Colorectal Surgery in Romania during the COVID-19 Pandemic

Recommendations of the Romanian Society of Coloproctology (SRCP) and the Romanian Association for Endoscopic Surgery (ARCE)

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As the COVID-19 pandemic extends, its negative consequences on the effectiveness of therapeutic programs - previously assumed by the medical community and imperatively suspended for a difficult-to-predict period of time - are becoming increasingly worrying.

In this context, as the evidence-based recommendations are not possible, most of the national and international scientific societies tried to develop balanced recommendations (1-4).

The Romanian Society of Coloproctology (SRCP) and the Romanian Association for Endoscopic Surgery (ARCE) have created a working group that, taking into account recent publications, the statements of international academic societies, the national legislative context and the unique experience of countries severely affected by this pandemic (China, Italy, Spain, USA, etc.) proposes for Romania, the following recommendations for medical practice in colorectal surgery during the COVID-19 pandemic.

These recommendations are subjected to continuous review, depending on the global and national situation of the pandemic,

the particular needs of each hospital, the recommendations of the competent authorities and the evolution of the literature that publishes the conclusions of ongoing clinical trials.

Overview

The SARS-COV-2 virus that generates COVID-19 can display airborne transmission by direct exposure (respiratory droplets) or by direct contact with surfaces contaminated with viral particles. Therefore, in addition to frequent hand hygiene and social distancing (over 1.5-2 m), universal protection by wearing a face mask should be mandatory in both medical institutions and public places. Direct fecal-oral transmission of SARS-CoV-2 virus has also been suspected, due to the identification of viral RNA in the mucosa of the digestive tract and in the faeces (5). Furthermore, the ACE-2 receptors to which the virus SARS-VOC-2 binds are present in large numbers in the digestive tract (6).

COVID-19 has complex implications in digestive tract diseases due to the presence of digestive symptoms (nausea, diffuse abdominal pain, diarrhea, weight loss) in 30-50% of infected patients (7). The presence of digestive symptoms may be associated with a poorer prognosis of those patients (8).

Institutional Strategy

The local and national context of expansion and impact of the pandemic, imposes specific therapeutic strategies for patients with colorectal pathology, adapted to the new condi-

tions of medical and social safety.

The Italian Society of Colorectal Surgery, whose position we have assumed, proposes that the strategic approach of each hospital should take into account the impact of the COVID-19 Pandemic on regional health systems, as well as the human and material resources of that particular health unit (9). Stratification of the treatment indications for colorectal pathology is detailed in *Table 1*.

The main objectives of this strategy are both to effectively control the nosocomial spread of SARS-VOC-2 virus and especially to avoid the disproportionate allocation of human and material resources to colorectal patients, potentially deprived of the same medical service, in the context of critical and unpredictable needs of COVID-19 patients.

Patients' Testing

Limiting or, as far as possible, eliminating in-hospital transmission of COVID-19 disease is mandatory in controlling the spread of the pandemic. This ensures the safety of medical staff and patients with colorectal pathology, vulnerable in the context of specific morbidity.

In this respect, we recommend the systematic testing, at hospital admission, of all the patients with colorectal pathology, using the RT-PCR method (10). Consequently, it will be possible to separate patients infected with SARS-CoV-2 from the negative ones, thus protecting the patients already admitted for other serious conditions (non-COVID19). Until the confirmation of the RT-PCR result, patients will be isolated in an intermediate sector, intended for

Table 1.

Priority level (relative to the treatment of COVID-19 patients)	Institutional resources (Human and material)	Assumed operational strategy
Low	There are enough resources	<ul style="list-style-type: none"> • Elective procedures for colorectal oncological surgery. • Patients should be treated in non-COVID-19 hospitals / departments. • Surgery for benign conditions should be postponed until the peak of the pandemic has been exceeded
Moderate	The hospital's resources are limited	<ul style="list-style-type: none"> • All surgical cases and elective endoscopic procedures should be postponed
High	Critical unavailability of hospital resources	<ul style="list-style-type: none"> • Surgery should be limited to those patients with life-threatening conditions (eg. gastrointestinal bleeding, perforation or obstruction), advanced symptomatic tumors, urgent anorectal, etc.)

potentially asymptomatic carriers and cared for by dedicated, properly equipped medical staff. This protocol will have an impact on the protection of medical staff, limiting the risk of small epidemic outbreaks within the hospital.

On the other hand, taking into account the limitations of the RT-PCR test, the current level of knowledge of COVID-19 disease and the resources of the hospital, patients who are scheduled to have colorectal surgery should be investigated extensively to ensure that they are not in the incubation stage of the disease. For this purpose, we recommend that, regardless of the presence of a respiratory symptoms suggestive for COVID-19, all patients requiring colorectal surgery be evaluated using computed tomography (CT) of the chest (without contrast), seeking the suggestive aspects of the viral disease (11). The presence of SARS-CoV-2 ribonucleic acid (RNA) in sputum using the transcriptase-polymerase reverse chain reaction (RT-PCR) is recommended to confirm the diagnosis of COVID-19, but the sensitivity of this assay may be lower than CT, (60–80% vs. 97%) (11) or similar to it (12). A recent meta-analysis showed that the positive predictive value of CT outside China is between 1.5% and 30.7%, while for RT-PCR it was between 47.3% and 96.4%, with a very high negative predictive value, up to 99.8% for both techniques (12). If the patients have received a negative SARS COV-2 test confirmed, they will be referred to non-COVID departments and the therapeutic decision taken by the multidisciplinary medical board will be applied.

Patients will be closely monitored throughout the hospitalization period and, if necessary, may be retested if clinical / lab suspicions of COVID-19 disease arise.

These protocols will reduce postoperative morbidity and mortality related to COVID-19.

Informed Consent

In SARS-CoV-2 positive patients requiring emergency surgery, the risk of increased morbidity and mortality in the context of viral infection should be highly considered. In the context of the pandemic with the new

coronavirus, this information should be communicated to the patient and should also be included in the informed consent signed by the patient.

We also recommend to be noted that, regardless of the preventive actions taken, in accordance with the recommendations in force and depending on the sensitivity and specificity of current tests, there can be no guarantee that patients will not contract SARS CoV-2 virus during hospitalization or convalescence.

Organization of Colorectal Departments

Medical institutions treating patients with colorectal pathology should consider staging indications according to the phases of the pandemic and available medical resources (*Table 1*), as well as organizing separate circuits for SARS-CoV-2-positive patients and those SARS-CoV-2 negative. The two circuits should include wards, operating rooms, intensive care units, radiology and endoscopy as well as related staff dedicated to infected and uninfected patients, respectively.

If this set-up is ineffective or epidemiologically compromising, we recommend the referral of the infected and, respectively, uninfected patients to the hospitals with expertise in colorectal pathology, selected and designated COVID-19 positive and COVID-19 negative, respectively. We recommend to the medical teams to be informed about the possibilities of regional access to the competent colorectal departments or hospitals.

RT-PCR testing and systematic evaluation by chest CT of patients with colorectal pathology for new coronavirus infection is recommended at any new admission. Patients confirmed SARS-CoV-2-positive will be transferred to COVID-19 designated hospitals or to COVID-19 positive departments of the same hospital.

Patients with colorectal pathology, presenting to the hospital for a major emergency requiring prompt use of specific surgical or endoscopic treatment before confirmation of infection with the new coronavirus (SARS-CoV-2), will be considered suspected of COVID-19. Consequently, surgical or endoscopic interven-

tions will be performed under the conditions of circuits and protection specific to SARS-CoV-2-positive patients.

The medical staff of the hospital must be monitored on daily-base, checking the body temperature at the entrance to the hospital but also by repeated scheduled RT-PCR testing, depending on the symptoms and the epidemiological context.

Surgical Strategy

Each case will be evaluated according to the level of medical emergency and it will be adapted to the possibilities of the hospital and the needs of the patient.

All oncological cases will be discussed in the hospital multidisciplinary tumor board meeting, and the decisions will be made for each case.

During the pandemic, in all the candidate to emergency surgery, the treatment should be oriented by the minimal risk of the interventional complications. This attitude is recommended regardless of the existence of COVID-19 disease, being applicable to both SARS-CoV-2 positive and SARS-CoV-2-negative patients. For example, the Hartmann procedure should be considered instead of the colo-anal anastomosis or, when there is occlusion or perforation. Such decisions will be taken locally and in the medical, logistical and institutional context, based on the local impact of COVID-19.

Minimally Invasive Colorectal Surgery

The information regarding the possibility of aerosolization of SARS-CoV-2 viral particles during laparoscopic or robotic operations are very limited, and current recommendations are strongly marked by this limitation.

Looking from a similar perspective, to the laparoscopic surgeries performed in recent decades in patients with HIV, hepatitis B and C, we found that viral DNA was identified in the smoke produced by the use of electro-surgery in these interventions. On the other hand, there are no articles in the literature documenting an increased risk of viral contamination, related to surgical smoke or pneumo-

peritoneum loss, for surgeons, anesthetists or operating room staff (13). In the case of patients with such viruses for whom surgical treatment is indicated, it is recommended to minimize the exposure of surgeons to contaminated blood, suggesting the use of laparoscopic techniques safer from this point of view than the classic laparotomy (14).

In addition, there is evidence from the outbreaks of respiratory viruses similar to SARS-CoV-2, such as influenza and other coronaviruses SARS (severe acute respiratory syndrome) or MERS-CoV (Middle East Respiratory Syndrome), that haven't shown any proof of transmission of the disease through surgical smoke or gas losses in laparoscopic surgery (15).

On the other hand, we want to emphasize that the application of all known and available safety measures in order to reduce the possibility of intraoperative contamination with SARS-VOC-2 virus should be constantly considered.

Laparoscopic procedures are performed under general anesthesia, and this involves intubation, ex-tubation and mechanical ventilation, aerosol-producing procedures, which in a COVID-19 positive patient, contain aerial viral particles. The surgical team should reduce exposure during intubation and the extubation procedure and should be equipped with appropriate protective equipment (PPE), including N95 masks, visors, gowns, waterproof caps, coveralls, double gloves, boots, according to Romanian Ministry of Health regulations (16).

Taking into account that the potential risk of intraoperative contamination with SARS-CoV-2 is unknown, patients with colorectal pathology can benefit from the advantages of laparoscopic or robotic surgery if mandatory institutional conditions and experience of the operating team for minimally invasive surgery are met. In this context, the proven benefits of the minimally invasive approach to colorectal pathology, reducing the hospital stay and the associated complications, should be considered as a matter of priority.

In the absence of specific equipment or if

there is limited experience in laparoscopy of the surgical team, the minimally invasive approach in a COVID-19 positive patient is not recommended.

In order to use minimally invasive surgery, the potential of the equipment to ultra-filtrate most aerosolized particles will be taken into account, and the correct and appropriate use of personal protective equipment (PPE) is mandatory.

The SAGES - EAES recommendations (17), also adopted by ARCE, for the use of minimally invasive surgery during the COVID-19 Pandemic, emphasize the importance of setting the carbon dioxide insufflation pressure to a minimum, reducing the size of skin incisions enough to allow trocar insertion, but preventing the gas leaks, and the permanent use of an ultrafiltration devices (filtered surgical smoke exhaust system) (18). We also recommend the application of measures to limit viral contamination when changing instruments during surgery or exhaling pneumoperitoneum, when removing working trocars, converting to open technique or extracting the specimen. The use of an endobag and a wound protector is recommended for the specimen's extraction in all patients undergoing minimally invasive colorectal surgery.

If the colorectal surgeries involves an extended duration, in the context of prolonged wearing of high level PPE with an unfavorable ergonomic impact, relaxation breaks or, as the case may be, conversion to open technique should be considered.

Transanal surgery (TAMIS / TaTME), due to the specificity of the work platforms, may involve an increased risk of aerosolization, and SARS-COV-2 viral particles have been detected in the stool. (19) If the conditions for directing and ultrafiltration of surgical smoke are not met or in the absence of specific personal protective materials, this approach is not recommended in a pandemic context.

Taking into account the complexity of colorectal surgery, we include specific recommendations of the professional societies (5,6,8,9, 20-22).

Proctology is one of the subspecialties significantly affected by the COVID-19 pandemic, as many of the specific procedures are performed in dedicated outpatient clinics and most have a limited or suspended schedule. On the other hand, diagnostic procedures such as endoanal ultrasound or anorectal manometry will be delayed according to recent evidence of virus persistence in faeces.

Patients with proctological conditions could be temporarily helped by phone calls, e-mail or online consultation platforms, in order to benefit from the advice of specialists, but the therapeutic possibilities will be limited.

Proctology outpatient clinics must operate in accordance with the rules of epidemiological triage, social distancing in the waiting room and the patient must wear a face mask. Schedules of consultations and interventions should avoid crowding of patients and allow compliance with all rules of post-procedural environmental sanitation. Medical personnel must wear appropriate protective equipment.

The major risk for the medical staff is when performing the diagnostic or treatment anoscopy, given the fact that viral particles have been isolated from secretions, intestinal fluids and feces. If an anoscopy is to be performed, the doctor and nurse must be equipped in the same way as for an endoscopy throughout the procedure.

Major anorectal emergencies, anoperianal infections with sepsis, hemorrhages with severe anemia or lipothymia will be referred to hospital emergency services.

Smaller perianal abscesses without signs of sepsis will be drained as easily and efficiently as possible, under local anesthesia. Surgical treatment will be accompanied by broad-spectrum antibiotic therapy, covering anaerobic germs, probiotics during antibiotic therapy and rigorous local hygiene recommendations. In this way, visits to the doctor for simple maneuvers of local toilet and dressing can be reduced.

The same can be done for smaller pilonidal abscesses

Acute and chronic anal fissures can be

emergencies due to intense and exhausting pain for the patient. It does not require anoscopy for diagnosis, nor is it recommended without general or local anesthesia.

If conservative treatment is chosen, it can be prescribed for 2-3 weeks for acute fissures, the chance of healing being 50-80%. Treatment of chronic but very painful fissures by topical treatment (based on calcium blockers, nitroglycerin, glyceryl trinitrate) could be prescribed for at least 1 month from the beginning. If there is a possibility of botulinum toxin treatment, this would be preferable because it provides the patient with a prolonged effect on sphincter relaxation for at least 3 months, and follow-up visits, depending on the context of the pandemic, can be postponed until the end of this period (23).

Patients with symptomatic grade II-III internal hemorrhoids undergoing rubber band ligation may be scheduled for sessions at 6-8 weeks intervals, thus reducing visits, meanwhile maintenance Detralex treatment may relieve symptoms.

Procedures using electrocoagulation, radiofrequency, laser should be avoided or applied with the necessary cautions to limit the risk of viral aerosol contamination.

Endoscopy

Endoscopic procedures have an increased risk of infection for both patients and healthcare professionals. The increased risk occurs because the procedures generate aerosols, especially upper digestive endoscopy (including ultrasonographic endoscopy or retrograde endoscopic cholangio-pancreatography), but also lower digestive endoscopy (colonoscopy) due to the presence of viral particles in the lower digestive tract and feces, for a period longer than in nasopharyngeal tampons (19,24,25).

Consequently, in endoscopy clinics, specific protocols must be followed for the stratification and protection of the risks of medical staff, starting with the triage measures, respectively for the use of the required level of personal protective equipment (PPE). It is mandatory epidemiological triage of all patients, to be performed as much as possible

by phone (24 hours before the procedure), respectively before admission in the endoscopy unit. In addition, the epidemiological triage of medical staff, performed daily, is also necessary. COVID-19 high-risk patients are preferably referred to dedicated COVID-19 hospitals if endoscopic procedures are not immediate emergencies and patients are stable.

Several digestive endoscopy societies (such as ESGE, ASGE, BSG) have stratified endoscopic procedures according to risk (26).

- urgent procedures that cannot be postponed and must be performed (upper and lower gastrointestinal bleeding, foreign bodies, acute cholangitis, obstructive jaundice);
- semi-urgent procedures (dysphagia, severe anemia with cardiovascular complications, melena / rectal bleeding, recent hemorrhage, obstructive jaundice, US / CT / MRI scans with suspicion of tumor, confirmation of diagnosis by biopsies or cancer staging, complex polypectomies, ulcerative colitis or Crohn's disease for initial diagnosis, etc.);
- procedures that can be postponed, including screening and surveillance (patients with previous surgery for colon cancer or previous endoscopic polypectomy), diagnostic procedures for non-urgent pathology (irritable bowel syndrome, etc.).

It is not possible to control aerosol particles produced during endoscopic interventions, so all team members and all medical staff will wear the appropriate protective suit, including FFP2 / 3 mask, goggles and visor, boots and waterproof surgical gown (19). In addition, electrosurgical units should be set to the lowest possible power, and the use of monopolar electrosurgery and bipolar or plasma-argon coagulation devices should be kept to a minimum, as they may lead to aerosolization of viral particles.

All emergency endoscopies will be considered as having an increased risk of contamination, as COVID-19 positive patients may present with digestive symptoms.

The endoscopic equipment used for COVID19 positive or suspicious patients will be cleaned separately from the rest of the endoscopic equipment (14), and the consumable accessories will be disposable. For positive or suspicious COVID19 patients, evaluation by separate epidemiological pathways is required in endoscopy room with operating room circuits, preferably with negative pressure. The personal protective equipment is completed with disposable coveralls.

For patients with semi-urgent procedures (preferably scheduled within a maximum of two weeks), risk minimization measures including RT-PCR testing and chest CT 24-48 hours before the procedure are required, especially for cancer patients, which may be immunosuppressed and implicitly have an increased risk of COVID-19.

A special mention is the screening of patients at medium risk of colorectal cancer (performed either by annual FIT tests, followed by colonoscopy for positive patients or directly by colonoscopy performed every 10 years) which are currently postponed indefinitely in most medical systems. Similarly, groups of patients at high risk for colorectal cancer who require colonoscopic examinations at predefined intervals (Lynch syndrome, etc.) are currently delayed. These categories of patients should be prioritized for elective endoscopic procedures as the acute phase of the COVID-19 pandemic is overcome. The resumption of screening programs is an extremely important goal, as late performance of procedures can increase morbidity and mortality (27). We recommend that the scheduling of these procedures should be preceded by RT-PCR testing for SARS-COV-2 infection.

Patients with IBD who are suspected of having COVID-19, if they do not present a high risk of relapse, should stop thiopurines, delay treatment with Methotrexate and delay treatment with biologics, especially those that decrease lymphocyte counts. Due to the short duration of the infection period in which these treatments must be stopped (3-4 weeks), the possibility of a severe

relapse is very small. Steroid treatment in patients with IBD and COVID-19 should be carefully weighed against the risks and benefits, even if steroids have been used to control the release of cytokines in patients with COVID-19 (9). SARS-COV-2 uninfected patients will continue their previously recommended treatments.

Diverticulitis

The management of complicated acute diverticulitis depends on the clinical manifestations and has not changed following the spread of the COVID-19 pandemic. The initial conservative approach with observation and antibiotics is the recommended treatment.

If surgery is needed, it is very important that patients are tested before any elective or emergency surgery, even if they are asymptomatic. In COVID-19 positive patients requiring emergency surgery, the risk of increased morbidity and mortality in the context of viral infection should be considered. Elective surgeries should be postponed.

Strategies for Colorectal Cancer Patients

During the pandemic, the number of surgical procedures for patients with colorectal oncological pathology was significantly reduced, either because anesthetists and/or beds in intensive care units for COVID-19 patients were needed or because of surgery-induced immunosuppression may increase the risk and severity of COVID-19 in these patients. Taking into account these facts, it was recommended to postpone the surgical interventions for uncomplicated cases (stages I and II), in favor of the neoadjuvant treatments. However, while timing strategies may be justified by extreme inadequate hospital resources or in cases of serious threats to patient safety, it should be noted that delays in surgical treatment over 2-3 months can lead to a significant increase of the recurrence rate (28).

We do not know when things will return to normal, we cannot say how long we will have to postpone colorectal surgery expecting that the risk of hospitalization will be lower in the

near future. Moreover, none of the proposed neoadjuvant treatments have proven superiority to the traditional approach and all involve prolonged chemotherapy increasing the risk of complications related to a potential COVID-19 infection by lowering patients' immunity.

On the other hand, for COVID-19 patients, the treatment of SARS-COV-2 infection is a priority, and cancer surgery should be reserved only for life-threatening situations.

Regardless of the infectious status of the colorectal patient (SARS-COV-2 positive or negative), if non-surgical treatment can achieve the same goal as surgical therapy, non-surgical treatment will be preferred (e.g. stents should be preferred instead of palliative resections) (3, 9).

When evaluating different surgical options, the frequency and severity of postoperative complications should be considered. For example: in patients with lower rectal cancer and significant associated comorbidities with or without prior radio-chemotherapy, the Hartmann's procedure may be preferred to reconstruction that carries a high risk of anastomotic leaks, and it will probably require a longer recovery period and possible admission to Intensive Care Units (29). It is expected that, in the context of the pandemic, the rate of performing colostomies or diverting ileostomies will be higher than before, in order to avoid the risks of postoperative septic complications and the need to admit the patient to the Intensive Care Units.

In the context of the COVID-19 pandemic, it is reasonable to recommend less aggressive approaches to less aggressive cancers. For rectal cancer with clinical and imaging staging T3a-bN0M0, we consider that the primary surgical approach, with total mesorectal excision (TME), is the recommended option, the benefits of preoperative radio-chemotherapy being debatable in this situation (9). On the other hand, aggressive therapies with induction chemotherapy followed by preoperative radio-chemotherapy should be indicated especially in aggressive cases with a high risk of recurrence such as, mesorectal fascia

infiltration or positive mesorectal or extra-mesorectal lymph node metastases.

The decision regarding the proper therapeutic strategy for each patient with colorectal oncological pathology will be assumed by the medical team following the case analysis in the multidisciplinary oncological team of the hospital (tumor board). In choosing the surgical or non-surgical option, the procedural type, approach or treatment, the particularities of each case, the impact of the COVID-19 pandemic on the regional health systems and the stage of spread of the virus in that region will be taken into account, as well as the human and material resources available in that hospital.

Return after the Acute Phase of the Pandemic

Although there is general agreement that a region reached the plateau of infection when there is a stable number or a steady decline in new volumes of cases, for at least two weeks, unfortunately, there is no agreement with on the subsequent stages of operational recovery. (30). Very little is known about what to expect in terms of pandemic tail length and volume and / or how recovery will be influenced by the shape of the infection curve, flattened or not. There is also considerable uncertainty about the existence of a relapse following the initial recovery. This means that we should not expect to return to a "normal" pre-pandemic healthcare environment soon (8) and that the above recommendations are likely to be needed for a longer period of time.

In this context, we recommend a strategy of prioritization of the colorectal patients in the period after the resumption of the surgical activity. Thus, patients in the optimal window for surgical therapy in a multidisciplinary treatment program (e.g. rectal cancer at 8-12 weeks after completion of neo-adjuvant RCT) should probably be in the first eligible places, followed by patients with large tumors with potential complications (stenosis, hemorrhages) and those with aggressive tumors (poorly differentiated, Ki67 > 20%, lymph node metastases).

Both during the pandemic period and after,

until the recovery of the previous balance, we recommend an active communication with patients, supported by all available means. Thus, patients with colorectal pathology will explicitly realize that they have not been abandoned. Although decisions and strategies taken during crisis may have ethical implications, (31) most people are willing to accept a healthcare system that, in times of extreme need, prioritizes urgent life-saving measures, and related efforts to combat the vital consequences of the pandemic.

Conflict of Interest

The authors declare that they have no conflict of interest.

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