Index cholecystectomy: a continuing challenge for a provincial hospital

Magdalena M Sakowska, James McKay, Sarah Lake, Alf Deacon

Abstract

Aims To review the management of acute gallstone disease at a provincial New Zealand centre and compare to current national/international practice.

Methods All patients presenting to Nelson Hospital with acute gallstone-related pathology were identified from the study period. The first presentation within the audit period was defined as the index admission. Length of stay and interventions were recorded. Waiting lists were compared.

Results Between January 2004 to December 2010, 390 patients were admitted with acute gallstone-related pathology to Nelson Hospital. The index cholecystectomy rate was 17% (57/329) after exclusion of 61 ineligible patients; 158/329 patients subsequently underwent elective cholecystectomy, with patients waiting a median time of 97 days (range 7–1922). There were 132 Emergency Department visits (median one (range 0–8)), and 59 readmissions with acute gallstone-related pathology for those waiting for cholecystectomy. Of the 37 admitted with gallstone pancreatitis, 11 underwent cholecystectomy within 2 weeks of index admission. Waiting lists remained unchanged over time.

Conclusions Nelson Hospital has a low rate of index cholecystectomy. High numbers of patients represent to the emergency department or are readmitted whilst waiting for definitive surgery. Patients presenting with gallstone pancreatitis fail to receive treatment in accordance with international management guidelines.

Current best practice for acute gallstone disease is cholecystectomy at index admission. Delaying surgery results in recurrent episodes of pain or gallstone-related pathology, with up to 42% of untreated patients re-attending Emergency Departments (ED) and 70% returning for further inpatient management.

Current guidelines recommend that those presenting with mild acute biliary pancreatitis, should undergo cholecystectomy within 2 weeks if not at index admission, due to the risk of a subsequent episode of acute biliary pancreatitis which may be severe, life-threatening or even fatal.

Delaying surgery has no advantage as there is no difference in overall complications for early versus delayed laparoscopic cholecystectomy including conversion rates to open procedures, rates of bile duct injury and perioperative mortality. Furthermore, in those with calculus cholecystitis where symptoms fail to resolve with initial nonoperative treatment, conversion rates approach 45%. Thus failure of nonoperative treatment or delaying surgical treatment at index admission results in longer hospital stays and greater overall costs without added value care for the patient.
Since studies have alleviated some fears about increased morbidity with index laparoscopic cholecystectomy for acute gallstone disease, the barriers that remain to prompt surgical treatment must now be the lack of resources and/or infrastructure within public health institutions. The purpose of this paper was to review the management of acute gallstone disease management at Nelson Hospital over a 7-year period and compare to current national practice.

**Methods**

All patients presenting to Nelson Hospital with acute gallstone-related pathology were identified from the Nelson Hospital audit database by International Classification of Diseases – 10th revision (ICD-10) from January 2004 to December 2010. Gallstone-related disease was defined by ICD-10 codes as follows: cholelithiasis (k80x; which included choledocholithiasis with/without cholangitis), cholecystitis (k81x), and acute biliary pancreatitis (k85.1).

A free-text search of audit data (filled out by clinicians) was also used in case of incorrect coding using keywords gallst*, chole*, common duct and pancr*. Where data were missing or ambiguous, individual notes were recalled and systematically analysed.

Basic demographic data were collated as was length of stay. All gallstone-related admissions, ED visits, outpatient visits, subsequent admissions and interventions were recorded. The first presentation within the audit period was defined as the index admission. Thus, cholecystectomy performed during the index admission was classified as index cholecystectomy.

Admissions, ED visits, and outpatient visits, after the index presentation were classified as subsequent events. Follow up data were collected up until and including December 2010.

Waiting lists were reviewed over the same time frame and shown as the number of patients awaiting cholecystectomy for gallstone-related pathology at the end of each calendar month.

Nominal data are presented with percentages in parentheses (where the denominator is >50) and analysed. Continuous data is presented as median (range).

Ethical approval was not required as this study met the definition of an audit and quality assurance-related activity as detailed by the New Zealand National Ethics Advisory Committee guidelines.

**Results**

Between January 2004 and December 2010, 390 patients were admitted with acute gallstone-related pathology to Nelson Hospital (total of 465 admissions). The median age of these patients was 62 (range 14–94), 217 (56%) of these patients were female.

Sixty-one patients were not included in the analysis due to pregnancy (n=1), frailty/not fit (n=23), had opted for private treatment (n=18), were tourists and preferred treatment at their home centre (n=7) or declined for other reasons (n=12).

Fifty-seven of 329 (17%) patients underwent cholecystectomy at index admission. Eight (14%) underwent an open cholecystectomy and 6/49 were converted from laparoscopic to open. The remainder were treated nonoperatively with a combination of antibiotics, gut rest and intravenous fluids. The median hospital stay for those undergoing index cholecystectomy was 5 days (range 0–41).

Figure 1 shows the number of index cholecystectomies performed per year.
Those who did not undergo index cholecystectomy (272/329, 83%) were either waitlisted for elective cholecystectomy or for further review as an outpatient. Of these, 158 subsequently underwent elective cholecystectomy waiting a median time of 97 days (range 7–1922) with 12 (8%) outliers waiting more than 1 year. Figure 2 shows the number of patients waiting for elective cholecystectomy at the end of each calendar month. No trends were detected.
During subsequent follow up of the 272 patients who did not undergo index cholecystectomy, there were a total of 132 ED visits (median ED visits 1 [range 0–8]), and 59 readmissions with acute gallstone-related pathology. Those who re-presented acutely, 11 (19%) underwent subsequent cholecystectomy on that acute admission.

There were 37 patients admitted with mild biliary pancreatitis. These 37 patients accounted for a total of 74 admissions during the study period with gallstone-related pathology. Eleven of 37 underwent cholecystectomy within 2 weeks of index admission.

**Discussion**

The index cholecystectomy rate at Nelson Hospital (17%) remains low when compared to the current practice seen at tertiary centres such as Christchurch (78%), Auckland (66%)\(^9\) and Middlemore (67%)\(^11\) Hospitals.

The lack of acute surgical facilities at this secondary centre contributes to this shortfall. Nelson Hospital has no dedicated acute surgical theatre; any acute operating is negotiated with other specialties, slotted in between elective lists, onto occasional extras lists or at the end of elective lists that have finished early.

If an acute patient is unwell enough to warrant an urgent operation, elective lists are cancelled. After hours operating time is available but this is not an ideal time to be performing acute cholecystectomy which may additionally require an intraoperative...
cholangiogram. Secondly, low numbers of acute admissions, when compared to tertiary centres, mean that at this hospital, the acute general surgeon on call will, realistically, continue to have clinics, endoscopy lists and even elective lists scheduled concurrently either in public or private. These in turn would need to be cancelled in order to offer an acute cholecystectomy service whether the consultant surgeon is required to perform or supervise the operation. Lastly, there is no in-house endoscopic retrograde cholangiopancreatography (ERCP) service.

All patients requiring common duct clearance with ERCP need to be triaged and transported to a tertiary centre for a next available list which may be up to 2 weeks away for non-urgent patients. By the time this occurs, the patient may no longer be an inpatient, or the window of operating opportunity (within 72 hours of onset of symptoms especially for cholecystitis) elapses and patients are subsequently waitlisted for elective cholecystectomy once their inflammation has settled.

Taking all this into consideration, patients who are not definitively treated with cholecystectomy, as seen in this study and by others, will represent with recurrent symptoms and this will ultimately contribute to their unnecessary suffering, affect their potential contribution to society be that financial or other, and be an additional financial burden on the health institution.

It may be unrealistic to offer an acute cholecystectomy service at a hospital to size of Nelson. A more practical solution could be one where patients are given a definitive date for surgery, for example, 6 weeks after the onset of acute symptoms.

Surgery within 72 hours from onset of symptoms is safe as the oedema facilitates dissection, beyond this time, maturation of inflammatory tissues increases risk of bile duct injury and rates of conversion to open procedures. By 6 weeks, the inflammation is settled bringing these risks back to a safe baseline.

If patients are waiting a median of 80 days to undergo elective cholecystectomy, this increases the likelihood of a second attack, further delaying definitive treatment. For those with mild biliary pancreatitis, a date should be secured within 2 weeks of presentation as stipulated by current international guidelines. Another solution could entail a dedicated weekly list for acute cholecystectomy, accepting a slightly longer waiting time until surgery but facilitated by a surgeon with upper gastrointestinal subspecialty training.

Given the relative inaccessibility of ERCPs at this centre, surgical common duct exploration could be undertaken by that specialist as this has been shown in a meta-analysis to be an equivalent treatment to ERCP in terms of duct clearance, mortality and overall morbidity for those with choledocholithiasis at time of intraoperative cholangiogram. Any such change needs to be driven by clinicians.

Unlike data published from Christchurch Hospital, no effect on waiting lists can be seen at Nelson Hospital. A clinician driven change towards index cholecystectomy at Christchurch Hospital is thought to have prevented waiting lists from ballooning out to numbers seen pre-waiting list cuts. Any effect on waiting lists at Nelson is likely to be difficult to detect given the low numbers of acute presentations seen (10-fold less than at Christchurch Hospital) and the seasonal effects on the population.
Overall, when compared to tertiary centres, different constraints exist at this provincial hospital contributing to the low index cholecystectomy rate. Representation rates are unacceptably high particularly for those presenting with gallstone pancreatitis as they fail to receive treatment in accordance with international management guidelines.

If at all possible, patients should be advocated for by the attending surgeon to undergo acute cholecystectomy and Nelson Hospital needs to urgently review the provision of an in-hours acute theatre to facilitate this. Other potential solutions include assuring elective surgical treatment within the minimum safe operating time frame.

Competing interests: Nil.

Author information: Magdalena M Sakowska, General Surgical Registrar, Department of General and Vascular Surgery; James McKay, House Surgeon, Department of General and Vascular Surgery; Sarah Lake, Clinical Audit; Alf Deacon, Consultant General Surgeon, Department of General and Vascular Surgery; Nelson Hospital, Nelson/Marlborough District Health Board, Nelson

Correspondence: Dr Magda Sakowska, General Surgical Trainee, Department of General & Vascular Surgery, Palmerston North Hospital, 50 Ruahine Street, Private Bag 11036, Palmerston North 4442, New Zealand. Email: magda.sakowska@xtra.co.nz

References:


