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Original Research Article

Laparoscopic cholecystectomy: do upper GI and lower GI surgeons have similar outcomes?

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ABSTRACT

Background: Laparoscopic cholecystectomy is operation performed on a regular basis, regardless of surgeon's primary specialty. Common complications include bile duct injury, bile leaks, bleeding, and bowel injury. In Tier 2 Hospitals, upper GI surgeons will manage patients with non-complex OG and HPB disease including laparoscopic cholecystectomy. The AUGSGBI proposed that laparoscopic cholecystectomy (LC) be performed by surgeons trained in upper GI surgery. NICE guidelines recommend similarly. Concentration of surgical expertise and volumes led to lesser conversions and complications. The aim was to compare the complication rates of consecutive patients undergoing laparoscopic cholecystectomy by upper and lower GI consultants in one hospital.
Methods: This was a retrospective observational study. We collected 100 consecutive patients from a list of laparoscopic cholecystectomies performed by upper GI surgeons (UGI) and lower GI (LGI) surgeons. All complications were identified from electronic patient records. Complications were recorded according to the Clavien and Dindo system. Median length of stay (LOS) was recorded and compared between the two groups.
Results: There was no difference in between groups with respect to sex, age, length of stay or ASA grade, nor a significant difference in complication rates between surgeons of upper and lower GI surgeons.
Conclusions: In this study in a selected group, we did not find any difference in procedure related complications between operations conducted by upper GI and lower GI surgeon groups. However, there appeared to be a higher rate of port closure related complication at the umbilicus in operations performed by the lower GI team.

Keywords: Laparoscopic, Cholecystectomy, Upper GI, Colorectal, Outcome, Complications

INTRODUCTION

Gallstone related diseases account for around a third of emergency general surgery admissions and referrals. Laparoscopic cholecystectomy is a procedure performed by all level of trainees and surgeons. Common complications include bile duct injury, bile leaks, bleeding, and bowel injury.[1]

In tier 2 hospitals (typically district general hospitals without specialist OG and HPB Teams), majority of upper GI surgeons will manage patients with non-complex OG and HPB disease including laparoscopic cholecystectomy.[2] The AUGSGBI proposed that laparoscopic cholecystectomy (LC) should be performed by surgeons trained in upper GI surgery.[3] NICE guidelines recommend similarly, that surgeons regularly performing these procedures should undertake it. Concentration of surgical expertise and volumes led to lesser conversions and complications.[4,5]

Aim

This study aims at comparing LC performed by upper and lower GI surgeons with comparisons of post-operative complications between both groups.

METHODS

Data were collected of patients who underwent Laparoscopic Cholecystectomy from April 2012 to April 2016. Of these, the first 100 consecutive patients with complications, with surgeons who had upper GI and lower GI as their specialism were collected from electronic patient records and their complications were recorded at a District General Hospital.

Patients were selected randomly to allocate 100 complications of each, performed by upper GI and lower GI surgeons, all of whom had more than 5 years of experience as consultants at the time of the study to eliminate bias. Complications were gleaned from electronic patient data with a strong culture of documentation in patient records to remove measurement error.

Inclusion criteria

Inclusion criteria were 1) laparoscopic cholecystectomy above 18 years age 2) performed by upper or lower GI surgeons 3) first 100 patients with complications in both groups

The duration of follow up was 12 months from operation. Data was classified in the Clavien Dindo method and stratified. Operations converted to open were excluded and intraoperative problems such as bleeding, bile spillage or those where part of the gall bladder were left behind, were not recorded.

Exclusion criteria

Exclusion criteria were 1) operations where part of the gall bladder was left behind 2) operations performed by surgeons with other specialisms 3) patients who had on table cholangiogram or CBD exploration

We did not find evidence to show that there was a difference in complication rates between elective and emergent cholecystectomies and therefore we did not apply this differentiation in this study.

Statistical analysis

Tests of significance of results were calculated, for age, sex, ASA grade and length of stay in hospital by Chi squared and Wilcoxon rank sum to compare the two groups.

All the consultants were then compared on individual complication rates as mean and as the range of complications between was very narrow, no test was applied for this variable.

RESULTS

Of the 100 patients with complications in each group, the male/ female patients were 19/81 in the UGI and 18/62 LGI (Figure 1). Of these There were 15 complications in the UGI group (n=100) and 13 in the LGI group. The mean age was 53.9 and 51.9 in both groups. The mean length of stay was 1.2 in the UGI days and 1.1 in LGI group for those without complications and 1.5 in both groups with complications (Table 1, 2).

The mean ASA grade of patients was 1.7 and 1.54 in the UGI and LGI group respectively without complications and 1.5 in both with complications. In the UGI group, 12 were classified as grade 1, 1 as gr 3a and 2 as grade 3b.

Of the grade 1 complications, there were pain around ports, wound bleeding, infection, persistent post op vomiting and one case of hypotension which responded completely to intravenous fluids (Table 3). One patient, grade 3a, underwent ERCP for retained stone and two patients, grade 3b, had port site hernia repair and wound debridement under GA. There was no mortality in this group and no other complications.

Table 1: Complications-all patients.

	Upper GI	Colorectal	Total
No complication	85	87	172
Dindo 1	12	5	17
Dindo 3a	1	2	3
Dindo 3b	2	5	7
Dindo 5	0	1	1
Total	100	100	200

In the LGI group (n=100), there were 13 complications, 5 grade1, 2 grade 3a, 5 grade 3b and one death. Grade 1 were wound related and pain, 3a-2 patients requiring ERCP for retained stones, 3b-2 patients requiring elective repair of port site hernia and 3 patients who underwent laparoscopy for post of washout for sepsis.

Table 2: Complications.

	Upper GI	Colorectal	Total
Dindo 1	12	5	17
Dindo 3a	1	2	3
Dindo 3b	2	5	7
Dindo 5	0	1	1
Total	15	13	28

The sex ratio was similar in both groups, M/F 19/81 in UGI and 18/82 in LGI groups, and the difference rates of complication between sexes were not significant (p=0.596). There was no significant difference in age (p=0.7196), length of stay (p=0.9439) for those with

complications or levels of complexity by ASA grades in those without (p=0.1487) and with complications. Comparison of rates of each Clavien Dindo grade for each consultant was similar with a range of 84.38-89.47 (Table 4).

Table 3: Grade 1 complications.

	Upper GI	Colorectal	Total
No complication	85	87	172
Dindo 1	12	5	17
Dindo 3a	1	2	3
Dindo 3b	2	5	7
Dindo 5	0	1	1
Total	100	100	200

Table 4: Complications by surgeon specialism.

	Clavien Dindo grade					
Consultant	**None**	**1**	**3a**	**3b**	**Total**	**Percentage**
A	30	3	0	2	35	85.71
B	55	9	1	0	65	84.62
C	22	2	0	1	25	88.0
D	16	1	0	1	18	88.89
E	17	0	0	2	19	88.47
F	27	2	2	0	32	84.38
G	03	0	0	0	03	100

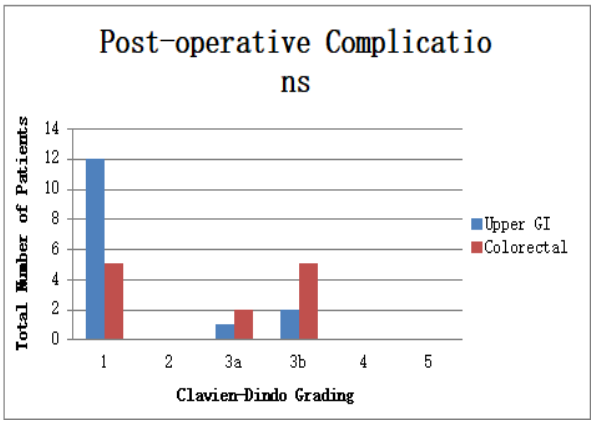

Figure 1: Complications.

The complication rate is a tight band between 84.38 and 89.47% [one surgeon with low numbers excluded]. These are all similar there will be none that stand out as bad – no test required.

DISCUSSION

In the UK, about 50 to 67,000 laparoscopic cholecystectomies take place every year, the procedure is widely done by consultants of many specialties by various grades of trainees as well as consultants. Of these, about 85% are elective procedures and rest emergency.[6,7]

In the UK, it is recommended that surgeons perform about 200 procedures every 5 years, which is about 40/year to improve quality of care.[8] This study compares two specialties, the upper and lower GI to see how the specialty of the surgeon performing the operations, reflects on the number of complications and length of stay in hospital.

Complications following laparoscopic cholecystectomy depends on patient factors such as age>65, BMI>30, diabetes, smoking, hypertension, disease characteristics such as thickened GB wall, per-icholecystic fluid on CT, sludge, stones in Hartmann's pouch as well as expertise of the surgeon. This is a small observational study looking at a random set of procedures to assess if surgeon specialty alone had any bearing on risk of complications.

Giger et al concluded that the risk of possible perioperative complications can be estimated based on patient characteristics (gender, age, ASA score, body weight), clinical findings (acute versus chronic cholecystitis), and the surgeon's own clinical practice with LC (>100 versus 11 to 100 interventions).[9] Although Murphy et al found that higher surgeon and hospital volume were associated with fewer complications, neither surgeon nor hospital volume was independently associated with increased risk of complications.[10]

Whilst expertise and number of procedures were found to influence outcomes, some authors found the specialism of the operating surgeon important both for risk of conversion to open as well as complications. Beliaev et al found that compared to the UGI surgeons, non-UGI surgeons have a two times higher incidence of conversion to open (OR=2.1; 95% CI: 1.1–3.7; P=0.0122).[11] Boddy

et al in a 10-year audit found evidence of improved outcomes when laparoscopic cholecystectomy was performed under the care of surgeons with a specialist interest in upper GI or hepato-pancreaticobiliary surgery.[12]

Limitations

In this study we have considered a small number, which may be a reason that complications like duct and bowel injury were not seen. Larger studies done, but which were done some time ago showed a lesser complication rate in upper GI/HPB surgeon group. This may not be reflected in this study due to changes in the pathway and way laparoscopic cholecystectomy may have evolved over the last few years. This could be addressed in a larger systematic review.

CONCLUSION

We looked for evidence that laparoscopic cholecystectomy performed by non-upper GI surgeons increased complications. This study did not show a significant difference in complications seen in laparoscopic cholecystectomies between those conducted by upper GI and lower GI surgeons. Therefore, we feel that non-upper GI surgeons may feel safer performing this operation and expect similar outcomes. However, a larger prospective study may improve insight.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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