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Recommendations of the Brazilian College of Surgeons for laparoscopic surgery during the COVID-19 pandemic.

Recomendações do Colégio Brasileiro de Cirurgiões para cirurgia videolaparoscópica durante a pandemia por COVID-19

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A B S T R A C T

During the current COVID-19 pandemic, the surgical community faces the possible risk of infection of health care professionals involved in the surgical procedure. This leaves to concerns and questions referred to the most adequate surgical approach at this moment. With the objective of guiding surgeons, and based in many different protocols published until now, the Brazilian College of surgeons brings recommendations about this subject. The aim of this technical note is, trough a compilaton of publications and recommendations from Scientific Societies of Surgery worldwide, to provide guidelines regarding laparoscopic access during the COVID-19 pandemic.

Headings: Coronavirus. Laparoscopy. General Surgery.

The Brazilian College of Surgeons recommendations regarding laparoscopic surgery response to the COVID-19 pandemic.

The COVID-19 pandemic has required high surveillance among the surgical healthcare workers who face the potential risk of infection while performing any surgical procedure. Particular concerns and questions regarding the most adequate surgical approach at this moment is of utmost importance. The Brazilian College of surgeons publishes its recommendations on the topic based on the many different protocols published until now, with the objective of guiding surgeons.

It is important to highlight that the current recommendations are compilations of other scientific societies and preliminary publications. Due to the constant modification of the pandemic, these recommendations may have to be updated.

1. Elective surgical procedures should be postponed.

Non-emergency procedures should be postponed with the goal to make available more hospital beds, intensive care units and ventilators[1]. Furthermore, the infection of a patient who underwent an elective surgery may increase his/her morbimortality.

2. Personal protection equipment (PPE) and COVID-19 education of the surgical team.

To educate the surgical team in regarding the protection equipment is extremely important. All members of the team should be trained on the appropriate use of the equipment. Training sessions are important to decrease not just the transmission of the virus, but also to avoid the loss of equipment due to its inadequate use under the current shortage scenario, which highlights the importance of routine training direct to pandemics[2].

3. Specific surgical area preparation for COVID-19 patients

The organization of an exclusive surgical area for patients with COVID-19 is important to hamper the dissemination of the disease.

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The experience from centers in the United States, Canada and Singapura showed key points:

- A specific surgical center for all cases of COVID-19 with low traffic of people and with non-essential materials, including personal items like cellphones, pens and keys.
- Only the surgical equipment to be used during the operation should be in the room.
- The anesthesia recovery should be done in the surgical center, with an appropriate team until the transfer to an isolated area, whenever possible.
- The transportation of the patient to and from the surgical center, to and from the ICU or to and from the separated/isolated room should follow strict paths, with hardly any other people around.
- Surgeries with decreased operating time with less exposure of the surgical team should be considered[2].

4. Screening of patients before the operation

All patients, as much as possible, should undergo specific interview regarding the possibility of the infection/contamination by COVID-19[3]. The fast-immunologic testing is also recommended[4], and this will help determine the urgency of the case to undergo surgery in a timely manner. Also, Covid-19 testing will help identify those without disease symptoms but who are carriers. A thoracic CT scan a screening method that has been recommended by some authors, especially for those patients who will undergo an abdomen CT scan[5].

5. The use of PPEs and the surgical team

Common safety measures, similarly, to those adopted for other viral infections with potential transmission during the operation should be carried out. Attention should be focused on eye protection or total facial protection devices (face-shields)[6]. Regarding surgical masks, the Ministry of Health recommends the N95/PFF2[7], despite a recent paper[8] having shown that the coronavirus-19 has a size of 50-200nm, and the N95 mask can only filter particles bigger than 300 nm. Nonetheless, this mask presents a 95% of efficacy in this scenario[9].

The use of two pairs of gloves is also recommended due to the risk of contamination during removal. Following the same principle, the removal of the surgical gown should be done by a different health care professional such as, the assistant nurse[6].

The surgical procedure should be performed by the most experienced surgeon, and the number of people in the surgical field should be restricted to those essential to the act[10].

6. The use of trocars

The introduction and removal of surgical instruments through the trocars should be carefully performed, as well as its cleanliness[4]. The sealing valves and rubbers should be rigorously checked to avoid leakage of the pneumoperitoneum. When possible, it is recommended to have less puncture sites[3]. The use of sealing methods around the incisions (balloon trocars, suture cerclage, and so on) are strongly recommended[4]. All the trocars should only be removed after the completed emptying of the pneumoperitoneum[11,12].

7. Management of the pneumoperitoneum

There are no specific studies which have assessed the dissemination of the coronavirus through the aerosol dispersion produced by the pneumoperitoneum. However, previous studies, which assessed other viral diseases, strongly recommend caution in the management

of the pneumoperitoneum during laparoscopic procedures[13,14]. Filtration mechanisms should be used in the inflation and emptying of the pneumoperitoneum[10]. It is recommended to use the minimum intra-abdominal pressure possible, between 10-12mmHg[1,3,11]. Many recommendations have been made to keep a closed system pneumoperitoneum in[11,12]. The technique of emptying the pneumoperitoneum, either during the operation to remove smoke or at the end of the procedure, should allow the minimum chance of carbonic gas dispersion to the surgical environment. Ideally, there should be a connection of a tube (such as an IV line or drain) to the trocar which is less used during the operation. The other extremity should be connected to a filtering device, and this should be placed at a safe distance, at least 2 meters, from the surgical team[15]. Some water sealed devices[16,17]. Spinelli and Pellino[16] recommend closed systems like those used for intra-abdominal chemotherapy (PIPAC). However, these are expensive and may not be available in all the hospitals. If there is no emptying mechanism, close the valve in the inflation working trocar before the CO_2 flow from the insufflator is turned off (even if there is a filter in the system). If this precaution is not performed, the intra-abdominal contaminated CO_2 may be pushed back to the insufflator when the intra-abdominal pressure is higher than the pressure inside it[15]. Furthermore, it is important to reduce the time in the Trendelenburg position as much as possible. This minimizes the effect of the pneumoperitoneum upon the lung circulation and function, it reduces the susceptibility to the pathogens and the increase of postoperative complications among COVID-19 patients[4].

8. The use of energy devices

Previous authors have demonstrated pathogen aerosol dispersion produced by the electrocautery smoke[18,19], which may also apply to the COVID-19. Specifically, during laparoscopy, the smoke can be expelled to the external environment under higher pressures due to the pneumoperitoneum. The use of electric or ultrasonic equipment, for 10 minutes, during laparoscopic surgery is associated to a higher particle concentration than open procedures[19]. An explanation of this phenomenon the low mobility of gas in the abdominal cavity, which tends to stay concentrated. Thus, the risk of exposure is higher in laparoscopic than open procedures[3]. Excessive cauterization also be avoided[3]. The intensity of the electrocautery should be adjusted to the minimum required[4]. The same care should be taken with the use of ultrasonic devices, due to the capacity to produce blood and tissue particles[3,20,21].

9. Digestive tract anastomosis

Intracorporeal anastomosis should be preferred to the extracorporeal, aiming to diminish the risk of fecal aerosol dissemination and sudden depressurization of the pneumoperitoneum[17]. However, this measure should be evaluated in regard to the increase in the length of time to perform the operation and the required pneumoperitoneum, as well as the experience of the surgeon.

10. Extraction of the surgical specimen, video-assisted surgery and drains

The extraction of the surgical specimens should be performed after the emptying of the pneumoperitoneum[11,12]. Hybrid video-assisted procedures are not recommended due to the lack of control of the gas[15]. The use of drains should be indicated only when strictly necessary, since the placement of drains through the trocar incisions under laparoscopic vision increases the risk of gas dispersion to the external environment in an uncontrolled manner[15].

11. The decision to indicate or not the laparoscopic approach.

Although there are some recommendations favoring the laparoscopic approach in selected cases[22], the decision regarding this should be evaluated case by case, taking into account the following variables: for how long the pneumoperitoneum is required and the surgical trauma recovery related to the procedure. The benefit of the laparoscopic approach should outweigh the risk of viral aerosol dissemination[3]. In patients with the confirmed COVID-19 diagnosis, it is important to evaluate a nonsurgical treatment or a less invasive therapy when possible[3,22].

It is important to highlight that all these recommendations are based on principles of safe video laparoscopy surgery, considering other infectious diseases, such as hepatitis, acquired immunodeficiency syndrome, and not specifically Covid-19. As such, they are subject to constant updating, as new evidence is proven. Furthermore, the recommendations must be individually analyzed according to the structure of the Surgical Services and the personal experience of the surgeons.

R E S U M O

Diante do quadro de pandemia da COVID-19, a comunidade cirúrgica enfrenta o possível risco de contágio de profissionais envolvidos no ato operatório; gerando preocupações e dúvidas referentes a escolha da via de acesso mais adequada nesse momento. Com objetivo de orientar os cirurgiões, baseado em diversos protocolos publicados até o momento, o Colégio Brasileiro de Cirurgiões traz recomendações acerca deste assunto. O objetivo desta nota técnica é, através de uma compilação de publicações e recomendações de Sociedades Científicas de Cirurgia de todo mundo, trazer orientações relativas ao acesso laparoscópico durante a pandemia por COVID-19.

Descritores: *Coronavirus. Laparoscopia. Cirurgia Geral.*

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