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## To evaluate the safety of performing emergency urologic surgery on patients positive for COVID-19

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### Abstract

SARS COV-2 is a novel coronavirus that first appeared in Wuhan, China, during the second half of 2019. The virus, which causes a severe respiratory illness called COVID-19, has spread rapidly, causing a worldwide pandemic. Healthcare institutions have been overwhelmed by this rapidly spreading dangerous and untreatable disease, causing governmental healthcare policies to shift towards emergency services rather than elective and less urgent treatments. Healthcare services, including in urology, have been prioritized to spare resources, protect people from the disease and limit its spread. Patients who require emergency urologic procedures are tested for COVID-19 prior to intervention, with those found positive undergoing procedures in COVID-19 dedicated facilities. This study evaluated outcomes in COVID-19 positive patients who underwent emergency urologic procedures.

**Methods:** This retrospective case series analyzed outcomes in all COVID-19 positive patients who underwent emergency urologic procedures during the first 3 months of the epidemic in Qatar.

**Results:** During the 3-months period, from 1 March through 31 May 2020, 32 COVID-19 positive patients underwent emergency Urologic procedures. All 32 were men, of mean  $\pm$  SD age  $35.1 \pm 10.9$  years. Only four patients had cough and sore throat, whereas the other 28 were asymptomatic. Most surgeries were performed under spinal anesthesia lasting around 20 minutes and most patients were discharged to an isolation facility the next day. All patients recovered uneventfully, and none required ICU admission or oxygen support. None of the surgeons or other operating room personnel was infected.

**Conclusion:** International guidelines for patient prioritization and triaging during the COVID -19 pandemic are safe and efficient. Performing emergency urologic procedures on COVID-19 patients under strict infection control conditions is safe for patients and healthcare personnel.

**Keywords:** urologic surgery, SARS COV-2, COVID-19, Cricket, untreatable disease

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### Introduction

Qatar recorded its first confirmed case of coronavirus disease-19 (COVID-19) on 29 February 2020 <sup>[1]</sup>. In March, the Ministry of Public Health (MOPH) of Qatar announced several changes that affected the provision of routine healthcare services in the Qatari healthcare system. These changes, including changes in outpatient services, inpatient visitor policy and emergency services at government hospitals, were designed to prioritize resources and to protect patients, visitors and public from the spread of COVID-19 <sup>[2]</sup>. Similarly, many services at private health facilities were limited to emergency services only <sup>[3]</sup>. In addition, five hospitals, including two newly opened hospitals in Mesaieed and Ras Laffan, were designated as facilities dedicated to COVID-19 treatment <sup>[4]</sup>. Since April, all patients scheduled for surgery throughout the country have been tested preoperatively for COVID-19, with patients testing positive transferred to a COVID-19-dedicated hospital for further management.

Similar to other healthcare services, the urology service has been affected by these measures. For example, outpatient services are delivered through teleconference, and outpatient procedures, such as external shock wave lithotripsy (ESWL) have been postponed. Urologic surgery is restricted to patients with tumors and those requiring emergency procedures. Because most of these

emergency procedures involve urolithiasis, the urology department at Hamad General Hospital (HGH) implemented specific measures to protect patients and healthcare personnel from COVID 19. Because the clinical indications of COVID-19 can overlap with other conditions, such as urosepsis, it is necessary to assess COVID-19 positivity prior to any procedure <sup>[5]</sup>. In general, whenever possible, it is better to avoid performing surgery under anesthesia or insert stents or nephrostomy tubes under local anesthesia in patients positive for COVID-19 <sup>[6]</sup>. For example, a recent retrospective cohort study of 34 patients with confirmed COVID-19 who were unintentionally scheduled for elective surgery found that 15 (44.4%) needed ICU care and seven (20.5%) died <sup>[7]</sup>. Thus, patient care should not be compromised by avoiding anesthesia, whereas performing surgery under anesthesia should not harm the patient. This study evaluated outcomes in COVID-19 positive patients who underwent emergency urologic surgical procedures.

### Methods

This retrospective study included all adult patients in Qatar who were referred for emergency urologic surgery from HGH to Hazm Mebaireek General Hospital (HMGH) from 1 March

through 31 May 2020. All the patients were identified from theater registration. Their medical records were reviewed, and the relevant data were retrieved. The study protocol was approved by the institutional review boards of HGH and HMGH, which waived the requirement for informed consent because of the retrospective nature of this study.

All demographic and clinical characteristics were summarized using descriptive statistics. All statistical analyses were performed using SPSS 20.0 statistical software.

## Results

During the study period, 32 COVID-19 positive patients requiring emergency urologic surgery were identified at HGH, a non COVID-19 facility, and referred to HMGH, a COVID-19 facility. All patients were found to be positive by routine preoperative PCR testing. All 32 patients were men, of mean  $\pm$  SD age  $35.1 \pm 10.9$  years. Four patients had cough and sore throat, whereas 28 were asymptomatic for COVID-19, and none has symptoms specific to COVID-19, such as loss of taste or anosmia. Seven patients had diabetes, six had hypertension, and one was positive for renal impairment. None of these patients had been treated with a COVID-19 antiviral treatment protocol.

Clinically, three patients were positive for fever. Other vital signs were within normal ranges, with all patients having oxygen saturation  $>96\%$ . The results of laboratory testing are shown in Table 1. Most patients underwent surgery within 3 days of presentation, 31 under spinal anesthesia and one under general anesthesia. Mean  $\pm$  SD operation time was  $20.3 \pm 15.8$  minutes, with most surgical procedures being endourological interventions (Table 2). Average hospital stay was one day. All patients recovered uneventfully, with none requiring ICU admission or oxygen support. Seven of the 32 patients were started on anti-COVID treatment postoperatively. None of the surgeons or other healthcare professionals was infected with COVID-19.

**Table 1:** Baseline clinical and metabolic characteristics of COVID-19 positive patients requiring emergency urologic surgery

Variable	Mean $\pm$ SD (N = 32)
Temperature ( $^{\circ}$ C)	$36.8 \pm 0.47$
Respiratory rate (breaths/min)	$18.3 \pm 1.5$
WBC ( $\times 10^3/\mu$ L)	$9.16 \pm 2.9$
Lymphocytes ( $\times 10^3/\mu$ L)	$23 \pm 10$
D-Dimer (mg/L) (5 patients only)	$0.3 \pm 0.5$
Creatinine ( $\mu$ mol/L)	$113 \pm 84$
BUN (mmol/L)	$5.75 \pm 4.46$
Potassium (mmol/L)	$4.16 \pm 0.68$
Cl (mmol/L)	$101.53 \pm 2.87$
HCO <sub>3</sub> (mmol/L)	$24.87 \pm 3.22$
ALT (U/L)	$27.80 \pm 20.03$
AST (U/L)	$28.43 \pm 12.86$
Bilirubin ( $\mu$ mol/L)	$12.20 \pm 6.92$
CRP (mg/L)	$22.7 \pm 34.9$

**Table 2:** Surgical Procedures Performed

Surgery	n (%)
Ureteral stenting	27 (84.3)
Ureteroscopy	2 (6.3)
Radical Orchiectomy	1 (3.1)
Cystolitholapaxy	2 (6.3)

## Discussion

One method of controlling an epidemic is to divide government hospitals into two main categories. The first category consists of dedicated hubs for treatment of COVID-19 positive patients; these facilities should include limited surgical staff members and operating rooms, for infected patients requiring surgery. The second category consists of hospitals dedicated to patients not infected with COVID-19 who require hospitalization for medical, emergency surgery and urgent oncological procedures. Personnel, including surgical personnel, should not be able to move between dedicated and non-dedicated hospitals.

To cope with the COVID-19 outbreak, many urological societies worldwide have developed guidelines to minimize the risk of outbreak among the patients and health care providers [8]. To determine whether urologists worldwide changed their practices in response to the COVID-19 outbreak, a survey was conducted to assess whether current practices are in line with COVID-19 guidelines [9]. This survey showed that most urologists prioritized common urological procedures in accordance with the guidelines for patient management during the pandemic. Deviations from these guidelines were due to regional limitations of resources (9). Another survey of urologists in Arabian gulf countries showed that, in response to the COVID-19 pandemic, most changed their routine practice of patient management in accordance with worldwide recommendations and guidelines to limit the progression of the outbreak [10].

Similarly, Hamad Medical Corporation HMC applied measures to reduce the risk of disease transmission among patients and healthcare workers. Changes in outpatient services, visits to inpatients and emergency services were in accordance with MOPH guidelines for governmental hospitals [4]. Since April 2020, patients of unknown COVID-19 status who present at the HGH emergency department have been tested for COVID-19 prior to any surgical intervention unless their clinical condition was critical requiring immediate surgical intervention. Non-critical patients testing positive for COVID-19 have been transferred to a COVID-19 dedicated hospital for further management. Surprisingly, the incidence of COVID-19 infection was found to be higher in healthcare workers assigned to a non COVID-19 facility than to a COVID-19 facility, most likely due to the strict compliance with preventive measures applied in the latter facilities [11].

Most operations were performed within 3 days from the time of COVID-19 diagnosis, with the delay caused by waiting for PCR test results. These results were usually delayed for 24 hours during the initial period of the pandemic due to the limited availability of the required resources. Patients requiring organ saving surgery underwent surgery at HGH but were considered COVID-19 positive until proven otherwise.

All the patients in the present study were young men, a finding likely reflecting the population of Qatar, the majority of whom are young and expatriates. In Portugal, significantly fewer women than men sought emergency urological services during the COVID-19 pandemic, a difference attributed to the effects of COVID-19 on the relative willingness of men and women to seek urological care [12].

Although most worldwide guidelines recommend that only symptomatic patients be tested, most COVID-19 positive patients were found to be asymptomatic. Both asymptomatic and

symptomatic individuals can transmit SARS-CoV-2 to uninfected persons, with viral infectivity being similar in asymptomatic and symptomatic patients [13]. In addition, viral load was shown to be similar in asymptomatic and symptomatic patients [14]. All patients undergoing surgery at hospitals in Qatar must undergo routine preoperative testing for COVID-19 to minimize the risk of exposure of healthcare workers and to minimize the unnecessary use of personal protective equipment. Patients found to be positive for COVID-19 are transferred to designated facilities for further management, thereby completely separating patients positive and negative for COVID-19. Similar protocols have been introduced in China and Italy, with complete preoperative health screening required for all patients undergoing surgery, whether they are symptomatic or not [15]. Our implementation of this protocol may explain why most of the patients in the present study were asymptomatic.

Regional anesthesia has many advantages over general anesthesia, as the former minimizes the risk of exposure of the anesthesia team to infection during airway management, reduces the utilization of anesthesia medications and prolongs the life of the machines used to deliver anesthetics [7, 16]. In agreement with worldwide recommendation, only one of the 32 patients in the present study required general anesthesia.

International guidelines during the pandemic recommend that elective surgery be postponed, and only emergency or unavoidable surgery be performed [8]. Initial experience from Wuhan, China, in patients who were unintentionally scheduled for elective surgery during the COVID-19 incubation period and who were asymptomatic showed that 44.1% of these patients required ICU care, and 20.5% died (17). An international, multicenter, cohort study reported similar findings, with postoperative pulmonary complications occurring in about 50% of patients with perioperative SARS-CoV-2 infection and a high mortality. These findings indicate the necessity of balancing the increased risks associated with SARS-CoV-2 infection against the risks of delaying surgery in individual patients. That study identified male gender, age  $\geq 70$  years, comorbidities (ASA grades 3–5), cancer surgery, and a need for emergency or major surgery as factors associated with adverse outcomes [18]. In contrast, the patients in the present study were young and male, with an uneventful postoperative course, resulting in discharge home or to a COVID-19 facility to complete the required period of isolation. None of these patients developed post-operative complications within 14 days after discharge.

Managing COVID-19 positive patients requiring surgery is challenging, making the protection of healthcare workers mandatory during the pandemics. In Wuhan, 41% of infected patients were suspected of acquiring SARS-CoV-2 infection in-hospital, 26% required ICU care, and 4.3% died [19]. Although it is difficult to prove that SARS-CoV-2 is transmitted through the genitourinary tract, this possibility is suggested by the presence of virus in urine (20). Thus, all healthcare workers including urologists should adopt sufficient protection strategies to guard against infection when dealing with COVID-19 positive patients [21]. In the present study, none of the urologists was infected with COVID-19.

Although surgery-associated mortality and complication rates have been reported to be significantly higher in patients positive than negative for COVID-19 [21], all the patients in the present

study had an uneventful post-operative recovery and completed their period of isolation without any significant complications.

## Conclusion

Adoption of international recommendations for COVID-19 positive patients requiring urologic surgery resulted in the absence of mortality or morbidity during the postoperative period, and the protection of healthcare workers from infection. Proper triaging of urology patients during the COVID-19 pandemic enabled the safe performance of emergency surgery in these patients.

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