

Proactive nursing care is the key to successful day case laparoscopic cholecystectomy at a rural hospital.

Day case cholecystectomy

Informed consent statement: Retrospective study does not require patient informed consent.

ABSTRACT

AIM: Day case laparoscopic cholecystectomy is achievable but in most hospitals it is not routine. We describe our experience with day case laparoscopic cholecystectomy in a rural Queensland hospital.

METHODS: Retrospective analysis of consecutive adult patients with uncomplicated cholelithiasis who underwent day case laparoscopic cholecystectomy by the one surgeon.

RESULTS: 75% of patients were women with a mean age of 38 years and ASA class 2. The nurse in Post Anaesthesia Care Unit was pivotal in enabling 48 out of 51 patients to be discharged home on the day of surgery. All operations were performed by the one surgeon. Anaesthesia was not **protocolled**.

CONCLUSION: While good patient selection, optimized anaesthesia and sound surgical techniques are recognised as prerequisites for day case surgery, the role of the nurse in the Post Anaesthesia Care Unit is pivotal.

Keywords: nursing; rural surgery; laparoscopic cholecystectomy; day case surgery

22 **Core tip:** Surgical units planning on introducing same day discharge following laparoscopic
23 cholecystectomy need to have well trained Post Anaesthetic Care Unit nurses.

24 **INTRODUCTION**

25 Patients undergoing elective laparoscopic cholecystectomy (LC) generally have an overnight
26 stay due to post-operative pain, nausea and vomiting. Day-case surgery, while reducing the
27 financial burden on the health care system, may offer patients more comfort by being able
28 to recuperate in their own environment. Day-case elective LC has been shown to be safe in
29 select patient groups with an unanticipated admission rate of 3.4% to 24.3% [1-4]. This is
30 typically due to nausea and vomiting, pain, and conversion to an open procedure. Operative
31 time over 60 minutes has been shown to have a four-fold increase in the likelihood of
32 unplanned admission. [2] Patients should be American Society of Anaesthesiologist (ASA)
33 class I or II, consent to day surgery, have a responsible adult at home on discharge, live
34 within 30 minutes of the hospital [4] and have BMI <35 [5].

35 Approximately 25% of the Australian population live in rural Australia, however over 85% of
36 Australian surgeons currently work in a metropolitan area. [5, 6] Establishing a surgical
37 service in a rural hospital is of benefit both to the patient, who has the convenience of being
38 in close proximity to the hospital, but also the hospital staff, who are able to establish and
39 maintain skills. There are no reports of routine day-case LC in a rural hospital. [7]

40 We reviewed the outcome of 51 patients who were planned to undergo day-case
41 laparoscopic cholecystectomy at Beaudesert Hospital in Queensland. Beaudesert Hospital is
42 a 40 bed rural hospital some 60 km from a tertiary centre in Brisbane and the Gold Coast.

43

44 MATERIALS AND METHODS

45 Patients were referred to Beaudesert Hospital Surgical Outpatients clinic by their General
46 Practitioner via a Central Referral Hub. Based on symptoms and preoperative investigations,
47 the senior author (APW) determined whether the patient was eligible for day case
48 cholecystectomy at Beaudesert Hospital. Those who were not (e.g. suspicion of
49 choledocholithiasis) were referred to another institution. Day case surgery was discussed
50 with the patient in the nursing preadmission clinic, by the anaesthetist as well as the senior
51 author (APW). **Choledocholithiasis was suspected if there was a history of jaundice or acute**
52 **pancreatitis, liver function tests were elevated or ultra sound scan showed biliary dilatation.**
53 **The constraints of a small hospital prevented day of surgery ultrasonography.**

54

55 Only patients ASA class 1 or 2 with BMI below 35 kg/m² were offered day case
56 cholecystectomy at Beaudesert Hospital. The anaesthetic technique was not protocolled. All
57 patients were paralysed with a non-depolarizing muscle relaxant (rocuronium, Merck Sharp
58 & Dohme, Australia) and intubated. Typically, anaesthesia was induced with propofol
59 (AstraZeneca, Australia) and maintained with a volatile agent (sevoflurane, Baxter
60 Healthcare, Australia) without the use of nitrous oxide. Multimodal antiemesis was provided
61 with dexamethasone (Aspen Pharmacare, Australia) plus ondansetron (Mayne Pharma,
62 Australia). Multimodal analgesia was provided with fentanyl (AstraZeneca, Australia),
63 morphine (Hospira, Australia), paracetamol (Phebra, Australia) and parecoxib (Pfizer,
64 Australia). Muscle paralysis was reversed (neostigmine (AstraZeneca, Australia) and
65 glycopyrrolate (Aspen Pharmacare, Australia)) at completion.

66

67 A typical 4 port laparoscopic cholecystectomy was performed with pre-emptive local
68 anaesthetic (port site + intraperitoneal). Insufflation was with unwarmed, non-humidified
69 carbon dioxide. A drain was never used. Intraoperative cholangiography was never
70 performed. Bile duct injury was avoided by implementing the critical view of safety. [8]
71 Patients were recovered on a one to one basis in the Post Anaesthesia Care Unit during the
72 initial stage, focusing on pain level, consciousness level, nausea and vomiting, wound
73 assessment and comfort. These were managed by listening to patient needs and making the
74 patient part of their recovery process decision making. Symptoms were managed by a
75 combination of pharmacological and non-pharmacological means. Postoperative
76 instructions were discussed with the patient and their carer and an information leaflet
77 provided. Any questions the patient or their carer had were answered. To help each patient
78 feel safe and cared for, all were given a contact phone number and all were reassured that a
79 nurse would give them a courtesy phone call the next day.

80 **RESULTS**

81 Between October 2013 and November 2015, 51 laparoscopic cholecystectomies were
82 performed by the senior author (APW) at a 40 bed rural hospital in Queensland. 38 patients
83 were female and 13 male. Mean age was 38 years (range 20 – 66 years). 49 patients had a
84 history either consistent with or typical of biliary colic. Median ASA was 2 (range 1 – 2).
85 Median BMI was 27 (range 18 – 34). Nassar Grade 1 operative difficulty (easy) was
86 encountered during 20 operations, Grade 2 (normal) during 19 and Grade 3 (difficult) in 12
87 (duodenal adhesions to gallbladder in 6, fibrosed **hepatobiliary** triangle in 5 and low entry of
88 right posterior **sectoral** duct in 1). Nassar Grade 4 was not encountered.[9] There were no
89 conversions to open cholecystectomy. Post operatively there were no bile leaks and no bile

duct injuries. One patient with normal preoperative liver function tests and non dilated biliary tree on ultrasound scan required a postoperative Endoscopic Retrograde Cholangiopancreatography with sphincterotomy upon representing with a retained bile duct stone.

48 patients were discharged home from recovery on the day of surgery. Length of stay in Post Anaesthesia Care Unit ranged from 2 hours to 10 hours (median 3.6 hours). While many met the discharge criteria after 2 hours and were happy to go home to sleep it off in their own environment, some patients required a longer stay for the following reasons: pain management, being stable but sleepy, nausea, needing extra reassurance and awaiting pickup by carer. Three patients required over night admission (1 vomiting, 1 pain, 1 pain and vomiting). Table 1 shows patient and surgical features based on the pain score upon arrival to the Post Anaesthetic Care Unit.

During this time frame, 17 patients seen at the surgical clinic at Beaudesert Hospital were booked onto the senior author's waiting list at the larger Logan Hospital due to comorbidities or the suspicion of choledocholithiasis.

DISCUSSION

Successful day case surgery is typically attributed to advances in surgical and anaesthetic care. [10] Our observations suggest that without one on one proactive nursing care in the Post Anaesthesia Care Unit, routine day case laparoscopic cholecystectomy may not be achievable – but this component is not always stressed. [11] A successful day case surgical programme consists of multiple intertwined elements including the identification of appropriate and motivated patients, thorough preoperative patient preparation, optimized anaesthesia and surgery being performed by a senior surgeon. However, tying these together is the crucial role of the experienced motivated Post Anaesthesia Care Unit nurse

113 who ensures smooth patient recovery and rapid turnover which is required to run a unit
114 efficiently. [10]

115 In this study 94% of selected patients (48 / 51) following elective laparoscopic
116 cholecystectomy were discharged home on the day of surgery at a median of less than 4
117 hours following completion of surgery. Overall, 75% of patients undergoing laparoscopic
118 cholecystectomy were women with a mean age of 38 years and median ASA class 2. The
119 surgical technique was standardized by virtue of being performed by the one surgeon.
120 Anaesthesia was not protocolled: a non-volatile agent was used for induction and a volatile
121 was used for maintenance. A multimodal approach to analgesia and antiemesis was
122 employed. Surprisingly, the patient's first pain score in the Post Anaesthesia Care Unit was
123 not related to the dose of intraoperative fentanyl, morphine, parecoxib and paracetamol. In
124 the Post Anaesthesia Care Unit, physiological parameters such as oxygen saturation were
125 used in combination with psychosocial aspects as part of a patient-centred approach to
126 successfully managing their recovery.[12] All patients were counselled regarding
127 postoperative pain, wound management, personal hygiene, level of exercise and return to
128 work as these have previously been identified as being deficient.[12]

129 The key features of this study include employing a safe standard surgical technique, non-
130 protocolled anaesthesia and a rural hospital setting. Limitations include its retrospective
131 nature and selection of only healthy patients with uncomplicated cholelithiasis.

132 During the preoperative clinic visits, patients were made aware that same day surgery does
133 not imply same day recovery. While patients often appreciate having the option of day case
134 surgery, several obstacles exist: lack of postoperative surveillance, overoptimistic
135 expectations concerning recovery and patient and carer insecurity regarding what to expect

during the recovery process.[12] One of the roles of the Post Anaesthesia Care Unit nurse is to build up patient confidence through reassurance, advice about what to expect during a 'normal' recovery, and explanation of patient concerns was crucial. This allows the patient feel well enough physically and confident enough emotionally to go home on the day of surgery.

CONCLUSION

During our study we found that successful day case cholecystectomy requires not only educated and motivated patients, optimized anaesthesia, sound surgical technique but also proactive nursing care especially in the Post Anaesthesia Care Unit.

PACU pain score	Female	Mean age	Mean intraop fentanyl (number received)	Mean intraop morphine (number received)	Number received intraop 1 gram paracetamol	Number received intraop 40 mg parecoxib	Mean duration of surgery	Nassar 3 difficulty	Admitted
0 – 4 N = 24	18 (75%)	40 years	132 µg (24)	5 mg (15)	17 (71%)	16 (67%)	52 min	5 (21%)	1 (4%)
5 – 6 N = 12	9 (75%)	37 years	122 µg (12)	7 mg (6)	9 (75%)	8 (67%)	49 min	3 (25%)	1 (8%)
7 – 10 N = 15	11 (73%)	35 years	128 µg (15)	6 mg (8)	11 (73%)	9 (60%)	48 min	4 (27%)	1 (7%)
Total N = 51	38 (75%)	38 years	129 µg (51)	6 mg (29)	37 (73%)	33 (65%)	50 min	12 (24%)	3 (6%)

Table 1. Post Anaesthetic Care Unit pain score and patient characteristics
PACU: Post Anaesthetic Care Unit; intraop: intraoperatively; N = number; Nassar level of surgical difficulty (see text).

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