

Cholecystectomy at the time of COVID-19: How pandemic changed surgical management

Filippo Montali¹, Michela Rigoni¹, Alfredo Annicchiarico^{1,2}, Baldinu Manuel², Edoardo Virgilio^{1,2}, Renato Costi^{1,2}

¹Department of General Surgery, Vaio Hospital, Fidenza, Italy; ²Department of Medicine and Surgery, Parma University, Parma, Italy

To the Editor,

The spread of the COVID-19 pandemic brought massive changes in clinical practice of all medical specialties: surgery was one of the most affected. During the first pandemic wave, many hospitals hardly maintained oncological, transplant, and emergency surgery. In contrast, gastrointestinal and biliary elective surgery for benign disease was completely blocked and postponed, in accordance with ESTES and ACS recommendations (1). Such a sequence of events profoundly changed not only hospitals and caregivers' practice, but also the general population's attitude and access towards health facilities. Many patients needing or even waiting for an already scheduled elective procedure or a specialist consultation did not show up due to the fear of becoming infected with the virus, and thus preferred to keep a social distance. As a consequence, most elective surgery, such as procedures for uncomplicated gallstone disease and hernia, was cancelled, creating a significant backlog of patients (2). A rapid decrease in the number of procedures performed, in particular concerning biliary benign disease, was seen during the first wave of the COVID-19 pandemic. Several multicenter studies have examined the effects of the pandemic on abdominal surgery in particular biliary surgery, for example, CHOLECOVID or CHOCOLATE trial (3,4). These studies showed that cholecystectomies planned for the treatment of biliary colic were delayed, leading to an increase in gallstones-related diseases needing surgery in patients in worse

clinical conditions. A more conservative management of acute cholecystitis (AC), a decrease in the number of laparoscopic cholecystectomies along with the enhancement of antibiotic therapy and percutaneous drainage, are cogent treatment options, although laparoscopic cholecystectomy is still considered the gold standard approach for AC.

During the national lockdown, in some secondary care hospitals situated in the North of Italy, the urge to treat COVID-19 patients led to a total interruption of all surgical activities, both elective and emergency. Vaio Hospital became one of the secondary care hospitals in Northern Italy converted into a COVID-Hospital. In this setting, we decided to perform a retrospective pilot study to examine the impact of the pandemic on cholecystectomy, including patients' characteristics (all tested negative for COVID-19), clinical, laboratory/imaging features, surgical procedures and outcomes.

Analyzing our cohort of 200 patients who underwent cholecystectomies in two different time frames (before and during the COVID outbreak), surprisingly, patients' characteristics and perioperative outcomes were similar in the pandemic and control group. There was a statistically significant difference between the two groups in terms of the incidence of patients undergoing cholecystectomy with concomitant acute pancreatitis (AP), being more frequent in the pre-pandemic group ($p=0.001$). In the pre-pandemic group, there was also the largest number of patients undergoing ERCP for common bile duct stones (CBDS) before cholecystectomy (Table 1). This

Table 1. Preoperative and intraoperative features.

	Pre-pandemic group n	Intra-pandemic group n	p-value
Total	100	100	1
Acute cholecystitis (preoperative imaging)	39	26	0.45
Choledocholithiasis	16	5	0.01
Pancreatitis (AMY/LIP)	8	3	0.01
ERCP	16	5	0.96
WBC	8.49	8.12	0.45
PCR	36.09	23.99	0.25
GPT	100.86	54.02	0.0273
GOT	96.01	47.96	0.0164
ALP	127.78	91.08	0.0097
Operation time (min)	80,09	73.24	0.2
Elective surgery/emergency surgery	89/11	87/13	0.10
LC/OC*	100/0	94/6	0.83
Conversion to open surgery	11	5	0.42
Early Complications	13	10	0.49
Severe complications (CD>2)**	6	3	0.73
Reintervention	2	1	0.88
Mortality	1	1	0.92
Length of stay (LOS)	7.23	5.39	0.085
Preoperative LOS	3.28	2.59	0.28
Postoperative LOS	3.83	2.79	0.13

*LC/OC: Laparoscopic/Open cholecystectomy; **according to the Clavien/Dindo classification; Statistically significant p-values ($p < 0,05$) are written in bold type.

finding could be explained by a more conservative approach adopted during the pandemic when, wherever possible, it was decided to treat choledocolithiasis and to postpone surgery also in order not to overload surgery and intensive care units. This approach is consistent with other studies in the literature (5). More than 95% of cholecystectomies were performed with the laparoscopic technique, but, of note, in the intra-pandemic group, we found a higher number of cholecystectomies performed d'emblée with the open technique. This could be explained considering the high average age (53 years) of the surgeons in our surgical team, many of whom are extremely familiar

with laparotomic surgery, to reduce operating time in supposedly complex cases. A resurgence of laparotomy surgery for cholecystectomy, particularly in emergency settings, was observed during the COVID pandemic, also in many other countries of the world (6). There was no significant difference between the pandemic and control group regarding the conversion rate, as well as in postoperative outcomes, including morbidity and mortality, between the pandemic and control groups. Although not statistically significant, a trend towards a shorter hospital stay was recorded in the intrapandemic group (5,3 versus 7,2 days, $p=0,08$).

This small retrospective study shows how the COVID-19 pandemic has partially changed the clinical approach to one of the abdominal surgical procedures most frequently performed in the world. The peculiarity of this study lies in the setting: a secondary care hospital that has completely blocked the surgical activity for 3 months, becoming a COVID-19 hospital. Upon the resumption of surgical activity, the clinical approach of surgeons towards cholelithiasis, particularly in emergency settings, appears to have changed. Patients with concurrent AP were treated conservatively, as well as a higher rate of AC was treated with antibiotic infusion to postpone surgery. Most complex cholecystectomies were performed *d'emblée* with the open technique by senior surgeons. The postoperative stay was shortened. Therefore, the types of patients have not changed during the pandemic; however, the attitude of surgeons has changed, resulting in more conservative and more laparotomy-oriented particularly in cases supposed to be technically demanding.

Ethic Approval: CET-AVEN and SIRER ID: 5929-160384, 2024 (in course).

Conflict of Interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

Authors Contribution: FM and RM conceived and wrote the manuscript. RC: supervised and corrected the project. EV and MB corrected the formal English. FM and RM: reviewed the pertinent literature. AA and RC: analyzed and validated the data.

Declaration on the Use of AI: None.

References

1. Coimbra R, Edwards S, Kurihara H, et al. European Society of Trauma and Emergency Surgery (ESTES) recommendations for trauma and emergency surgery preparation during times of COVID-19 infection. *Eur J Trauma Emerg Surg* 2020;46(3):505-10. doi: 10.1007/s00068-020-01364-7.
2. COVIDSurg Collaborative. Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery plans *Br J Surg* 2020; 107(11):1440-9. doi: 10.1002/bjs.11746
3. CHOLECOVID Collaborative. Global overview of the management of acute cholecystitis during the COVID-19 pandemic (CHOLECOVID study). *BJS Open* 2022 Jun; 6(3): zrac052. doi: 10.1093/bjsopen/zrac052
4. Laparoscopic cholecystectomy versus percutaneous catheter drainage for acute cholecystitis in high risk patients (CHOCOLATE): multicentre randomised clinical trial *BMJ* 2018; 363: k3965. doi: 10.1136/bmj.k3965
5. Strohaecker J, Sabrow J, Yurttas C, et al. Management of Symptomatic Gallstone Disease during COVID-19 Lockdown in a High-Resource Setting: Is There a Need for Treatment Alterations? *Visc Med* 2022;38(4):265-71. doi: 10.1159/000519789
6. Hassan R, Johari M, Nijhar JS, Sharifah BSA, Low LL, Amri N. Emergency Laparotomy in a COVID-19 patient with acute abdomen. *Med J Malaysia* 2021;76(2): 254-7.

Correspondence:

Received: 7 November 2024

Accepted: 29 January 2025

Filippo Montali MD, PhD

Unità Operativa di Chirurgia Generale,

Ospedale di Vaio, Fidenza (Parma),

Via Don E. Tincati 5 43036

Azienda Sanitaria Locale di Parma, Italia

E-mail: fmontali@ausl.pr.it