

Mitigating the risks of surgery during the COVID-19 pandemic



In response to the evolving COVID-19 pandemic, most governments and professional bodies recommended cancellation of elective surgery. This action was important to free up hospital bed capacity and ensure supplies of personal protective equipment (PPE), as well as to protect patients and health-care workers. In *The Lancet*, The COVIDSurg Collaborative¹ report 30-day results of an international cohort study assessing postoperative outcomes in 1128 adults with COVID-19 who were undergoing a broad range of surgeries (605 [53.6%] men and 523 [46.4%] women; 214 [19.0%] aged <50 years, 353 [31.3%] aged 50–69 years, and 558 [49.5%] aged ≥70 years). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection was diagnosed postoperatively in more than two-thirds of the patients (806 [71.5%]). The primary outcome was overall postoperative mortality at 30 days and the rate was high at 23.8% (268 of 1128 patients). Pulmonary complications occurred in 577 (51.2%) patients and 30-day mortality in these patients was 38.0% (219 of 577), accounting for 82.6% (219 of 265) of all deaths. Risk factors for mortality were patient age of 70 years or older, male sex, poor preoperative physical health status, emergency versus elective surgery, malignant versus benign or obstetric diagnosis, and more extensive (major vs minor) surgery. The high proportion of these patients who were diagnosed with SARS-CoV-2 infection in the postoperative period is of interest. These patients probably acquired their infection before being admitted to hospital, thus reflecting the high prevalence of SARS-CoV-2 in the community.

First, we commend the National Institute for Health Research Global Health Research Unit on Global Surgery and all the surgeons and anaesthetists who contributed data across 24 countries in the first few months of the COVID-19 pandemic. The COVIDSurg Collaborative took advantage of a web-based cohort design and enrolled patients (partly retrospectively) between Jan 1, and March 31, 2020. However, it should be recognised that speed and a simplified data collection process relying on site investigators identifying cases can come at a cost. No control group was used, so the outcomes in those who did or did not have COVID-19 cannot be directly compared. Protocols for laboratory testing and radiological investigation were not standardised.

Thus, there is a risk of ascertainment bias because patients who had an uneventful postoperative course were unlikely to be tested for SARS-CoV-2 or have radiological investigations and so were not counted in the analysis. Those developing respiratory or sepsis complications after surgery will receive additional postoperative testing and this might have inflated the apparent COVID-19-attributed mortality and respiratory complications. Ascribing cases on a clinical diagnosis or CT scan might have led to inclusion of non-COVID-19 cases, and inflates the risk estimates because of other underlying disease processes. However, the investigators provide some reassurance with a sensitivity analysis limited to RT-PCR-confirmed cases and the results were consistent with the main findings. The investigators did not collect some relevant prognostic information such as body-mass index and immunosuppressant therapies and longer-term outcomes are unknown.²

Nevertheless, these results are worrying because the rate of poor outcomes exceeded those seen in most types of major surgery. Severe COVID-19 is associated with a marked inflammatory and prothrombotic state.³ These pathological processes are exacerbated by surgery and immobilisation, leading to a perfect storm detrimental to good postoperative outcomes. Furthermore, early data from China showed that older patients and those with comorbidities, particularly hypertension and diabetes, were most vulnerable to COVID-19.⁴ A similar demographic and clinical profile

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is typical of many types of surgery,⁵ and so there is probably a multiplicative risk process.

How should policy makers, surgeons, and other perioperative physicians respond to these concerning results? Cancelling or deferring surgery has its own consequences that can result in a worsening of a patient's condition or add risk to the eventual surgery. A sizeable proportion of the patients in this study (280 [24.8%]) had elective surgery,¹ which raises an important question about the competing risks of delaying surgery until recovery from COVID-19 versus progression of disease or distress in the intervening period. The study highlights the need for clear perioperative guidelines for emergency and elective surgery during the pandemic. Further research is needed to define what threshold of community prevalence would threaten adequate supplies of PPE and hospital capacity as elective surgery recommences. In the absence of a vaccine, are there effective chemoprophylaxis treatments that could mitigate a SARS-CoV-2 infection in the postoperative period? How is cancer biology affected by SARS-CoV-2 infection or the immune response that follows?

Most patients in the study came from Italy, Spain, the UK, and the USA—these countries' health systems were all largely overwhelmed in the early stages of the COVID-19 pandemic.^{6–9} Staff training, PPE,¹⁰ intensive care unit (ICU) beds, and ventilators were often scarce or insufficient. Countries vary widely in terms of their capacity to respond to an outbreak of a novel infectious disease.¹¹ Furthermore, there is a clear risk to hospital staff if infectious patients are not detected as early as possible.

Some elective (eg, cancer surgery or caesarean section) and most non-elective surgery must continue throughout any pandemic, and if the prevalence of COVID-19 is low and hospital resources are coping with demand for ward and ICU beds, more elective surgery can recommence.¹²

Globally, many governments and professional bodies are moving from a position of curtailment to reopening of elective surgery.^{13,14} This requires a low prevalence in the community and access to SARS-CoV-2 testing, and ensuring there are sufficient trained staff, hospital

and ICU beds, PPE, and all other necessary medical supplies.^{6,7} COVID-19 might affect access to safe surgery, especially in low-income and middle-income countries and for homeless people, migrants, and refugees—this is a great concern that needs to be addressed. Surgery is an essential part of modern medicine, but additional risks during the COVID-19 pandemic must be carefully considered.

We declare no competing interests.

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