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Gynecological Cancer Surgeries during COVID-19 Pandemic - An Experience from Tertiary Care Hospital of Pakistan

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ABSTRACT

Background: Immunocompromised cancer patients stand high case fatality risk if encountered severe infection. This study aims to evaluate outcomes and complications of gynecological cancer surgeries performed during COVID-19 pandemic.
Methods: A retrospective study conducted at Aga Khan University hospital, Pakistan. Patient's medical records who underwent gynecologic cancer surgery or deferred between March-December 2020 were reviewed. Age, BMI, comorbid, COVID-19 status, clinical stage of disease and intraoperative data were collected. Post-operative complications per Clavien-Dindo classification i.e., Infection, thromboembolism, Urinary/bowel problems, and mortality within 30 days were noted. Statistical analysis performed using SPSS-19. Mean, SD ratios calculated for age and BMI. Frequency/percentages for priority levels and Categorical variables were equated using Chi square test.
Results: Total 116 patients were included. Early-stage disease found in 64% patients. Surgical approach was laparotomy in 77.6%, including 48% complex surgeries. Prioritization based on BGCS framework, including 89% levels 2 and 11% level 3. PCR testing for all pre-operative patients initiated late in institute hence done in 77% however verbal screening performed in 90% patients. Two patients found COVID positive, so surgery delayed. Post operative complications of grade 1, grade 4a and grade 5 were observed in four patients. Twelve patients had clinical suspicion of COVID post operatively, 3 were found to be positive and one required ICU care.
Conclusion: During pandemic, treatment provision posed challenge due to concern of infection to both patients and healthcare workers. However, with adequate preventive measures, cancer surgeries can be performed with low risk of severe complications and post-surgical COVID positivity.

Key Words: COVID-19, Gynecology Oncology, Surgery, Guidelines

INTRODUCTION

The whole world underwent catastrophic effects of COVID-19 (Coronavirus Disease 2019), an illness caused by a fast-spreading virus called SARS-CoV-2 which produced serious and life-threatening respiratory tract infections. Older population with co-morbid are particularly at high risk to contract this deadly disease. This also includes cancer patients who are generally immunocompromised. [1-3]
Wuhan University Hospital shared in their report that Hospital-acquired transmission of COVID-19 accounted for 41.3% of cases and infection rate in patients with cancer was 0.79%, out of which 50.0% had been discharged but deaths were reported amongst 25.0% of these cases. Older than

60 years had a higher prevalence of COVID-19 than those with ages 60 years or less (4.3% vs. 1.8%).[4] This has been a major concern in treating these high risk cancer patients during the pandemic. The second major concern was the availability of resources for continuing the routine treatment of these patients. Worldwide, access to routine healthcare facilities have been constrained or significantly reduced because of the exhaustion of all the personnel and medical amenities in providing acute care to complicated and critically ill COVID- 19 patients. [5, 6]

Looking at the overwhelming health infrastructure, the governments, policy makers and all the medical societies including Gynecologic oncology came forward to make clear frameworks for the care of Non-COVID-19 diseases as per evidence and value based priorities. [7] .Safety of patients, their families, medical staffs and associated teams is of utmost importance along with the provision of high quality medical services to the gynecological oncology patients where there is an intention to treat. Service provision was also mandatory wherever it is anticipated that the delay in providing treatment can affects their overall survival(OS).[2]

The American College of Surgeons categorized most gynecologic cancer cases as semi-urgent (i.e., non-elective) surgeries, second only to trauma cases and surgical emergencies. British gynecological cancer society(BGCS) categorized cancer patients requiring surgery in to priority level 1a, 1b, 2 and 3 based on emergency, urgent and elective nature for 1a, 1b, and 2 levels and priority level 3 is designated to those surgical procedures that can be delayed for 10-12 weeks with no predicted negative outcome. [8] Minimally invasive and vaginal approaches were recommended as they known to be associated with lower morbidity as well as shorter hospitalization.[9]

Aga Khan Hospital is a tertiary care Hospital where a dedicated team is providing services to gynecological cancer patients. Like everywhere else, this pandemic has affected the routine provision of services. This retrospective analysis was planned to analyze the impact of this pandemic on our Gynecologic oncology services and to compare it with international standards as proposed by BGCS. Moreover, looking into the experience of management of these high-risk patients in this challenging time sheds light on best strategic planning in any upcoming future pandemic.

METHODS

Study design & Participants:

It was a retrospective, single center study conducted at Aga Khan University hospital, Karachi, Pakistan. After ethical approval from institutional ethical review committee (2020-5474-14592), medical charts and electronic data of patients who underwent gynecologic cancer surgery or were deferred for the same between March-December 2020 were reviewed.

Data Collection:

A predesigned proforma was filled for each study participant with an anonymous ID. Demographic data collected were date of surgery, age, BMI, and any associated comorbid. Pre-operative data including COVID-19 testing status, clinical stage of disease along with the intra-operative data were noted. Final stage of disease and post-operative complications within 30 days of surgery were also noted, which includes both COVID and non-COVID related complications (infection, thromboembolism, Urinary problems, bowel problems and mortality). However, Clavien-Dindo classification was used to classify the post-operative complications.[10]

Data Analysis:

Statistical analysis was performed using SPSS version 19 The mean and SD ratio were calculated for age, and BMI. Frequency and percentages were calculated for priority levels for surgeries performed during the study period. Categorical

variables were compared using Chi square test.

RESULTS

The study included 116 patients, 48(41.4%) endometrial, 50(43.1%) ovarian, 14(12.1%) cervical and 4(3.4%) vulval & vaginal cancers. Table 1 showed the clinicopathological features. The mean age of the study population was 55.7±12.79SD. Majority of the patient had high body mass index (BMI). Out of all, 86(74.1%) were obese having BMI between 25-34.9 kg/m^2. Half of the patients presented in stage 1 disease i.e., 59(50.9%), stage two was 11(9.5%), stage three 36(31%) and stage four were 6(5.2%). Stage was not known in four patients as they underwent diagnostic procedures. Surgical approach was laparotomy in 90(77.6%) patients. Based on the BGCS framework for prioritization of these surgeries, 103(89%) procedures were priority level 2 and 13(11%) belong to priority level 3.

Data reflected that the surgery was postponed for 11(9.5%) patients out of which 2 were COVD-19 positivity on pre-operative testing. While 3(2.6%) patients declined to undergo surgery during the pandemic. Whereas Physician preference to postpone the surgery was the reason found in 6(5.2%) ovarian cancer patients. All these patients were given alternate treatment options like neo-adjuvant chemotherapy, however one patient didn't receive any treatment during the quarantine period and underwent surgery after being COVID negative.

Tables 1: Clinicopathological features.

Age(years) Mean (Range)	**55.7(22-85)**
BMI (Kg/m^2) =n (%)	
• Underweight (<18,5)	4(3.4)
• Normal (18.5-25)	16(13.8)
• Obese (25-34.9)	86(74.1)
• Morbid Obese (>35)	10(8.6)
Co-Morbid	
• None	50(43.1)
• Hypertension	49(42.2)
• Diabetes	10(8.6)
• Respiratory disease	2(1.7)
• Cardiovascular disease	1(0.9)
• Others.	4(3.4)
Type of cancer=n (%)	
• Uterine	48(41.4)
• Ovarian	50(43.1)
• Cervical	14(12.1)
• Vulval	2(1.7)
• Vaginal	2(1.7)
Type of surgery=n (%)	
• Surgical Staging for uterine cancer	45(38.8)
• Debulking surgery for Ovarian cancer	45(38.8)
• Debulking surgery for ovarian cancer with bowel resection and colostomy	7(6)
• Laparotomy and wide local excision of recurrent pelvic mass (CA Cervix)	1(0.9)
• Radical Hysterectomy for cervical cancer	4(3.4)
• Cervical cancer staging,	9(7.8)
• Wide local excision for vaginal cancer	2(1.7)
• EUA and Vulval biopsy	2(1.7)
• Peritoneal biopsy for suspected ovarian cancer	1(0.9)
Surgical Approach=n (%)	
• Laparotomy	90(77.6)
• Laparoscopy	12(10.3)
• Others	14(12.1)
Stage of cancer=n (%)	
• not known	4 (3.4)
• stage 1	59(50.9)
• stage 2	11(9.5)
• stage 3	36(31)
• stage 4	6(5.2)
Surgical Priority as per BGCS guideline =n (%)	
• level 2	103(88.8)
• level 3	13(11.2)

Table 1 To Be continued…	
Surgery postponed =n (%) • not applicable • Patient preference • Physician preference • Covid-19 positive.	 105(90.5) 3(2.6) 6(5.2) 2(1.7)
Treatment during wait period • not applicable • no treatment • chemotherapy continue	 106(91.4) 1(0.9) 9(7.8)

COVID status of the study population is presented in Table 2. Verbal screening (by a questionnaire) was conducted for around 90% of patients starting in mid-March. Formal COVID testing by Polymerase chain reaction (PCR) for all pre-operative patients was commenced in April and hence 89 (77%) of all patients underwent this testing. Only 2 (1.7%) of these patients came out to be positive on pre-operative testing. Out of 12 (10.3%) patients with clinical suspicion of COVID in the post-operative period, 3 were found to be Covid positive, including one requiring ICU admission.

Table 2: COVID status and treatment.

COVID Verbal Screening=n (%)	
Yes	104(89.7)
No	12(10.3)
COVID PCR testing=n (%)	
Done	89(76.7)
Not done	27(23.3)
Pre-operative COVID PCR=n (%)	
Positive	2(1.7)
Negative	87(75)
Not known	27(23.3)
Post-operative COVID PCR	
Not done	104(89.7)
Done	12(10.3)
Positive	3(25)
Negative	9(75))

Table 3 shows that the status of post-operative complications and readmission in the study group. Complications based on Clavien-Dindo classification, grade 1, grade 4a and grade 5 were observed in 4 (3.44%) patients including one mortality. The mortality occurred on 26th postoperative day in a patient who was a diagnosed case of advanced ovarian cancer with pulmonary embolism at the time of initial diagnosis. The patient was given anticoagulation along with neo-adjuvant chemotherapy followed by debulking surgery, with bowel resection and colostomy. Later, the patient was presented in emergency with cardiac arrest and could not survive.

On median, hospital stay was reported to be 5 days for the study participants. Out of total, 7 (6%) patients readmitted within 30 days of surgery. The reason for admission evident from the data was fever, weakness, surgical site infection in most of the patients except one, who was admitted with burst abdomen and required urgent surgical intervention.

Table 3: Length of stay & post-operative complications.

Length of stay(days)Median (Range)	**5.0 (1-20)**
Complications: Clavien-Dindo grade=n (%)	4(3.44)
Grade 1	2
Grade 2	-
Grade 3	-
Grade 4a	1
Grade 4b	-
Grade 5	1
Readmission within 30 days of surgery=n (%)	6(5.17)

DISCUSSION

During COVID-19 pandemic, continuous provision of routine treatment to gynecological cancer patients posed a great challenge. On one side, there were real-time concerns of patients and healthcare worker's exposure to this deadly virus while on the other hand postponement or delay in surgical treatment raises the apprehension of its impact on disease progression and overall survival.

Our study findings supported the fact that careful case selection, preoperative screening/PCR testing, vigilant personal protective equipment (PPE) and minimizing trafficking during hospital stay was crucial. It enabled the provision of surgical management of these patient without any significant increase in risk to the patient or health care workers, and this has also been supported by Santiago and colleagues.[11]

After careful case selection, very few gynecological cancer surgeries were postponed during the studied period. It is proven that in patients with known medical co-morbid, the risk of immune function impairment as well as systemic inflammatory response after surgery is high.[3, 11] An individualized case based decision was taken for each cancer patient in our study population. Surgery was postponed where seems appropriate in the best interest of patient after discussing these cases in multidisciplinary meeting and on consensus medical treatment was offered. This was in line with the recommendations set by British Gynecologic Cancer Society (BGCS), European Society of Medical Oncology (ESMO) and Society of Gynecological Oncology (SGO). [2, 8, 12] This was also opted by Turkish gynecological oncologist as a preferred method.[13]

Delaying surgery for 6-8 weeks for localized disease is also a recommended option by Ramirez et al.[14]American cancer society along with American college of surgeons looked at more than 4 million cancer patients undergoing surgery during this pandemic and concluded that majority of these procedures can be safely postponed beyond the usual wait time for at least 4 weeks.[15] Retrospective reviews showed that surgery was also deferred for patients who tested COVID positive on pre-operative testing. However, these patients were asymptomatic for Covid infection and underwent surgical procedure after 4 weeks once their isolation is completed and they tested negative. GlobalSurg Collaborative, international, multicenter, prospective cohort study looked at timing of surgery after COVID infection and recommended that where possible, surgery should be performed after 7 weeks of infection and should be delayed further if patient is still symptomatic.[16] Since our both patients were asymptomatic and tested negative so surgery was performed after 4 weeks of initial diagnosis and both of them performed well post operatively and had smooth recovery.

Surgical approach was laparotomy in three quarter of our patients. This was possibly based on factors like stage of disease at presentation, type of cancer, and the surgeon's preference. There is a potential risk of aerosol induced infection in laparoscopic surgeries while creating pneumoperitoneum and surgical smoke during pandemic. [9] Concerns raised regarding this were addressed by many authors. [9, 17, 18] including systematic review by Michael El Boghdady et al.[19] Study findings illustrated that there is no scientific proof for the increase in risk of SARS-CoV-2 virus spread if the necessary precautions are taken during minimal access surgeries. Literature showed that Personal protective equipment (PPE) with proper downing and doffing, limited presence of staff during intubation and induction of patient, controlled and limited influx of staff in operating theatre are the most important recommendations and precautions proposed that ensures safety.[19] Since the minimal access surgeries are well proven to reduce the hospital stay of patient and promote quicker recovery, these benefits should be taken in to account where possible. [13]

In the study population, only four patients had postoperative complications. Study of Couto et al also showed negligible risk of postoperative complications observed in a cohort of patients undergoing surgeries during pandemic. [20] Mortality rate within 30 days of surgery was found to be low i.e. 0.86% in our study when compared to 1.4% in the COVIDSurg study in patients who did not have a pre-operative COVID 19 infection.[16] A study from Tata memorial center also confirms zero mortality and very few major complications.[21]

Although, this is a relatively large series of gynecological cancer patients undergoing surgeries in a single center in ten months duration during this pandemic, there are certain limitations in our study. Not all patients were tested preoperatively and there were concerns regarding asymptomatic

carriers and false negatives. However, it is found that there is no scientific proof of the increase in risk of SARS-CoV-2 virus spread if the necessary precautions are taken during minimal access surgeries and our study also supported this. Nevertheless, the results can be generalized to other surgical specialties considering the complexities of our procedures. The low rate of morbidity and mortality in our series justifies providing surgical care to cancer patients during the pandemic. Furthermore, in-line with the shared literature and study findings, we proposed that with adequate preventive measures, cancer surgeries can be performed with low risk of severe complications and post-surgical COVID positivity.

CONCLUSION

In COVID-19 pandemic, continuous provision of routine treatment to gynecological cancer patients was a great challenge. Exposure to this infection was a real-time concern for both, patients, and healthcare workers. This study supported the findings that with adequate preventive measures, cancer surgeries can be performed with low risk of severe complications and post-surgical COVID positivity.

Declaration by Authors

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