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Platinum Opinion

Considerations in the Triage of Urologic Surgeries During the COVID-19 Pandemic

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As hospitals begin bracing for the possibility of a surge in demand for ventilator-level care for COVID-19 cases, the possibility of having to cancel elective surgeries to increase access to care is real. Many hospitals, and the American College of Surgeons, are recommending cancellation of elective surgeries [1]. The term *elective* in this setting is inherently vague and open to interpretation. As a result, urologists and hospitals throughout the world will have to make their own difficult decisions about which surgeries should continue under the current circumstances. While hospital systems and/or governments may request that "elective procedures" be delayed until the strain on the hospital system from COVID-19 has decreased, the characteristics of an "elective" procedure in urology are context-dependent and have not been well defined in the current crisis.

Lessons learned from Singapore, Asia, and some European countries will be important in helping us respond to these challenging demands [2]. The choice of urgent or emergent surgeries that should still occur will depend on capacity and demand, but must also be counterbalanced by the effects of delaying surgery. This is particularly true for patients with urological cancers and complicated stones. Urologists can help by decreasing the demand for ventilators, personal protective equipment, and other critical hospital and human resources by minimizing surgeries without compromising patient outcomes whenever possible. As a community, we must also weigh the impact of nonsurgical therapies such as systemic chemotherapy that can leave patients at greater risk of contracting and potentially succumbing to COVID-19.

Will the global pandemic change short-term progression and/or mortality rates for aggressive urologic cancers? And will this affect the in-hospital mortality and complication rates for frail patients with aggressive genitourinary malignancies? Prior data on delays to care are the best current guide by which we can begin to select cases to prioritize in the face of acutely decreased resources and diversion of operative resources to care for COVID-19 patients.

We have put together preliminary recommendations in that regard and discuss the rationale for these difficult decisions. These suggestions were curated with input from multiple departments in the USA and Europe. In general, considerations should include nonsurgical treatments when available or deferral of surgery until the demand for ventilators and inpatient beds falls, where possible.

Table 1 is a suggested list of surgeries that should be prioritized if COVID-19 surges warrant cancellation of most elective surgery. These recommendations, which can be applied in the current and any future situation in which ventilators and other operating room resources are scarce, prioritize moving forward with cases where evidence suggests that even short-term delays may affect patient survival. We also suggest alternatives for the management of common urgent or emergent urologic procedures that may spare the use of ventilators, and consider the use and impact of common urologic treatments on patients during an infectious outbreak. Finally, while we do not incorporate patient age and frailty into these recommendations, the risk of a postoperative COVID-19 infection and its potential impact on a patient's postoperative course should also be considered.

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https://doi.org/10.1016/j.eururo.2020.03.027

Table 1 – Suggested triage of surgical cases during the COVID-19 pandemic.

Condition	Recommended surgeries	Rationale	Average length of stay
Oncology			
Bladder cancer	• Cystectomy for MIBC, regardless of receipt of neoadjuvant chemotherapy	• Delaying cystectomy for MIBC by 90 d increases pN + rate [3], decreases OS and progression-free survival [4], and is associated with higher pathologic stage [5]	• 5–8 d (USA) [6,7]
	• Cystectomy for CIS refractory to third-line therapy		
	• TURBT for suspected cT1+ bladder tumors	• cT1 tumors are understaged in up to 50% of cases, representing a significant risk of missed MIBC [8]	• Outpatient procedure
Testicular cancer	• Orchiectomy for suspected testicular tumors	• Limited data on survival after delay to orchiectomy [9], but orchiectomy is an outpatient procedure with potential OS benefit and should be prioritized [10]	• Orchiectomy: outpatient procedure
	• Postchemotherapy RPLND	• To spare a ventilator and inpatient stay (RPLND), radiation post-orchiectomy can be encouraged when surveillance is not an option. Chemotherapy use should be balanced by concern for immunosuppression and increased risk of COVID-19 infection/sequelae	• RPLND: 4–6 d (open) [11]
	• Favor chemotherapy or radiation rather than RPLND when clinically appropriate		• 1–3 d (minimally invasive) [12]
Kidney cancer	• Nephrectomy for cT3+ tumors, including all patients with renal vein and/or IVC thrombi	• More advanced renal tumors, particularly with associated vein thrombi, may progress rapidly and create more complicated surgeries and adversely affect survival and/or surgical morbidity [13]	• Nephrectomy: 3 d [14]
	• Planned partial or radical nephrectomy for cT1 masses should be delayed or other forms of ablative approaches should be considered in selected patients		• IVC thrombectomy: 5–10 d [15]
	• Planned partial or radical nephrectomy for cT2 should be considered for delay based on patient considerations, such as age, morbidity, symptoms, and tumor growth rate	• For cT1–2 (stage I–II) masses, delaying surgery by 3 mo has not been associated with decreased CSS or OS	• 1–2 d (minimally invasive)
			• 2–4 d (open) [16]
Prostate cancer	• Most prostatectomies should be delayed	• Surgery for NCCN high risk may be considered, depending on patient age and disease risk. However, given the availability of other treatment modalities, these surgeries may receive lower prioritization than others on this list (as delay of treatment up to 12 mo, even for high risk disease, may not alter operative outcomes, cancer specific mortality, or other outcomes).	• 0–2 d [20]
	• Shared decision-making to consider radiation therapy for NCCN high-risk disease	• Biochemical recurrence rates may be higher in high-risk men who delay definitive treatment, but there is not a clear cut-off time for this treatment benefit [17–19]	
	• Surgery for NCCN high-risk disease if patient is ineligible for radiation		
	• Selected high-risk patients and those with intermediate- or low-risk cancer should be delayed		
UTUC	• Nephroureterectomy for high-grade and/or cT1+ tumors	• 3-mo delay to surgery for UTUC has been associated with disease progression for all patients, and with CSS for patients with muscle-invasive disease [9,21]	• 1–4 d [23]
		• Early-stage particularly invasive UTUC has a high risk of being understaged [22]	
Adrenal tumors	• Adrenalectomy for suspected ACC or tumors >6 cm	• Adrenal masses >6 cm are much more likely to harbor carcinoma	• 0–1 d [25]
	• Consider delay of adrenalectomy for less suspicious adrenal masses (<6 cm, favorable imaging characteristics)	• ACC progresses rapidly, and achieving R0 at surgery provides the best chance of survival. Delay may decrease resectability and affect survival [24]	
Urethral/penile cancer	• Clinically invasive or obstructing cancers	• Data for these rare tumors are limited. Preventing lymph node metastases may spare significant patient morbidity. Furthermore, partial penectomy can be an outpatient procedure that puts a lower strain on hospital resources.	• Outpatient procedure
Endourology/stone disease			
Stones	• For obstruction/infection	• When possible, stents can be placed at the bedside to spare a ventilator [26]	• Outpatient procedure (unless concurrent infection)
	• Ureteral stent insertion	• Nephrostomy tubes can be placed under local anesthesia, sparing a ventilator	
	• Consideration for awake, bedside ureteral stent placement under local anesthesia	• If neither option is possible, an obstructed or infected upper tract is an emergency requiring intervention	
	• Consideration for nephrostomy tube		

Table 1 (*Continued*)

Condition	Recommended surgeries	Rationale	Average length of stay
Indwelling ureteral stent	• Delay most procedures	• Removal can be simple for most stents left in place even for up to 6–12 mo, and endoscopic stent management is possible in most patients for indwelling times up to 30 mo [27]	• Outpatient procedure
BPH	• Delay BPH procedures (TURP, HoLEP, PVP laser, etc.)	• Urinary obstruction can be adequately treated via a urethral or suprapubic catheter without the need for a procedure under anesthesia	• TURP: 1–2 d [28]
Female urology/incontinence			
Stress urinary incontinence, interstitial cystitis, overactive bladder, neurogenic bladder	• Delay all procedures		
Nerve stimulator in place	• Second stage nerve stimulator placement or removal	• Nerve stimulators with externalized leads may have a high rate of infection if left in place and should be either internalized via second stage or removed, either of which can be performed under local anesthesia	• Outpatient procedure
Reconstructive surgery			
Fistula with pelvic sepsis	• If systemic symptoms, diversion either with catheters/drains, or formal fecal stream diversion	• Fistula repairs are resource-intensive and should be delayed when possible	• Variable
	• Delayed definitive repair unless clinical conditions would require immediate repair		
Artificial urinary sphincter explants	• Infected explants, only	• Infected sphincters may progress rapidly to systemic infection and should be addressed emergently	• Variable
Urethral stricture			
Urethral obstruction	• Delay all procedures	• Suprapubic tube or Foley catheter placement in association with urethral dilation or incision is urgent in those with impending or complete lower urinary tract obstruction	• Outpatient procedure
Prosthetic surgery			
Erectile dysfunction	• Infected explants only	• Infected implants may progress rapidly to systemic infection and should be addressed on an emergency basis	• Variable
General urology			
Soft tissue infection	• Acute infections only; scrotal abscesses, Fournier's gangrene		• Variable
Ischemia	• Shunting for priapism		• 1–3 d
	• Testicular detorsion/orchidopexy		
Hemorrhage	• Clot evacuation for refractory gross hematuria		• 1–3 d
Trauma	• Penile/testicular fracture repair		• Outpatient procedure
	• Ureteral injury		• 1–3 d
	• Bladder perforation		
Transplant			
Renal transplantation	• Deceased donor transplants only	• Deceased donor transplants should proceed without delay	• 4–8 d [29]
	• Live donor transplants delayed	• Live donor transplants should be delayed to spare resources and delay the requisite immunosuppression for recipients, which could have an impact on COVID-19 infection	
Pediatrics			
Acute torsion	• Scrotal exploration, orchidopexy		• Outpatient procedure
GU obstruction	• Foley catheter/suprapubic tube placement		• Outpatient procedure
Infertility			
	• Delay all procedures		

ACC = adrenocortical carcinoma; BPH = benign prostatic hyperplasia; CIS = carcinoma in situ; CSS = cancer-specific survival; GU = genitourinary; HoLEP = holmium laser enucleation of the prostate; IVC = inferior vena cava; MIBC = muscle-invasive bladder cancer; NCCN = National Comprehensive Cancer Network; OS = overall survival; PVP = photoselective vaporization of the prostate; RPLND = retroperitoneal lymph node dissection; TURBT = transurethral resection of bladder tumor; TURP = transurethral resection of the prostate; UTUC = upper tract urothelial carcinoma.

As with all guidelines, these recommendations must be tailored to locally available resources and situations. This document reflects preliminary expert opinion from this group, and by no means should these recommendations be considered rigid or all-encompassing. It is our hope that this preliminary evidence and opinion may provide a starting point for discussions at a local level. Furthermore, other surgical service lines can use these urology recommendations as a framework in creating their own specialty-specific recommendations.

Conflicts of interest: The authors have nothing to disclose.

Acknowledgement: We thank Carol Spencer, the Lahey Clinic Librarian, for helping to rapidly gather relevant literature relating to delay of care for each urologic cancer type.

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