Urology in the Era of COVID-19: Mass Casualty Triage

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Abstract
Introduction: The COVID-19 pandemic represents an uncertain challenge that could generate large numbers of patients in a short period of time.
Methods: How best to manage this situation is evolving. There will not be an ideal solution so we must all work together to solve the challenge.
Results: Applying principles of mass casualty medicine in triaging urology patients in need of elective and emergent surgeries is of paramount importance.
Conclusions: Accordingly, there is a crucial need to find a guide to pragmatic management of urological patients during this pandemic.

Key Words: COVID-19, triage, pandemics

COVID-19 was announced as a pandemic by the WHO on March 11, 2020.1 This unprecedented health event places massive pressure on health care systems worldwide, in addition to severe negative social and economic impact. Although there is no direct effect of COVID-19 on the urinary tract from a urological point of view,2 this does not mean urologists will not get involved.

With the massive impact on health care systems we need a proper plan to face the anticipated rise in demand from health care, thus the need to reduce the level of activity in all surgical specialties including urology. This stepping down approach is necessary to follow infection control guidance, minimize the number of patients physically present in the hospitals, increase bed allowance for any possible sharp rise in COVID-19 admissions as well as free all possible equipment such as ventilators to be available whenever needed and to free many staff members to support health care demand for alternative roles.

The Royal College of Surgeons (RCS) published guidance for surgeons working during the COVID-19 pandemic,3 stating that the surgical workforce will need to adapt during the pandemic. Priorities in order of importance are to maintain emergency surgical capabilities, preserve the surgical workforce, fulfill alternate surgical roles and fulfill alternate nonsurgical roles.

The RCS recommendation was that any plan be dynamic, reactive and ready to change as the situation unfolds. Surgeons need to be flexible and collaborative, and show leadership in what are expected to be trying times. At some point, surgeons will triage and deliver health care to patients for maximal benefit as in mass casualty scenarios.3

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Abbreviations and Acronyms
NSAIDs = nonsteroidal anti-inflammatory drugs
PPE = personal protective equipment
PSA = prostate specific antigen
RCC = renal cell carcinoma
TURBT = transurethral bladder tumor resection
USS = ultrasound
Multiple professional societies have studied the science of sudden onset disaster mass casualty incidents to create and promote surge response guidelines. The COVID-19 pandemic has presented the health care system with challenges that have limited science to guide the staff, stuff and structure surge response.4 The WHO declared Europe the epicenter of the COVID-19 pandemic, with Italy being the hardest hit. In the United Kingdom, London is the most greatly affected. Similarly, in the United States, New York City is the most affected. Unfortunately, the U.S. had the highest number of cases reported at the time of writing this article. Meanwhile, COVID-19 has not yet hit the Middle East and North Africa as hard as the rest of the world.1

In the face of this pandemic, diminishing resources in most health care facilities makes the situation more critical, highlighting the crucial need to find a guide to pragmatic management of urological patients during this pandemic. On March 19, 2020 the British Association of Urological Surgeons (BAUS) launched a series of valuable guidance on management of various urological patients since service provision may need to deviate from the internationally accepted standard of care during the current COVID-19 pandemic.5

Outpatients

All clinics are to be converted into a virtual/telephone clinic at the main hospital site, which is the simplest form of telemedicine. Telemedicine is the use of telecommunication and information technologies in order to provide clinical health care at a distance. The current COVID-19 pandemic is again reminding us of the importance of using telehealth to deliver care, especially as a means of reducing the risk of cross-contamination caused by close contact.6

Nevertheless, relying just on sporadic uptake of telehealth, as in times of emergency such as the COVID-19 pandemic, is problematic. Clinician acceptance of telehealth relies on their perception of telehealth as effective, safe and normal. Clinicians may not be knowledgeable and aware of telehealth, which is not surprising given the limited telehealth training.6

At the main hospital site outpatient department 1 room should be prepared to be a clean urology room for patients who may need face-to-face consultation and it will be equipped with catheter stock and a flexible cystoscopy stack system.

BAUS COVID-19 Guidance: Bladder Cancer

Hematuria investigation, TURBT and treatment are outlined in Appendix 1.

COVID recommendation policy is against intravesical bacillus Calmette-Guérin or chemotherapy for nonmuscle invasive bladder cancer due to potential immunosuppressive effects. For patients currently on bacillus Calmette-Guérin complete induction if possible and then defer further treatment. COVID recommendation policy advises against neoadjuvant chemotherapy. All patients who have started radical radiotherapy to the bladder should continue.

BAUS COVID-19 Guidance: Prostate Cancer

Continue with current diagnostics and treatment protocols as long as possible but the diagnostic and treatment pathway may not be sustainable. Minimize the risk of missing significant prostate cancer and minimize risk of disease progression in those already diagnosed. Minimize imaging requests as radiology staff are likely to be deployed to emergency services. Magnetic resonance imaging scanners could be a potential source of COVID-19 transmission due to their enclosed space with reduced access/availability to patients with cancer and computerized tomography scanners are likely to be vital resources for the respiratory/intensive therapy unit teams.

Assume that PSA blood testing remains available. If patients are elderly/frail it may be most appropriate not to perform blood testing at present. For patients on primary androgen deprivation therapy the need for PSA followup can be put back to 6 monthly (Appendix 2). Radiotherapy should be avoided unless of urgent necessity due to rapid loss of function, eg spinal cord compression. The BAUS panel acknowledges that this will be exposing an increasing proportion of men to hormone therapy who would not ordinarily have chosen this modality. COVID recommendation policy is to avoid transrectal ultrasound guided prostate biopsy if possible due to risk of sepsis, which will necessitate hospital admission and possible critical care support.

BAUS COVID-19 Guidance: Kidney Cancer

Wherever possible, patients with suspected or proven kidney cancer should be treated according to currently accepted investigative and treatment strategies, until resources become so limited that severe risk stratification is required (Appendix 3). There is no role for renal mass biopsy.

COVID recommendation policy advises that there should be no role for the use of partial nephrectomy, ablation or stereotactic radiotherapy in the management of T1 cases during this period.

For BAUS COVID-19 guidance on testicular cancer see Appendix 4.
Urolithiasis

There is no COVID-19 guidance schema regarding management of urolithiasis published by any international or national urological association at the time of this writing. A recent publication proposed a simplified protocol for triaging patients with urinary stones during this pandemic, recommending a conservative approach in managing cases of renal colic to avoid in-hospital admissions.7 Included in that protocol is a telephone consultation to screen patients for history and/or symptoms suggestive of COVID-19 in order to manage accordingly. Any patient with suspected or confirmed COVID-19 requiring urgent endourological intervention would be treated in a dedicated operating room.

Surgical priority assessment was suggested for patients scheduled for stone surgical intervention based on several parameters, including stone size and location, obstructive uropathy, symptom control, presence of indwelling ureteric stent or nephrostomy tube, and other related factors, eg solitary kidney or impaired renal function.7

Based on their model treatment of a patient with a unilateral nonobstructing renal stone and normal renal function can be delayed, giving priority to a patient with a solitary kidney or an obstructing ureteral stone. Patients with urinary stones represent a wide spectrum of different case scenarios that need judicious clinical decision making to prioritize their management.7

Another recent publication addressed the safety of using non-steroidal anti-inflammatory drugs, eg ibuprofen, in urological practice, especially after few recent reports raised concerns about whether NSAIDs worsen COVID-19 symptoms.8 They concluded that NSAIDs are the most efficient treatment for renal colic, and are still indicated and should be maintained. Only in the case of doubt for a symptomatic viral infection with fever should NSAIDs be avoided and paracetamol (acetaminophen) be prescribed instead.

Inpatients

Emergency admissions are definitely justified, with communication with the accident and emergency team and surgical senior house officers to avoid any unnecessary admissions. A high index of suspicion must be maintained before diagnosing a patient in the emergency department with urosepsis in order to avoid misdiagnosis. Fever was identified in 43.8% of patients with COVID-19 on presentation.2 Thus, these patients need to be managed in isolation until a definite diagnosis is confirmed.

In such cases laboratory results can be helpful in guiding physicians in their clinical judgment. Checking full blood count is invaluable since lymphopenia has been found in more than 80% of patients with COVID-19 compared to neutrophilia known for actual bacterial sepsis.2 Also, serum ferritin is elevated in severe morbidity associated with COVID-19.9 Finally, according to European Urological Association guidelines, procalcitonin is a raised inflammatory marker in severe bacterial rather than viral infections.10 COVID-19 does not seem to increase the procalcitonin level.2

Theaters

The BAUS has published a triage schema for step down cancellation of urological surgical procedures during time of the pandemic,5 classifying certain procedures into low risk or high risk based on intensive care unit capabilities in the face of high demand for ventilators to support patients with COVID-19 (Appendix 5).

The American Urological Association (AUA) published considerations for elective urological surgery during COVID-19 by AUA Public Policy Chair Dr. Christopher Gonzalez, who stated that “we are seeing an incredibly rapidly evolving pattern which is also unprecedented and we do not have a road map for this, so a lot of learning is being done on the job.”11

The AUA recommended the general guidance proposed by the American College of Surgeons (ACS) to limit nonessential adult elective surgery and medical and surgical procedures. These considerations should assist in the management of vital health care resources during this public health emergency as well as in decisions that should be based on case-by-case evaluation. The ACS guidance for triaging surgical patients during the pandemic is summarized in Appendix 6.11

Uropathology

The frequency of specimens in urology being sent for pathological examination is decreasing during the pandemic crisis. Nevertheless, some surgeries such as inguinal orchiectomy, radical cystectomy and some radical nephrectomies cannot be delayed. Pathologists must be extremely cautious when handling such urological specimens. When sending fresh samples, pathologists should be given information regarding the patient’s COVID-19 status.12

The WHO recently published recommendations for handling COVID-19 positive specimens, eg pneumatic tube systems must not be used and specimens must be delivered by hand. Transport must be according to good biosafety practices and safety recommendations. Working under a laboratory extractor is mandatory in case of COVID-19 positivity. This applies to urine as well as surgical specimens.12
Regarding fresh-frozen specimens, the same protections for technical and medical staff must be applied. However, the main problem is persistence of COVID-19 on inanimate surfaces such as cryostats. The virus can survive temperatures of −20°C, the temperature used for cutting of fresh-frozen sections. Therefore, it is extremely important to reduce fresh-frozen sections to a strict necessity basis as cryostat disinfection takes a long time and many laboratories have only 1 cryostat available for fresh-frozen sections.12

Use of Personal Protective Equipment

Urologists generally do not perform aerosol generating procedures but are exposed to urine and blood in the course of their work. The risk of contamination from urine splash is minimal as COVID-19 has not been identified in urine to date (other coronaviruses have been found in urine). Aerosol risks to urologists may be more significant from patients coughing during intimate procedures, eg catheter insertion, cystoscopy or following intubation/extubation.

General advice has been published by BAUS (Appendix 7).5 If asked to perform a procedure on a ventilated patient, eg catheterization, make sure that it has been at least 20 minutes since intubation or any disconnection, wear an FFP3 mask or ventilated hood, and assume that all surfaces are contaminated. You should only enter the theater after 20 minutes when the airway is secured, fully connected and you have been informed that it is safe to do so (it can take 20 minutes for the aerosol to settle). At the end of the procedure the patient should be moved to a bed with no disconnection. The surgical team should then leave the theater as soon as possible to avoid exposure to aerosol during extubation. Everyone apart from the anesthetic team must leave the theater and only then should that team wake the patient. We have to assume the majority of patients seen in the next 3 months will have been exposed to COVID-19. Only perform invasive procedures on urgent and emergency cases. FFP3/N95 masks must be fit-checked. Remember all PPE equipment is single use. Reduce patient contact to a minimum and minimize the number of staff involved. Avoid diathermy smoke and if possible use a smoke extractor. Careful desufflation must be performed before port removal in laparoscopy to avoid it becoming an aerosol generating procedure. For self-ventilating cases, as well as your own PPE, make sure the patient wears a standard surgical mask during the procedure.

Conclusion

The COVID-19 pandemic is a health crisis faced by the whole world and posing a major challenge to every health care system. Urologists and other health care professionals generally make decisions based on the best available evidence. Reliable evidence about COVID-19 has yet to emerge, which makes it difficult to determine best practices in providing care. Accordingly, applying principles of mass casualty medicine in triaging urology patients in need of elective and emergent surgeries is of paramount importance.

Appendix 1.

| Clinical scenario          | Reduced service | Severely reduced service |
|----------------------------|-----------------|--------------------------|
| Hematuria investigation:  |                 |                          |
| Visible hematuria over     | Hematuria clinic | USS/Emergency service if severe fundoscopy and actively bleeding patients. |
| 45 years                  | USS/Defer       | Defer                    |
| Non visible hematuria      |                 |                          |
| over 60 years              |                 |                          |
| TURBT:                    |                 |                          |
| New bladder tumor         | Restrict to solid tumors | Stop TURBT                |
| Re-resection of bladder   | Restrict to very high risk nonmuscle invasive bladder cancer (ie very strong suspicion of under staging) | Stop TURBT                |
| tumor                     |                 |                          |
| Treatment:                |                 |                          |
| Nonmuscle invasive bladder | Flexible cystoscopy at 12 months | Stop surveillance |
| bladder tumor low risk    | Flexible cystoscopy at 12 months | Stop surveillance |
| Nonmuscle invasive         | Flexible cystoscopy at 6 months | Flexible cystoscopy at 12 months |
| bladder tumor intermediate risk | Flexible cystoscopy at 6 months | Flexible cystoscopy at 6 months |
| Nonmuscle invasive bladder | Flexible cystoscopy at 3 months | Flexible cystoscopy at 6 months |
| tumor high risk           | Radiotherapy    | Radiotherapy if available |
| Muscle invasive bladder    |                 |                          |
| MIBT T2-4 N0 M0 disease   |                 |                          |
| Muscle invasive bladder    |                 |                          |
| MIBT T2-4 N0 M0 where     |                 |                          |
| radiotherapy is            |                 |                          |
| contraindicated           |                 |                          |
| Flexible cystoscopy at     |                 |                          |
| 12 months                  |                 |                          |
| Flexible cystoscopy at 6   |                 |                          |
| months                     |                 |                          |
| Flexible cystoscopy at 3   |                 |                          |
| months                     |                 |                          |
| Radiotherapy               |                 |                          |
| Radiotherapy if available  |                 |                          |
| Radical cystectomy and     |                 |                          |
| urinary diversion          |                 |                          |
| Defer radical cystectomy   |                 |                          |
| for a maximum of 3 months  |                 |                          |

Appendix 2.

| Clinical scenario          | Reduced service |
|----------------------------|-----------------|
| Investigation:             |                 |
| PSA greater than 20 ng/ml  | Bone scan + start on hormone therapy + repeat PSA in 3 or 6 months |
| PSA less than 20 ng/ml     | USS estimation prostate volume so if PSA density >0.15 offer prostate biopsy; if PSA density less than 0.15 discharge for repeat PSA in 6 months |
| Treatment:                |                 |
| Low/intermediate risk      | Active surveillance PSA in 6 months or 50 mg bicalutamide once daily |
| nonmetastatic prostate     |                 |
| cancer                     |                 |
| High risk nonmetastatic    | Luteinizing hormone-releasing hormone or 150 mg bicalutamide once daily until a time is available to offer them curative therapy (radical prostatectomy/radical radiotherapy) |
| prostate cancer            |                 |
| Metastatic prostate cancer | Luteinizing hormone-releasing hormone Primary chemotherapy should be deferred |
Appendix 3.

Clinical scenario | Reduced service | Severe reduced service
--- | --- | ---
Investigation: Likely kidney tumors and complex cysts less than 4 cm | Imaging followup in 6–9 months | 
Likely kidney tumors and complex cysts more than 4 cm but less than 7 cm | Imaging followup in 3–6 months | 
T1a and T1b RCC | Surveillance | 
T2 RCC | Urgent nephrectomy | 
T3 RCC | Highest priority for urgent surgical intervention | 
Metastatic RCC | No cytoreductive nephrectomy | 
| No renal biopsy | 
| Referral to oncologist | 
| Little evidence against TKI | 

Appendix 4.

Clinical scenario | Reduced service | Severe reduced service
--- | --- | ---
Investigation: Testicular mass | US testes + tumor markers + staging computerized tomography | 
| Clinical staging if restricted access to imaging and blood tests | 
Treatment: Testicular cancer | Inguinal orchietomy | 
| Inguinal orchietomy when access permits | 
Adjuvant treatment: Pure seminoma high risk | Active surveillance or adjuvant carboplatin (provided they understand the need to self-isolate) | 
| Active surveillance | 
Nonseminoma high risk | Active surveillance or single cycle BEP (provided they understand the need to self-isolate) | 
| Active surveillance | Note: COVID recommendation policy advised there is no role for insertion of testicular prosthesis.

Appendix 5.

| 1st Cancellation | 2nd Cancellation | Last to be cancelled | Emergency cases |
| --- | --- | --- | --- |
| Day surgery, eg varicocele/hydrocele | Cystectomy (low risk) | Cystectomy (high risk) | Testicular torsion |
| Benign nephrectomy | TURBT (low risk) | TURBT (high risk) | Obstructed infected kidney |
| Andrology | Radical prostatectomy | Radical nephrectomy | 
| Functional/ reconstructive surgery | Nephroureterectomy (low risk) | Nephroureterectomy (high risk) | 
| Percutaneous nephrolithotomy | Inginal orchietomy | 
| Transurethral prostate resection, holmium laser prostate enucleation and other procedures for benign prostatic hyperplasia | Ureteroscopy with ureteric stone/stented patient | 

Appendix 6.

| Definition | Action | Example |
| --- | --- | --- |
| Low acuity surgery | Postpone | Hydrolece |
| Intermediate acuity surgery (not life threatening but potential for future morbidity and mortality) | Consider postponing | Low risk cancer |
| Requires in-hospital stay | Do not postpone | Highly symptomatic patients |

Appendix 7.

| Level | COVID-19 risk | Protection level |
| --- | --- | --- |
| 1 | Low risk | Surgical mask, surgical cap, visor/goggles/glasses, surgical scrubs |
| 2 | Asymptomatic | Surgical caps, gown |
| 3 | COVID-19 positive or high risk (symptoms + fever) | Surgical mask, surgical cap, visor/goggles/glasses |
| 4 | Low aerosol risk | Gloves |
| 5 | COVID-19 positive or high risk | Surgical caps, gown |
| 6 | Receiving aerosol generating treatment (eg ventilation, CPAP, high pressure nasal oxygen) in intensive care unit/intensive therapy unit/high dependency unit | FFP3 mask (fitted) or ventilated hood, surgical cap, visor/goggles/glasses |

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Editorial Commentary

This article brings timely attention to the current global COVID-19 viral pandemic. This pandemic is an unprecedented crisis of enormous social, economic and humanistic impact. During uncertain times like these, constructive input with pragmatic guidance is appropriate and welcomed.

The article borrows mainly from the authority of the British Association of Urological Surgeons, which has issued procedural guidelines for services administered to patients with urological conditions. Accordingly, recommendations are provided for managing a host of common clinical scenarios ranging from hematuria to PSA elevation, for logistical coordination of urological clinics and surgical procedures, and for basic precautionary measures urologists may follow to mitigate the risk of COVID-19 infection for themselves or their patients.

The author acknowledges similar proactivity of other professional societies relevant to our practices, including the American Urological Association and the American College of Surgeons, as sources of guidance for urologists. The AUA provides an Information Center on its website (https://www.auanet.org/covid-19-info-center) that can be accessed for the latest information and direction in light of this pandemic. In addition, The Journal of Urology® is publishing several editorials on topics such as day-to-day patient care, office and hospital based triage of urology procedures, training issues and the personal impact of treating the virus. These editorials are open access and available to anyone at www.jurology.com.

We urologists are challenged in these times of urgency to implement certain initiatives and courses of action. This includes medical triaging, which implies selectively serving patients in the near term and relegating some to receive less prompt care. This practice reconciles the realities that our medical profession as clinical specialists only occasionally situates us on the front lines of medical care, unlike that for many of our colleagues whose service at this time is critically needed, and that many of our surgical procedures would not be readily classified as “essential.” However, we should accept the responsibilities of conserving medical resources, applying alternative health care strategies (possibly for the long term) such as telehealth services, and preparing to deploy as clinicians in ways unconventional for our medical backgrounds but nonetheless adaptively with qualifications we can lend.

We are challenged in these times of enormous humanitarian need. We all must move forward smartly and collectively to achieve the best good. Our response must be that of strength of mind, action and spirit, as well as unity of purpose, to overcome this crisis.

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