



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

## Research Letter

# Perioperative Outcomes of Urological Surgery in Patients with SARS-CoV-2 Infection

Aoibhinn McDermott<sup>a</sup>, John O'Kelly<sup>a</sup>, Eoghan de Barra<sup>b,e</sup>, Fidelma Fitzpatrick<sup>c,d</sup>, Dilly M. Little<sup>a</sup>, Niall F. Davis<sup>a,f,\*</sup>

The global incidence of severe acute respiratory virus coronavirus 2 (SARS-CoV-2) infection continues to increase daily. To date, many urological centres have prioritised their patients for urgent surgical intervention because of a reduction in operating theatre availability and the risk of hospital-acquired SARS-CoV-2 infection [1,2]. The first confirmed case of SARS-CoV-2 infection in the Republic of Ireland was diagnosed on February 29, 2020 and as of May 8, 2020, there have been 22 385 confirmed COVID-19 cases, which represents a case rate of 453.3 per 100 000 population [3]. Here we present our perioperative outcomes for patients undergoing urological surgery during the initial stage of the SARS-CoV-2 pandemic in Ireland (between March 16 and May 1, 2020, inclusive).

Our hospital has an onsite microbiology laboratory that performs daily SARS-CoV-2 real-time reverse-transcription polymerase chain reaction testing. Our screening policies for elective and emergency urology patients are detailed in the Supplementary material. During the initial 7-wk period of the SARS-CoV-2 pandemic, 101 urological procedures were performed: 73 urgent elective (age  $62 \pm 13$  yr, and American Society of Anesthesiologists [ASA] score  $2.65 \pm 0.56$ ) and 32 emergency cases (age  $51 \pm 20$  yr, ASA score  $1.68 \pm 0.82$ ). Elective surgery was prioritised according to recent European guidelines and patients were then placed on a centralised departmental theatre waiting list [1]. Details on all elective and emergency urological procedures are summarised in Supplementary Table 1 and Supplementary Table 2, respectively.

In total, seven patients (7/101, 7%) developed symptoms of SARS-CoV-2 infection during the postoperative period, of whom three male patients (3/101, 3%) were diagnosed with symptomatic SARS-CoV-2 infection. All three SARS-CoV-2-positive patients developed significant postoperative pulmonary complications (Supplementary Fig. 1) and one patient died. The remaining four patients were subsequently diagnosed with pyelonephritis ( $n = 1$ ) or postoperative atelectasis ( $n = 3$ ) after a negative SARS-CoV-2 nasopharyngeal swab (Table 1).

Data on the safety of surgical procedures in SARS-CoV-2 hospitals are important so that knowledge can be provided to surgeons on perioperative SARS-CoV-2-related outcomes during the COVID-19 pandemic. At present, various guidelines and opinions on preoperative SARS-CoV-2 screening protocols are available (eg, thorax computed tomography vs nasopharyngeal swab). However, such guidelines are limited by their level of evidence as, to date, they are based on expert opinion without robust prospective data [4]. Our current departmental policy is to perform a screening telephone interview 7 d before surgery and to advise elective patients with asymptomatic COVID-19 to self-isolate. A second screening telephone interview in conjunction with a nasopharyngeal swab is carried out 24–48 h before all elective surgery cases.

Our short-term findings demonstrate that the incidence and mortality rate of symptomatic SARS-CoV-2 infection is approximately 3% and 1%, respectively, among patients

**Table 1 – Summary of clinical parameters and clinical course in seven patients with suspected SARS-CoV-2 after urological surgery<sup>a</sup>.**

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6	Patient 7
Gender	Male	Male	Male	Female	Female	Female	Male
Indication for PO SARS-CoV-2 NS	Pyrexia, dry cough, malaise	Pyrexia, dry cough, dyspnoea	Dry cough, dyspnoea, malaise	Pyrexia, dry cough	Pyrexia	Pyrexia	Pyrexia, dry cough
SARS-CoV-2 Dx	Yes	Yes	Yes	No (atelectasis)	No (atelectasis)	No (pyelonephritis)	No (atelectasis)
Positive SARS-CoV-2 NS	Yes	Yes	No	No	No	No	No
Age (yr)	53	82	67	70	49	56	77
Procedure	LN	TURBT	RARP	LN	Cystectomy	Cystectomy	Nephroureterectomy
Comorbidities	HTN	HTN, ex-smoker	Smoker	HTN, provoked DVT	Thrombophilia	HTN	T1DM, HTN
ASA score	3	3	2	2	3	2	3
BMI (kg/m <sup>2</sup> )	33.6	29.6	31.6	35.5	34.8	25	33
Time to Dx after surgery (d)	14	4	20	2	4	26	2
Onset to Dx (d)	3	6	1	1	1	1	1
Date of SARS-CoV-2 Dx	April 12, 2020	April 18, 2020	April 9, 2020	N/A	N/A	N/A	N/A
ICU support required	No	No	Yes	No	No	No	No
Fever	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Highest fever (°C)	39.1	40	35.5	38.2	38.5	39.1	38.2
Diarrhoea	No	No	No	No	No	No	No
Highest CRP (mg/l)	269	272.9	107	Not measured	282	186	224
Lymphopenia	No	Yes	No	No	Yes	Yes	Yes
Elevated sCr (μmol/l)	176	194	161	127	No	No	258
SARS-CoV-2–related events	Viral pneumonia: bilateral pleural effusions and patchy GGO on CXR	Viral pneumonia: GGO changes involving all lobes of both lungs on CT, MI	Overwhelming ARDS within 4 h of readmission	N/A (atelectasis)	N/A (atelectasis)	N/A	N/A
SARS-CoV-2 treatment	NIV (CPAP/BiPAP)	NIV (CPAP/BiPAP)	Ventilated	N/A	N/A	N/A	N/A
SARS-CoV-2 outcomes	Discharged after 27 d	Current inpatient (20 d after Dx)	Mortality	N/A	N/A	N/A	N/A

ARDS = acute respiratory distress syndrome; ASA = American Society of Anesthesiologists; BiPAP = bilevel positive airway pressure; BMI = body mass index; CPAP = continuous positive airway pressure; CRP = C-reactive protein; CT = computed tomography; CXR = chest X-ray; DVT = deep vein thrombosis; Dx = diagnosis; GGO = ground glass opacity; HTN = hypertension; ICU = intensive care unit; LN = laparoscopic nephrectomy; MI = myocardial infarction; N/A = not applicable; NIV = noninvasive ventilation; NS = nasopharyngeal swab; PO = postoperative; RARP = robot-assisted radical prostatectomy; sCr = serum creatinine; T1DM = type 1 diabetes mellitus; TURBT = transurethral resection of bladder tumour.

<sup>a</sup> Patients 1 and 2 had a positive PO NS for SARS-CoV-2. Patient 3 had a clinical diagnosis of SARS-CoV-2. Patients 4–7 had one or more symptoms of SARS-CoV-2 and a negative NS for SARS-CoV-2.

undergoing urological surgery during the pandemic. Diagnosis of postoperative SARS-CoV-2 infection is difficult, as symptoms mimic common postoperative surgical complications (eg, atelectasis). Patients who experience postoperative COVID-19 are likely to develop significant respiratory complications and have a prolonged inpatient admission. Information from this study will enable surgeons to balance the risk of delaying urgent surgical procedures against the increased morbidity and mortality associated with SARS-CoV-2 infection.

**Conflicts of interest:** The authors have nothing to disclose.

## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.eururo.2020.05.012>.

## References

- [1] Stensland KD, Morgan TM, Moizadeh A, et al. Considerations in the triage of urologic surgeries during the COVID-19 pandemic. *Eur Urol* 2020;77:663–6.

- [2] Campi R, Amparore D, Capitanio U, et al. Assessing the burden of nondeferrable major uro-oncologic surgery to guide prioritisation strategies during the COVID-19 pandemic: insights from three Italian high-volume referral centres. *Eur Urol* 2020;78:11–5.
- [3] Health Protection Surveillance Centre. Novel coronavirus. Dublin, Ireland: HPSC; 2020. [www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/](http://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/)
- [4] Royal College of Surgeons in Ireland. Coronavirus. Clinical guidance for surgeons. Dublin, Ireland: RCSI; 2020. [www.rcsi.com/dublin/coronavirus/surgical-practice/clinical-guidance-for-surgeons](http://www.rcsi.com/dublin/coronavirus/surgical-practice/clinical-guidance-for-surgeons)

<sup>a</sup>Department of Urology, Beaumont Hospital, Dublin, Ireland

<sup>b</sup>Department of Infectious Diseases, Beaumont Hospital, Dublin, Ireland

<sup>c</sup>Department of Microbiology, Beaumont Hospital, Dublin, Ireland

<sup>d</sup>Department of Clinical Microbiology, The Royal College of Surgeons in Ireland, Dublin, Ireland

<sup>e</sup>Department of International Health and Tropical Medicine, Royal College of Surgeons in Ireland, Dublin, Ireland

<sup>f</sup>Department of Surgery, The Royal College of Surgeons in Ireland, Dublin, Ireland

\*Corresponding author. Department of Urology, Beaumont Hospital, Dublin 9, Ireland. Tel. +353 1 8093000.

May 12, 2020

# Surgical Volume, Safety, Drug Administration, and Clinical Trials During COVID-19: Single-center Experience in Shanghai, China

Hongkai Wang<sup>a,b</sup>, Junlong Wu<sup>a,b</sup>, Yu Wei<sup>a,b</sup>, Yao Zhu<sup>a,b,\*</sup>, Dingwei Ye<sup>a,b,\*</sup>

Since December 2019, COVID-19 has spread rapidly around the world [1,2]. Patients with genitourinary cancers are facing delays to treatment and thus oncological outcomes may be compromised. Here we report the impact of COVID-19 on surgical volumes, surgical safety, drug administration, and clinical trials in our center, which is one of the largest genitourinary cancer departments in China.

During the COVID-19 epidemic in China, we experienced an 80% decrease in surgery volumes (Fig. 1A). Urgent surgery was still performed for more lethal cancers such as T2+ bladder cancer, T3+ renal cell carcinoma, renal pelvic carcinoma, and high-risk prostate cancer (Supplementary Table 1). Surgery for less lethal disease (eg, repeat transurethral resection of bladder tumor) was significantly decreased, which meant using a tailored approach to maximize patient benefit. We also tried to reduce unnecessary hospital visits for cancer patients as they have a higher risk of COVID-19 infection [3]. On February 19, 2020, we saw a drop in the supply of blood products as COVID-19 prevented blood donation. Thus, we had to stop most of the surgeries for more advanced cancers, resulting in another 75% decrease for such patients (Fig. 1B). This highlights that

redistribution of blood products is needed as early as possible during public health emergencies.

The general condition of surgical patients was better during this time than previously. Patients were less likely to have comorbidities, postoperative complications decreased by 20%, and the transfusion rate was nearly 0%, although discharge times were similar to 2019. One reason for this might be that patients with unknown fever or abnormal blood cell counts were transferred to designated COVID-19 hospitals. Fewer patients aged >70 yr presented for surgery (a decrease of 82% was observed; Fig. 1C). This may reflect the higher death rate from COVID-19 in this group of patients, which might have made them more cautious. Oral drug administration was not delayed, but intravenous chemotherapies, percutaneous injection of androgen deprivation therapy (ADT), and intravenous PD-1 therapies were restricted. Appropriate deferral of ADT and PD-1 immunotherapies (not recommended to be delayed for >1 mo) was allowed. Enrollment in clinical trials was stopped from January 19 to March 2, and patients within trials had numerous protocol deviations. Of 110 patients in 33 ongoing clinical trials, each