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ARAŞTIRMA YAZISI / RESEARCH ARTICLE

COVİD-19 PANDEMİSİ SIRASINDA ELEKTİF JİNEKOLOJİK CERRAHİ: TEK MERKEZ DENEYİMİ

ELECTIVE GYNECOLOGICAL SURGERY DURING COVID-19 PANDEMIC: A SINGLE CENTER EXPERIENCE

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ÖZET

AMAÇ: Bu çalışma, tersiyer bir sağlık merkezinin, COVID-19 salgınının iki pik dönemi arasındaki elektif jinekolojik operasyonlarla ilgili deneyimini değerlendirmeyi amaçlamaktadır.

GEREÇ VE YÖNTEM: 15 Mart 2020 ile 30 Nisan 2021 tarihleri arasında Afyonkarahisar Sağlık Bilimleri Üniversitesi Hastanesi'nde elektif jinekolojik cerrahi uygulanan 609 hasta retrospektif olarak incelenmiştir.

BULGULAR: Tüm hastaların ameliyat öncesinde yapılan covid-19 testleri negatif çıkmış ve 17 hasta (%2,8) hastaneden taburcu olduktan sonraki 8 haftalık süreçte COVİD-19'a yakalandı. Pozitif test sonucunun elde edilmesi için geçen ortalama süre 4,0±1,3 hafta (aralık: 2-7 hafta) olarak hesaplandı. Elektif jinekolojik ameliyatların en sık endikasyonları anormal kanama (%30,9), adneksiyal kitle (%19,2) ve uterin leiomyoma (%16,9) idi. Operatif histeroskopi en çok uygulanan jinekolojik operasyon (%26) olurken, bunu abdominal histerektomi (%17,6) ve laparoskopik histerektomi (%16,2) izledi. Hipertansiyon ve diyabet birlikteliği, servikal yetmezlik ve servikal serklaj, ameliyat sonrası COVİD-19 testi pozitif çıkan hastalarda anlamlı olarak daha fazla görüldü (tümü için p=0,001). Hastaneden taburcu olduktan sonra COVİD-19 testi pozitif çıkan hastalar ile covid-19'a yakalanmayanlar, ameliyat sonrası komplikasyon ve hastanede kalış süresi açısından istatistiksel olarak benzerdi. Elektif jinekolojik cerrahi uygulanan 4 hasta (%0,65) hastaneden taburcu olduktan sonraki 8 hafta içinde hayatını kaybetti. Ölümlerin hiçbiri COVİD-19 enfeksiyonuyla ilgili değildi.

SONUÇ: Elektif jinekolojik cerrahinin uygulanması COVID-19 salgını sırasında güvenli bir yaklaşım olarak karşımıza çıkmaktadır. Hipertansiyon ve diyabetin eş zamanlı varlığı ve servikal serklaj, COVİD-19'un postoperatif bulaşmasıyla ilişkili olabilir.

ANAHTAR KELİMELER: COVID-19, Jinekoloji, Cerrahi.

ABSTRACT

OBJECTIVE: This study aims to assess the experience of a tertiary health center about the elective gynecological operations between the two peaks of COVID-19 pandemic.

MATERIAL AND METHODS: This is a retrospective review of 609 patients who underwent elective gynecological surgery at Afyonkarahisar Health Sciences University Hospital from 15 March 2020 to 30 April 2021.

RESULTS: All patients tested negative for COVID-19 preoperatively and 17 patients (2.8%) contracted COVID-19 during the 8-week-long period after the hospital discharge. The average time to test positivity was calculated as 4.0±1.3 weeks (range: 2-7 weeks). The most common indications for elective gynecological surgeries were abnormal bleeding (30.9%), adnexal mass (19.2%) and uterine leiomyoma (16.9%). Operative hysteroscopy was the most performed gynecological operation (26%), followed by abdominal hysterectomy (17.6%) and laparoscopic hysterectomy (16.2%). The concurrence of hypertension and diabetes mellitus, incompetent cervix and cervical cerclage was significantly more prevalent in the patients who tested positive for COVID-19 after surgery (p=0.001 for all). The patients who tested positive for COVID-19 following hospital discharge and those who did not contract COVID-19 were statistically similar with respect to postoperative complications and duration of hospitalization. Four patients (0.65%) who underwent elective gynecological surgery died within 8 weeks following the hospital discharge. None of the deaths were related to COVID-19 infection.

CONCLUSIONS: Performing elective gynecological surgery appears as a safe approach during COVID-19 pandemic. Concurrent existence of hypertension and diabetes mellitus and cervical cerclage might be associated with postoperative contagion of COVID-19.

KEYWORDS: COVID-19, Gynecology, Surgery.

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INTRODUCTION

Since its emergence in China, COVID-19 has become a global problem of public health. That is, World Health Organization has defined the COVID-19 outbreak as a pandemic and identified its cause as a novel virus and named it as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) (1, 2). It has been shown that SARS-CoV-2 spreads by human-to-human transmission. This virus is more transmissible than the coronavirus that causes severe acute respiratory syndrome (SARS) and, thus, has infected a cohort of patients more than ten times the number of SARS patients (3, 4). It has been reported that COVID-19 affected more than 118 million individuals and caused more than 2.6 million deaths worldwide (1, 2).

The swift dispersion of the pandemic has led to a progressively increasing burden on healthcare systems of the countries. Initially, surgical procedures were either postponed or canceled to enhance the availability of beds and medical staff in hospitals. This preventive measure also allowed the transformation of operating rooms into intensive care units (5, 6). It was also considered that the transmission risk related with hospitalization, anesthesia and surgery would be reduced when elective surgeries were postponed or canceled. Therefore, approximately 28 million surgical operations were canceled within 3 months of the first pandemic peak (5, 7). On the contrary, delaying elective surgeries would impair the physical and mental well-being of the patients, and especially those who have malignancy. This impairment might decrease the quality of life and result in workforce loss (8 - 10).

In Turkey, National Pandemic Coordination Board and Operation Centers have been established to control the spread of COVID-19 throughout the country. The National Board advised the postponement or cancelation of all elective surgeries during the pandemic waves (11).

This study aims to assess the experience of a tertiary health center about the elective gynecological operations between the two peaks of the COVID-19 pandemic.

MATERIAL AND METHODS

This is a retrospective review of 609 patients who underwent elective surgery at the gynecology department of Afyonkarahisar Health Sciences University of Hospital from 15 March 2020 to 30 April 2021. The patients who had emergency surgeries, the patients who underwent procedures at the outpatient clinics and the patients who underwent surgery while being positive for SARS-CoV-2 were excluded from the study.

Every patient who decided to undergo elective gynecological surgery was informed about the contagion of SARS-CoV-2 and the risks of COVID-19 infection as well as their surgical procedure. These patients were also educated about their preparation for surgery and protection against viral infections. Accordingly, the patients were asked to read, understand, and sign a written informed consent form for COVID-19. This written consent focused on the risk of contracting SARS-CoV-2 as a nosocomial infection, possible hazardous effects of COVID-19 and the patients' responsibility for notifying the attending physicians and other health care personnel about their symptoms that could be related with COVID-19 infection.

As a part of preoperative evaluation, the patients were investigated about the symptoms of COVID-19 or any close contact with COVID-19 infected individuals and instructed to give SARS-CoV-2 reverse transcriptase polymerase chain reaction (PCR) test by nasopharyngeal swab within 24 hours preceding the operation day. Whenever there was a positive test or a high index of suspicion for COVID-19, the patients were referred to the department of infectious diseases and surgery was postponed for 7 weeks. If SARS-CoV-2 RT-PCR test was negative, the patient was hospitalized and the necessity of self-isolation during hospitalization was emphasized once more. As a safety measure for avoiding the contagion risk, no companions or visitors were allowed into the inpatient clinic during the hospitalization period.

On the operation day, the patients were transported directly from their rooms to the operating room and the staff appointed with the transpor-

tation of the patients wore personal protective equipment so that the risk of contagion was minimized. Elective gynecological surgeries were performed in an isolated operating room. The team in the operating room consisted of a chief surgeon, an assistant surgeon, one resident, a chief anesthesiologist, an assistant anesthesiologist, one scrub nurse and one circulating nurse who wore personal protective equipment.

In case laparoscopy was planned, all instruments including suction systems were controlled before surgery. Additionally, safety measures were extended to decrease the exposure for the aerosols during laparoscopy. For instance, insufflation was provided through the Verres needle, the intra-abdominal pressure was kept as low as possible and Verres needle was closed before being removed. Similarly, the trocars were kept closed while being introduced into abdomen and tightly set holes were opened to prevent gas leakage during laparoscopy. Electrocautery was limited to minimum and, thus, smoke occurrence was suppressed.

After the cessation of surgery, the patients woke up and recovered from anesthesia in the operating room. Then, they were directly transferred to their room, without entering the postoperative recovery unit. Following each operation, all surfaces of the operating room were disinfected with diluted chlorine bleach (≥500 ppm) (12). After the disinfection procedure, it was made sure that 30 minutes passed before the next patient was transported to the operating room.

Complying with the Enhanced Recovery after Surgery protocol, the patients were encouraged for early mobilization at the sixth postoperative hour (13). On the first postoperative day, the patients were transferred to another newly disinfected and well-ventilated room. The decision for the discharge was made when the patients were able to take care of themselves, and thus, maintain their social isolation after their discharge. The patients were strongly recommended about the significance of social isolation.

On the day of discharge, SARS-CoV-2 RT PCR test was obtained from the patients and none of the patients tested positive. To determine the COVID-19 contagion, phone calls were made, and Public Health Management System was checked every week during a period of 8 weeks after the hospital discharge. Seventeen patients (2.8%) tested positive for COVID-19 during the 8-week-long period after the hospital discharge. Data related with preoperative, operative, and postoperative characteristics were acquired from the medical records.

Ethical Committee

Ethical Approval for the study was received from Afyonkarahisar Health Sciences University Ethics Committee with number (03.02.2023/2).

Statistical Analysis

Collected data were analyzed by Statistical Package for Social Sciences version 22.0 (SPSS IBM, Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (range: minimum - maximum) whereas categorical variables were denoted as numbers or percentages where appropriate. Kolmogorov-Smirnov test was used to test the normality of data distribution. Student t-test and chi-square test were used for the comparisons. Two-tailed p values less than 0.05 were accepted to be statistically significant.

RESULTS

A total of 609 elective gynecological surgeries were carried out during a period of 14.5 months. Although all patients tested negative for COVID-19 preoperatively, 17 patients (2.8%) tested positive for COVID-19 during the 8-week-long period after the hospital discharge. The average time to test positivity was calculated as 4.0±1.3 weeks (range: 2-7 weeks).

Table 1 shows the preoperative characteristics of 17 patients who tested positive for COVID-19 after hospital discharge and 592 patients who had no COVID-19 after discharge. Both patient groups were statistically similar with respect to age, preoperative hemoglobin, chronic diseases, and indications for surgery. The most common indications for elective gynecological surgeries were abnormal bleeding (30.9%), adnexal mass (19.2%) and uterine leiomyoma (16.9%).

Table 1: Preoperative characteristics of the patients

	COVID-19 negative (n=592)	COVID-19 positive (n=17)	p
Age (years)	44.7±12.9	41.3±11.2	0.281
Preoperative hemoglobin (g/dl)	12.5±1.8	12.9±1.8	0.355
Chronic diseases	15 (2.5%)	1 (5.9%)	0.395
Hypertension	7 (1.2%)	0 (0.0%)	0.652
Asthma	2 (0.3%)	0 (0.0%)	0.810
Hypertension + Asthma	2 (0.3%)	0 (0.0%)	0.810
Diabetes mellitus	2 (0.3%)	0 (0.0%)	0.810
Coronary artery disease	1 (0.2%)	0 (0.0%)	0.865
Hypertension + Diabetes mellitus	1 (0.2%)	1 (5.9%)	0.001*
Indications			
Abnormal bleeding	183 (30.9%)	5 (29.4%)	0.895
Adnexal mass	114 (19.2%)	4 (23.5%)	0.660
Uterine leiomyoma	100 (16.9%)	2 (11.8%)	0.577
Infertility	45 (7.6%)	0 (0.0%)	0.238
Urinary incontinence	46 (7.8%)	0 (0.0%)	0.232
Endometrium cancer	39 (6.6%)	2 (11.8%)	0.401
Cervical intraepithelial lesion	34 (5.7%)	1 (5.9%)	0.981
Genitourinary prolapsus	15 (2.5%)	0 (0.0%)	0.506
Incompetent cervix	11 (1.9%)	3 (17.6%)	0.001*
Cervical cancer	5 (0.9%)	0 (0.0%)	0.704

*p<0.05 was accepted to be statistically significant.

The concurrence of hypertension and diabetes mellitus was significantly more prevalent in the patients who tested positive for COVID-19 during the recovery period following surgery (p=0.001). Moreover, incompetent cervix was significantly more frequent as the indication for surgery in the patients who contracted COVID-19 after surgery (p=0.001).

Seventeen patients who tested positive for COVID-19 following hospital discharge and 592 patients who had no COVID-19 following hospital discharge were statistically similar in aspect of elective gynecological surgeries **(Table 2)**. The only exception was cervical cerclage which was significantly more prevalent in patients who contracted COVID-19 after surgery (p=0.001). Operative hysteroscopy was the most performed gynecological operation (26%), followed by abdominal hysterectomy (17.6%) and laparoscopic hysterectomy (16.2%).

Table 2: Operative characteristics of the patients

	COVID-19 negative (n=592)	COVID-19 positive (n=17)	p
Operative hysteroscopy	154 (26.0%)	5 (29.4%)	0.753
Laparoscopic hysterectomy	104 (17.6%)	2 (11.8%)	0.534
Abdominal hysterectomy	96 (16.2%)	2 (11.8%)	0.622
Salpingoopherectomy/Cystectomy	56 (9.5%)	2 (11.8%)	0.750
Urogynecological operations	46 (7.8%)	1 (5.9%)	0.774
Diagnostic laparoscopy	45 (7.6%)	0 (0.0%)	0.238
LEEP**	34 (5.7%)	1 (5.9%)	0.981
Myomectomy	18 (3.0%)	1 (5.9%)	0.506
Vaginal hysterectomy	15 (2.5%)	0 (0.0%)	0.506
Cytoreductive surgery	13 (2.2%)	0 (0.0%)	0.537
Cervical cerclage	11 (1.9%)	3 (17.6%)	0.001*
Frozen section procedure	55 (9.3%)	0 (0.0%)	0.201

*p<0.05 was accepted to be statistically significant.

**Loop Electrosurgical Excision Procedure

Table 3 demonstrates the postoperative characteristics of 17 patients who tested positive for COVID-19 after hospital discharge and 592 patients who did not contract COVID-19 after discharge. Both patient groups were statistically similar with respect to postoperative complications and hemoglobin. In addition, the patients who tested positive for COVID-19 following hospital discharge and those who did not contract COVID-19 were statistically similar with respect to postoperative histopathological findings and duration of hospitalization.

Table 3: Postoperative characteristics of the patients

	COVID-19 negative (n=592)	COVID-19 positive (n=17)	p
Postoperative complications			
Bowel injury	2 (0.3%)	0 (0.0%)	0.810
Ureter injury	2 (0.3%)	0 (0.0%)	0.810
Postoperative hemoglobin (g/dl)	11.5±1.7	12.0±1.4	0.317
Duration of hospitalization (days)	3.7±3.0	4.2±4.0	0.487
Postoperative death	4 (0.6%)	0 (0.0%)	0.734
Postoperative pathology			
Endometrial polyp	102 (17.2%)	3 (17.6%)	0.964
Myoma uteri	98 (16.6%)	3 (17.6%)	0.905
Benign ovarian cyst	81 (13.7%)	0 (0.0%)	0.101
Endometrial cancer	38 (6.4%)	3 (17.6%)	0.069
Endometrial hyperplasia	36 (6.1%)	3 (17.6%)	0.055
Cervical intraepithelial lesion	27 (4.6%)	0 (0.0%)	0.368
Ovarian cancer	27 (4.6%)	1 (5.9%)	0.798
Endometrioma	25 (4.2%)	1 (5.9%)	0.739
Chronic endometritis	20 (3.4%)	0 (0.0%)	0.441
Cervical cancer	14 (2.4%)	0 (0.0%)	0.521
Tubo-ovarian abscess	10 (1.7%)	0 (0.0%)	0.589
Uterine sarcoma	9 (1.5%)	0 (0.0%)	0.609
Adenomyosis	7 (1.2%)	0 (0.0%)	0.652
Chronic cervicitis	6 (1.0%)	0 (0.0%)	0.677

Four patients (0.65%) who underwent elective gynecological surgery lost their lives within 8 weeks following the hospital discharge. None of the deaths were related to COVID-19 infection. Two deaths occurred because of thromboembolism, one death was due to stroke and other death was attributed to cardiac infarction. Seventeen patients who tested positive for COVID-19 were kept under surveillance at home for 5 days by the home health-care services. Only 7 patients were symptomatic (41.2%) and none of them required treatment in intensive care unit. After surveillance period ended, the patients were advised about their postoperative recovery and protection from viral infections.

DISCUSSION

The COVID-19 pandemic has led to pronounced disturbance in the daily routine of health services (14). As a result, elective surgeries were either canceled or postponed so that the patient safety was ensured, and the contagion was slowed down (14, 15).

It has been estimated that 1.5 million to 3.5 million elective surgeries would be canceled worldwide every week, indicating a weekly cancellation rate of 61% to 86%. An estimation for Turkey showed that nearly 82000 operations were cancelled each week during COVID-19 pandemic (7). Moreover, it was predicted that approximately 90% of the canceled and postponed operation had been planned for benign diseases while 8% of them had been scheduled for malignancy and nearly 2% of them had been for obstetric indications. As for gynecological elective surgeries, a cancelation rate of 39% was calculated (7, 16).

On the other hand, restricting elective surgeries would exert negative effects on both the patients and health care systems (16). The ne-

gative effects on patients include decrease in quality of life, deterioration in health, and related deaths. The negative effects on health care centers would become evident when hospitals resume elective surgery (17). Since there would be problems in prioritization and rescheduling of elective surgeries, waiting periods would be prolonged and workload in medical facilities would be increased (16, 17).

A modelling was made to point out that it would take 43 to 48 weeks for the elimination of the cumulative workload if daily routine of surgical volume was elevated by 20%. The time span that would be required to overcome the surgical backlog would differ from 29 to 32 weeks if the number of elective surgeries per day would be increased by 30% (7, 18). However, increasing the workload might cause fatigue and burnout of surgeons which might lead to adverse consequences subsequently (19). Therefore, this study has been designed to investigate the safety of elective gynecological surgery during the COVID-19 pandemic.

In this study, all patients tested negative for COVID-19 preoperatively and 17 patients (2.8%) contracted COVID-19 postoperatively. A similar Turkish study about elective gynecological operations gave the postoperative positivity rate for COVID-19 as 0.39% while another Turkish study evaluating the elective general surgery operations in the same facility yielded a postoperative positivity rate of 3% (20, 21). A study focusing on cardiovascular procedures reported the postoperative positivity rate as 3.8% and a study about elective colorectal surgeries found the postoperative positivity rate as 5.1% (22, 23). The discrepancy about postoperative positivity could be attributed to the heterogeneity in study populations and variations in regulations that were created for COVID-19 pandemic.

This study addresses operative hysteroscopy, abdominal hysterectomy, and laparoscopic hysterectomy as the most performed elective gynecological operations. However, a similar study yields these procedures as abdominal hysterectomy, laparoscopic hysterectomy and conization/LEEP (20). This contradiction can be attributed to the sociodemographic variations of the cities in which these health care facilities are situated. This study noted a significantly higher prevalence for the concurrence of hypertension and diabetes mellitus in patients with postoperative positivity for COVID-19. This finding complies with that of Zhong et al. who declared that the patients undergoing elective orthopedic surgery during the pandemic had significantly more co-morbidities and higher rate of re-admittance within 30 days of hospital discharge despite their younger age (24). Therefore, concurrent existence accompanying diseases can be considered as a reason for taking extra measures against COVID-19 or for postponing the elective surgery as longer as possible. An interesting finding of this study is the significantly higher prevalence of cervical cerclage in patients who contracted COVID-19 after hospital discharge. Hence, prolongation of waiting period might be suggested for patients who are to undergo cerclage for cervical insufficiency.

The present study failed to show any significant differences in postoperative complications of the patients who contracted COVID-19 and those who were able to avoid COVID-19 after hospital discharge. This finding resembled that of a multi-center prospective study which was held in a highly incident area of Spain. The authors concluded that surgery time and intra-operative bleeding were unassociated with a higher risk of contracting COVID-19 postoperatively (25).

In this study, postoperative mortality rate was 0.65% and none of the deaths were related to COVID-19 infection. There is limited data about the mortality related with COVID-19 during the postoperative period (26). A study focusing on cardiovascular procedures reported a postoperative mortality rate of 4.1% but only one death was due to COVID-19 related pneumonia (22). Kader et al. estimated the death risk as 1 in 700 for the individuals who went through surgery as they tested false negative for COVID-19. This death risk would be much lower (1 in 140000 at most) if the current global infection fatality rate (1.04%) was put into formula (27).

Accordingly, elective gynecological surgery appears as a safe approach during COVID-19 pandemic based on the findings of the present study. However, regulations and precautions might be observed more strictly, and the delay period might be prolonged as much as

possible in patients with concurrent existence of hypertension and diabetes mellitus and patients who have been scheduled for cervical cerclage. It would be prudent to remind that the power of the present study was limited by its retrospective design, relatively small cohort, and lack of long-term data. Another limitation was the SARS-CoV-2 RT PCR testing which was done 24 hours preceding surgery and on the day of discharge. Since SARS-CoV-2 has a median incubation period of 5.1 days, there is a 0.07% probability of SARS-CoV-2 infection with a false negative test (27, 28).

Further research is required to attest the safety of elective gynecological surgery and specify the factors associated with postoperative morbidity and mortality during the COVID-19 pandemic.

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