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Impact of the COVID-19 Pandemic on Severity of Cholecystitis after the First Pandemic Phase: A Retrospective Observational Single Center Study

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1. Abstract

1.1. Background

With the new coronavirus disease 2019 (COVID-19) Scientific societies recommended the postponement of optional surgeries to increase the bed capacity of the Intensive Care Unit. We designed a retrospective case-control study in a single center comparing the data collected from April to October 2019 comparing them with those collected from April to October 2020 relating to patients undergoing VLS or open cholecystectomy for benign disease to see if there was a difference statistically significant in the severity of the clinical presentation, in the length of hospitalization, in the duration of surgery.

1.2. Methods

we selected 154 patients (54 in 2019, 66 in 2020), who underwent VLS / open cholecystectomy for benign gallbladder disease. All clinical data were retrospectively collected in a PC data set. Statistical analysis was performed using SPSS software version 21.0.

1.3. Results

There was a significant difference between the 2019 and 2020 for the clinic presentation, length of hospital stay and duration of the surgical intervention. We observed in 2020 a worsening of the clinical presentation which led to a more complex and lasting surgical intervention and an increase in the length of hospitalization.

1.4. Conclusion

Postponing an operation even for benign pathology leads to a significantly worse outcome, an exacerbation of the underlying disease or an unacceptable reduction in the patient's quality of life. Before deciding to cancel or perform all surgical procedures, various medical and logistical considerations must be made while looking at the future impact. In fact, given the uncertainty about the impact of COVID-19 in the coming months, delaying non-urgent surgical interventions in some cases risks making them reappear as more serious emergencies at a time when they will be less easily manageable, also impacting economic resources in a historical moment. where it is necessary to rationalize human and economic resources.

2. Introduction

The Covid-19 pandemic in recent months has forced the National Health Service to divert all its energies in the fight against the virus and in assisting Covid-19 patients by suspending diagnostic procedures and non-urgent treatments related to oncological and non-oncological pathology, causing inevitable delays in providing care. Diseases of benign surgical interest have undergone a diagnostic delay and a delay in treatment, manifesting themselves, in the months following the first Lockdown, with a more complicated clinical presentation and difficult surgical management [1-3] In fact, in the months of maximum emergency, screening programs were temporarily suspended in Italy, as in many other countries, both because health personnel were diverted to take care of patients with COVID-19 pneumonia and for the need to reduce contagion to a minimum, visits and diagnostic tests were suspended. On the other hand, patients were strongly discouraged from undergoing treatment or diagnostic tests for fear of contagion. We

therefore noted that for patients with gallbladder calculosis, there was an aggravation of the clinical presentation of this pathology such as to require a higher level of care. We therefore designed a retrospective case-control study in a single center comparing the data collected from April to October 2019 comparing them with those collected from April to October 2020 relating to patients undergoing VLS or Open cholecystectomy for benign disease to assess whether there was a difference in terms of the difference in the clinical presentation of the pathology, intra-operative and post-operative complications, increased conversion from laparoscopic to open surgery, increased surgical times, increased number of hospital days.

3. Methods

3.1. Study Design

We performed a retrospective case control study in a single center, collecting data on patients who underwent urgent and elective VLS cholecystectomy from April to October 2020, comparing them with the data for April to October 2019. 66 patients who underwent VLS / open cholecystectomy from April to October 2020 were selected. In the same observation period, but the previous year, 54 patients were selected. The surgical interventions were performed by the same equipe and one operator performed laparoscopy.

3.2. Setting

This was a Single Center, retrospective and Case-Control Study.

3.3. Inclusion Criteria for Cases

- Patients undergoing VLS cholecystectomy;
- Benign pathology of the gallbladder and biliary tract;
- Patients with symptomatic gallbladder stones;
- Patients with acute cholecystitis;
- Patients with chronic lithiasic cholecystitis;
- Patients on the waiting list for scheduled surgery;
- Patients belonging to our Department of General Surgery afferents from the emergency room who needed hospitalization in the surgical department;
- COVID-19 negative Nasal and oropharyngeal swab;

3.3. Inclusion Criteria for Control

The criteria for inclusion of the control are the same without the recognition of the COVID-19 Nasal and oropharyngeal swab;

4. Outcomes

The aim of the study was to evaluate whether there were statistically significant differences between the two groups regarding the severity of the clinical presentation of patients belonging to our department of General Surgeons, duration in minutes of surgery, length of hospitalization post-operative, 30-day mortality and laparoscopic to open surgery conversion rates

5. Statistical Analysis

All clinical data were prospectively collected in a PC data set. Statistical analyses were performed using SPSS 25.0 (IBM SPSS Statistics, New York, USA). Continuous data were reported as means (standard deviation), while descriptive variables were reported as frequencies. The correlation between quantitative variables was assessed using a Pearson correlation, when appropriate. Student's T-distribution was used to compare the of the two groups of the surgery and Media (range) of length of hospital stay of the two groups. Statistical significance was set at $p<0.05$.

6. Results

A total of 120 patients with a mean age of 54,2 years were included in this study. The 2020 group operated in the period between April 2020 and October 2020 included 66 consecutive patients, most of whom were men (n=41, 90%), with a mean age of 38.2±12.2 years; this was matched to a 2019 group of patients operated in the period between April 2019 and October 2019, also comprising mostly men (n=40, 92%), with a mean age of 45.4±15.7. In 2020 group 27 patients were treated for symptomatic gallbladder stones (40.91%); 23 patients (34.85%) develop acute uncomplicated cholecystitis; 7 patients (10.61%) develop acute cholecytitis localized perforation; 9 patients (10.64%) develop Severe acute cholecystitis free perforation with gangrene and peritonitis. Worsening abdominal pain, high fever and intense chills, stiffness with positive Blumberg's sign, or paralytic ileus are indicative of empyema (pus) in the gallbladder, gangrene or perforation. For *Surgery treatment* 58 patients (87.77%) of the interventions were started and finished laparoscopically; 5 (7.58%) interventions were started and finished with an open surgery; 3 (4.55%) were converted; Media (range) of length of hospital stay was 4.06 days. Thirty Postoperative mortality was 0. Mean time of duration of the surgery was 54,9 minutes. In 2019 group 32 (59,26 %) patients were treated for symptomatic gallbladder stones; 15 patients (27,78%) develop acute uncomplicated cholecystitis; 5 patients (9,26%) develop acute cholecytitis localized perforation; 2 patients (3,70 %) develop severe acute cholecystitis free perforation with gangrene and peritonitis. Surgical Treatment: 50 patients (92,59 %) were started and finished lapasoscopally; 2 (3,70 %) interventions were started and finished an open surgery; 2 (3,70 %) were converted. Media (range) length of hospital stay was 2,6 days. Thirty Postoperative mortality: 0. Mean time of duration of the surgery was 39,8 minutes. Compared to 2019, the overall cases of patients undergoing cholecystectomy increased with an increase of 12 patients. This increase may be justified by the fact that patients did not undergo unnecessary medical or surgical treatment during the first lockdown. There was a significant difference between the length of hospital stay of the 2019 group and that of the 2020 group (Figure 1). The comparison between the means of the two groups was statistically different ($p <0.05$). Considering the duration of the surgery between 2019 and

2020, a statistically significant difference was found (Figure 2). Also in this event the Comparison between the means between the two groups was statistically significant ($p < 0.05$). In addition, a significant difference was noted between 2019 and 2020 for clinical presentation highlighted with an overall increase in patients presenting with complicated and uncomplicated acute cholecystitis compared to those with symptomatic stones. Specifically, in the 2020 group 39 patients contracted complications of the pathology while in the 2019 group only 22 patients. In the 2020 group we also asked if they had episodes of abdominal pain more or less associated with fever during the lock down: 25 patients (38%) replied that they had had an episode of abdominal pain; 9 (14%) two episodes of abdominal pain; 10 (15%) pain with fever; 22 (33%) asymptomatic only 5 patients (7.6%) went to the emergency room for abdominal pain during the first lock down.

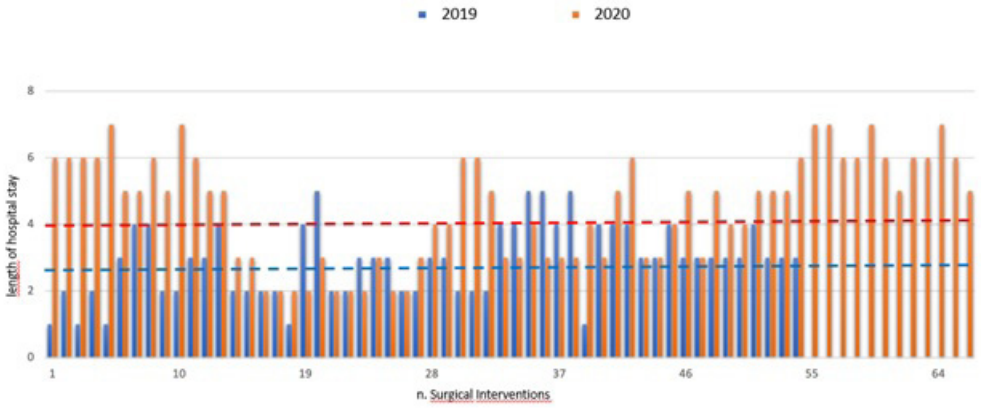

Figure 1: There was a significant difference between the length of hospital stay of the 2019 group and that of the 2020 group.

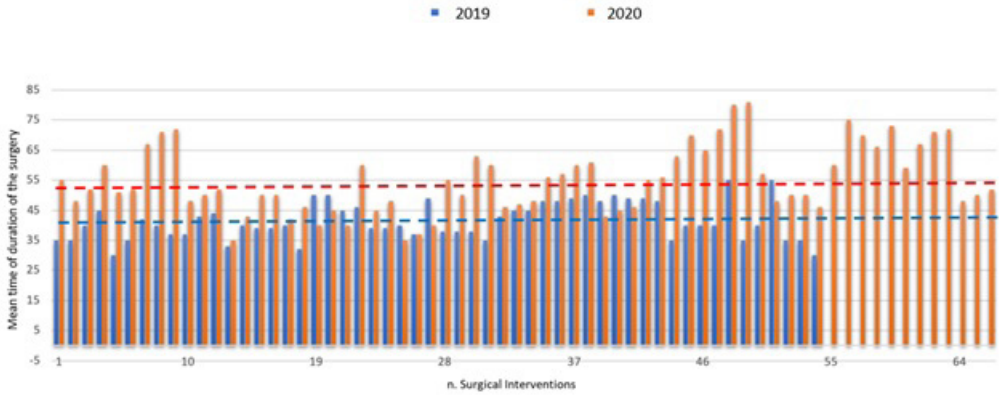

Figure 2: The comparison between the means of the two groups was statistically different ($p < 0.05$). Considering the duration of the surgery between 2019 and 2020, a statistically significant difference was found.

7. Discussion

Laparoscopic cholecystectomy is one of the most common abdominal surgeries. According to the major Italian and world surgical companies SICE, ACS, AICO, CRSA, SICG, SICO, SPIGC, WSES, early cholecystectomy is recommended because studies show that cholecystectomy performed "as soon as possible" is not inferior to delayed cholecystectomy in terms morbidity, mortality, conversion rate and the shorter overall length of hospitalization [4]. The current COVID-19 pandemic underlines the importance of the conscious use of human and financial resources. [5] No health system has been prepared for an event of this magnitude. Hospitals and health systems have begun to implement measures to increase the triage capacity to provide critical care services following current local guidelines, specific to each country or region. The pandemic has largely affected surgical activities: new provisions have been enacted by scientific societies in the management of the surgical patient, recommending the postponement of elective surgeries, [6] and surgical staff have been mobilized to provide non-surgical care to COVID-19-related patients. At the University Hospital of Würzburg, a priority list was drawn up in four levels of urgency based on the recommendations of the international surgical societies considering cholecystectomy in the Level of urgency IV which includes all other elective procedures. Postponing a non-urgent operation for a benign disease leads to a significantly worse outcome, an exacerbation of the underlying disease, or an unacceptable reduction in the patient's quality of life. [7]. In this survey, [3] focused on urgent interventions, showed a decline in the overall number of urgent cases, but associated with a more severe presentation due to diagnostic delay. All patients with fever, without respiratory symptoms were advised not to go

to hospital. However, fever could be a manifestation of abdominal disease. Many interventions, both urgent and non-urgent, were not performed with considerable delay and with the risk of overloading the intensive care units and surgical wards already crowded in the following months. Our study shows that during the first block, patients with severe abdominal symptoms did not go to the hospital for fear of contagion, resulting in a rebound after the end of the block and a worse clinical presentation of gallbladder diseases that weigh on health care costs.

8. Conclusion

From our experience we therefore suggest that you better decide to cancel or perform all surgical procedures, both urgent and non-urgent, and making various medical and logistical considerations. Indeed, given the uncertainty about the impact of COVID-19 in the coming months, delaying some cases risks making them reappear as more serious emergencies at a time when they will be less easily manageable.

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