COVID-19: gynecologic cancer surgery at a single center in Madrid

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Highlights

- Gynecological cancer surgery during the COVID-19 pandemic was possible without compromising the safety of patients or healthcare providers in the setting of COVID-19 free institutions.
- A total of 126 gynecologic cancer surgeries were performed during the peak of the COVID-19 crisis, with a postoperative complication rate of 11.9%.
- A COVID-19 free area at our institution allowed us to treat patients with gynecological cancer during this period.

ABSTRACT

Objectives While numerous medical facilities have been forced to suspend oncological surgery due to system overload, debate has emerged on using non-surgical options on cancer cases during the pandemic. The goal of our study was to analyze, in a retrospective cohort study, the results of gynecological cancer surgery and evaluate postoperative complications in a single center in one of the most affected areas in Europe.

Methods We retrospectively analyzed the records of patients who were referred between March 2020 and May 2020 for primary surgical treatment of breast, endometrial, ovarian, cervical, or vulvar cancer.

Results The study included a total of 126 patients. Median age was 60 years (range 29–89). Patients were referred with breast (76/126, 60.3%), endometrial (29/126, 23%), ovarian (14/126, 11.1%), cervical (5/126, 4%), or vulvar cancer (2/126, 1.6%). Polymerase chain reaction (PCR) test for detection of severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) was only conducted in 50% of cases due to the low availability of tests during the first phase of our study, and was indicated only in suspected cases according to the healthcare authorities' protocol. Median hospital stay was 1 day (range 0–18). Excluding breast surgery, laparoscopy was the most used procedure (43/126, 34.1%). 15 patients had a postoperative complication (15/126, 11.9%); only in 2 patients (2/15 13.3%) were there reports of Clavien–Dindo grade 3 or 4 complications. 6 patients tested positive for COVID-19 following a PCR diagnostic test, and these surgeries were cancelled.

Conclusions Adequate protective measures in the setting of COVID-19 free institutions enabled the continuity of cancer surgery without significant compromise of the safety of patients or healthcare workers.

INTRODUCTION

The novel coronavirus disease 2019 (COVID-19), which the World Health Organization (WHO) declared a pandemic on March 11, 2020[1], has exposed weaknesses, both in expertise and resources, in the Spanish healthcare system. The speed of progression and transmission placed a major burden on the system, testing its effectiveness and sustainability.

Since the WHO announced that COVID-19 can be characterized as a pandemic, many scientific societies have issued recommendations for the treatment of specific pathologies, including societies related to gynecologic oncology and gynecologic surgery.[2–6] Almost all of these recommendations have been based on learned assumptions or expert opinions and have been aimed at containing transmission and prioritizing all healthcare resources on COVID-19. Many medical decisions on how to cope with the current pandemic are being made on a patient by patient basis, with the results stemming from research published in the first weeks of the pandemic.

Many medical centers have not been able to offer gynecologic cancer surgery with optimal guarantees of health and safety for patients and staff. This has resulted in the recommendations of non-surgical alternatives to standard treatment during the early stages of the pandemic.[7]

Some reports suggested that surgical treatment may aggravate and potentially hinder the recovery of patients infected with COVID-19.[8] Although the initial recommendations translated into a pronounced reduction in elective surgeries, the guidance was later extended to include high resource consuming surgeries.

In March 2020, Spain had the second highest number of confirmed COVID-19 cases in Europe. The Community of Madrid, where our MD Anderson Cancer Center is based, was considered the epicenter of the pandemic in Spain. By the end of April, more than 61 000 people had been infected, of whom more than 8100 died. Currently, data on experience and outcomes of oncological patients surgically treated during this ongoing pandemic are rare. The aim of this study was to evaluate surgical treatment of gynecological cancer patients during the COVID-19 outbreak in our center.

METHODS

Study Design and Participants

This was a single center, retrospective study conducted at MD Anderson Cancer Center, Madrid. We reviewed the records of patients who had undergone gynecologic or breast oncological surgery between March 23 and May 5. The study was reviewed and approved by the medical ethical committee. The clinical outcomes of these patients were monitored up to May 20, the final date of follow-up.

MD Anderson Cancer Center Madrid, given its characteristics and focus on the treatment of cancer patients, can be comparatively considered as a relatively COVID-19 free center. Since nationwide lockdown declaration on March 14, regional healthcare authorities established the hospital as a reference for other institutions regarding priority oncological surgeries. During this period, the hospital was divided into two separate areas, independent of each other, assisting COVID-19 cases and at the same time allocating resources to surgical care, follow-up, or ongoing treatments of patients with cancer.

Patients were referred with a diagnosis of gynecological or breast cancer, and a treatment recommendation according to the protocols and committees of each center. Physical examination and review of each patient history, especially regarding COVID-19 related symptoms or epidemiological risk factors, were performed by a gynecologic oncologist and an anesthesiologist at our center. Further examinations such as ultrasound, magnetic resonance imaging, or computerized tomography scans were requested if needed. All patients were required to have a preoperative blood analysis and a chest X-ray, reported by a specialized chest radiologist, who required thoracic computerized tomography in the case of suspected infection.

During the first phase of the study (March 23 to April 24), the polymerase chain reaction (PCR) test for detection of severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) was not conducted systematically, but only in those cases with clinical suspicion or close contact with a confirmed case. In the last period (April 25 to May 5), the PCR test was performed in all cases. All PCR testing results were available 48 hours after sample collection.

Data Collection

We reviewed clinical and nursing records, and laboratory and radiology findings of all patients. All data were obtained from the electronic medical records. Information included demographics, underlying comorbidities, surgical type, complications, and COVID-19 status. The Clavien–Dindo classification was used for grading postoperative complications.[9] Statistical analysis was performed with SPSS software V.25.0 (IBM SPSS Statistics, Chicago, Illinois, USA).

RESULTS

A total of 126 patients, resident in Madrid, were studied. Median age was 60 years (range 29–89). Patients were referred with breast, endometrial, ovarian, cervix, or vulvar cancer. Clinicopathologic characteristics of the patients who underwent surgery are shown in Table 1.

Excluding breast surgery, laparoscopy was the most used procedure, with only four laparotomies performed.

Table 1 Baseline characteristics

Characteristic	
Age (years) (median (range))	60 (29-89)
Age <65 years (n (%))	79(62.7)
Age ≥65 years (n (%))	47(37.3)
Ethnic origin n(%)	
Caucasian	111(88.1)
African	5(4.0)
Asian	1(0.8)
Latin	9(7.1)
Weight (kg) mean (±SD))	68.3(±12.4)
Body mass index (n (%))	
Normal (<25kg/m2)	53(42.1)
Overweight (25–29.9kg/m2)	43(34.1)
Obesity I–II (30-34.9kg/m2)	28(22.2)
Obesity III–IV(≥≥35 kg/m2)	2(1.6%)
Comorbidity (n(%))	
Hypertension	42(33.3)
Malignancy	22(17.5)
Diabetes	11(8.7)
History of cardiovascular disease	17(13.5)
History of respiratory disease	7(5.6)
Post neoadjuvant treatment	24(19.0)
Disease type (n(%))	
Low–intermediate risk endometrium cancer	19(15.1)
High risk endometrium cancer	10(7.9)
Borderline ovarian tumor	6(4.8)
Early stage ovarian cancer	3(2.4)
Advanced stage ovarian cancer	5(4.0)
Early stage cervical cancer	3(2.4)
Advanced stage cervical cancer	2(1.6)
Breast cancer	76(60.3)
Vulvar cancer	2(1.6)
Age (years) by disease type (median (range))	
Low–intermediate risk endometrium cancer	60 (29-83)
High risk endometrium cancer	69 (60-89)
Borderline ovarian tumor	52 (40-71)
Early stage ovarian cancer	45 (42-60)
Advanced stage ovarian cancer	63 (43-83)
Early stage cervical cancer	37 (33-62)
Advanced stage cervical cancer	65 (59-71)
Breast cancer	59 (37-81)
Vulvar cancer	73 (60-86)

Median hospital stay was 1 day (range 0–18). A total of 28 outpatient surgeries were performed (28/126, 22.2%); all were breast conservative procedures. Fifty-nine patients (59/126, 46.8 %) were

Table 2 Surgical perioperative data

Surgical and postoperative data	
Surgical approach (n (%))	
Laparoscopy	43 (34.1)
Laparotomy	4 (3.2)
Breast	76 (60.3)
Vulvar	2 (1.6)
Vaginal	1 (0.8)
Disease type (n (%))	
Low–intermediate risk endometrium cancer	19 (15.1)
High risk endometrium cancer	10 (7.9)
Borderline ovarian tumor	6 (4.8)
Early stage ovarian cancer	3 (2.4)
Advanced stage ovarian cancer	5 (4.0)
Early stage cervical cancer	3 (2.4)
Advanced stage cervical cancer	2 (1.6)
Breast cancer	76 (60.3)
Vulvar cancer	2 (1.6)
Admission to intensive care unit	3 (2.4)
Hospital stay (days)	
Median (range)	1 (0–18)
Discharged after surgery (n (%))	28 (22.2)
1 day admission after surgery (n (%))	59 (46.8)
Readmission (n (%))	4 (3.2)
Complications Clavien–Dindo grade (n (%))	15 (11.9)
1	9 (60)
2	4 (26.7)
3	1 (6.7)
4	1 (6.7)

discharged from hospital 1 day after surgery. One patient required extended hospitalization of 18 days due to rectosigmoid stapled anastomosis bleeding that required endoscopic hemostasis.

Fifteen postoperative complications (15/126, 11.9%) occurred, 13 were Clavien–Dindo grade 1 or 2 (13/15, 86.7%), and only 2 (2/15 13.3%) were grade 3 or 4. Three patients were admitted to the intensive care unit after surgery due to prolonged operative time and previous comorbidities. Patients were discharged from the intensive care unit the day after admission. None of the patients required admission to the intensive care unit after surgery due to perioperative complications. Four patients required readmission. Of these, one was related to surgical wound infection (1/4), another two to adynamic postsurgical ileus (2/4), and only one patient (1/4), with a previous history of decompensated cirrhosis, was readmitted and required management in the intensive care unit due to acute renal dysfunction. Surgical procedures and postoperative outcomes are detailed in Table 2.

Six patients tested positive for COVID-19 and these surgeries were therefore canceled. Of these cancellations, two were discovered when the PCR was conducted due to clinical symptoms and four were discovered when the test was performed routinely (3–4 days before surgery). No patient developed symptoms related to COVID-19 or yielded a positive test in the postoperative period (Table 3).

DISCUSSION

Our study showed that we were able to safely manage 126 gynecological cancer surgeries in the COVID free zone during the pandemic, avoiding delays or cancellations. This was not possible in many centers in our country due to healthcare system overload.

Although there are no specific reports in cancer patients regarding the incidence of COVID-19, they are considered high risk due to older age, increased incidence of comorbidities, and lower immunity. Limited and heterogeneous data from China[10] and Italy[11] initially reported a possible higher incidence of COVID-19 infection in cancer patients. A more recent meta-analysis[12] found an overall prevalence of cancer in patients with COVID-19 of 2% (3% in studies with a sample size <100), higher than expected from the non-COVID-19 population. Furthermore, patients with cancer seem to have a higher risk of severe events compared with those without cancer .[13] Even though the data are not conclusive, cancer patients are considered at high risk and multiple measures have been suggested, adapted, and recommended for treatment and follow-up. Subsequently, treatment of cancer has been impacted in an exceptionally significant way in this period, especially regarding surgery.[14–16]

Surgical treatment is the cornerstone of all gynecological cancer management, especially in the initial stages. According to a study by Amodeo et al on postoperative immune function,[17] major surgery induces suppression of the cellular immune response, a circumstance that could lead to a higher likelihood of contracting the infection and a greater severity of symptoms in such cases. Based on the physiopathological data on SARS-COV-2, Bestieret al in their article suggest an increased risk of postoperative complications and mortality in infected patients .[18]

During this pandemic, surgery was questioned on the basis of a greater possibility of postoperative complications, a greater risk of infection by COVID-19 after surgery due to alteration of the immune system with greater severity of infection, the use of hospital

Table 3 COVID-19 status

	1st period (no systematic PCR test)	2nd period (systematic PCR test)
Canceled for COVID-19 positive	2	4
PCR COVID-19 tested	62	64
PCR positive	2	4
PCR negative	60	60
Evolution 14 days, COVID-19 free	All	All
Evolution 30 days, COVID-19 free	All	All

PCR, polymerase chain reaction.

resources, including staff, and the risk of exposure and contagion by COVID-19 virus for both staff and patients.

Most hospitals in our region exceeded their capacities from the beginning of the pandemic and were forced by the emergent situation to cancel their surgical activity. Although some surgeries in cancer patients may be considered elective (plastic reconstruction, closure of stomata, removal of stents), most have a curative intent, and although they may be delayed without a negative effect on survival, postponing may have a negative effect on the evolution and prognosis of disease. A recent publication from the Naval Medical University in Shanghai reported on the inherent risks of delaying surgery for colorectal cancer during the COVID-19 outbreak in China.[19] In our center, we canceled elective surgery but not those with curative intent.

The study showed that the possibility of postsurgical complications was not greater than in a COVID-19 free period, but our follow-up time was short and may not reflect the true rate of infection.

COVID-19 infection was detected in only six patients, requiring cancellation of surgery. Five were operated after a PCR test was negative. It should be noted that PCR was not systematically performed at the start of the study, and was only done in 50% of cases. This was due to the low availability of tests, which was applied only in suspected cases according to the protocol of the healthcare authorities.

None of the patients were diagnosed with COVID-19 during follow-up. It must be considered that the postoperative period occurred during nationwide lockdown, which could have influenced the risk of transmission and subsequent infection.

Due to the low availability of PCR tests, our center established an exhaustive screening protocol implemented by both the gynecologic oncologist and the anesthesiologist. To reduce the risk of transmission, all patients were admitted the same day of the surgery, minimizing the traffic inside the hospital, limiting accompanying family members to only one person.

The infection risk for healthcare workers during this period was a key concern. By the end of April, the number of infected health professionals in Spain was 28 326 (data from the National Epidemiological Surveillance Network). In our institution, four members of the surgical team (out of 44, 9.1%), were infected. None of them were gynecologic oncologists.

The laparoscopic approach was used in the majority of patients operated on during the study period. This approach has been questioned in some reports[20] on the basis of a greater possibility of virus exposure due to the use of pneumoperitoneum and surgical smoke. This could lead to aerosol induced infection. It is understood that SARS-CoV-2 virus is transmitted by respiratory droplets with the highest risk arising in aerosol generating procedures, as intubation and extubation during surgery, and during the operation itself due to the use of energy and CO_2 insufflation. Although there is limited evidence on the specific COVID-19 risk in laparoscopic procedures, previous studies have shown the presence of other pathogens (corynebacterium, human papillomavirus, hepatitis B virus, and HIV).[21] The presence of these pathogens is not an absolute contraindication for the use of the laparoscopic approach, although a series of recommendations must be considered to avoid possible exposure to viral particles. In our center, we have incorporated many of these recommendations since the COVID-19 outbreak, such as enhanced personal protective equipment, disposable eye protection, maximal care during insufflation and desufflation, prevention of dispersion from trocars, use of laparoscopic filters to evacuate smoke, and evacuation of pneumoperitoneum using vacuum suction before removing trocars. Following these recommendations, and with the few current data, there is no evidence to assume an increased risk of COVID-19 transmission. Since SARS-CoV-2 has been found in gastrointestinal tracts or via anal swabs, the risk should cautiously be considered in the event that bowel involvement is anticipated.[22 23]

The strength of this study is based on the number of cases operated on during the period of greatest incidence of the pandemic, with a low number of grade III–IV complications and no incidence of postoperative COVID-19 infection. However, it has several limitations. The number of low complexity surgeries with short hospital stays included in the study may have influenced the risk of postoperative contagion, and the fact that the PCR test before surgery was not performed in half of the patients due to low availability could have reduced the diagnosis of the infection. Nevertheless, despite the lack of PCR, it must be noted that none of our patients developed symptoms or had a positive test after surgery.

This study, conducted in a partial COVID-19 free hospital, showed that with adequate preventive and protective measures, cancer surgery was possible and did not significantly compromise patients or healthcare workers. Healthcare authorities must take this into account and provide resources to ensure good quality of care for diseases that are not immediately life threatening but significantly affect survival. It is essential that the system guarantees a COVID-19 free path in referral hospitals for cancer treatment.

Contributors JdS conducted the study which was planned and reported by the gynecologic, oncology, and anesthesia team (authors listed), who were involved in the surgical procedures.

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