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REVIEW

The COVID-19 Pandemic and Colorectal Cancer: 5W1H - What Should We Do to Whom, When, Why, Where and How?

COVID-19 Pandemisi ve Kolorektal Kanser: 5N1K- Neyi, Neden, Nasıl, Nerede, Ne Zaman ve Kime Yapalım?

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ABSTRACT

The treatment of colorectal cancer, which is an important cause of cancer related death and is still an important public health problem, has become a matter of debate due to the COVID-19 pandemic that emerged in December 2019. This pandemic has forced us to rearrange our entire surgical practice. However, during these arrangements it should be ensured that patients are less affected by the pandemic, hospital resources should be used more efficiently and the risk of healthcare professionals should be minimized.

This study discusses how to plan the multimodal treatment of colorectal cancer during the pandemic by using surgical, chemotherapeutic, and radiotherapeutic options while evaluating tailored treatments and the current international guidelines.

Keywords: Colorectal Cancer, COVID-19, pandemic, SARS-CoV-2

ÖZ

Kansere bağlı ölümlerin önemli bir nedeni olan ve halen önemli bir toplum sağlığı sorunu olan kolorektal kanserin tedavisi, Aralık 2019'da ortaya çıkan COVID-19 pandemisi nedeniyle tartışma konusu halini almıştır. Yapılacak düzenlemeler hastaların pandemiden daha az etkilenmesini, hastane kaynaklarının pandemi için daha etkili kullanılmasını sağlamalı, sağlık çalışanlarını riske sokmadan planlanmalıdır. Ancak onkolojik ve cerrahi sonuçların bu yapılacak tedavi değişikliklerinden etkilenmemesi ana amaç olmalıdır.

Bu çalışmada, kişiselleştirlmiş tedavi ile güncel uluslararası kılavuzlar da tartışılarak, pandemi döneminde kolorektal kanserin cerrahi, kemoterapi, radyoterapi seçenekleri kullanılarak multimodal tedavisinin nasıl planlanacağı tartışılmıştır.

Anahtar Kelimeler: Kolorektal Kanser, COVID-19, pandemi, SARS-CoV-2

Introduction

After the outbreak of the new coronavirus (Sars-CoV-2) in Wuhan-China in December 2019, the World Health Organization declared it as pandemic on date 11/March/2020. After the diagnosis of the first case of Corona Virus Disease 2019 (COVID-19) in Turkey on 11.03.2020, the Ministry of Health of the Republic of Turkey recommended to postpone all elective surgeries on 17.03.2020 to lower the work load in hospitals and to prevent the disruption of healthcare services that will be required in the future period.

After these developments, the approach towards the surgical treatment of colorectal cancer patients has been the subject of debate among healthcare professionals. Is colorectal cancer surgery an emergency or elective procedure or which conditions necessitate emergency surgery? Should we continue the colorectal procedures as if nothing has happened, or should the operations be delayed? How long can colorectal operations be postponed without harming patients? Regarding these questions, the purpose of this review was to establish an optimal colorectal cancer management during COVID-19 pandemic.

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Colorectal Cancer Treatment During the COVID-19 Pandemic

"Treat the patient, not the disease."

Tailored therapy is the most important step in the treatment of colorectal cancer. The evaluation of 5 different steps and management of colorectal cancer patients regarding a tailored therapy has gained more importance these days.

Factors to Consider in the Treatment Planning

1. Identifying Patients at Risk

The patient's age and concomitant diseases need to be evaluated thoroughly. Most of the deaths during the COVID-19 outbreak are in the group of over 60 years of age, and particularly in those with comorbid diseases. Unfortunately, colorectal cancer is frequently seen in this age group. Furthermore, the review of the risk factors of patients who have died during the COVID-19 outbreak has shown that the infection had an unfavorable course in patients with coronary heart disease, chronic pulmonary disease, diabetes, hypertension, immunosuppressive diseases (cancer, post-organ transplantation, steroid use, chronic kidney failure), autoimmune diseases, severe obesity and in those who are smokers. Moreover, the male sex mortality rates have been found to be higher in the COVID-19 pandemic.[1,2]

Other conditions that should not be overlooked are the evaluation of the patient's performance (Karnofsky or WHO score) and the nutritional condition. During the treatment of colorectal cancer, these characteristics of the patient should also be evaluated.

2. Clinical Presentation

In our country, approximately 20-25% of colorectal cancer patients initially present to the emergency departments. Therefore, patients with tumor obstruction, perforation or blood loss are need to be evaluated separately. The fact that some patients do not present to the emergency department despite having abdominal and defecation complaints that impair their quality of life should be considered. However, if the outbreak is prolonged, we will encounter cases in advanced stages since elective colonoscopy would be performed more rarely.

3. Tumor Characteristics

In every patient diagnosed with colorectal cancer, clinical staging and radiological evaluation of the lung and the entire abdomen are necessary. Based on the clinical staging, the disease should be classified as early, local, regional (presence of lymph node metastasis) or systemic. However, overcrowding in radiology clinics could limit the staging. In addition, patients without clinical findings, but with radiological subileus or closed perforation should also be considered as an emergency.

4. Surgical Risk Factors

The treatment plan should be made after clinical staging considering the morbidity, length of surgical procedure, the estimated length of hospital stay, the need for intensive care unit (ICU), and the need for blood/blood products. Scoring systems for morbidity risk estimations can be used for this purpose (https://riskcalculator.facs.org/RiskCalculator/).[3] Furthermore, it should be kept in mind that the preoperative risk assessment of the patients by American Society of Anesthesiologists Clasification (ASA Class) is also very important in the decision-making process. (For example, long and complicated surgeries such as cytoreductive surgery and hyperthermic perfusion or pelvic exenteration would not be appropriate during this period.)

In emergency or elective surgeries that cannot be deferred, it will be appropriate to prefer procedures such as stoma only or resection and stoma to reduce risks.

5. The Condition of the Health Care System

The COVID-19 pandemic is progressing day by day, affecting the healthcare system in different ways. Therefore, the conditions of the healthcare workers, the availability of a separate operating room and separate ICU for surgical patients in hospitals should also be evaluated.

What should be the best option for treatment of colorectal cancer?

Based on the experience gained from colorectal cancer patients in China and Italy, several associations have published guidelines and/or recommendations to protect both patients and healthcare professionals, as well as, to provide uninterrupted services to patients when necessary.[4-7]

The general trend in these publications is to postpone elective surgery as much as possible but to perform emergency surgery provided that general measures are taken. The situation regarding colorectal cancer surgery appears to be a bit more complicated. While there is no debate about performing surgery for emergency conditions such as obstruction or perforation, other conditions associated with colorectal cancer requires further consideration of the status of the patient, the stage of the tumour, the risk of the surgical procedure and the condition of the respective hospital.

The Guidelines and Recommendations of International Associations

The "COVID-19 Guidelines for Triage of Colorectal Cancer Patients" of the American College of Surgeons (ACS), recommend approaching each case individually based on 3 different scenarios for colorectal cancer surgery.[5]

I- In the first scenario, if the number of COVID-19 patients in the hospital is limited and the hospital has sufficient capacity; surgery is recommended as soon as possible in nearly obstructing colorectal cancers, tumors requiring frequent blood transfusions, rectal cancers nonresponsive to neoadjuvant therapy, early stage cancers that do not require neoadjuvant-adjuvant therapy, and in tumors with suspected local perforation or sepsis.

Prophylactic surgeries required for hereditary syndromes, small colon or rectal carcinoids, large polyps and even malignant polyps can be deferred for 3 months.

II- In the second scenario where the number of COVID-19 patients are increasing and the ICU and ventilator capacity is limited; emergency surgery is recommended in cases with nearly obstructing colon cancer where stenting is not an option, in nearly obstructing rectal cancer, in patients requiring high blood transfusions (inpatient) and in cases with pending evidence of local perforation or sepsis.

III- In the third scenario where ICU is at full capacity and the need for ventilators cannot be met due to patient overcrowding in hospitals due to progression of the pandemic, surgery is recommended only for colorectal cancer patients with perforating, obstructing, actively bleeding tumors (inpatient transfusion dependent) or septic patients.[5]

Similarly, the guidelines published by the *Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)* only recommends surgical intervention in cancer patients who are likely to progress or who require emergency intervention.[7]

The Association of Coloproctology of Great Britain and Ireland (ACPGBI) has a much more conservative approach and recommends alternative strategies such as colonic stenting for patients with obstruction, and even percutaneous drainage for cases with perforation if the patient is suitable and the the resources of the hospital are sufficient.[4] If, despite all, surgical treatment was required, it is recommended to perform preoperative risk assessment by consulting anesthesiologists and intensive care specialists as well and make decisions based on hospital resources. The rationale for this conservative approach is to avoid the growth of overall mortality due to the high environmental risk posed by COVID-19 and the efforts for the careful use of hospital resources. Therefore; it is recommended to determine the urgency or emergency of the clinical condition by considering the presenting condition, symptoms, and the disease severity at admission. Also; it is recommended that either planned or unplanned need for ICU should be estimated, optional strategies to reduce this need should be mediated, and potential capacity of ICU should be taken into account.[4]

During the COVID-19 pandemic, one of the points to be considered when making the decision for surgery in colorectal cancer patients is the current condition of the hospital. It is necessary to ask the questions of how long we can keep colorectal cancer patients waiting due to the insufficient hospital capacity and the sharp increase in the numbers of COVID-19 cases.

Several studies report different results regarding the length of time for the deferral of colorectal cancer surgery. A large-scale population-based study analyzed 39,000 newly diagnosed colorectal cancer patients. The study compared the survival by the time elapsing from diagnosis to treatment separately for each disease. It was observed that the survival rates were significantly different across patient groups treated within 30 days, in the 31-150 days, and > 151 days of diagnosis.[8] In a retrospective study comparing the time between the moment of diagnosis and treatment (surgical or neoadjuvant treatment) in colon and rectal cancer, separate analyses were performed both for 35 days and 49 days, and no difference was identified between the patients in whom treatment had commenced within 35 days and patients whose treatment began after 35 days, with respect to survival. Similar results were also obtained when the same data were examined for day 49.[9] In another study, Wanis et al. compared 908 stage I-III colon cancer patients with respect to disease-free survival and overall survival according to the time from diagnosis to surgery.[10] The comparison of those who had surgery earlier or later than 30 days revealed that there was no difference in overall survival or disease-free survival, and furthermore, there was no difference even when the threshold was taken as 60 and 90 days. Flemming et al. also compared 4326 stage I-IV colon cancer patients with respect to overall survival and cancer-specific survival according to the time to surgery.[11] In patients with time to surgery >42 days, no difference was identified in overall survival and cancer-specific survival. In a larger-scale retrospective cohort study conducted by Kucejko et al., it was identified that the best survival values were in those operated between 3-6 weeks.[12] The reason for this is thought to be the need to take enough time during the first weeks after the diagnosis to perform proper staging, and also that the patients can be made more suitable for the surgery particularly with respect to their cardiac, pulmonary and nutritional conditions. Considering all these studies, it may be thought that elective colon cancer surgery can be deferred for approximately 6 weeks.

In rectal surgery, it has been shown that when the time between the first symptoms and treatment is longer than 60 days, the rate of survival is lower.[13] In their large cohort study, Yun et al. determined that the deferral of surgery for longer than 30 days was associated with poor survival in rectal cancer.[14]

In other words, it appears possible to wait 30 days without affecting survival in rectal cancer as well. In fact, it takes 2-3 weeks from the time of diagnosis to surgery or neoadjuvant treatment in many specialized centres on colorectal surgery. Advanced imaging and/or preoperative preparations are performed during this period. However; even a 6-week deferral for rectal cancer surgery similar to the optimum deferral period for colon cancer may not be sufficient to avoid the exhaustion of hospital resources in a potential crisis situation like the one especially experienced in Italy.[15]

Today, another approach in rectal cancer is the total neoadjuvant therapy (TNT) approach.[16] *The Society of Surgical Oncology* states that if feasible, the TNT option should also be considered in rectal cancer cases.[17] It should also be remembered that patients receiving long-term neoadjuvant therapy or TNT will need to visit hospital facilities regularly, resulting in an increased risk of COVID-19 transmission and a higher demand for the use of hospital resources. Therefore, the balance between relatively higher hospital admissions of a patient managing with TNT and risk of colorectal surgery should be well characterized during the era of COVID 19 pandemic. ACPGBI recommends short-term radiotherapy for rectal cancers to rule out that possibility.[6] Phase III studies comparing short-term radiotherapy and long-term chemoradiotherapy have failed to show a difference in local control, disease-free and general survival between these two approaches.[18,19] Although long-term chemoradiotherapy is preferred in distal rectal cancers that have invaded the sphincters, the nearby organs, or have a positive lateral lymph node, it should not be overlooked that these patients will be spending a long time in the hospital during the pandemic. It is for this reason that even without the COVID-19 pandemic, short-term radiotherapy is being used more frequently today. Short-term radiotherapy will reduce the use of hospital resources and more importantly, the risk of patient and healthcare workers being infected. Moreover, it should be kept in mind as an option that even patients who can be referred directly to surgery can receive short-term radiotherapy by expanding the indication if needed.[6] In rectal cancer, surgery after neoadjuvant radiotherapy can be planned in 8 or even 12 weeks at the latest.[5,6] Moreover, if there is a good response after neoadjuvant therapy and it is feasible to deliver additional chemotherapy, surgery could be deferred even further.[5] In patients with a complete response after neoadjuvant therapy, the "wait and see approach" could also be suggested by closely monitoring the patient and discussing the situation with the patient.[6] In locally advanced and recurrent rectal cancers and metastatic colorectal cancers, chemotherapy can be considered as an option to defer surgery.[5] It is recommended to make all these decisions in multidisciplinary tumor (MDT) board and to inform the patient in detail.[6,7]

During the COVID-19 pandemic, the principles of radiation oncologists are grouped in 3 for the treatment of rectal cancer, similar to the treatment of all other tumors: postponing treatment if the patient's survival and/or local control is not being risked, if treatment cannot be deferred to complete treatment in the shortest time feasible using hypo fractionated plans, and to ensure the safety of the patient and the treatment team. The Turkish Radiation Oncology Association has provided all the necessary information to all its members and has notified them of all the precautions necessary in items by taking into account the recommendations of hospital infection committees and in particular, the publications from Wuhan and Italy.

Another important issue for patients is the quality of life in the deferral period with cancer besides the impact of the COVID-19 pandemic. Studies have shown that the quality of life is also unfavourably affected in those patients.[20]

Before making the decision to treat colorectal cancer cases immediately or later, it would be beneficial to remember one more subject. Although the adenoma carcinoma sequence takes about 7-10 years for colorectal cancer to develop, this process may decrease to 2-3 years in familial and hereditary colorectal cancers. In other words, progression of the disease occurs in a shorter time in familial and hereditary colorectal cancers. This condition should also be considered when deciding whether to defer treatment. Another issue to consider within this context is that patients younger than 50 years old present at advanced stages and with unfavourable prognosis. This explains why colorectal cancer is the first among cancer related deaths under the age of 50.[21]

Another point that should be known when the treatment plan is being made is that the pandemic is also expected to last 3-4 months in our country, as in China and Italy.

Surgical timing decisions for colorectal cancer patients during the pandemic

Based on the assessment of all these data, it would be appropriate to classify colorectal cancer patients in 4 stages according to the treatment priority. However, all the factors discussed above should be involved in the treatment decison; including the patient related factors, mode of presentation, tumoural characteristics, the morbidity of the surgical procedure, and the hospital infrastructure (Table).

1- Emergency Patients

Patients with radiologically confirmed or clinically diagnosed obstruction, perforation and massive bleeding should be operated immediately.

2-Asymptomatic Patients

In general, during the outbreak in our country, it will be appropriate to defer elective colorectal cancer surgery for 30 days and make a decision again at the end of this period. However, some patients are seriously concerned that the pandemic may become prolonged and this will increase the waiting time and lead to progression. In addition, during this waiting period, psychological disorders such as severe anxiety and depression may also develop. These patients can be operated in hospitals not providing healthcare services for patients affected by the pandemic or in hospitals maintaining the appropriate standards after informing patients about the risk of COVID-19 infection and obtaining their informed consent.

When deciding to deferral, the opinion of infectious diseases specialists and epidemiologists become important. Opinions should be sought before postponing for 1 to 1.5 months, and if the pandemic is anticipated to progress in this period, the patient and the physician may need to evaluate the surgical decision within the current circumstances. It is important that this decision should also be included in the patient's file in written form with its reasons.

i. Surgical Timing in Colon Cancer

Patients diagnosed as a result of screening tests are generally asymptomatic and Stage I - II patients. It is known that the oncological outcomes of stage I - II colon cancer found in radiological staging will not be affected unfavourably by the deferral of the treatment for 30 days. If patients are going to have to wait for more than 30 days, the risks of COVID-19 should be explained thoroughly, consent should be obtained, and a joint decision should be made. At the end of the 30-day deferral, the patient can be interviewed online and the treatment can be deferred further for an extra month depending on the current situation of healthcare facility and the patient's symptoms. However; a need for a further deferral at the end of the 60-day-period warrants radiological staging for decision making in those patients. Furthermore, in asymptomatic but stage III colon cancer patients, it is known that the first 30-day deferral period would not affect the oncological outcomes. However, if deferral will be longer than 30 days, discussing a plan of neoadjuvant chemotherapy (oral regimens if possible) in an online MDT board will be appropriate. In asymptomatic stage IV colon cancer patients, it is possible to identify the chemotherapy protocols in the MDT board based on the status of systemic diseases and to continue chemotherapy or to plan surgery depending on the radiological response after three courses of chemotherapy (Table).

ii- Surgical Timing in Rectal Cancer

Similarly, cases detected as a result of screening are generally asymptomatic. It is known that for 30 day deferral in stage I rectal cancer cases would not affect the oncological outcomes. If patients are going to have to wait for more than 30 days, the risks of COVID-19 should be explained thoroughly, consent should be obtained, and a joint decision should be made. At the end of the 30-day delay, the patient should be contacted online and depending on our country's condition and the patient's symptoms, treatment can be deferred for another month. However, if it is required to defer once again at the end of the 60 days, in such cases, radiological staging is necessary to make a new decision. Even though radiotherapy is not indicated for all patients with stage II rectal cancer, a short-term (5x5Gy) radiotherapy could be administered to gain time during the pandemic. Then, the radiotherapy response should be evaluated in the 8th week after radiotherapy. If there is a regression with radiotherapy, it will be feasible to prolong the waiting period up to 12 or even 16 weeks. In stage III rectal cancer cases, although radiotherapy is not indicated for all patients, during the pandemic, it is recommended to deliver short-term (5x5Gy) radiotherapy and to assess the response to radiotherapy at the 8th week after radiotherapy. If there is a regression with radiotherapy, it would be feasible to prolong the waiting period up to 12 or even 16 weeks. In stage II and III cases, during the waiting period, the consolidation chemotherapy protocol should also be discussed in the MDT board. In stage II and III patients, if there is no regression at the 8th week with radiotherapy, the decision for surgery can be made depending on the infrastructure of the hospital. The long-term radiotherapy protocol will not be appropriate during the pandemic period, as it increases the length of stay in the hospital, resulting in raising the risk of transmission. It is necessary to choose protocols that will minimize the patient's hospitalization for both radiotherapy and chemotherapy procedures.

In addition, in rectal cancer patients who have received neoadjuvant chemoradiotherapy (long-term) before the pandemic, the response should be assessed on week 8 and if there is a good response, the delay should be completed to 16 weeks. If the patient is not a good responder surgery should be planned.

3- Symptomatic Patients

In these patients, the decision for surgery can be made without a delay depending on the severity of symptoms and findings, and their effect on the quality of life. The presence of symptoms and findings that impair the general condition of the patient are important for the decision of surgery (blood transfusion need, persistent abdominal pain, tenesmus, severe diarrhea, severe weight loss, etc.). Symptomatic patients are generally those between stages II-IV. It is necessary to plan treatment after identifying the clinical stage by good

TSCRS - COLORECTAL CANCER GUIDELINE DURING COVID-19 PANDEMIC

Tailored Colorectal Cancer Treatment

1) Identifying Patients at Risk
a- Cvd19 mortality 60(+) years↑ ↑
b- Comorbidity increases Cvd19 mortality
c- ASA Class
d- Performance status
e- Nutritional status

2) Clinical Presentation
a- Obstruction
b- Perforation
c- Massive bleeding
d- Severe anemia (Hgb 7g/dL ↓)

3) Tumor characteristics
Radiological staging
a- Early (pTis/pT1)
b- Local
c- Regional (LN (+))
d- Systemic

4) Surgical Risk Factors
a- Length of surgical procedure
b- Need for ICU
c- Need for blood transfusion
d- Risk Calculator*

5) Current Situation of the Heathcare
a- Healthcare providers?
b- Capacity? and separate? ICU for surgical patients
c- Separate operating rooms?

Colorectal Cancer Treatment During the Pandemic
Patient constent must include the risk of Cvd19
1.Emergency Cases: Should be operated immediately
-Obstruction, perforation, massive bleeding
2.Asymptomatic- Symptomatic Cases (See next column)
3.Malignant Polyps (3 months deferral and then decision)
4.Prophylactic Treatment for Polyposis Syndromes (6 months deferral)
Reduce the risks during surgery (Stoma, Resection+Stoma, Diverting-protective stoma, etc.)

Asymptomatic-Symptomatic Cases
Decisions of the treatment must be discussed at MDT Board (online)
Discuss the risks with the patient (Surgery/Cvd19/Deferral of treament)
Discuss the options & rational solution with the patient

	COLON	RECTUM
STAGE I	30 day deferral period ↓ Online interview ↓ Further deferral for 30 days depending on current situation of healthcare and patient's symptoms ↓ Radiological restaging and decision at the end of 60 day period .	30 day deferral period ↓ Online interview ↓ Further deferral for 30 days depending on current situation of healthcare and patient's symptoms ↓ Radiological restaging and decision at the end of the 60 day period.
STAGE II	Symptomatic Patient (Poor QoL): Surgery **OR** 30 day deferral period ↓ Online interview ↓ Further deferral for 30 days depending on current situation of healthcare and patient's symptoms ↓ Radiological staging and decision at the end of the 60-day period.	Symptomatic Patient (Poor QoL): Surgery **OR** Short-term (5x5 Gy) RT ↓ Restaging at week 8 (to evaluate the response to RT) ↓ **Poor response:** Surgery --- **Response is obtained** ↓ Surgery in the week 12-16 Consolidation chemotherapy during the waiting period?
STAGE III	Symptomatic Patient (Poor QoL): Surgery **OR** A 30-day deferral period ↓ Surgery if current healthcare situations are appropriate ↓ If not ↓ MDT Neoadjuvant Chemotherapy (Oral regimens if possible)	Symptomatic Patient (Poor QoL): Surgery **OR** MDT Board ↓ Short-term (5x5 Gy) RT ↓ Restaging at week 8 (to evaluate the response to RT) ↓ **Poor Response:** Surgery --- **Response is obtained** ↓ Surgery in the week 12-16 Consolidation chemotherapy during the waiting period?
STAGE IV	Symptomatic Patient (Poor QoL): Surgery **OR** MDT Board ↓ 3 cycles of chemotherapy ↓ Decision based on the response	Symptomatic Patient (Poor QoL): Surgery **OR** MDT Board ↓ 3 cycles of chemotherapy ↓ Decision based on the response

- If tumour regression is observed in the MR examination in the 8th week after neoadjuvant chemoradiation , it will be appropriate to extend the deferral time to the 16th week. However, surgery should be considered if tumour regression is not observed or disease progression is observed in the 8th week.
- Abbreviations:Cvd19=COVID-19, RT=Radiotheraphy, ICU=Intensive care unit,
Hgb= Hemoglobin, QoL=Quality of Life, ASA Class= American Society of Anesthesiologists Class, MDT Board=Multidisciplinary Tumor Board
- *American College of Surgeons Risk Calculator

radiological staging. For patients who are symptomatic but can wait, deferral of the surgery during the pandemic should be preferred. The treatment according to the stages is as described for asymptomatic stage I, II and III.

Another issue that should not be forgotten is to select the protocols that will minimize the patient's hospitalization for both radiotherapy and chemotherapy procedures. Therefore, total neoadjuvant therapy approaches may not be feasible in stage III rectal cancer.

4- Malignant Polyp - Patients Scheduled for Prophylactic Surgery

It will be appropriate to postpone prophylactic surgeries in patients who have undergone polypectomy and have been diagnosed with malignant polyps, and in inherited polyposis syndromes.

What to do in Patients Who Have a Surgical Decision?

When making the decision for surgery, the resources of the hospital should be evaluated first. If the resources are not sufficient, the patient should be referred to a COVID-free hospital in your region. These patients in the risk group should be informed not only about the surgery they will undergo but about the risk of COVID-19 infection as well.[7] The risk of infection with SARS-CoV-2 must also be added to the consent that will be obtained. Patients should be questioned very carefully regarding a history of COVID-19 during the preoperative period. In patients who are scheduled for elective surgery, the PCR test must be performed 14 days before the operation date and patients with a negative test should be asked to come to the hospital after absolute isolation at home. To the patients that come to the hospital, a repeat PCR test and a computed thorax tomography should be performed 24 hours before the surgery. In cases which the patient's evaluation results are suitable, elective surgery can be performed. Otherwise, they should receive COVID-19 therapy. Patients who require emergency surgery should be regarded as cases of suspected COVID-19, and abdominal and thorax computed tomographies must be obtained.[4] It is very important that all the staff should be careful and follow the protocols during the preoperative and postoperative period to prevent infection for all patients hospitalized for surgery. In the operating room, the staff and the doctors are required to operate using personal protective equipment.[4,7,22]

Does Minimally Invasive Surgery (MIS) Increase the Risk of Transmission?

It is known that the SARS-CoV-2 virus is an enveloped virus that is transmitted by droplets.[23,24] Furthermore, rt-PCR tests demonstrate that the virus is tested positive in the stool of approximately 30% of patients.[25] It is not known whether there is a risk for infection in MIC/laparoscopic or open abdominal surgery. Nevertheless, based on the fact that viruses such as Corynebacterium, papillomavirus and HIV can be present in surgical smoke, it is possible that SARs-CoV-2 may also be present in the smoke caused by energy devices and the cautery or the pneumoperitoneum created by CO2 during laparoscopy.[26-28] Since the aerosol risk is much higher in laparoscopic surgery than open surgery, laparoscopic surgery is not recommended.[4,6,29] In particular, colleagues in China prefer open surgery. However, SAGES argues that the advantages of laparoscopic surgery such as fewer complications and shorter hospital stay should particularly be taken into consideration.[7] They have stated that contrary to open surgery, nearly all of the particles formed during dissection in laparoscopy can be cleared away using closed ultrafiltration systems.

MIS should not be preferred in patients who are known to be infected or suspected from their history and evaluations performed. However, in patients with negative test results and no signs of COVID-19 pneumonia on thorax computed tomography, MIC can be performed under strict precautions.

It is thought that a very efficient filtering can be achieved when the smoke aspiration systems produced to provide a better view in laparoscopic surgery are used with an ultra-low particulate air (ULPA) filter capable of filtering 0.05 microns.[30] If the surgery is to be performed laparoscopically, to reduce the release of aerosols, it is recommended to cut port entrances small enough to avoid gas leak, to use cautery and energy devices as minimally as possible, if possible to only use monopolar cautery with an aspirator, to maintain intraabdominal pressure at minimum level, and to finalize the pneumoperitoneum using filtered smoke release systems before extracting the specimen, converting to open surgery for any reason and closing the port incisions.[7,30]

Does ERAS Have a Role?

The concept called Enhanced Recovery after Surgery (ERAS) or the perioperative multimodal approach aims for early discharge from the hospital, early return to daily life, the use of various perioperative strategies to improve the recovery conditions, to reduce the postoperative stress and to integrate evidence-based medicine into patient management. It has been shown that ERAS protocols decrease the length of hospitalization without affecting the complication or re-hospitalization risks.

Although individual components vary, most ERAS programs include avoiding prolonged hunger, optimization of comorbidities in the preoperative period, preoperative

carbohydrate loading, targeted hemodynamic therapy, multimodal analgesia by avoiding opiates, avoiding or early removal of the tubes (nasogastric tube, foley catheter and drains), and supporting the gastrointestinal functions, and early recovery is targeted as a result of these measures.

During the pandemic period in particular, ERAS will not only ensure that the patient is discharged from the hospital earlier but will also prevent the contact of patient secretions and fluids with the surrounding environment by avoiding nasogastric catheter, drains and bladder catheter applications.

The development and widespread use of ERAS in combination with minimally invasive surgery represents a paradigm shift in perioperative care. Although ERAS protocols are mostly associated with laparoscopic surgery and there will be an expected decline in performing minimally invasive surgery during this period, most of the ERAS protocols can also be implemented in open surgery. As long as the condition of the patient, the surgeon, and the healthcare centre suffice the requirements, the application of ERAS protocols will be beneficial for patients, surgeons, and public health.

How will we Make the Final Decision in The Treatment of Colorectal Cancer Patients During the COVID-19 Pandemic?

The risks the colorectal cancer disease and the COVID-19 pandemic impose on the healthcare system should be evaluated by momentary comparisons. Considering the principle of "treating the patient but not the disease", after the 5 factors that should be considered in the treatment planning described above have been assessed separately, the morbidity-mortality created by the operation (https://riskcalculator.facs.org/RiskCalculator/) and COVID-19 should be assessed and the final decision must be made accordingly.

Conclusion

According to the GLOBOCAN 2018 data, colorectal cancer continues to be a serious public health problem, ranking 3rd among cancer related deaths and 4th among the most common cancer types.[31] During the COVID-19 pandemic, the surgical management of colorectal cancer should be planned ensuring that patients are less affected by the pandemic and hospital resources are used more effectively without putting healthcare workers at risk. However, the main purpose should be that the oncological and surgical results would not be affected by these treatment changes.

There is no need to change the surgical timing of conditions regarded as emergencies. However, in emergency surgeries, the use of minimally invasive surgery should be avoided, or appropriate technical equipment and protective equipment should be used.

In cases where we consider it elective, postponing the surgical treatment of colorectal cancer for Stage I and II patients for 4-8 weeks may be brought to the agenda. MDT board must be held to discuss in stage III patients and neoadjuvant treatment options should be evaluated for both the colon and the rectum. Short-term treatments and a long-term waiting period should be preferred in patients who are scheduled for radioterapy.

Minimally invasive surgery should not be used in cases known to be suspected or infected and should be used after all necessary precautions have been taken in non-infected patients.

ERAS applications should be placed in the agenda in order to benefit from the advantages of early discharge and to prevent the contact of the patient's body fluids with the external environment.

As a result, considering the point Turkey has reached during the pandemic, it appears highly likely that hospital resources will be mobilized for COVID-19 patients in the days ahead. Undoubtedly, emergency surgery should be performed. However, in such a case, the surgery of patients with colorectal cancer who are in the risk group should be deferred as much as possible after taking treatment precautions that will not affect the survival, will not risk the patient's health, will not put healthcare professionals at any unnecessary risk, and will ensure the more appropriate use of hospital resources.

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