What factors are associated with prolonged hospital stay following planned day-case Laparoscopic Cholecystectomy?

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Abstract

While many studies of day case laparoscopic cholecystectomy focus on improving day case rates, the outcomes of those patients who fail day case discharge and have a prolonged length of stay (>48 hours) are less well documented. This case-controlled study investigates the factors responsible for prolonged admission following planned day-case laparoscopic cholecystectomy in a District Hospital performing approximately 250 laparoscopic cholecystectomies per year with a background day-case rate of 35% .

Keywords: Day case surgery; Laparoscopic cholecystectomy; Length of stay; failed discharge.

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Introduction

The implementation of day-case laparoscopic cholecystectomy (LC) in England is a key National Health Service (NHS) target proposed by the NHS Institute of Innovation and Improvement. [1] Laparoscopic cholecystectomy is a high volume surgical procedure, and when performed as a day-case enables increased surgical department efficiency and reduced service cost with no reduction in patient satisfaction, safety, morbidity, re-admission rate, pain, or quality of life.[2,3]

The majority of studies looking at this target have focused on the safety of day case laparoscopic cholecystectomy, and deemed it a safe method of practice. [4]

Other studies and guidelines have investigated ways of improving day-case rates across the NHS.[5–7] However, few studies have investigated why patients fail to achieve day-case discharge following elective surgery and what factors are responsible for this. This case-controlled study investigates the factors responsible for prolonged admission (> 48hours) following planned day-case LC in a large District General Hospital performing approximately 250 LCs per year with a background day-case LC rate of 35% .

Methods

Over a 3 year period from 2007–2010 all patients undergoing consecutive planned day-case laparoscopic cholecystectomy (n=776) were included in the study. Patients' demographics, operative details, antibiotic usage, intra- and post-operative complications, and analgesic requirements were recorded using a standardised proforma. The case-controlled groups under investigation were classified as successful day cases (same day admission and discharge) or failed day cases with prolonged admission (>48hr admission). All consecutive failed day-cases (DC) with greater than 48hr admissions (n=62) were included. Their outcome measures were compared and contrasted to a matched control group of consecutive successful DC patients (n=62). IBM SPSS Statistics version 15 (IBM Corporation, New York) was used for statistical analysis.

Results

The 62 prolonged stay (>48 hours) patients represented 8.0% of the total LCs performed over the 3 year period (62/776). The demographic profile of the study groups, (Failed DC and Successful DC) revealed similar patient age (58yrs v 53yrs), sex (male: 24.2% v 29.0%), co-morbidity, smoking status (21% v 24.2%), BMI > 35 (24.2% v 16.4%), ASA grading, and previous abdominal surgery rate (40.3% v 37.1%) (Table 1).

The most common indication for surgery (Figure 1) in the failed DC group was acute cholecystititis (45.2%) while in the successful DC group this accounted for only 21.0% of indications ($p<0.01$ 2-tailed X^2 test with Yates correction). In contrast, biliary colic was the primary indication for surgery in the successful DC group in 67.7% of cases but only 30.6% but in the failed DC group. (67.7% vs 30.6%, $p<0.01$ 2-tailed X^2 test with Yates correction). The operative duration was longer in the failed DC group compared with successful DC group (median 90mins vs 60 mins $p<0.001$, Mann-Whitney U-Test). Conversion to open (30.6% vs 0%) and use of intra-abdominal drains (45.2% vs 1.6%) were also significantly greater in the failed DC group ($p<0.001$ 2-tailed Fisher's Exact Test) as were early post-operative complications (42.9% vs 16.2%) ($p<0.05$ 2-tailed X^2 test with Yates correction). The experience level of the lead surgeon did not have a statistically significant impact on length of stay.

Generic operative complications such as post-operative nausea and vomiting (PONV), chest pain, port site pain and wound haematoma were similar between the 2 groups (Table 1), but the proportion of specific operative complications was significantly greater in failed DC versus successful DC (using 2- tailed Fishers exact testing), including sub-hepatic collections (8.1% v 0%) and bile leaks (8.1% v 0%). Social care concerns and poor pain control were responsible for prolonged admission in 8.1% and 11.3% of cases respectively.

Discussion

This study reveals multiple factors associated with failed discharge in patients undergoing planned day-case LC. Many (but not all) of these factors are preventable and their avoidance is likely to result in higher day-case LC rates and better patient care. Overall, the factors correlated with prolonged unplanned admission were:

Table I Summary of all data collected for consecutive patient suffering unplanned prolonged hospital stay (Failed DC) versus those achieving successful day-case discharge (Successful DC).

Demographics	Failed DC Group(n=62)	Successful DC Group (n=62)	p value
Patient Age *	58 (48-67)	53 (39-62)	NS
Male (%)	24.2	29.0	NS
Diabetes (%)	17.7	9.7	NS
Smoker (%)	21.0	24.2	NS
ASA grade (%)	I 29.0	I 30.6	NS
	II 61.3	II 56.5	NS
	III 8.1	III 3.2	NS
	IV 1.6	IV 0.0	NS
BMI > 35 (%)	24.2	16.4	NS
Previous abdo surgery*	40.3	37.1	NS
Indication for LC (%)	Biliary Colic 30.6	Biliary Colic 67.7	<0.01
	Cholecystitis 45.2	Cholecystitis 21.0	<0.01
	Recent pancreatitis 8.1	Recent Pancreatitis 4.8	NS
	Previous jaundice 6.4	Previous jaundice 1.6	NS
	Empyema 4.8	Empyema 1.6	NS
*Operative time (mins)	90 (60-110)	60 (50-70)	<0.001
Lead Surgeon (%)	Consultant 66.2	Consultant 42.1	NS
	Registrar 29.0	Registrar 47.4	NS
	Associate Specialist 4.8	Associate Specialist 10.5	NS
Conversion open (%)	30.6	0.0	<0.001
Drain insertion (%)	45.2	1.6	<0.001
Post-operative Complications (%)	Total : 42.9	Total : 16.2	<0.01
	PONV : 8.1	PONV : 6.5	NS
	Subhepatic collection: 8.1	Subhepatic collection: 0	=0.058
	Bile Leak 8.1	Bile Leak: 0	=0.058
	Chest pain / LRTI 6.5	Chest pain / LRTI 0	NS
	Wound haematoma: 1.6	Wound haematoma: 3.2	NS
	Urinary Retention 3.2	Urinary Retention 1.6	NS
Significant post-op port-site Pain (%)	11.3	4.8	NS
ITU admission (%)	3.2	0.0	NS
Mortality (%)	0.0	0.0	NS

*Values are given as median and interquartile range.

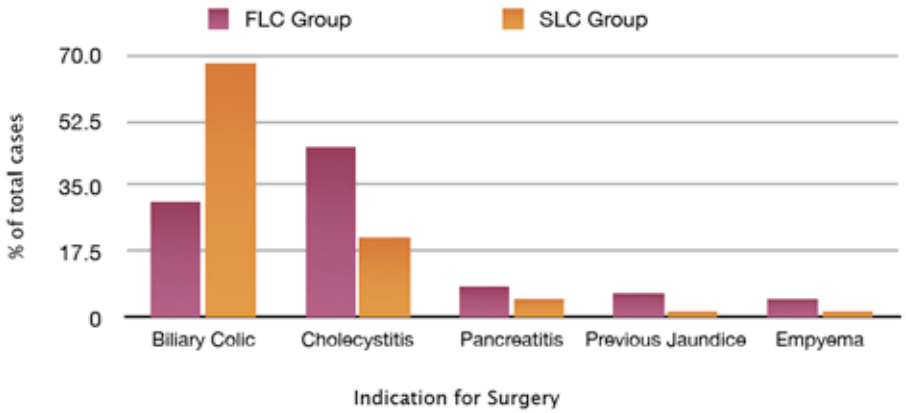

Figure I Indications for surgery in both groups.

Pre-operative Surgical indications (cholecystitis vs biliary colic)

Operative Longer operating time, conversion to open , use of intra-abdominal drains

Post-operative Delayed removal of drains, bile leaks and perihepatic collections

Although only 8% of all planned day-case laparoscopic cholecystectomies result in a prolonged hospital stay, these patients represent an unfortunate group who suffer significant morbidity, including post-operative pain, PONV, and specific procedure-related complications including conversion to the open procedure. The need for a surgical drain in LC should be minimal, as a dry liver bed should be a surgical pre-requisite before exiting the abdomen. Even if a drain is considered necessary, it is possible in most cases to remove the empty drain later in the day and allow safe discharge. Finally delayed discharge as a result of social concerns can be prevented by ensuring appropriate social support is in place before admission.

A reduction in length of stay may require improved surgical technique with appropriate attention to detail6. In the hospital in question the conversion rate has been reducing year on year since 2005 as a result of an ongoing teaching and audit programme. Thus, if this trend continues, a reduction in prolonged stay patients should be expected, benefiting both the economic fortunes of the hospital, but most importantly, the quality of care of the patient.

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