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A study on approach to acute surgical abdomen in covid 19 positive patients

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Abstract
Background: Since the beginning of Covid19 pandemic, the management of patients infected with the COVID19 virus has impacted the emergency department, surgical & medical teams & Intensive Care Units in terms of management & safety of both the patients & the healthcare workers. With the operating rooms being reserved for emergency purposes in most of the medical facilities, a dilemma is prevalent in terms of triaging patients in terms of choice of conservative & surgical management, as well as the possible outcomes.
Aims: Our study aims at estabilishing a literature to provide key suggestions for the management of acute surgical abdomen in Covid19 infected patients, keeping in mind the safety of both, the patient & the healthcare workers.
Methods: This is a retrospective observational study, including 23 patients with the diagnosis of acute surgical abdomen with Covid19 infected status, in a span of 60 days at Silchar Medical College & Hospital
Results: Out of the 23 different cases studied, 5 cases of acute cholecystitis, 3 cases of acute gallstone pancreatitis, 1 case of acute choledocholithiasis & 2 cases of acute appendicitis were conservatively managed. 4 cases of hollow viscus perforation & 2 cases of acute intestinal obstruction were managed surgically. 5 cases of hollow viscus peforation & 1 case of appendicular abscess were managed by percutaneous drainage of peritoneal fluids.
Conclusion: Deferring the surgery in acute surgical abdomen, wherever feasible is the key to patient & healthcare worker safety in times of ongoing pandemic of Covid19.

Keywords: covid19, acute surgical abdomen, laparoscopy, exploratory laparotomy, percutaneous drainage, conservative management.

1. Introduction
Due to the ongoing pandemic & imposition of guidelines by the CDC, WHO & the MoHFW India, the operating rooms have been strictly reserved for emergency cases in the public sector health care facilities. The use of laparoscopy for the diagnosis & treatment in acute emergencies have been restricted due to the risk of aerosol generation during the creation of pneumoperitoneum [3]. A number of acute surgical abdomen have been encountered in our setup like- hollow viscus perforation, intestinal obstruction, acute appendicitis, acute cholecystitis, acute gallstone pancreatitis & acute choledocholithiasis without cholangitis; all with COVID19 positive status. The management of the cases have been done with due consideration of the condition of the patient, in terms of severity of the abdominal conditions, comorbidities (ASA Score), severity of COVID19 infection, which were assessed based on clinical, hemodynamical & radiological evaluations.

Materials & methods
The study period was from April 1, 2020 to May 1, 2020 at the Department of General Surgery, Silchar Medical College & Hospital, Assam, India. The type of study was observational study. Inclusion criteria: All cases of acute surgical who were tested to be Covid19 positive by either of the following methods- RAT, RTPCR or CT-Thorax. Exclusion criteria: Pediatric patients (<12 years of age).
A total of 23 cases were studied which included 9 cases of hollow viscus perforation, 2 cases of intestinal obstruction, 5 cases of acute cholecystitis, 3 cases of acute pancreatitis, 3 cases of acute appendicitis & 1 case of acute choledocholithiasis. All the cases were tested positive for COVID19 by one of the following- RAT, RTPCR or CT-thorax [1], depending of the standard operation procedure (SOP) by Government of Assam during that period. All the decisions regarding the patient management were made by a multidisciplinary team comprising of senior experienced surgeons, physicians & anesthestists with the informed consent of the patient's attendants. Of the 9 cases of Hollow viscus perforation, 5 cases underwent emergency exploratory laparotomy with primary repair of the defect, with or without omental patch reinforcement; 4 cases were managed by bedside ultrasonography guided placement of per-cutaneous drain [6]. The 2 cases of intestinal obstruction underwent exploratory laparotomy with simple adhesiolysis in one case & manual reduction of intussception in 2nd case. 1 case of acute appendicitis with appendicular abscess was drained per-cutaneously under ultrasonography guidance. The remaining cases i.e., 3 cases of acute gallstone pancreatitis, 5 cases of acute cholecystitis, 1 case of choledocholithiasis & 2 cases of acute appendicitis were managed conservatively with adequate pain relief, iv-antibiotics, adequate hydration & withholding per-orally; gradually stepping up to oral medications & oral feeding [4]. The COVID19 was managed symptomatically as per the prevailing SOPs, by fever management, hydration,

oxygenation, ventilation, Injection remdesivir etc., based on the severity of the disease. The operating room was dedicated to COVID19 surgeries, with negative pressure set-up, separate donning & doffing areas for PPEs, dedicated & well-trained staff & separate entry & exit points. Outcomes were noted in terms of type of management (conservative/ surgical), mortality, patient recovery & the COVID19 status of the treating staff at the end of the duty.

Fig 1: Ultrasonography guided placement of per-cutaneous drain

Fig 2: Operative set-up, minimal staff, all wearing PPEs

Results

The observations have been tabulated in the table. Out of the 9 cases of hollow viscus perforation, 5 were operated upon, 4 were managed by placement of percutaneous drains. Both the cases of intestinal obstruction were operated upon. 1 case of appendicular abscess was managed by placement of percutaneous drain. The remaining cases i.e., 3 acute gallstone pancreatitis, 5 acute cholecystitis, 1 acute choledocholithiasis & 2 acute appendicitis cases were managed conservatively. 2 deaths were noted, 1 case of hollow viscus perforation managed by percutaneous drainage [Figure1] & 1 case of acute gallstone pancreatitis. 1 healthcare worker involved in the management of a case of hollow viscus perforation was infected with COVID19 virus.

Discussion

Coronavirus commonly causes acute lower respiratory tract infection with some reports of gastrointestinal symptoms like nausea, vomiting & loose stools [2] & even some cases of hollow viscus perforation associated with it being reported [7]. Consistent with the existing protocol, mandatory screening of all patients presenting to the emergency room was done. RAT for symptomatic patients, RTPCR for asymptomatic patients & symptomatic patients with RAT negative status & CT-thorax for symptomatic RAT & RTPCR negative patients.

The case were patients were hemodynamically stable, where delaying a surgical intervention did not endanger the life of the patient & the cases where severity of COVID19 disease & associated comorbidities outweighed the risk from surgery, a conservative approach was adopted. The remaining patients where deferring the surgery posed a direct threat to the life of the patient, the patients were taken up for surgery with all safety precautions. Out of the 23 cases, 21 cases could be discharged from the hospital uneventfully whereas 2 deaths were noted in the study, both of which were declared as COVID19 deaths. 1 healthcare worker was infected during the study period.

The protocols followed in the preoperative period was primarily to triage the patients [4, 8] as to determine the need for surgical intervention & the extent of surgical intervention. Mandatory use of PPEs, protective goggles, double gloves were ensured. Intra-operative setup: the operative room was a negative pressure room, aerosol generating proceedures were avoided, personal protective equipments were used by the staff, minimal use of operative equipements, minimum number of working [Figure2] staff with proper training were ensured in the operating room [5].

Some of the protocols followed by us during the pandemic were:

Evaluation of any patient

1. Wear of fully covering personal protective equipements, after leaving all personal belongings in a safe area, pulling back (tying up) of hair.
2. Once examiner is prepared, he/she would go to the patient by the shortest path, also avoiding touching anything.
3. After the required examination process is completed, the examiner would go to the designated area, where another person/team would help in removal of the PPE.
4. PPE is removed without any haste, in the order of removal of most contaminated element (gloves) to the least contaminated element (inner mask), while applying virucidals followed by hand washing at the end.
5. The examination room & the instruments used for the same are cleaned from time to time separately.
6. All the managing staff need not use PPEs [10], those who are not in direct contact with the patient, eg., the circulating nurses and supportive staff, for them a surgical mask would suffice.
7. Minimal number of person should be attending the patient.
8. Surgical [9, 11] protocol:
9. Using drapes, followed by PPEs
10. Avoiding sharp instruments as much as possible; manipulations to be done with instruments & not with hands.

11. Using verbal commands instead of manually passing the required instruments from hand to hand.
12. Trying to use exsufflation in laparoscopy before making a fresh incision to avoid aerosol generation.
13. Discarding all the used materials, unused drugs & devices separately.
14. Trying to keep atleast one hour gap between proceedures, to allow thorough cleaning in between.
15. Use of hydrogen peroxide & formaline for disinfecting purposes.
16. Post-operative care
17. The patient is allowed to recover in isolation.
18. Patient handling is done with full protective measures.
19. Care of stomas is to be done with extra caution as it forms a direct source of transmission.
20. In case of a death, body handling & packing is done with utmost care, following the guidelines laid down by the State; as to avoid exposure risk to the handlers.

Conclusion

From the study we concluded that, surgery should be deferred in cases where the risk from surgery outweighs the benefits for the patient. In cases where a delay in surgery might directly endanger the life of the patient, surgery should be considered, but with minimal equipments & staffs, but with maximum safety precautions. All patients are to be assumed positive unless & until proven otherwise.

Abbreviations

RAT-rapid antigen tests, RT-PCR- reverse transcriptase polymerase chain reaction, CT-computed tomography, PPE-personal protective equipments, ASA score- American Society of Anesthesiologists score, PA – Pain abdomen, AD – Abdominal distension, dysp – dyspnea

Sl no.	Age	Sex	Covid 19 diagnosed by	Covid severity	Symptoms	ASA grade	Diagnosis	Management	Outcome	Staff affected
1	19	M	RAT	Mild	PA, guarding	1	Hollow-viscous perforation	Laparotomy + primary repair	Uneventful	0
2	43	M	RAT	Severe	PA, guarding, dysp, fever	4	Hollow-viscous perforation	Bedside local drain	Death	0
3	40	M	RTPCR	Mild	PA, guarding, dysp, fever	1	Hollow-viscous perforation	Laparotomy + primary repair	Uneventful	0
4	32	M	RTPCR	Asymptomatic	PA, guarding	1	Hollow-viscous perforation	Laparotomy + primary repair	Uneventful	0
5	24	M	RAT	Mild	PA, guarding, dysp	1	Hollow-viscous perforation	Laparotomy + primary repair	Uneventful	0
6	29	M	RAT	Mild	PA, guarding, dysp	1	Hollow-viscous perforation	Laparotomy + primary repair	Uneventful	1
7	45	M	RAT	Moderate	PA, guarding, dysp	1	Hollow-viscous perforation	Bedside local drain	Uneventful	0
8	38	F	RAT	Mild	PA, guarding, dysp	4	Hollow-viscous perforation	Laparotomy + primary repair	Uneventful	0
9	26	M	RTPCR	Moderate	PA, guarding, dysp	1	Hollow-viscous perforation	Laparotomy + primary repair	Uneventful	0
10	42	F	RTPCR	Asymptomatic	AD, pain, vomiting	1	Intestinal obstruction	Laparotomy + Adhesiolysis	Uneventful	0
11	3	M	RAT	Asymptomatic	AD, PA , vomiting	1	Intestinal obstruction	Laparotomy + reduction of Intussusception	Uneventful	0
12	35	F	RAT	Mild	Fever, PA	1	Acute biliary pancreatitis	Conservative	Uneventful	0
13	44	M	CT THORAX	Moderate	PA, fever, dysp	3	Acute biliary pancreatitis	Conservative	Death	0
14	38	F	RAT	Mild	Fever, PA	1	Acute biliary pancreatitis	Conservative	Discharged	0
15	41	F	RTPCR	Asymptomatic	PA	1	Acute Cholecystitis	Conservative	Discharged	0
16	43	F	RAT	Mild	PA	2	Acute Cholecystitis	Conservative	Discharged	0
17	38	F	RAT	Mild	PA, dysp	1	Acute Cholecystitis	Conservative	Discharged	0
18	46	M	RAT	Mild	PA, dysp	3	Acute Cholecystitis	Conservative	Discharged	0
19	28	F	RAT	Mild	Fever, PA	1	Acute Cholecystitis	Conservative	Discharged	0
20	36	F	RAT	Moderate	Fever, PA	1	Choledocholithiasis	Conservative	Discharged	0
21	17	F	RAT	Mild	Fever, PA	1	Appendicular abscess	Percutaneous drainage	Discharged	0
22	28	M	RTPCR	Asymptomatic	PA, vomiting	1	Acute appendicitis	Conservative	Discharged	0
23	22	M	RTPCR	Asymptomatic	PA, nausea	1	Acute appendicitis	Conservative	Discharged	0

Fig 3

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