

Urgent Elective Laparoscopic Cholecystectomy during the COVID-19 Pandemic

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ABSTRACT

Aim: In April 2020 routine elective surgery in England was suspended in response to coronavirus disease-2019 (COVID-19). Low COVID-19 infection and mortality rates in the South West of England allowed urgent elective surgery in Plymouth to continue with the necessary precautions. The aim of this study was to assess outcomes following elective laparoscopic cholecystectomy during the initial phase of the COVID-19 pandemic.

Materials and methods: Records of 54 consecutive patients undergoing urgent elective laparoscopic cholecystectomy between March 25, 2020, and June 25, 2020, were analyzed retrospectively. Patients were telephoned after 30 days. All patients underwent COVID-19 swab testing 24 to 72 hours prior to surgery and during admission if clinically indicated. The primary outcome measure was COVID-19 related morbidity. Secondary outcome measures were non-COVID-19 related morbidity, mortality, and length of hospital stay.

Results: Fifty-four patients [19 male, 35 female; median age 59 years (20–79); median body mass index (BMI) 31 kg/m² (22.9–46.8); median ASA 2] underwent laparoscopic cholecystectomy during the study period. Fifty-one patients (94%) were of White-British ethnicity. One patient tested positive for COVID-19 preoperatively. There were no COVID-19 diagnoses postoperatively and no COVID-19 related morbidity. There were no deaths at 30 days. Forty-four patients (81%) had a day-case procedure. Forty-two (78%) procedures were performed by a supervised trainee.

Conclusion: Elective laparoscopic cholecystectomy can be performed safely and training maintained in areas of low COVID-19 prevalence with the necessary precautions.

Clinical significance: This small study provides some evidence to aid decision-making around the provision of elective surgical services during this ongoing pandemic.

Keywords: Cholecystectomy, Coronavirus, COVID-19, Surgery.

World Journal of Laparoscopic Surgery (2022): 10.5005/jp-journals-10033-1490

INTRODUCTION

Perioperative coronavirus disease-2019 (COVID-19) infection results in significant mortality and respiratory morbidity, the 30-day mortality rate for elective patients with COVID-19 has been reported as 18.9%.¹ Guidance has been published on the prioritization and management of patients requiring surgery and the recovery of surgical services^{2–10} however limited data have been published on the outcomes of elective surgery during the initial phase of the pandemic. The largest study to date included both adults and children and did not stratify results by type of elective surgery or country of origin.¹

The first UK lockdown was announced on March 23, 2020. It has been estimated that 81.5% of benign upper gastrointestinal/hepatobiliary operations may have been cancelled or postponed worldwide during the initial 12-week peak of the COVID-19 pandemic.¹¹ In the UK this could represent up to 50,000 laparoscopic cholecystectomies.¹² As part of our hospital's response to increasing resources for COVID-19 patients, routine elective surgery ceased and access to the theater was initially reduced from 5 all-day operating lists per week to 3 for our unit.

The UK has experienced regional variation in COVID-19 prevalence. The number of confirmed cases in the South West of England in June 2020 was less than 20 per 100,000 compared with 40 or more per 100,000 in areas of London and the North West of England.¹³ The accompanying mortality rates have also been much lower (41 per 100,000 in the South West of England vs 137 per 100,000 in London, in June 2020).¹⁴ As such, urgent elective surgery including esophagogastric cancer surgery and laparoscopic

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How to cite this article: Jones RM, McCormick AP, Ariyathenam A, *et al.* Urgent Elective Laparoscopic Cholecystectomy during the COVID-19 Pandemic. *World J Lap Surg* 2022;15(1):87–89.

Source of support: Nil

Conflict of interest: None

cholecystectomy continued to be performed at Derriford Hospital in Plymouth throughout the first wave of the pandemic. All necessary precautions were taken perioperatively as national and local guidance evolved.

The aim of this study was to determine outcomes after urgent elective laparoscopic cholecystectomy during the initial phase of the COVID-19 pandemic.

MATERIALS AND METHODS

Records and laboratory results of consecutive patients who underwent elective laparoscopic cholecystectomy by five surgeons in a single tertiary surgical unit between March 25th 2020, and June 25th 2020, were analyzed retrospectively. Patients were telephoned after 30 days and asked if they had postoperative COVID-19 testing

performed, as results from tests arranged in the community were not always accessible. They were also asked if they had been treated for any postoperative complications.

The primary outcome measure was COVID-19 related morbidity. Secondary outcome measures were non-COVID-19 related morbidity as defined by the Clavien-Dindo classification,¹⁵ 30-day mortality, and length of hospital stay.

Only patients from the urgent waiting list were operated on electively during this period. These include patients with cholecystitis, cholangitis, pancreatitis, or recurrent severe biliary colic. No changes to our “urgent” classification were made during this period. Both day-case and inpatient procedures were performed. Operations were performed by a consultant or supervised trainee.

COVID-19 PRECAUTIONS AND DEVIATIONS FROM THE STANDARD OF CARE

Patient Selection

Patients were booked from the urgent waiting list in our usual manner.

Preoperative

The preoperative assessment took place by telephone, with patients attending in person for blood tests, electrocardiograph (ECG), and methicillin-resistant staphylococcus aureus (MRSA) swabs. COVID-19 screening questions were asked before attendance. COVID-19 swabs were performed 48 hours prior to surgery and patients were asked to self-isolate from this time. Results were available within 24 hours. Thoracic imaging was not routinely requested preoperatively. Our usual admission ward had been reallocated, so patients were admitted for surgery via the day-case recovery area. The risk of perioperative COVID-19 infection was discussed with our patients but no specific figures were given. In all cases, patients were advised that the benefits of surgery outweighed the risks.

Intraoperative

Anesthetists and operating department practitioners (ODPs) performed intubation in “red” personal protective equipment (PPE) (visor/goggles, FFP3 face mask, double gloving, and gown) for the first 6 weeks. “Amber” PPE (visor/goggles, standard surgical mask, gloves, and apron) was used in the following 6 weeks. Surgeons were operating in “red” PPE during the first 2 weeks followed by “amber” PPE in the following 10 weeks. Cholecystectomy was performed in our standard manner. Pneumoperitoneum was safely evacuated via a filtration system before closure and trocar removal.⁷ Training was maintained throughout.

Postoperative

The postoperative care was provided in our usual surgical wards and day-case recovery area. These had been designated “green” wards with patients only admitted there if they did not have symptoms or clinical suspicion of COVID-19 and had negative swab tests. COVID-19 swabs were performed on any patients who developed a fever or symptoms, along with prompt patient isolation. All other surgical inpatients were swabbed on admission. In-patient results were available within 4 hours of testing. Routine swabbing of asymptomatic staff was not being performed at the time of this study.

RESULTS

Fifty-four patients underwent elective laparoscopic cholecystectomy during the study period. Five patients could

not be contacted postoperatively. Demographic and treatment details are listed in Table 1. Fifty-one patients were of White British ethnicity. All patients underwent preoperative COVID-19 swab tests. Eight patients required a postoperative COVID-19 swab test, all of whom had a negative result. Only one patient was swabbed due to potential COVID-19 symptoms. Six patients were tested routinely as they were readmitted to the hospital. One patient was routinely swabbed by their employer. One asymptomatic patient had a positive COVID-19 swab preoperatively, they were contacted and their surgery was postponed.

Outcomes are detailed in Table 2. There was no COVID-19 related morbidity. Of the six patients (11%) who were readmitted within 30 days of discharge, four were treated for postoperative pain and had normal investigations, including a magnetic resonance cholangiopancreatogram (MRCP). One patient was readmitted with pancreatitis which was managed conservatively following a normal MRCP. One patient was readmitted with an occult trocar injury to the small bowel and underwent two emergency laparotomies during their stay including a small bowel resection and ileostomy. Two

Table 1: Demographic and treatment details

| Female:Male | 35:19 |
|--|----------------|
| Median age (range), years | 59 (20–79) |
| Median BMI (range), kg/m ² | 31 (22.9–46.8) |
| Median ASA | 2 |
| Comorbidities | |
| Diabetes | 8 |
| Hypertension | 14 |
| Cardiac | 6 |
| Respiratory | 7 |
| Indication for surgery | |
| Cholecystitis | 27 |
| Cholecystitis with gallbladder perforation | 3 |
| Biliary colic | 15 |
| Pancreatitis | 9 |
| Surgical approach | |
| Laparoscopic | 54 |
| Open/converted | 0 |
| Procedures performed by trainee | 42 |

Table 2: Outcomes

| | |
|---|------------|
| COVID-19 related morbidity | 0 |
| Non COVID-19 morbidity | 5 |
| Bowel injury | 1 (CD IVa) |
| Pancreatitis | 1 (CD II) |
| Pai | 4 (CD I) |
| Wound infection | 1 (CD I) |
| Nausea | 1 (CD I) |
| Bile leak | 0 |
| Bile duct injury | 0 |
| 30-day mortality | 0 |
| Median overall length of stay (range), days | 0 (0–3) |
| 30-day readmission rate | 6 |

CD, Clavien-Dindo classification

patients were reviewed by their GP postoperatively for a wound infection, and nausea. There were no bile leaks or bile duct injuries. There were no deaths within 30 days of surgery. Four patients had a cholecystostomy drain in-situ at the time of surgery. All procedures were completed laparoscopically. Forty-two (78%) procedures were performed by a supervised trainee.

DISCUSSION

A survey of over 1,700 surgeons in June 2020 in the UK showed that only 33% had been unable to undertake any elective surgery during the previous 4 weeks, and only 57% of general surgeons who had recommenced were performing surgery for benign disease.⁸ While recovery of elective surgical services is now underway in many areas, further suspension or reductions have become necessary over the periods of local or national lockdown, and this is likely to continue for some time. With the effects of the ongoing vaccination program yet to be determined, we must consider how to safely maintain elective services during the ongoing pandemic.

At the time of writing, this was the first UK study to report outcomes for elective laparoscopic cholecystectomy during the COVID-19 pandemic. The principal findings of this study were that laparoscopic cholecystectomy can be performed safely with the necessary precautions in an area with a relatively low infection rate.

This observational study has potential limitations, including the potential for selection bias. At the beginning of the study period, there was reluctance from many patients to accept offers of a date for elective surgery, citing their fears about contracting COVID-19. This cohort of patients could have included older, more comorbid patients, however, our day-case and readmission rates for the unit were unchanged. Uptake did increase throughout the study period, and our usual practices were followed when booking patients from the urgent waiting list for surgery. Five patients were not contactable postoperatively and we were, therefore, unable to exclude the possibility that they were diagnosed with COVID-19 in the community, or had morbidity not requiring hospital admission. Although this is a relatively small cohort with limited follow-up, we felt that it was important to report our outcomes from the first 3 months of the pandemic to provide evidence to support the resumption and continuation of elective surgery.

The main factors that allowed us to continue with urgent elective surgery were the relatively low rate of COVID-19 infection in our population and hospital, access to preoperative testing, and adequate supplies of PPE. In addition, there had been no redeployment of surgical consultants or trainees to other areas. We were able to resume our normal capacity of five all-day theater lists per week after 8 weeks.

CONCLUSION

Elective surgery was suspended at the beginning of the COVID-19 pandemic in the UK, the prolonged nature of this pandemic with fluctuating local case numbers and several national lockdown periods requires flexibility in the provision of elective surgical services. Policies should be driven locally taking into consideration the rate of new COVID-19 cases, testing capacity, adequate PPE supply, and availability of essential perioperative services.^{9,10} This study has shown that laparoscopic cholecystectomy can be performed safely during the COVID-19 pandemic with the necessary precautions, and surgical training maintained, in areas with a low prevalence of COVID-19.

Clinical Significance

This small study provides some evidence to aid decision-making around the provision of elective surgical services during this ongoing pandemic.

Statement of Ethics

Ethics committee approval was not required as this study was approved by the University Hospitals Plymouth Research and Development Department as a service evaluation.

Author Contributions

DC/TW/GS/AA/LH/RJ designed the study, data collection and analysis performed by RJ/AM. Article written by RJ. All authors revised and approved the final version.

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