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Urologic oncology surgery during COVID-19: a rapid review of current triage guidance documents

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Abstract

The Coronavirus Disease 2019 pandemic placed urologic surgeons, and especially urologic oncologists, in an unprecedented situation. Providers and healthcare systems were forced to rapidly create triage schemas in order to preserve resources and reduce potential viral transmission while continuing to provide care for patients. We reviewed United States and international triage proposals from professional societies, peer-reviewed publications, and publicly available institutional guidelines to identify common themes and critical differences. To date, there are varying levels of agreement on the optimal triaging of urologic oncology cases. As the need to preserve resources and prevent viral transmission grows, prioritizing only high priority surgical cases is paramount. A similar approach to prioritization will also be needed as nonemergent cases are allowed to proceed in the coming weeks. While these decisions will often be made on a case-by-case basis, more nuanced surgeon-driven consensus guidelines are needed for the near future. © 2020 Published by Elsevier Inc.

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Introduction

First reported in Wuhan, China on December 31, 2019, the Coronavirus Disease 2019 (COVID-19) has placed healthcare systems in an unprecedented situation. By January 20, 2020, the United States had its first case, and on March 11, 2020 the World Health Organization declared COVID-19 a pandemic [1,2]. An expected shortage of hospital beds, personal protective equipment, ventilators, and the need to limit close physical interaction in order to reduce potential viral transmission rapidly affected the care urologic surgeons are able to safely provide.

While urologic surgeries often contribute to just a portion of the overall surgical volume for most hospitals, urologists must be prepared to alter their practices to meet the

demands of the pandemic. The reported experiences of urology departments elsewhere in the world highlight this extraordinary burden being placed on hospitals. In Italy, a 30% reduction in urologic cases at a large tertiary care center within 2 weeks of the outbreak gave way to the cessation of all surgical cases not long after [3]. Similar reductions occurred at one of the largest hospitals in Singapore in order to preserve resources [4]. In the absence of an across-the-board discontinuation of surgical cases, guidelines on which operations should be prioritized are needed.

Urologists, and specifically urologic oncologists, are faced with especially unique challenges in producing universal triage schemas, given that our patients have a wide range of conditions with varying levels of acuity. The need to implement these guidelines will vary across different locations based on the impact of COVID-19 in each locality. Additionally, acute phases of the outbreak with the highest surges in affected patients and limitations in resources may necessitate different schemas than later recovery phases. Many groups have suggested triage proposals to

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assist with these decisions. Herein, we sought to review current United States and international urologic oncology triage proposals from professional societies, peer-reviewed publications, and publicly available institutional guidelines as of May 9, 2020 to identify common themes and critical differences.

Acute phase triage

Prior to the COVID-19 outbreak, no guidelines existed for urologic oncology surgical triage. The American College of Surgeons (ACS) initially adapted an Elective Surgery Acuity Scale (ESAS) to assist in the surgical decision-making process [5]. The American Urological Association has thus far embraced these ACS guidelines as well [6]. While not entirely specific to urology, ESAS offers three tiers of acuity based on the morbidity-potential of the illness and also factors in the overall health of the patient. “Low-risk” cancer is placed in Tier 2, or intermediate acuity surgery, and surgery is recommended for postponement if possible. All other cancers are considered high acuity Tier 3 and should not be postponed. Clearly, this leaves a considerable amount of room for interpretation and the nuances of oncologic care are not fully encapsulated by this schema. To overcome the limitations of the ESAS, the ACS has started to produce a more detailed framework for handling cancer care during the pandemic [7]. Although not yet comprehensive to include all urologic malignancies, it incorporates different phases of the pandemic and provides initial guidance for when the curve is flattened and declining.

Several groups have proposed triage guidelines that are more specific to individual disease sites. Unfortunately, there is considerable heterogeneity among these recommendations, making a consensus policy difficult to produce (Tables 1 and 2). Despite this, common themes exist which can help guide provider decision-making. Radical cystectomy for muscle invasive bladder cancer was universally considered a surgery that should not be postponed [8–10]. This is likely a reasonable approach given prior reports showing a significant decrease in survival outcomes associated with delaying surgery in this population [11,12]. Similarly, there is agreement that clinical stage \geq T3 renal cell carcinoma should be given highest priority [8–10,13–15]. A delay in surgical extirpation for these advanced cases may exacerbate local and systemic symptoms often associated with the disease in addition to leading to worse surgical outcomes [16]. For testicular cancer, a radical orchiectomy was also collectively listed as a high priority case [8,10,13–15,17]. Prompt surgical removal can expedite the start of potentially curative systemic therapy depending on the pathologic diagnosis. Additionally, these operations are typically same-day procedures and thus utilize a relatively small amount of resources.

On the other hand, it is less clear how high-risk nonmuscle invasive bladder cancer should be managed. Stensland et al. recommend surgery only for CIS refractory to third-line

therapy [8]. These guidelines are more stringent than those proposed by Kutikov et al. who suggested performing radical cystectomy for all high-risk nonmuscle invasive cancers without delay [9]. Conversely, institutional protocols from Duke University classified high-risk nonmuscle invasive disease as intermediate priority [10]. Two authors proposed schemas in which radical cystectomy for all high-risk bladder cancer are given highest priority, but low-risk cancer surgeries can be postponed [13,17]. Similar to the lack of granularity within the ACS guidelines, classifying bladder cancer by simply low- or high-risk without further stratification by muscle invasion, prior treatments, or other disease characteristics may place some patients in a higher priority category than necessary. This lack of triage consensus may have detrimental downstream effects on healthcare systems that experience severe resource shortages.

Most providers would likely agree that the majority of men with low-risk prostate cancer should undergo active surveillance. However, guidelines on the optimal handling of radical prostatectomy (RP) for men with intermediate- and high-risk prostate cancer are not congruent. The National Comprehensive Cancer Network suggests radical surgery for patients with asymptomatic unfavorable intermediate-, high-, and very high-risk prostate cancers can be deferred [18]. They note that surgery can be delayed “until deemed safe,” which does not account for the potential long-term changes to healthcare systems caused by COVID-19. Goldman et al. suggest surgery be delayed for no more than 4 weeks in intermediate-risk and higher disease [13]. Alternatively, Kutikov et al. advocate that performing RP within 3 months is acceptable for high-risk prostate cancer and delaying $>$ 3 months is safe for low- or intermediate risk [9]. The recent ACS triage guidelines restricts RP to men with unfavorable intermediate- and high-risk prostate cancer diagnosed $>$ 3 months prior if the hospital still has adequate resources including ICU and ventilator capacity, minimal COVID-19 patients, and no rapid increase in patients is expected [7].

Urologic malignancies that are less prevalent present a unique challenge in this current situation. Data for these tumors are fairly limited, and thus fitting them into triage schemas is difficult. For example, some authors have a broad recommendation of first priority surgery for penile cancer and delayed treatment for adrenal tumors [13]. Others take a more nuanced approach, and categorize these based on tumor size and stage [8,10]. In cases where the effects of delaying surgery on survival is less clear, it may be reasonable to prioritize patients who are actively symptomatic.

A recent analysis from three centers in Italy reported that over 750 cases from the previous year were high-priority according to one classification schema [19]. Furthermore, many patients were part of the vulnerable population as 26% had an American Society of Anesthesiologist score of \geq 3. Comparable centers in the US likely have similar statistics. For this reason, urologists must be prepared to triage patients in their own practice by priority levels for surgery. Especially in

Table 1
Published peer-reviewed surgical triage schemas for urologic malignancies

Cancer Type/Stage	Goldman et al. [13]	Stensland et al. [8]	Kutikov et al. [9]	Desouky et al. [17]
Renal				
cT1-2	<ul style="list-style-type: none"> • Can delay >12 weeks SRM • Delay 4–12 weeks if partial nephrectomy for mass >4 cm • Delay <4 weeks for radical nephrectomy 	<ul style="list-style-type: none"> • Consider for delay based on patient considerations such as age, morbidity, symptoms, and tumor growth rate 	<ul style="list-style-type: none"> • Can delay >3 mo for renal mass <3 cm • No delay for >T1b 	<ul style="list-style-type: none"> • Delay T1 • No delay for T2
≥cT3	<ul style="list-style-type: none"> • No delay 	<ul style="list-style-type: none"> • No delay 	<ul style="list-style-type: none"> • No delay for >T1b 	<ul style="list-style-type: none"> • No delay
Adrenal				
	<ul style="list-style-type: none"> • Delay <4 weeks if cancer is suspected or symptomatic • Delay >12 weeks if cancer is not suspected and asymptomatic 	<ul style="list-style-type: none"> • Consider delay for less suspicious tumors (<6 cm, favorable imaging characteristics) • No delay for suspected ACC or tumors >6cm 	N/A	N/A
UTUC				
	<ul style="list-style-type: none"> • No delay for nephroureterectomy 	<ul style="list-style-type: none"> • No delay for high-grade and/or cT1+ tumors 	<ul style="list-style-type: none"> • Delay >3 mo for low-grade UC • No delay for high-risk nonmuscle invasive or muscle-invasive UC 	<ul style="list-style-type: none"> • Nephroureterectomy for high-risk last to be cancelled • Low-risk second cancellation tier
Bladder				
	<ul style="list-style-type: none"> • No delay for “high risk” • Delay 4–12 weeks for “not high risk” 	<ul style="list-style-type: none"> • No delay for MIBC or CIS refractory to third-line therapy 	<ul style="list-style-type: none"> • Delay >3 mo for low-grade UC • No delay for high-risk nonmuscle invasive or muscle-invasive UC 	<ul style="list-style-type: none"> • Cystectomy for high-risk last to be cancelled • Cystectomy for low-risk—second cancellation tier
Prostate				
	<ul style="list-style-type: none"> • Delay <4 weeks if GG3-5 OR GG2 with more than 2 cores OR tumor length >5 mm OR Gleason 3_3 with >50% core positivity in number of cores OR any PSA >10 • Can delay >12 weeks if GG1 OR GG2 with 2 or fewer cores of max length <5 mm 	<ul style="list-style-type: none"> • Consider radiation for NCCN high-risk patients • Surgery for select high-risk patients if ineligible for radiation 	<ul style="list-style-type: none"> • Delay >3 mo for low- and intermediate risk • Delay <3 mo for high-risk 	<ul style="list-style-type: none"> • Second cancellation tier
Testicular				
	<ul style="list-style-type: none"> • No delay for orchiectomy • Delay RPLND <4 weeks 	<ul style="list-style-type: none"> • No delay for orchiectomy or postchemotherapy RPLND 	N/A	<ul style="list-style-type: none"> • Orchiectomy last to be cancelled
Urethral/ Penile				
	<ul style="list-style-type: none"> • No delay for penile cancer 	<ul style="list-style-type: none"> • Surgery for clinically invasive or obstructing cancers 	N/A	N/A

the oncologic setting, this may be distressing to both the patients and surgeons [20]. Choosing one patient over another to undergo a cancer treatment from which they would both benefit undoubtedly represents an ethical dilemma. To address this issue, Prachand et al. developed a scoring system to quantitatively assist in the decision-making process [21]. It wisely incorporates disease and patient characteristics, as well as elements that affect resource limitations and COVID-19 transmission such as the projected length of hospital stay and need for ICU care. However, it is not clear if this type of tool would unjustly prioritize certain malignancies over others, or whether it maximizes the number of patients able to be treated.

Recovery phase triage

In addition to selecting which patients should undergo surgery at the height of resource limitations in hospitals, optimal pathways for when time-sensitive, nonemergent oncologic surgeries eventually start to resume must also be produced [7]. This is potentially even more complicated as the backlog of cases at some institutions will be immense and there is no clear benchmark for when it is safe to resume surgeries that are not emergent. A fundamental understanding of the capabilities and constraints of each hospital, as well close monitoring of the number and trend

Table 2
Institutional surgical triage schemas for urologic malignancies

Cancer Type/Stage	Duke University [10]	Guy's and St. Thomas' [14]	Dana-Farber/Brigham and Women's [15]
Renal			
cT1-2	<ul style="list-style-type: none"> • T1—low priority • T2—intermediate priority 	<ul style="list-style-type: none"> • Nephrectomy (time-sensitive) last to be cancelled 	<ul style="list-style-type: none"> • Defer surgery until normal services resume
≥cT3	<ul style="list-style-type: none"> • Highest priority 	<ul style="list-style-type: none"> • Last to be cancelled 	<ul style="list-style-type: none"> • Perform surgery without delay
Adrenal	<ul style="list-style-type: none"> • >3 cm tumors—high priority • <3 cm tumors—intermediate priority 	N/A	N/A
UTUC	<ul style="list-style-type: none"> • Ta/T1 low or high grade—Intermediate priority • T2—high priority 	<ul style="list-style-type: none"> • Nephroureterectomy for low risk—second cancellation tier • High-risk disease—last to be cancelled 	N/A
Bladder	<ul style="list-style-type: none"> • Intermediate risk NMIBC—low priority • High-risk NMIBC—intermediate priority • MIBC—high priority 	<ul style="list-style-type: none"> • Cystectomy for low-risk cancer—second cancellation tier • High risk disease—last to be cancelled 	<ul style="list-style-type: none"> • Cystectomy within 8 weeks of neoadjuvant chemotherapy
Prostate	<ul style="list-style-type: none"> • Intermediate risk, <6 mo wait—low priority • High risk, <6 mo wait or Intermediate risk, >6 mo wait—Intermediate priority • High risk, >6 mo wait- high priority 	<ul style="list-style-type: none"> • High cancer risk—second cancellation tier 	<ul style="list-style-type: none"> • Low and favorable intermediate risk—defer surgery • High risk—consider neoadjuvant therapy while awaiting surgery
Testicular	<ul style="list-style-type: none"> • Primary RPLND—low priority • Postchemo RPLND, stable mass—intermediate priority • Orchiectomy, growing postchemo mass RPLND—high priority 	<ul style="list-style-type: none"> • Orchiectomy—last to be cancelled 	N/A
Urethral/ Penile	<ul style="list-style-type: none"> • Tis/Ta/T1/low grade—intermediate priority • T2+/High grade—high priority 	N/A	N/A

of COVID-19 cases in the community will be critical in this regard [22]. Providers must also be prepared to adapt their practices multiple times as the burden of COVID-19 may fluctuate. Given our knowledge of prior influenza pandemics, multiple peaks over time will force a toggling between acute and recovery phase triage schemas [23].

Whether or not the same prioritization schemas developed for the surge of patients will apply to a recovery phase is unknown. During the acute phase of the outbreak when resource utilization is at or near its peak, only the most time-sensitive procedures will likely be performed. A recent review of ethical considerations during this time highlights the need to avoid discrimination in resource allocation between patients with COVID-19 and those without [24]. Thus, in the absence of a complete shutdown of surgical services, every effort should be made to perform the highest priority cases in which any delay in care may confer adverse oncologic outcomes.

For patients in which a delay in surgery may be acceptable, accounting for surgical and patient characteristics that may further deplete resources are important to consider

when creating triage schemas. Factors such as patient comorbidities and performance status, complication risks of the surgery, and expected need for resources such as blood products and intensive care unit admission should be included in the decision-making process. Healthcare systems in coordination with providers should take stock of these metrics associated with each surgical procedure to help in this regard [25]. Although the top priority should always be maximizing patient outcomes, this information will be valuable in estimating the rate at which nonemergent cases are able to occur, especially during the recovery phase.

Conclusions

The COVID-19 pandemic has rapidly changed urology departments and training programs worldwide [26]. As the need to preserve resources and reduce transmission of COVID-19 increases, prioritizing only high priority surgical cases is paramount. In the urologic oncology setting, evidence-based approaches should be developed and employed as we learn from COVID-19 to decide which

cases can be delayed without compromising survival and functional outcomes. Triage schemas from individual institutions are useful to review in order to understand different treatment practices in this rapidly evolving environment. However, consensus guidelines will be vital in allowing urologic oncologists to continue providing high-level, standardized care to patients in all locations. To date, both the European Association of Urology and British Association of Urological Surgery have prepared such recommendations [17,27]. Importantly, the development of consensus triage schemas should involve urologic oncologists, anesthesiology/nursing leadership, hospital leadership, epidemiologists, health policy experts, and medical ethicists. Factors such as cancer type and risk, patient characteristics, local COVID-19 epidemiology, and healthcare system resources should be incorporated into surgical decision making as well. While there is an immediate need for these protocols in the current environment dealing with COVID-19, such guidelines will be useful in any situation when healthcare resources are limited. As the current situation rapidly evolves, we must be diligent to critically read and evaluate all new evidence and recommendations [28–31]. Minimizing the depletion of resources to combat COVID-19 without unjustly placing the patient population at increased risk of poor outcomes from their genitourinary malignancies should be the ultimate goal.

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