

COVID-19: No benefit of chest inclusion in acute abdomen CT

Editor

COVID-19 thus far has over 8 million cases globally, and a reported 614 deaths per 1 million population in the United Kingdom. The SARS-CoV2 infection is associated with high mortality for individuals who undergo emergency surgery, with an associated mortality of 24%¹.

For patient/staff safety and practicality, guidance has focused on early identification of individuals at risk of COVID-19. The intercollegiate agreement between several surgical colleges and associations² states: "Any patient undergoing an abdominal CT scan for acute pain as an emergency presentation should have a CT chest at the same time, unless CT chest previously performed within 24 hours. Current tests for COVID-19, including CXR and chest CT, may be false negative." The diagnostic significance of CT chest for COVID-19 is apparent, but so too is the radiation exposure, roughly equivalent to 2 years background radiation. Given that chest radiological changes may not be present in early disease, the additional risk may outweigh clinical gain.

A range of symptoms have been documented thus far for COVID-19, and although mainly respiratory or coryzal, there are documented cases of abdominal presentations within COVID-19³. It is important to be aware, that lung bases are included in abdominal imaging and can be sufficient for identification of COVID-19⁴. We aimed to look at the clinical significance of routine inclusion of CT chest in emergency general surgical admissions.

We reviewed the CT Chest/Abdomen/Pelvis imaging for non-traumatic emergency surgical patients across 4 sites in the North of Scotland over 7 weeks (25th March to 12th

Statistic	Value	95% confidence interval
Sensitivity	60%	14.7 – 94.7%
Specificity	86.4%	77.4 – 92.8%
Positive Predictive Value	18.8%	8.7 – 36%
Negative Predictive Value	97.6%	93.3 – 99.2%

May). A COVID-19 score was allocated to the images, identifying those with radiological features of SARS-CoV-2. Imaging was then correlated with SARS-CoV-2 RT-PCR results. These images were re-reviewed with attention to lung base findings. A second data set in the same time-period was collected relating to all CT chest imaging. This set was collected to better appreciate the CT changes in COVID-19, and the proportion with lung base changes.

A total of 212 patients had a CT Chest/Abdomen/Pelvis during the study timeframe. Out of these, twelve patients were identified radiologically as suspected COVID-19. Thus, 200 patients (95%) had a CT scan of their chest with no findings of SARS-CoV-2. This data highlights the low proportion of patients with the virus but does not shed light on the diagnostic significance of lung bases in the COVID-19 patient. Therefore the second data set was collected; the further analysis of CT Chest imaging. This set identified 77 patients with suspected COVID-19. In both cohorts, 98% of patients identified had changes visible in lung bases.

Assuming a prevalence of 5% in the community, the predicted sensitivity and specificity of CT chest is presented in *Table 1*.

With the majority of symptoms being respiratory or coryzal, our data would suggest that routine additional CT chest adds little in the management of this pandemic in low prevalence areas.

Instead focused history and examination can be correlated with lung base findings.

Ultimately the goal is to deliver a complete surgical service for our patients without compromising safety⁵. Therefore, accepting a low disease prevalence, the addition of chest imaging has not significantly contributed to the identification of patients with COVID-19. These data have changed regional practice with NHS Grampian NHS Shetland and NHS Orkney no longer including thoracic imaging unless there is a high clinical suspicion, or if on review the lung bases are suggestive of COVID-19. Given the dynamic nature of this pandemic, and the resource strain, we feel that this is safe for patients, reduces radiation exposure and has a low false negative rate.

C. Brennan^{ORCID}, B. Morrissey,
S. Dubois-Marshall, D. McAteer,
A. Qadir and G. Ramsay^{ORCID}

DOI: 10.1002/bjs.11934

- 1 COVIDSurg Collaborative. Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study. *Lancet* 2020; **396**: 27–38.
- 2 Royal College of Surgeons of England. Updated Intercollegiate General Surgery Guidance on COVID-19; <https://www.rcseng.ac.uk/coronavirus/joint-guidance-for-surgeons-v2/>
- 3 Saeed U, Sellevoll HB, Young VS, Sandbaek G, Glomsaker T, Mala T. Covid-19 may present with acute

- abdominal pain. *Br J Surg* 2020; **107**: e186–e187.
- 4 Siegel A, Chang PJ, Jarou ZJ, Paushter DM, Harmath CB, Arevalo J Ben *et al.* Lung Base Findings of Coronavirus Disease (COVID-19) on Abdominal CT in Patients With Predominant Gastrointestinal Symptoms. *Am J Roentgenol* 2020; <https://doi.org/10.2214/ajr.20.23232> [Epub ahead of print].
- 5 COVIDSurg Collaborative. Global guidance for surgical care during the COVID-19 pandemic. *Br J Surg* 2020; <http://doi.wiley.com/10.1002/bjs.11646> [Epub ahead of print].