

# Laparoscopic cholecystectomy: experience in a district general hospital

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## SUMMARY

*In many centres laparoscopic cholecystectomy has become the procedure of choice for symptomatic gallbladder stones. By comparison with conventional cholecystectomy it appears to be associated with minimal morbidity, shorter hospital stay, earlier return to work and a better cosmetic result. The present study reviews the results of the first 50 laparoscopic cholecystectomies performed at Altnagelvin Area Hospital.*

## INTRODUCTION

The management of symptomatic gallstones has undergone a remarkable change in the past 18 months. The first cholecystectomy was performed by Langenuch<sup>1</sup> in 1882 and is still the 'gold standard' method for dealing with the diseased gallbladder. Alternative treatments which have been advocated recently for gallstones include dissolution therapy,<sup>2,3</sup> extracorporeal shockwave lithotripsy,<sup>4,5</sup> percutaneous cholecystectomy<sup>6</sup> and cholecystolithotomy.<sup>7</sup> All of these techniques, however, leave the gallbladder *in situ* with the possibility of stone recurrence.

Laparoscopic cholecystectomy was attempted in 50 consecutive patients and was successfully completed in 47 cases. Three patients (6%) were converted to open cholecystectomy. There was one death in the series. Apart from this case, the initial findings confirm the feasibility of this technique and demonstrate a low morbidity with minimal requirement for postoperative analgesia. These results compare favourably with other recent experience.<sup>8,9</sup>

## PATIENTS AND METHODS

Between February and October 1991, laparoscopic cholecystectomy was performed on 50 patients (10M : 40F) with symptomatic cholelithiasis; mean age was 44·9 years (range 22–68 years). Acute biliary infection was present in two patients; one of whom had acute cholecystitis (48 hours duration) and the

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other had cholangitis ten days prior to surgery, and had an ERCP performed two days prior to laparoscopic cholecystectomy. Diagnosis was made by ultrasound scan in 46 patients and by oral cholecystogram in four patients. Preoperative liver function tests were performed on all patients. With one exception; all patients were admitted one day prior to surgery.

Suitability for this procedure was determined using pre-defined selection criteria similar to those described by Zucker et al.<sup>10</sup> Absolute contraindications were previous upper abdominal surgery, pregnancy, bleeding disorders, choledocholithiasis, jaundice and empyema of the gallbladder. Sixteen patients had previous abdominal surgery (7 hysterectomy, 6 appendectomy, 1 laparoscopy, 1 caesarean section and 1 lower midline incision — operation not known). All patients received prophylactic antibiotics (cephradine 500 mg or ceftioaxime 1 g) with induction of anaesthesia, and subcutaneous heparin 5,000 units subcutaneously eight hourly during the perioperative period until ambulatory.

Laparoscopic cholecystectomy is performed by two surgeons and one assistant; all procedures were performed under general anaesthesia with the patient supine. To minimise the risk of bladder or stomach injury, a nasogastric tube and urinary catheter were inserted in the first 21 patients. The remaining 29 patients were instructed to empty their bladder immediately before operation and only a nasogastric tube was inserted.

Pneumoperitoneum is established by inserting a Veress needle through the midline just below the umbilicus and approximately five litres of carbon dioxide is insufflated into the peritoneal cavity to maintain a pressure of approximately 15 mmHg (Solos rapid insufflator). To facilitate this, the patient is placed in the 20° trendelenburg position. The Veress needle is replaced by an 11 mm trocar and sheath through which is passed a laparoscope which is attached to a video camera. After a full laparoscopic examination of the abdomen, and under direct intraperitoneal vision, a second 11 mm diameter trocar is inserted just to the right of the midline and falciform ligament four finger breadths below the xiphoid. A third trocar (5 mm diameter) is then placed two finger breadths below the right subcostal margin in the midclavicular line and a fourth trocar (11 mm) is placed in the anterior axillary line three finger breadths below the right subcostal margin. The remainder of the procedure is performed by video dissection displayed on a television monitor.

Grasping forceps are inserted through a portal placed in the anterior axillary line, and the fundus of the gallbladder is grasped and pulled gently to the right and up over the liver edge to expose the gallbladder. The patient is then positioned in the 20° head-up position and rotated slightly to the left to allow the viscera to fall away from the gallbladder thus further improving the exposure. Through the upper portal in the mid-clavicular line, the surgeon inserts another pair of forceps which grasp the neck of the gallbladder and pull it gently to the right. This manoeuvre exposes Calot's triangle and by a combination of blunt and sharp dissection using forceps or diathermy scissors placed through the upper midline portal, the cystic duct and artery are exposed. The exposed artery and duct are divided between 6 mm titanium clips. Intraoperative cholangiography was not performed routinely. Using electrocautery the gallbladder is dissected from the gallbladder bed and removed via the anterior axillary portal. If a large stone is encountered the gallbladder neck can be delivered on to the skin. It is then

opened and following aspiration of bile, the stone is crushed by an instrument placed inside the gallbladder. Alternatively, the incision can be enlarged slightly using a grooved director and a scalpel and the gallbladder removed. The gallbladder bed is inspected for haemostasis, irrigated with saline and if necessary a drain may be placed.

## RESULTS

Laparoscopic cholecystectomy was successful in 47 patients. Of the three failures, one had dense intra-abdominal adhesions, one had a very fibrosed gallbladder and in one patient it was not possible to create a pneumoperitoneum due to obesity. Operative time varied from 20 to 195 mins (Table I). In six patients trauma to the gallbladder resulted in bile leakage. A subhepatic suction drain was inserted in four patients. In one patient the gallbladder perforated when it was being removed from the abdomen and a large gallstone slipped back into the peritoneal cavity. The sub-umbilical incision was extended and the stone was removed manually. Blood loss in all procedures was minimal.

TABLE I  
*Total operative time from induction of anaesthesia*

<i>Operative time (mins)</i>	<i>Number of patients</i>
0 – 60	12
61 – 120	26
121 – 180	5
> 180	4

Wound problems were confined to bruising around the trocar sites. Oxygen saturation fell in one patient following induction of anaesthesia and during the operation. The cause for this was unknown but it was felt to be related to the laparoscopic procedure. Otherwise we did not identify any significant pulmonary complications. Three patients complained of shoulder pain up to 24 hours post-operatively. One patient developed chest pain two days postoperatively and required treatment for unstable angina.

There was one death, a 68-year-old female who had a difficult operation due to adhesions of the omentum and transverse colon to the gallbladder. She developed septicaemia due to a large subphrenic and subhepatic collection of fluid. Approximately one litre of bile and blood was aspirated under ultrasound control three days postoperatively. She was treated with metronidazole, ceftioaxime, and gentamicin intravenously, but her condition gradually deteriorated and she died two days later. At autopsy, there was no evidence of damage to anatomical structure including the bile ducts, hepatic ducts or cystic artery.

Forty-four patients received intravenous crystalloid solutions for one postoperative night, two patients for 48 hrs and one patient for five days (subsequently died). Hospital stay was compared to the last 50 open cholecystectomies carried out by the same surgical team. This was shorter in the laparoscopic cholecystectomy

group, mean 4.2 days (range 3–10 days), compared to the open cholecystectomy group, mean 8.0 days (range 3–18 days) (Table II). The patient in whom oxygen saturation fell remained in hospital for seven days and the patient with unstable angina stayed nine days. Intramuscular postoperative analgesic requirement was as shown (Table III). The patient who developed the subphrenic fluid collection and subsequently died had seven injections of morphine/cyclizine followed by intravenous morphine infusion. Most patients took simple non-narcotic analgesia up to discharge.

TABLE II

*Total hospital stay in 47 patients having laparoscopic cholecystectomy (mean 4.2 days, range 3–10 days), and 50 patients having open cholecystectomy (mean 8.0 days, range 3–18 days)*

<i>Hospital stay days</i>	<i>Laparoscopic cholecystectomy (n = 47)</i>	<i>Open cholecystectomy (n = 50)</i>
3	15	1
4	19	4
5	5	6
6	6	9
7	1	5
8	0	4
9	0	9
10	1	4
11	0	2
12	0	1
13	0	2
15	0	2
18	0	1

TABLE III

*Total number of postoperative injections for analgesia per patient (either morphine tartrate 10mg with cyclizine tartrate 50mg/ml (44 patients) or dihydrocodeine tartrate 50mg/ml (3 patients))*

<i>Number of injections</i>	<i>Number of patients</i>
0	3
1	9
2	13
3	9
4	11
5	1
7	1

## DISCUSSION

Apart from one death in this series, our initial experience with laparoscopic cholecystectomy has been most rewarding, particularly in terms of patient recovery, reduced hospital stay and minimal requirements for postoperative analgesia. The procedure however, takes longer than open cholecystectomy, but with increasing experience operating time should decrease.

The requirement for postoperative analgesia is minimal, 95% of our patients requiring four or less injections for pain relief. In addition, postoperative morbidity is relatively trivial and infrequent, self-limiting shoulder pain and wound bruising being most notable. The length of postoperative hospital stay in our series is longer than that reported by Reddick and Olsen<sup>11</sup> who performed 60% of their (carefully selected) patients as day cases. This was due to our relative caution with the early patients, whom we wished to observe well into their recovery period in case they developed as yet unidentified complications. With increasing experience in the management of these patients, we have found that, even in our small series, the duration of hospital stay has decreased.

Preliminary results from many centres suggest that laparoscopic cholecystectomy has important potential, but larger series are required before its permanent place in the management of gallbladder stones can be established. Whenever difficulties arise which render continuation of the procedure unwise or unsafe, the surgeon should have no hesitation in converting to a standard open cholecystectomy. This should be regarded as an option rather than a complication and if appropriately exercised, it should limit the risk of adverse outcome.

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