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# Impact of COVID-19 on Laparoscopic Surgery: A Short Survey of the Surgeons Working at the Frontline in this Pandemic

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## Abstract

**Introduction:** COVID-19 poses serious risk to surgeons performing laparoscopic surgery. This risk can be exponential however scientific evidence to quantify this risk is lacking. Surgical community is divided in their opinion with regards to role of laparoscopy in COVID-19.

**Methods:** We performed literature search to identify studies, guidance from major institutions to provide cumulative evidence and to formulate formal opinion on role of laparoscopy in COVID-19. We also performed short survey to assess the opinion of surgeons in this regards.

**Results:** Literature search revealed guidelines from major surgical institutions, which were included in the study. Three papers published in the last few days did not report any patient's data. Our survey revealed surgical community is divided in their opinion with regards to role of laparoscopy in surgery and stressed the need for more robust evidence.

**Conclusion:** Surgeons are divided in their opinion as to whether or not to perform laparoscopic procedures during COVID-19 pandemic. Although guidelines have to be followed currently, there is more than urgent need for robust evidence.

## Introduction

Over the past four decades Laparoscopy has revolutionized the gastrointestinal surgery. Laparoscopic procedures are frequently being performed in almost all specialties of abdominal surgery. The proven benefits of laparoscopic surgery includes less blood loss, shorter hospital stay, early recovery and improved quality of life. COVID-19, a corona virus pandemic started in the Wuhan city of China towards the end of 2019, has engulfed almost the entire world [1]. The pandemic has impacted all aspects of clinical practice both for physicians and surgeons, and the hospitals around the world are overwhelmed [2–4]. Routine elective surgical procedures have been halted and the Public Health England has advised against routine elective procedures though oncological surgery is still to continue [5]. Among other challenges faced by medical community, the surgeons are concerned the spread of virus by Aerosol Generating Procedures (AGPs), which without doubt pose greater risk and challenge [2–6]. Aerosol Generating Procedures including endotracheal intubation, Upper GI endoscopy and Laparoscopy [2–6], and with the advent of virus in patient's faeces, colonoscopy too, poses greater risk from this contagion [3–9]. In the midst of rapidly evolving pandemic there is limited evidence of laparoscopy causing aerosols, however in view

of safety major decisions to protect surgical community has to be taken. It is with concept all four Royal Colleges of Surgeons of the United Kingdom, American College of Surgeons, SAGES as well as British Society of Gastroenterology have produced comprehensive guidance on avoiding risks produced by AGPs [2–9]. Additionally, Surgical Royal Colleges and ACS have recommended against performing laparoscopic procedures [3–6]. Moreover, clear instructions have been provided on the type of PPE to be worn by surgeons whilst performing these procedures [6–9]. The primary aim of this study is to critically appraise the current literature to assess role of laparoscopy in COVID-19. This would not only assist surgeons in the field with decision-making but also pave the way for quality research to answer this question. We conducted a short survey of practicing surgeons in the region to include their view with regards to laparoscopy.

## Methods

Current literature was searched by two authors (SR, KB) using MESH terms Laparoscopy, Laparoscopic surgery, COVID-19, Minimally Invasive surgery and COVID-19, Laparoscopic Appendectomy, Laparoscopic Cholecystectomy in COVID-19 epidemic and pandemic. All major medical search engines including Google scholar, PubMed, Medline, Cochrane review were searched. Any dispute rose between the two authors was discussed mutually and an agreement reached between the authors to include or exclude particular study. The author is well aware of importance of laparoscopy, its benefits and implications to the surgeons in the field. We are also aware the surgical community does understand the challenge posed by the COVID-19 on their daily practice. However, due to limited patients data available and scarcity of the evidence, the author decided to run a comprehensive survey to assess the ground reality and seek the opinion of the surgeons working at the frontline in this pandemic. The authors were well aware of extreme pressure that surgeons are facing due to this pandemic, large numbers of responses were not expected. The comprehensive questionnaire was prepared to receive snap short of current practice.

## Results

During the current evolving pandemic no study with any patient data was identified in the all the major search engines reviewed. Mostly the guidance from major surgical institutions was identified. One study with combined experience from China and Italy has also provided guidance with regards to implications of COVID-19 on MIS and no experience involving cases was provided. Studies with outcome of the data are yet to be published as we move forward with pandemic. The Guidelines provided by all major organizations follow same principles of safe surgery [2–7]. The sum up of these guidelines suggests avoiding laparoscopic surgery, managing acute surgical conditions with conservative approach where possible and continuing oncological resections [3–9]. Moreover, use of appropriate PPE is of significance importance to avoid

surgical workforce safety [4–9]. Furthermore, if laparoscopic procedures are to be performed, strict adherence to guidance should be adopted [3–9]. This includes extreme caution during establishing pneumoperitoneum (small incision), small incision, use of veress needle, or visitor may be more helpful. Use of Endoseal should be considered [4–6]. In addition low pressure of gas (10 mmHg–12 mmHg), suction of the gas at the end of surgery will reduce the risk of AGPs [4–7]. Our survey was well responded by the surgical community, opinion was sought from 30-surgeons in the region. Of these 24 surgeons practicing MIS and involved in frontline emergency surgery during COVID-19 responded. The opinion was divided in the surgical community; almost 50% ( $n = 12$ ) of surgeons believe laparoscopic surgery is unsafe (Figure 1). However remaining 50% ( $n = 12$ ) think that since the benefits of laparoscopic surgery are more it should be performed. Moreover, approximately 60% of surgeons believe laparoscopy is AGPs (29%,  $n = 7$ ) (Figure 2) and they are concerned about safety of staff and surgeon (29%,  $n = 7$ ). Only 12% ( $n = 3$ ) (Figure 3) of surgeons reported that laparoscopy should be performed in highly selected cases in our survey. More importantly all of the surgeons were aware of guidelines produced by various surgical societies. In addition, almost all of the surgeons agree that since there is lack of evidence and MIS has proven benefits a quality research in this area is the need of the time.

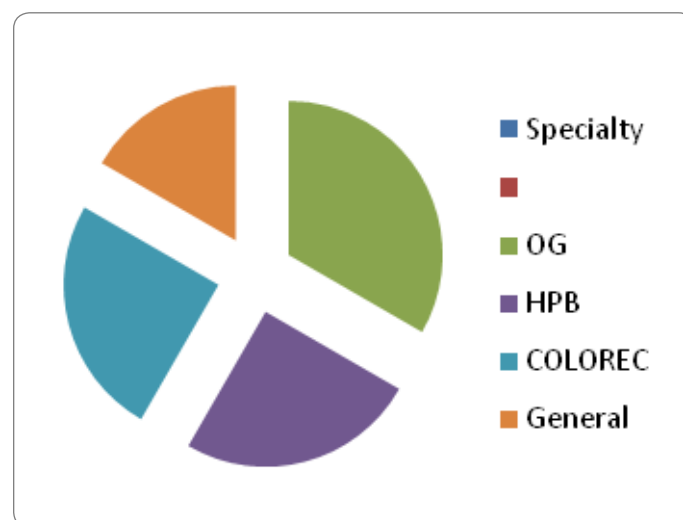


Figure 1: Specialty of the Consultants.

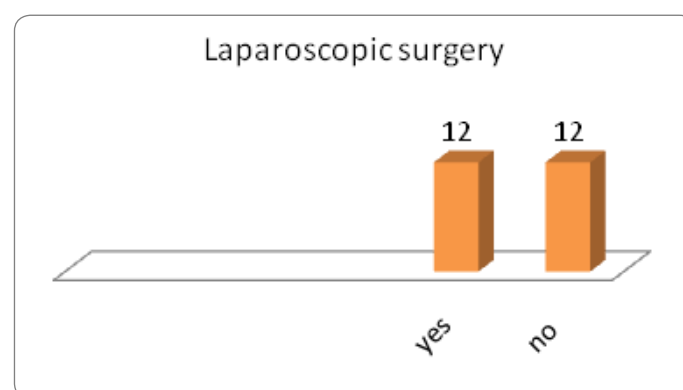


Figure 2: Do you think Laparoscopic procedures are safe?

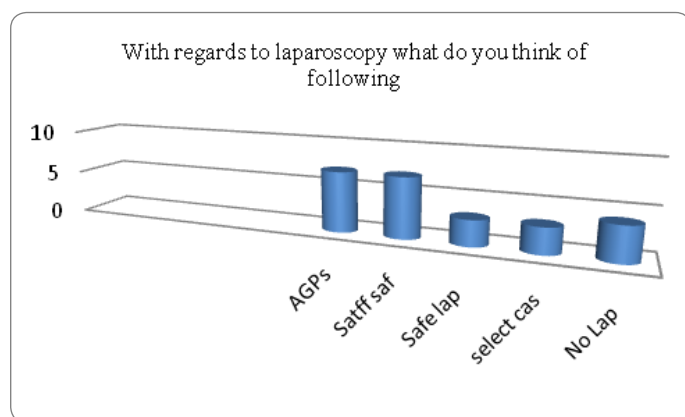


Figure 3: With regards to laparoscopy what do you think of the following?

## Discussion

We aimed to highlight the specific challenge confronted by today's surgeons due to rapidly evolving COVID-19 pandemic specifically with regards to laparoscopic surgery. Since its inception laparoscopic surgery has been established as an accepted standard. Although this study is based on a survey and opinion of the experts in the field, the current literature falls short of conclusive evidence. The respondents of the survey represented wider surgical specialties involved in abdominal procedures on daily basis reflecting major bulk of laparoscopic surgery and inclusiveness of the study. There is no comparative data in literature however guidance from major institutions apply to all specialties [6–9]. The survey has shown that all surgeons were well acquainted with current guidance from major institutions. As the survey was carried out in the United Kingdom, majority of respondents were familiar with intercollegiate guidance on COVID-19 and its implications on surgery. The mechanism of getting aware of the guidelines could have varied from active quest on the topic to effective communication by the colleges to their members and fellows. The survey truly reflects that surgical community is divided in terms of their opinion when it comes to the implications of COVID-19 on laparoscopy.

Half of the respondents (50%,  $n = 12$ ) proposed in favor of performing laparoscopic surgery and considered it safe. This rationale could be well elicited by the fact that laparoscopic surgery has an established advantage over open surgery and this superiority cannot be undermined by an unverified potential risk of infection. Moreover, the current generation of surgeons are well equipped with laparoscopic techniques, however they will be more naïve to an open surgical procedure, performed less often during routine practice. Such dilemma however can be overcome with the help of senior colleagues and adherence to general principles of surgery. Additionally, laparoscopy can be performed if necessary safety precautions are to be adopted [6,7] such measures include but not limited to use of small incision, veress needle or visport to establish pneumoperitoneum, low pressure CO<sub>2</sub> (10 mmHg–12 mmHg), use of ENDOSEAL devices, avoiding prolong Trendelenburg position and suction of CO<sub>2</sub> at the end prior to closure could avoid transmission of virus [3–9].

This is also reflected in more recent guidance on how to approach safely if to perform laparoscopic procedures [4]. As the pandemic is growing and information is being catered this opinion is gaining strength [4–6] although this belief cannot be disregarded, counter argument is also valid. In our survey half of the surgeons (50%,  $n = 12$ ) endorsed that laparoscopic surgery should be abandoned. The most explicit reasons were the concerns over aerosol generation and potential harm to surgeons and nursing staff. The aerosol generation during laparoscopic surgery can happen at any of the steps, such as endotracheal intubation, establishing pneumoperitoneum and during the procedure leaks of CO by instrumentations [3–6]. Additionally, significant aerosol generation happens towards the end of surgery [5–9]. Moreover, evidence available from SARS experience may be of valuable significance to this end. However currently there is not enough evidence and safety of the staff and surgeons is of paramount importance and is well reflected by the surgical guidelines [3–9]. Our survey reflects well the lack of evidence causing confusion in the surgical community, which could have dangerous consequences. Till robust evidence available the author advise to surgeons in the field is to strict adherence to the surgical guidelines. The author would also recommend to our colleagues with regards to attendance at various webinars organized by the surgical institutions such PanSurg ([www.pansurg.org](http://www.pansurg.org)), SAGES, Royal college of Surgeons of Edinburgh, American College of Surgeons etc. it would be not very long before the evidence will be available as major trials are underway and would answer most of these questions.

## Conclusion

It is imperative that there is difference of opinion in the surgical community with regards to performing laparoscopic procedure during this pandemic. However, author believes this would be short-term and more robust evidence from various trials being carried out at present will answer most of these questions. Moreover, it is of paramount importance that surgical community should follow institutional guidelines based on safety precaution.

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