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## Delaying surgery for patients with a previous SARS-CoV-2 infection

### Editor

With at least 28 elective million operations delayed during the first three months of the COVID-19 pandemic, the number of patients who will require surgery after a previous SARS-CoV-2 infection is likely to increase rapidly<sup>1</sup>. Operating on patients with an active perioperative SARS-CoV-2 infection is now known to carry a very high pulmonary complication and mortality rate<sup>2</sup>. Urgent information is needed to guide whether postponing surgery in patients with a previous SARS-CoV-2 infection leads to a clinical benefit, and the optimal length of delay.

The COVIDSurg-Cancer study was a prospective cohort study of patients undergoing curative elective cancer surgery during the COVID-19 pandemic up to 24 May 2020<sup>3</sup>. We performed a pre-planned subgroup analysis of patients undergoing surgery with previous SARS-CoV-2 positive swab that were not suspected to have active COVID-19 at the time of surgery. Propensity score matching was used to match previous SARS-CoV-2 swab positive patients to patients with no a positive swab test in a 1:4 ratio. Multivariable logistic regression was used to explore associations of previous SARS-CoV-2 with rates of postoperative pulmonary complications and death in matched groups. Full methodology is available in the *Appendix*.

Of 122 patients with a previous positive SARS-CoV-2 swab, 22.1% ( $n = 27$ ) were operated on within 2-weeks of diagnosis, 49.2% ( $n = 60$ ) between 2 and 4 weeks, and 28.7% ( $n = 35$ ) after 4 weeks. The number of infected patients increased during each month of the study period (*Supplementary Figure 1*). Patients underwent surgery in 78 hospitals from 16 countries, predominantly in

Italy ( $n = 44$ ), UK ( $n = 28$ ) and Spain ( $n = 20$ ). 112 patients with a previous positive swab were matched to 448 patients with no positive swab. In the propensity score matched model, previous SARS-CoV-2 infection was associated with increased odds of pulmonary complications compared to no infection (10.7% [12/122] versus 3.6% [16/448], adjusted odds ratio 3.84, 95% confidence interval 1.51-9.74,  $p = 0.004$ , *Supplementary Figure 2*). When split by time from swab to surgery, both pulmonary complications and mortality were lowest at least 4 weeks after notification of a positive swab test (*Table 1*). However, 71.3% (87/122) of patients had surgery within 4 weeks of SARS-CoV-2 infection in this series.

There are significant limitations of these data, including risk of selection bias and a small sample size, meaning this data should be considered as exploratory. Until that time, this data provides the first signal that those with a positive SARS-CoV-2 swab pre-operatively should have their surgery delayed for at least 4 weeks after notification.

Further research is urgently needed to validate these figures in a larger series and explore differences in recovery between asymptomatic SARS-CoV-2 and symptomatic COVID-19. GlobalSurg-COVIDSurg Week is a multi-centre international snapshot study planned for October 2020 and will explore these research questions in detail. At the time of writing there are over 1300 centres registered in 105 countries, with representation across all surgical specialties. The study protocol and registration are available at: [globalsurg.org/surgweek/](http://globalsurg.org/surgweek/)

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**Table 1 Outcomes of operated patients with a previous SARS-CoV-2 positive swab**

30-day postoperative outcomes	Previous SARS-CoV-2 positive swab <i>N</i> = 122	Time from previous SARS-CoV-2 positive swab		
		1 to 2 weeks <i>N</i> = 27	2 to 4 weeks <i>N</i> = 60	> 4 weeks <i>N</i> = 35
<b>Pulmonary complications</b>	<b>9.8%</b> (5.2%-16.6%) 12/122	<b>18.5%</b> (6.3%-38.1%) 5/27	<b>11.7%</b> (4.8%-22.6%) 7/60	<b>0.0%</b> (0.0%-10.0%) 0/35
<b>Mortality</b>	<b>3.4%</b> (0.9%-8.4%) 4/119	<b>7.7%</b> (0.9%-25.1%) 2/26	<b>3.4%</b> (0.4%-11.7%) 2/59	<b>0.0%</b> (0.0%-10.3%) 0/34

Previous positive swab is defined as a confirmed SARS-CoV-2 infection by nasopharyngeal swab (qRT-PcR) greater than one week before the day of surgery. Postoperative pulmonary complications were defined as pneumonia, acute respiratory distress syndrome or unexpected ventilation. Outcomes were defined up to 30 days from the day of surgery with Day 0 as the day of surgery. Full definitions are available in the Appendix.

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- 1 COVIDSurg Collaborative. Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery plans. *Br J Surg* 2020; <https://doi.org/10.1002/bjs.11746> [Epub ahead of print].
- 2 COVIDSurg Collaborative. Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort. *Lancet* 2020; **396**: 27–38.

#### Supporting information

Additional supporting information can be found online in the Supporting Information section at the end of the article.