Covid-19: BSTI/BSGAR decision tool for chest imaging in patients undergoing CT for acute surgical abdomen

Acute Surgical Abdomen
Clinical decision already made that
- Urgent CT abdomen / pelvis is required
- Patient is stable enough to be sent to CT

Assess Covid-19 Probability*
Take swab for PCR if not already done

Low Probability*
- Neutrophilia
- Apyrexial
- Alternative diagnosis more likely
- CXR (if already done) normal or showing alternative diagnosis**

High Probability*
- Lymphopenia (<1.0)
- No other likely cause (NB coronavirus can cause abdominal symptoms)
- CXR (if already done) showing classic or probable Covid-19**

Do not do CXR just to look for COVID if the patient needs a CT A/P anyway

CT ON NON-COVID SCANNER
- CT Abdomen/Pelvis (typically PV phase)
- Plus EITHER low dose non-con CT chest OR all post-contrast (i.e. CT CAP)

CT ON COVID SCANNER
- CT Abdomen/Pelvis (typically PV phase)
- Plus EITHER low dose non-con CT chest OR all post-contrast (i.e. CT CAP)

RAPID CT REVIEW

Non-COVID/indeterminate
- Cannot exclude COVID
- However, combination of negative CT and low probability could aid surgical decision to operate or treat conservatively
- If at all possible, wait for swab results as well

COVID classic/probable
- Consider the patient COVID-positive
- Correlate with swab when result available
- Clean CT scanner as per COVID protocol

*Probability assessment as per PHE & local guidance

**In some cases the patient may have already had a CXR, and this could help guide COVID probability assessment as per the BSTI/NHSE radiology decision tool. See https://www.bsti.org.uk/covid-19-resources/. If no CXR has been performed, as per NELA guidance we would suggest going straight to CT.
Rationale for the tool

• In the patient with an acute abdomen requiring potential emergency surgical intervention, intubation and ventilation could be aerosol-generating.

• Reports are also emerging of increased mortality in Covid-19 positive patients in the setting of the acute surgical abdomen. As such, it may be useful to offer increased diagnostic confidence for Covid-19 in this setting, as it may influence the timing and approach to surgery.

• CT may help identify patients with Covid-19 before swab results are available; its sensitivity relative to RT-PCR has been quoted as 97% in high risk patients with respiratory symptoms. Although this is almost certainly an overestimate, a CT suspicious for Covid-19 in the emergency acute abdomen setting could be taken to suggest Covid-19.

• CT is only 54% sensitive in asymptomatic patients who are RT-PCR positive for SARS-nCOV-2 (Inui et al, Radiology Cardiothoracic Imaging March 2020 https://doi.org/10.1148/ryct.2020200110); as such, a negative CT cannot be considered to have sufficient negative predictive value to exclude Covid-19. However, in the emergency acute abdomen setting, a negative CT as well as low probability of Covid-19 could aid the confidence in the surgical decision to take the patient to theatre or manage the patient conservatively.

• As such, we advocate CT thorax (entire chest) opportunistically, if the clinical decision has already been made to send the patient for CT abdomen and pelvis, assuming cardiovascular and pulmonary stability.

• We stress that this recommendation does not apply to patients in whom abdominal CT (or MRI) is being performed for other reasons, or electively.

• We would recommend against extending the abdominal scan to only the caudal half of the thorax for two reasons: (1) an abnormality may be detected at the cranial-most aspect of the chest acquisition, leading to uncertainty; (2) although it would be rare for Covid-19 pulmonary findings to be solely located in the cranial half of the thorax, this is reported.

• We also suggest that rapid review by the acute reporting radiologist (ideally on the scanner table, if feasible) is obtained, to help guide probability of Covid-19 with respect to cleaning the scanners and directing the patient’s subsequent disposition (Covid vs non-Covid bays).