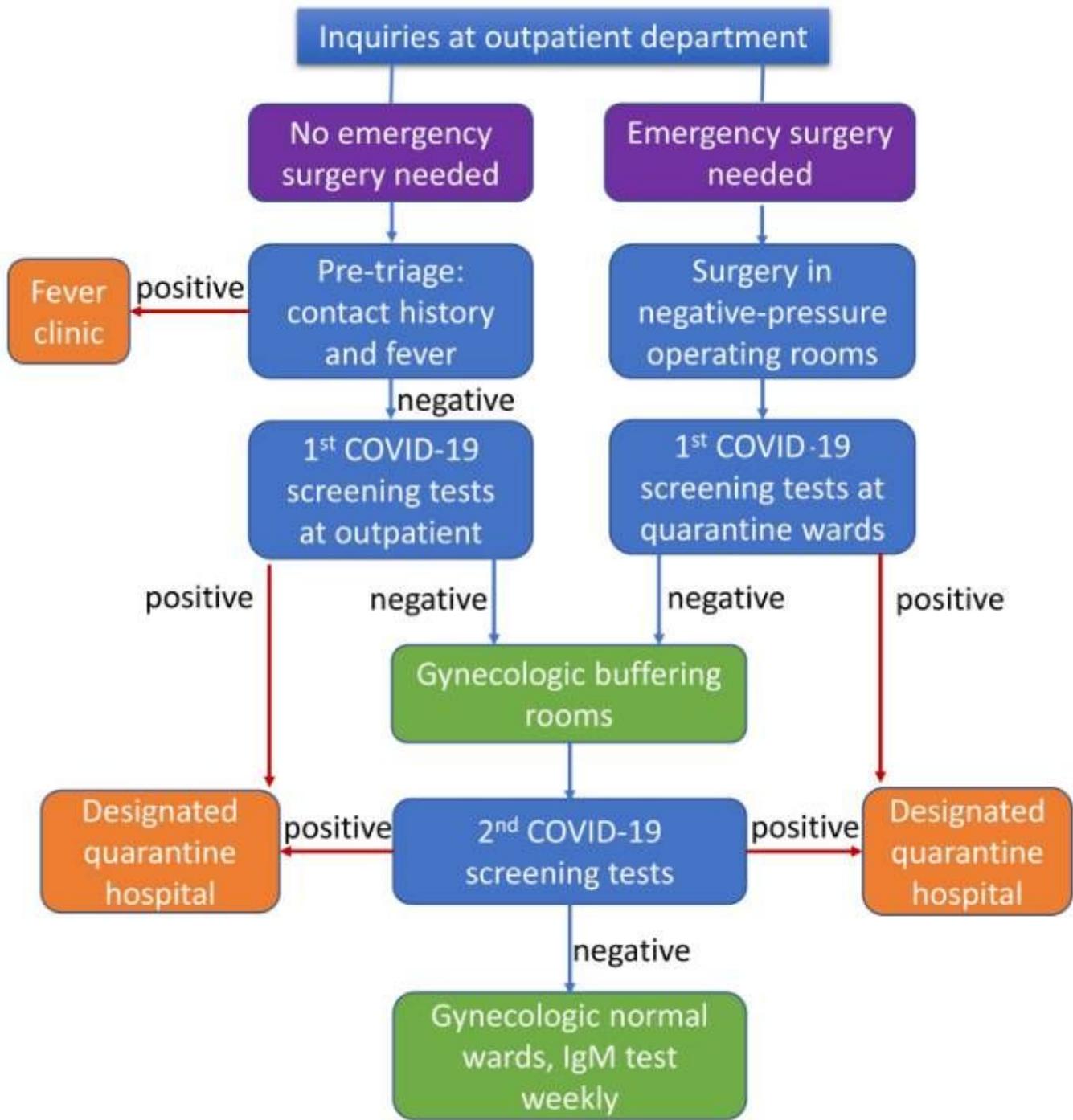


Figure 1

The flow chart of triage and treatment of emergency patients