

Does Ambulatory Care Clinic Follow-up Improve the Acute Cholecystectomy Service at a DGH?

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Abstract Introduction: Biliary disease is a common cause of admission to UK hospitals and NICE guidance recommends early cholecystectomy [1]. Evidence supporting early cholecystectomy is primarily from tertiary centres [2,3,4]. This study was undertaken in a District General Hospital to assess the acute cholecystectomy service. The primary aim was to assess the effects of ambulatory follow-up care clinics on reducing complications and readmissions. **Methods:** Data were collected for 2 groups: all patients having acute cholecystectomy on purpose built operation theatre lists during 6 month periods before, and after, the introduction of ambulatory follow-up clinics in 2013 and 2014. The methodology was kept identical to allow a fair comparison. The Nottingham CCG standards for Gallstone disease were used as gold standard. **Results:** There were 77 laparoscopic cholecystectomies performed during the initial pre-ACC period. There was a reduction in the length of inpatient stay in the 30 day follow up compared with the acute cholecystectomies performed in emergency theatre from an earlier audit, however the data showed 15% re-admission and 1% re-operation in newly developed service. An ambulatory care clinic(ACC) was set up and data was re collected. In the post-ACC period 87 patients underwent acute laparoscopic cholecystectomy. Median length of stay was unchanged at 1 day (range 0-48). A small increase in the number of day case discharges from 42.8% to 48.3% was observed ($p = 0.531$). A decrease in all grades of complications was observed including 30 day re-admission. This was reduced from 15.6% to 8% ($P < 0.05$). The reoperation rates were low and there was no mortality in either group. All these outcome measures met, or bettered, the standards from Nottingham CCG. **Conclusions:** The study showed that by introducing early and easily accessible ambulatory follow up, a reduction in re-admission rates can be achieved following acute cholecystectomy. There was no mortality during the study period, and a high day case rate with the demonstration that a safe service can be delivered in a DGH as compared to a tertiary center. We recommend that acute cholecystectomies with a provision for ambulatory follow up should be offered as a safe and effective practice.

Keywords: *cholecystectomy, cholecystitis, emergency general surgery, ambulatory care*

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1. Introduction

Biliary disease is a common cause of admission to UK hospitals and NICE guidelines recommend early cholecystectomy [1], as do other national guidelines [2]. For patients with acute cholecystitis in particular, there is a growing evidence base, that early cholecystectomy is safe and effective, with lower hospital costs, fewer work days lost, and greater patient satisfaction [2,3,4,5,6]. Delaying cholecystectomy, even in higher risk surgical candidates, has not been shown to reduce mortality, and results in a significant readmission rate [7]. However, these sentinel studies were undertaken in large tertiary centers, and there is little published evidence supporting the safety and effectiveness in smaller District General Hospitals (DGH).

Furthermore, the complications, and therefore follow up requirements, are different for emergency compared to

elective cholecystectomy and may lead to readmission if follow-up is not carefully planned and explained. There is little evidence assessing the impact of ambulatory care clinic (ACC) follow-up on the effectiveness of acute cholecystectomy services. In this study, the authors aimed to assess impact of the introduction of ambulatory care clinics on readmission following acute cholecystectomy in a DGH.

2. Methods

A retrospective review of medical records was performed over two separate six-month periods one year apart. The time periods used in the analysis were from May 2013 to December 2014 (before introduction of the ambulatory care clinics) and following the introduction of the service from June 2014 to Dec 2014.

All patients aged over 16 years who underwent an acute Cholecystectomy on a hot list within these two time frames were included. Patients were identified and

demographics and timing data were extracted from a prospectively maintained theatre surgical database.

The initial group from May 2013-November 2013 preceded the introduction of ambulatory care clinics. Details of demographics, dates of surgery, re-admissions prior to surgery, admission duration before surgery, and complications were recorded.

Following this data set, an ambulatory clinic was set up at for acute general surgical patients and post operative

follow up (see Figure 1 for description) and data was recollected. All patients having an acute cholecystectomy on hot lists were collected for June- Dec 2014. Methodology were kept identical for both periods to allow a fair comparison. The Nottingham CCG (Clinical commissioning Group) targets for gall bladder surgery recommended by Royal College of Surgeons in England (Figure 1) were taken as standards.

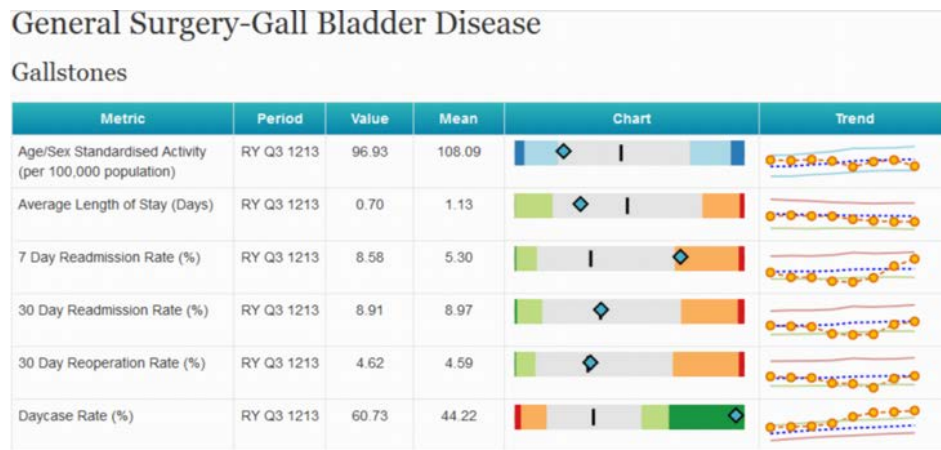


Figure 1. Nottingham CCG standards

The criteria to be booked on the hot list was gall stone disease presenting as an emergency admission necessitating cholecystectomy; this included diagnoses such as acute cholecystitis, biliary colic and gall stone pancreatitis.

2.1. Description of the Ambulatory Care Clinic

Before the introduction of the ambulatory care clinics, post-cholecystectomy patients were discharged home with only option for follow up as emergency referral by GP or through A&E to the acute surgical team should there be any post operative problem. This was presumed to result in unnecessary re-admissions due to lack of appropriate follow up. The ambulatory surgical clinics were set up for urgent review of acute surgical admissions and the patients discharged after acute cholecystectomy were provided with the information to follow up in this clinic held thrice a week allowing early assessment if necessary. The booking process for these clinics was fairly easy as

the patients could self-refer by ringing the surgical assessment unit as well as through GP or A&E in addition to some booked at the time of discharge on the request of operating surgeon. The patient was given an appointment in the next available clinic.

Data input was performed using Microsoft Excel 2011 (Microsoft, Redmond, Washington, USA) and statistical analysis with SPSS version 20 (IBM, Armonk, New York, USA). Dichotomous data were analyzed with the χ^2 test, and continuous data with Student's *t* test and Mann-Whitney *U* test. Two-tailed *P* values were used and the significance level was accepted at *P* < 0.05.

3. Results

There were 77 laparoscopic cholecystectomies in the pre-ACC group, and 87 in the post-ACC group. The diagnostic spread of each group is shown in Figure 2.

Diagnosis	Without ACC Follow-up	With ACC Follow-up
Acute Cholecystitis	19	28
Biliary Colic	27	30
Pancreatitis	8	16
Cholangitis	2	2
Choledocolithiasis	1	6
Gall bladder empyema	3	1
Dysfunctional gallbladder	1	1
Gallbladder Ca	0	1
Gallbladder polyp	1	1
GB Sludge	0	1

Figure 2. Diagnosis in each group

Compared to inpatient cholecystectomies performed in emergency theatre, the pre-ACC group had an improved day case rate, and consequently a reduction in total bed days in the 30 day follow up, as shown in [Figure 3](#)

Length of stay	Median	Interquartile range	Range	Total Days
<i>Pre ACC</i>	<i>1</i>	<i>0 - 1.75</i>	<i>0 - 26</i>	<i>151</i>
<i>Post ACC</i>	<i>1</i>	<i>0 - 2</i>	<i>0 - 48</i>	<i>206</i>

Figure 3. Length of Stay

	Pre-ACC	Post-ACC
Day case rate	42.8%	48.3%
30 Day Re-admission	15.6%	8%
Re-operation	1.2%	1.1%

Figure 4. Readmission, day case and re-operation rate

The data showed 15% re-admission and 1% re-operation in the pre-ACC acute cholecystectomy, which fell to 8% in the post-ACC group, as shown in [Figure 4](#). Mortality was 0 at both 30 days and 90 days follow up. Median Length of stay was unchanged at 1 day (range 0 - 48) ([Figure 3](#)). Increase in day case rate from 42.8% to

48.3% was observed ([Figure 4](#)) however was not statistically significant ($p = 0.531$). Decrease in all grades of complications was observed as shown in [Figure 5](#). All these criteria were noted to be at the same level or better than the standards at Nottingham CCG.

Clavien Dindo Grade	II	III	IV	V	Total
Post-ACC	0	2	0	0	2
Pre-ACC	2	5	1	0	8
P-value (two tailed fisher's exact test)	-	-	-	-	0.0468

Figure 5. Complications

4. Discussion

Following the introduction of the recent NICE guidelines [1], most hospitals are in the process of introducing acute cholecystectomy services. Additionally, the joint RSC (England) and ASGBI guidelines support the commissioning of both ambulatory care clinics (ACC) and acute cholecystectomy services [8]. ACCs and acute cholecystectomy go hand-in-hand; there are many examples of good practice where the ACC is used for the initial assessment and management of sub-acute biliary pathology, on an expedited outpatient basis, preventing admission and diverting operations to dedicated operating lists. The combination of ACC and dedicated lists is intended to help tackle the problem of delays waiting for cholecystectomy as an inpatient, which are shown to be up to 7 days [9].

Whilst this is good for the patient journey and hospital economics, this study has highlighted readmission

following acute cholecystectomy as a potential issue. The cited figure of £820 saving for early over late cholecystectomy [10] would be quickly offset by such readmissions. However, this study shows that ambulatory follow up can be utilized to deliver an acute cholecystectomy service more effectively and efficiently. As these clinics are already being developed under the RCS/ASGBI guidance, there is an opportunity to offer this to patients at minimal additional cost.

There are however limitations to this study, including the retrospective nature and lack of assessment of performance by type of gallbladder pathology.

Although this analysis has shown that early and easily accessible follow up was an important factor in reducing readmission rates, patients' outcomes also depend on factors that cannot be ameliorated by this approach. A combination of methods will need to be employed for any service to be maximally effective and efficient; this needs more studies with larger numbers of patients to determine the optimal combination of strategies.

5. Conclusions

In this study, rapidly and easily accessible ambulatory follow up has been shown to improve the efficiency of the acute cholecystectomy in a district general hospital.

Competing Interests

The authors have no competing interests to declare.

List of Abbreviations

DGH: District General Hospital

ACC: Ambulatory Care Clinic.

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