REVIEW ARTICLES

FACING COVID-19 OUTBREAK IN UROLOGY DEPARTMENT

Qamar Zia, Mudassar Sajjad*

Combined Military Hospital Lahore/National University of Medical Sciences (NUMS) Pakistan, *Combined Military Hospital Malir/National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

The world has changed in a very short span of just 6 months. All branches of medical practice including urology have been immensely affected by Covid-19. We have been forced to re-think, re-organize, re-group and re-prioritize our definitions, actions and outcomes. The degrees of urgency to intervene have been redefined. There has been a massive reorganization of teams, re-structuring of rotation plans, re-scheduling of outdoor and indoor appointments and re-allocation of roles all over the world. Finding a perfect new normal may not be possible especially with the practice of social distancing and fear to contract the virus.

A modified plan has to be in place which can define the new norm in urological practice. The most important aspect would be implementing telemedicine. This could be extremely challenging and at the same time dangerous in countries like Pakistan. We have to rationalize our outpatient appointments, preoperative work-up and indications to operate with least burden on our diagnostic services. Post-operative surgical practices need modifications with less follow-up visits in person. Operations need to be performed by senior surgeons to reduce the operating time, rate of complications and exposure. Role of Interventional radiologists cannot be overstated, more nephrostomies and ante-grade procedures can lessen the burden on operating rooms and wards.

Training of urology residents have suffered in current scenario which requires redefining of their curriculum. Judicious use of personal protective equipment by healthcare providers and number of patients in crowded clinics has to be rethought about.

Keywords: Coronavirus Disease 2019, Hospital Reorganization, Urology departments, Wuhan coronavirus, 2019 novel coronavirus.

INTRODUCTION

World Health Organization (WHO) officially declared COVID-19, a potentially lethal infection, as pandemicon 11 March 2020 and advocated for a comprehensive strategy to curtail its devastating effects[1]. Since 31 December 2019, when Chinese authorities notified WHO regarding this infection, this pandemic has now spread across all continents and countries[2]. As of 17th May 2020, 4597894 cases and 311588 deaths have been recorded worldwide, with United States of America to have the maximum number of deaths whereas Pakistan had registered the total number of 27474 cases including 873 deaths[3].

This pandemic may be the biggest public health crisis in our lifetimes, which posed an unprecedented challenge to the national health systems globally. Governments around the world are struggling to minimize mortality with desperate measuresranging from lockdown to social distancing. Developed countries with massive resources like the United Kingdom, struggled to keep pace with provision of Personal Protection Equipment (PPE), ventilators and enhancing the capacity of the intensive care units[4].

Health authorities of most countries responded rapidly to contain the spread of Covid-19[5], among various measurers, initially they started to screen individuals travelling from China and other endemic areas and later escalated to desperate measures like social distancing and locking down of cities. Moreover, International travel was banned and quarantining of suspected or confirmed cases was enforced[5]. Few of countries even declared the state of national emergencies[6].

When hospitals were affected in general, we saw urology departments suffered in particular.

Correspondence: Dr Qamar Zia, Consultant Urologist, CMH Lahore Pakistan (*Email: drqamarzia74@gmail.com)*

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The reasons were manifold, firstly huge burden of urology patients as 0.1-29% of patients of Covid-19 have associated acute kidney injury and association with high mortality rates (60-90%)[7]. Secondly suspension of elective surgeries led to reorganization of urology departments; their manpower was relocated and given other duties on required basis with new and complex rotas to follow. The development of new norm in difficult times was seen as a challenge by the urology fraternity, who reestablished themselves by getting guidance from the experiences of international societies and medical association worldwide.

Our aim was to review the areas of urology setup which were mostly hit by this novel disease, and to document various measures taken by urology fraternity worldwide in countering those challenges. This article will briefly encompass various modifications which can be carried out in dealing with urology patients along with emphasis on safe guarding from outdoor management to their discharge home and less risky follow up.

The New Challenges

Never been before the world has seen so many cancellations of planned events like now due to the Covid-19 pandemic. Annual meetings of European Association of Urology as well other medical conferences were cancelled[8]. Urologists saw themselves in an entirely new role, from managing patients of Covid-19 by putting on visors and PPE in emergency departments to working side by sides along with intensivists in critical care.

Among many challenges, the foremost was the suspension of all elective surgery lists and withholding of outpatient services[2], the main aim of stopping those services wasto increase the capacity for managing the critical care of patients[9], protectionof personal protective equipment[10] and saving of precious financial supplies[11]. Along with disruption of clinical services, urology residents' skills were lost as they worked mostly unsupervised. Similarly, there was a setback to clinical researches and trials leading to a negative impact on their final outcomes[12].

The absence of clear protocols increased the frustration among urologists, as they were not clear regarding the criteria for defining the deferrable and non-deferrable procedures along with running of virtual clinics. The mayhem of managing urology patients continued in the initial phase of pandemic when they were seen in wards on different floors of many hospitals with new criteria of attending patients by wearing PPE and managing social distance in wards and operating rooms.

Fighting all such challenges not only required a strong-will but also herculeanteam effort.

Adopting New Ways To Combat Challenges

One way to move forward in dealing with challenge of such massive scale was rapid reorganization. Well timed guidance was made available by big urology names like BJU International and European Urology; their latest news feed and updated webpages gave prompt guidance[13]. In addition, various guidelines and recommendations were also made handy by various experts and international societies[14], like the Research Urology Network (RUN) published a document guiding about various urology procedures during this pandemic which can be put on hold by sorting them into deferrable and non-deferrable groups[15].

Such reorganizations and development of various new clinical pathways for both emergency and elective surgeries[15] with the aim to minimize the access of patients to hospitals led to the saving of precious medical resources. The new and modified pathways also emphasizedon the early but safe discharge from the hospitals in respect to safeguarding of the communities.

Elective Surgeries

As per the recommendations of American college of surgeons, all elective surgeries were cancelled[16], which initially included cases of oncology as well renal transplantation. The aim

was to reduce the burden on the system, saving the ventilators, personal protective equipment and other critical hospital and human resources[15]. Defining elective surgeries can be difficult. Table-I shows one way of organizing various elective surgeries which can or cannot be deferred along with estimated duration of indoor stay in hospital. The deferrable surgeries of oncology has to be selected appropriately when merits clinically.

Table–I: Non-deferrable and deferrable elective surgeries with estimated hospital stay (modified from Stensland *et al*[15]).

Type	Deferrable	Non Deferable
Oncology	Bladder cancer	
		-Cystectomy (5-8 days[1]) -TURBT (outpatient)
	Testicular cancer	
	chemo or radiotherapy when clinically appropriate	-Orchidectomy (outpatient) -RPLND (4-6 days- open[2])
	Kidney cancer	
	<cT2 masses should be delayed/ ablative procedures on careful selection	-Nephrectomy (3 days[3], 5-10 days[3] with IVC thrombectomy)
	Prostate cancer	
	Almost all prostatectomies	-Prostatectomies for NCCN high risk cases only if patient is ineligible for radiation (0–2 days[5])
	Upper tract urothelial carcinoma	
		Nephroureterectomy (1–4 days[6])
	Adrenal tumors	
	Delay all adrenal surgeries except which are not deferrable	-Tumors >6 cm or adrenocortical carcinoma (2-5 days aslaparoscopic /6-11 days as open[7])
	Urethral/Penile cancer	
		-Clinically invasive or obstructing cancers (outpatient)
Transplant	Renal transplantation	
	Live donor transplants	-Deceased donor transplants only (4–8 days[8,9])
Reconstructive	Artificial urinary sphincter, explants, Urethral Stricture	
Prosthetic	Erectile Dysfunction	
Endourology	benign prostatic hyperplasia, Indwelling ureteral stent	
Female Urology/ Incontinence	Definitive repair for fistula surgeries, Stress urinary incontinence, Interstitial cystitis, Overactive bladder, Neurogenic bladder	
Infertility	Delay all procedures	

IVC = inferior vena cava, NCCN = National Comprehensive Cancer Network, RPLND = retroperitoneal lymph node dissection, TURBT = transurethral resection of bladder tumor, TURP = transurethral resection of the prostate

Emergency Surgeries

Emergency urology surgeries in Pakistan as well in other countries consist mainly of obstruction to the urological system, which can be infective or non-infective. In managing stone disease rather than going with primary procedures such as Percutaneous Nephrolithotomy, the preference can be given to just decompression of the renal system by ureteric stenting or drainage by percutaneous nephrostomies when there is support of interventional radiologists available[17]. Table-II

shows the justification of various emergency procedures with estimated stay in hospital. All patients need to be tested for Covid-19 naso-pharyngeal swab, and operating team has to consider patient as Covid-19 positive if result is not available.

Pre-operative Planning

New pathways for designing pre-operative workup is also based on the aim of reducing the exposure of patients to hospitals. It is a challenging task and maintaining the balance requires a lot of coordination. After telephonic triage of patients for Covid-19 a minimum number of essential diagnostic tests should be requested to lessen the burden on hospital laboratories. Covid-19 nasopharyngeal testing is made mandatory in the pre-admission phase especially in Covid-19 free hospitals for all patients on fast tract mechanism. At the end of the pre-admission work-up, each patient waiting for test results should be isolated in a single room within a dedicated area. After receiving a negative test result, the patient should be sent directly to the hospital ward. In the event of a positive test result in an asymptomatic subject, the patient must be isolated at home and hospitalization has to be postponed[18].

Recommended Pre-operative staging and workup is shown in table-III including reference to the latest EAU guidelines[19]. In this context, although adherence to recommendations of international guidelines should be respected, those examinations that are not essential for surgical planning and staging should be postponed[29].

Indoor Patient Management and Personal Protective Equipment

Suspected Covid-19 patients should be kept in properly designated wards as per hospital standing operating procedures. They should be further performed with routine diagnostic tests and eventually be transferred to dedicated Covid-19 wards in hospital. Both patients and health care providers should be provided with individual PPE, all indoor patients should wear face mask and observe the hygiene rules as per the recommendations of the Centers for Disease Control and Prevention[20].

A capping for maximum number of patients in a single room should be enforced and in those rooms a safe distance should be maintained. Allaerosols generating procedure must be performed with full PPE including FFP3 mask, visor or

Table–II: Emergency surgeries with estimated hospital stay (modified from Stensland *et al*[15]).

Type	Sub Type
Endourology	Stones
	Ureteral stent insertion for obstruction/infection (Outpatient[10]). Can be replaced with nephrostomy in IR department.
	Hemorrhage
	Clot evacuation for refractory gross hematuria (1–3 d)
Reconstructive surgery	Artificial urinary sphincter explants
	Infected explants, only (Variable)
Prosthetic surgery	Erectile dysfunction
	Infected explants only (Variable)
General urology	Soft tissue infection
	Acute infections only; scrotal abscesses, Fournier's gangrene (Variable)
	Ischemia
	Shunting for Priapism,Testicular detorsion/ Orchidopexy (1–3 d)
	Trauma
	Penile/testicular fracture repair (Outpatient)
	Ureteral injury Bladder perforation (1–3 d)
Paediatric Urology	Acute testicular torsion Scrotal exploration, Orchidopexy (Outpatient)
	Genitourinary obstruction Foley catheter/ Suprapubic tube placement (Outpatient)

safety glasses, gown and gloves[4]. The healthcare workers need to be trained for proper donning and removing of PPE to reduce risk of exposure.

Intraoperative Phase

In current challenging circumstances urologists may find themselves operating in different theatres with unfamiliar faces and equipment[21]. Theatre teams may be unfamiliar with a particular specialty and we may find them operating out of hours. One cannot give enough emphasis on adherence to WHO checklists and need to give more attention in the briefings. The critical steps and proposed operations need to be discussed with each member of team.

Surgical procedures if performed by experienced surgeons can not only reduce the operating time, but also minimize the risk of postoperative complications[16]. Use of minimal invasive techniques including laparoscopic and robot-assisted procedures have controversy regarding risk of spread of Covid-19 because of the use of laparoscopy gas[22]. Therefore as per the recommendation of the Intercollegiate General Surgery Guidance they should not be performed[23]. However, if still performed then extra caution is required to decrease the risk of viral contaminationby avoiding gas leak and judicious use of suction to remove surgical smokes[24].

Knowing the status of Covid-19 will ensure the proper use of the PPE. Initially use of full PPE can be distracting, one can face the problem of clarity in verbal communication with theatre staff due to wearing of visors and hoods. Furthermore, wearing full PPE for longer duration can be exhausting. Therefore, one must be careful regarding dehydration and one should take ample rest before, after or during the procedure to minimize the errors[25].

Table-III: Preoperative staging exam for non-deferrable oncological procedures in Covid-19 Pandemic.(modified from Simonato *et al*[31]).

Surgery	2020 EAU Guidelines	Modification
Radical cystectomy with urinary diversion for Muscle-invasive bladder cancer	-CT-TAP -CT-urography -Diagnostic ureteroscopy Abdomen/pelvic MRI	CT-TAP
Nephroureterectomy for High-risk upper urinary tract urothelial carcinoma	-CT-urography -Diagnostic ureteroscopy -Urethrocystoscopy	-CT-urography Flexible urethrocystoscopy
Radical prostatectomy for High-risk localized or locally advanced prostate cancer	-CT-TAP or MRI -Bone scan -Multiparametric MRI prostate	-CT Abdomen/pelvis -Bone scan
Radical nephrectomy for Renal cell carcinoma	Chest/abdomen CT Abdomen MRI	-CT chest/abdomen
Radical orchidectomy for Testicular cancer	-Serum tumor markers -CT-TAP -CTBrain MRI/TC (selected cases)	-Serum tumor markers -CT-TAP

CT = Computed tomography, TAP= Chest abdomen pelvis, MRI = Magnetic resonance imaging, EAU = European Association of Urology

Postoperative Phase, Discharge and Follow-Up of the Patients

As relatives are routinely denied access in Covid-19 pandemics to visit patients, therefore managing good communication with the relatives on telephone is critical step in the post-operative period. Staff should be detailed for providing daily updates on the recovery of the patients. Early recovery protocols should be adopted to decrease postoperative complications[26], but standard post-operative therapeutic pathways should not be modified to avoid readmission with complications.

Managing postoperative follow-up visits is another big challenge in the Covid-19 pandemic, which requires special consideration. It is recommended that patients with indwelling urinary catheters (nephrostomy tube, suprapubic cystostomy tube or transurethral catheter) should be informed and trained self-care at home. Patients discharged with indwelling internal ureteral stents need no specific advice.

Skin should be closed with absorbable sutures for both emergency as well elective cases, so that patients should not be called for removal of sutures as well for review of surgical wounds. Removal of catheter by cystogram should not be routinely offered. Routine blood tests after surgeries should not be offered. Tele monitoring for every operated patient should be done preferably[16].

Staff at wards should be trained to provide as much instructions as possible to the patients regarding care when at home with emphasis to safeguarding against the Covid-19 in the community by various routes. Patients need to be informed regarding the postoperative results of histopathological examination etc[16]. which can either be obtained from histopathology department on Fast track while patient is still admitted in ward or to be sent home later by email or phone call by the consultant/designated doctor of the case.

Training of Urology Residents

This might be the first time, when while treating a single patient we might have thought its impact on the whole community. While prioritizing those services along with massive reorganization led to the redistribution of urology trainees to other medical specialties[16]. There was enough cancellation of elective urology surgeries for a long time to affect the training of budding urologists[27]. The cessation of clinical rounds, outdoor clinics, MDMs and audits on one hand and less exposure in performing emergency surgeries by seniors only on the other hand had a stressful impact on the residents[16].

Various studies e.g. Chan *et al*[10] mentioned the impact of this pandemic on the residency training programs in Singapore. Also in the same context in Italy a successful experimentation was done on the online models for remote learning of undergraduates[10]. To keep the exposure of residents up-to-date various strategies including taking advantage by telemedicine has been recommended[28].

Role of Telemedicine

Telemedicine has been well received by the patients despite some barriers. Its role is more pronounced in times of public health emergencies[29]. It has been suggested that running a virtual clinic is way better than the cancellation of clinic especially in patients with high risk urological malignancies[39]. Luciani *et al*[14] has given a figure of about 55% success of direct consultation over telephone for urology patients and emphasized that in remaining mostly were cancelled by patients themselves. It was further mentioned that we should be careful regarding the inaccuracy and loss of relevant clinical information over telephone consultation. To minimize that, availability of electronic health records is crucial in order to provide error-free safe and effective delivery of healthcare.

Among telemedicine applications, smartphones and electronic mails can be used effectively until the invention and widespread availability of other advanced tele monitoring systems.

CONCLUSION

Urology fraternityall around the world saw unprecedented challenges, which led to the development of new but flexible guidelines for managing Covid-19 infection. Despite getting back to the normal routines such guidelines will help in managing urology patients in future. A new norm has been set into motion for the urology patients, starting from pre admission to their safe return to communities. Adherence to the modified pathways described above not only safeguard patients' but also providers' lives. Last

but not leasturologists need to learn and practice the art of using PPE and telemedicine.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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