N
ovel coronavirus disease-2019 (COVID-19) was primarily caused by severe acute respiratory syndrome coronavirus 2 infections. Although severe acute respiratory syndrome coronavirus 2 has been known to transmit primarily through respiratory droplets, some evidence suggests fecal/oral as an additional route of transmission. COVID-19 has rapidly spread globally with a logarithmic expansion of the cases, leading to the declaration of a pandemic from the World Health Organization on March 11, 2020. People’s daily lives have been tremendously disrupted by the COVID-19 pandemic.

The fact that up to 20% of patients with COVID-19 requires hospitalization has posed an unprecedented and largely unanticipated challenge to the health care systems worldwide, because we need to balance our capability to manage affected individuals and the ability to provide standard treatment for critically ill patients in a safe environment. As the COVID-19 pandemic continues to evolve, swift actions such as resource reallocation and staff redeployment are critical for ensuring the best outcomes for patients as well as health care providers. There have been expert opinions recommending a change in surgical care during the COVID-19 pandemic, but data on the real-world practice patterns of colorectal surgery remain unknown. Therefore, we conducted a practice study of surgical health care providers for colorectal diseases to evaluate the pattern and outcomes of the COVID-19 pandemic and demonstrate that this could be quickly accomplished with the aid of social media.

STUDY DESIGN AND ADMINISTRATION

This study was approved by the Institutional Review Board of the Sixth Affiliated Hospital of Sun Yat-Sen University. Colorectal surgeons or general surgeons who performed at least 1 colorectal surgery per week with their practice licenses registered at the major medical centers in China mainland were eligible for this study.
The study conceived by the key researchers (X.R.W., B.S., P.L., R.P.K.) mainly consisted of 4 domains: surgeon’s expertise and setting, practice patterns of colorectal surgery, factors associated with decision making for colorectal surgery, and safety and protection concerns of patients and health care providers. The study was programmed to a mobile application with a questionnaire.

The study was first conducted among members of the Chinese Society of Colorectal Surgery of China Medical Association. The members were allowed to distribute the questionnaire to others as indicated. All participants answered the questionnaire using the mobile communication application WeChat from April 24, 2020 to April 25, 2020.

Statistical Analysis
Descriptive statistics were computed for all variables. These included frequencies for categorical factors. A p value less than 0.05 was considered statistically significant.

RESULTS
Respondents
A total of 363 respondents completed the questionnaire, including 249 (68.6%) colorectal surgeons and 114 (31.4%) general surgeons performing at least 1 colorectal surgery per week. Of all the respondents, 158 (43.5%) were chief surgeons, a rank equivalent to full professor.

Practice Patterns of Colorectal Surgery
The surgical volume was reduced during the pandemic. One-hundred eighty-four (50.7%) surgeons reported that they operated on ≥7 cases on average per week before the COVID-19 pandemic compared with 31 (8.5%) respondents reporting the same number after the pandemic (p < 0.001). Two-hundred nine respondents (57.6%) reported that at least 25% of their elective surgeries were canceled or postponed, whereas only 50 (13.8%) reported that at least 25% of their emergent surgeries were canceled or postponed (p < 0.001). Patient concern about the risk for COVID-19 infection was the most common reason leading to the cancellation or postponing of both elective (n = 219, 60.3%) and emergent surgeries (n = 207, 57.0%). A total of 313 (86.2%) surgeons agreed that diverting all resources to patients who had COVID-19 adversely influenced the care of other patients. Sixty-seven (18.5%) respondents believed that at least 25% of their patients with elective surgery being canceled or postponed had a deteriorated disease condition. One-hundred fifteen (31.7%) surgeons experienced a higher percentage of emergent cases after the COVID-19 pandemic than before the pandemic (Supplementary Table 1 http://links.lww.com/DCR/B403).

Factors Associated with Decision Making for Colorectal Surgery During the Pandemic
The concern of the safety and protection of health care providers (n = 316, 87.1%) and timing of surgery (n = 257, 70.8%) were 2 main factors affecting decision making in colorectal surgery. The majority of respondents felt that the best timing for surgery during the COVID-19 pandemic should be determined based on the discretion of the treating surgeons (n = 286, 78.8%) or by governmental or institutional mandates (n = 251, 69.1%). Colorectal cancer was the main indication for elective or emergent colorectal surgery during the pandemic as reported by 237 (65.3%) surgeons. In general, there was a high agreement on the criteria for emergent colorectal surgery. The main indications for emergent colorectal surgery were bowel obstruction (n = 284, 78.2%) and bowel perforation (n = 237, 65.3%). Approximately 50% of respondents considered GI tract bleeding (n = 172, 47.4%) and perianal abscess (n = 157, 43.3%) as a surgical emergency (Supplementary Table 2 http://links.lww.com/DCR/B404).

Safety and Protection Concerns of Patients and Health Care Providers
Surgeons with adequate or somewhat adequate personal protective equipment (PPE) supply (285/304, 93.8%) were more likely to report that they could provide adequate or somewhat adequate care to patients undergoing colorectal surgery than their counterparts without adequate PPE (27/50, 54.0%; p < 0.001). Three-quarters of respondents (n = 273) voiced that more patients could safely have had elective surgery during the COVID-19 pandemic if the PPE availability had been maximized (78.2%, n = 284), if there was better planning and triage of resources (n = 316, 87.1%), and if greater testing of patients and hospital personnel (n = 269, 74.1%) was available. The majority of surgeons (n = 354, 97.5%) felt it was necessary to screen patients undergoing surgery for COVID-19, of whom 90.4% (n = 320) felt that all patients should be tested, whereas the remaining (n = 34, 9.6%) agreed with screening with other strategies (Supplementary Table 3 http://links.lww.com/DCR/B405).

DISCUSSION
It is clear that this rapidly evolving COVID-19 pandemic has exerted a broad threat to global health systems, in particular, to surgery-related departments, because preparing for the pandemic and caring for surgical patients are equally important to them.7 The actual impact of the pandemic goes far beyond the viral infection itself and the associated complications; rather, it also profoundly affects patients who are not infected.8 Competition for limited operating capacity led to elective noncancer procedures being largely canceled or postponed.10 Consistent with this
realities, this study showed that the percentage of surgeons who operated on at least 7 cases per week previously to the pandemic dropped significantly after the COVID-19 pandemic began, with emergent colorectal surgeries being less likely to be affected than elective cases. Most respondents reported that the majority of operations were canceled by patients, their main concern relating to the risk of COVID-19 infection.

Colorectal cancer has been one of the most common disease entities that colorectal surgeons in China deal with even in normal times. This fact was reflected by the results of our survey which demonstrated that most surgeons reported colorectal cancer as the main indication for colorectal surgery during the COVID-19 pandemic. Most respondents in the study voiced their concerns about a compromise of the care of patients with colorectal disease from the diversion of health care resources. As a result, a high percentage of participating surgeons felt that more patients could safely have had elective surgery during the COVID-19 pandemic. The right strategy might be to discuss this on a case-by-case basis, because resources, such as PPE supply, need to be maximized to allow the delivery of safe and effective care to surgical patients and minimize the infection risks for medical personnel. Hospitals designated to the care for COVID-19-infected patients may be better able to focus on the COVID priority to contain the spread of the virus. In agreement with expert opinion from review articles, the vast majority of surgeons from this study felt that it was necessary to screen patients for COVID-19 infection before they were admitted.

The findings of the current study have clinical merits. We must acknowledge that the pendulum of COVID-19 pandemic is likely to swing back and forth again several times before it reaches equilibrium. Therefore, it is critical that we come together as a surgical community to efficiently disseminate high-quality information based on existing experience and data. The results of this study may represent an opportunity for other countries to develop guidelines for the government, professional societies, and hospitals to decrease the potentially devastating effects of the health care crisis on other groups of patients. In the midst of the COVID-19 pandemic, the risks and benefits between the protection of patients and health care providers and the adverse outcomes resulting from delayed surgery need to be balanced. In particular, strict and consistent criteria for “emergent” colorectal surgery should be established that could help to simplify surgeons’ decisions to operate or not in their practice during the difficult times.

There are several limitations to our study. One of the main messages from this survey is that the COVID-19 pandemic leads to a reduction of workload in colorectal surgery. However, it is unclear which specific type of colorectal surgery has been compromised the most. Since the severity of COVID-19 pandemic was different among the cities across the country, it is reasonable to think that the practice patterns of colorectal surgery might not be the same. Unfortunately, data regarding which city or institution the surgeons are from is not available in this survey.

CONCLUSION

In conclusion, the COVID-19 pandemic clearly influenced the care of patients with colorectal disease. Elective colorectal surgeries were more likely to be affected than emergent cases.

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