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Laparoscopic cholecystectomy in a small rural hospital

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[résumé]

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Abstract

Objective: To review experience with laparoscopic cholecystectomy (LC) in a small rural hospital.

Setting: A 37-bed rural hospital in Goose Bay, Labrador.

Design: Chart review.

Patients: Sixty-nine consecutive patients with symptomatic cholelithiasis.

Intervention: Laparoscopic cholecystectomy.

Main outcome measures: Rate of successful completion of LC and postoperative morbidity.

Results: LC was successfully completed in 66 out of 69 patients. There was a transient low volume bile leak after LC in 1 patient. Six patients had superficial wound infections. Conversion to open cholecystectomy was required in 2 patients (2.9% conversion rate). LC was postponed in 1 patient. There was no perioperative mortality.

Conclusion: LC in a small rural hospital can be performed with a morbidity that compares favourably with results achieved in large surgical centres.

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Résumé

Objectif : Revoir l'expérience de la cholécystectomie par laparoscopie (CL) dans un petit hôpital rural.

Contexte : Hôpital rural de 37 lits à Goose Bay, au Labrador.

Conception : Étude des dossiers.

Patients : Soixante-neuf patients consécutifs atteints d'une cholélithiase symptomatique.

Intervention : Cholécystectomie par laparoscopie.

Principales mesures de résultats : Taux de réussite de la CL et morbidité postopératoire.

Résultats : On a procédé à une CL réussie chez 66 des 69 patients. Il y a eu une fuite transitoire d'un faible volume de bile après la CL chez un patient. On a constaté une infection superficielle de la plaie chez six patients. Il a fallu procéder à une cholécystectomie ouverte chez deux patients (taux de conversion de 2,9 %). On a reporté la CL chez un patient. Il n'y a pas eu de mortalité peri-opératoire.

Conclusion : Il est possible de procéder à une CL dans un petit hôpital rural avec un taux de morbidité qui se compare favorablement aux résultats atteints dans de grands centres chirurgicaux.

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The advantages of laparoscopic cholecystectomy (LC) over open cholecystectomy in terms of limited postoperative pain, reduction in hospitalization time, recovery periods and improved cosmetic results have been established in a number of studies.1–5 These studies also evaluated the safety of LC on patients treated in relatively large hospitals. This report reviews our experience with 69 consecutive patients who were offered LC at Melville Hospital.

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Methods

Melville Hospital is a 37-bed rural hospital located in Goose Bay, Labrador. The nearest large hospital is more than 1 hour away by aircraft. The hospital provides primary care, and secondary care in the core specialties of surgery, gynecology and obstetrics and anesthesiology. The catchment area population is approximately 16 000. A significant proportion of the population comprises Innu and Inuit people in Sheshashit, Nain, Davis Inlet, Hopedale, Makkovik and Rigolet. A high rate of cholelithiasis is present in the native communities. All procedures in the series were performed by the same surgeon.

LC equipment became available at the Melville Hospital in July 1995. Sixty-nine consecutive patients (59 women and 10 men, mean age 36.9 years, range 19 to 68 years) were admitted for LC over a 2-year period. Preoperative assessment consisted of detailed clinical review and investigations (complete blood count, liver function tests, measurement of urea and electrolyte levels and serum amylase, and ultrasonography of the liver and biliary tract). Electrocardiography was performed in patients over 45 years of age.

Ultrasonography was focussed on the characteristics of any gallstones (size, number and location), the diameter of the common bile duct, the size of the gallbladder, the thickness of the gallbladder wall, and assessment of the liver and pancreas.6

Patients were offered LC if it was reasonably certain that choledocholithiasis was not present. The presence of acute cholecystitis was not a contraindication, and patients were only excluded if multiple previous abdominal operations made successful LC unlikely. Informed consent was obtained after a detailed discussion about the benefits and possible complications of LC. In keeping with routine surgical protocols, all patients received a Fleet enema the night before surgery and 5000 IU of heparin subcutaneously 2 hours before induction of anesthesia. Patients were requested to void before surgery and a Foley catheter was not inserted during the procedure.

Patients with jaundice or a recent history of jaundice, an elevated alkaline phosphatase level or dilated common bile duct were offered open cholecystectomy locally. Patients who chose LC

were referred for endoscopic retrograde cholangiopancreatography,7 retrieval of stone(s) in the common bile duct, if present, and LC.

Operative treatment

LC was performed according to the Dundee technique.8 In the majority of cases, the open technique was used for insertion of the infraumbilical trocar and subsequent induction of pneumoperitoneum.9–11 The 3 other trocars (subxyphoid and right subcostal along the midclavicular and anterior axillary lines) were inserted under laparoscopic visual control. A thorough laparoscopic assessment of the intraperitoneal organs was carried out before proceeding with LC.

At LC, the gallbladder–cystic junction (the critical anatomical landmark) was initially identified. A short segment of the proximal cystic duct was subsequently mobilized.12–14 Cholecystocholangiography was performed in all cases in which the gallbladder –cystic duct junction and cystic duct were not easily skeletalized (8 patients).

Cholecystocholangiography15

A Veress needle was used to puncture the gallbladder fundus. Bile in the gallbladder was aspirated and 50 mL of contrast medium was instilled into the gallbladder. Films were obtained during further installation of contrast medium, with the patient in a 20º Trendelenburg position and tilted to the right, with traction on the gallbladder released. The cholecystocholangiogram provided an adequate "roadmap." Details of the extrahepatic bile duct anatomy relevant to LC were outlined (Fig. 1).

After positive identification, the cystic duct was divided between clips. The cystic artery was identified and divided between clips, and the gallbladder awas removed from the gallbladder bed. A single dose of cefotetan (1 g, intravenously) was administered intraoperatively. A suction drain was routinely inserted in the right subhepatic space through the subxyphoid cannula and left in situ.

Postoperative management

Routine observations were performed and analgesia was prescribed. Oral fluids and early mobilization was encouraged. The suction drain was removed after 24 hours if drainage was minimal. Heparin subcutaneously was continued after the operation and until the time of discharge. The patients were discharged 24 hours postoperatively if they lived in the area. Patients living in outlying communities were encouraged to stay in the town or in the hospital for 48 hours.

The patients were reviewed at 2 and 4 weeks postoperatively. Liver function tests were performed at both visits.

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Results

LC was successfully completed in 66 patients. One patient (1.5%) had a transient low-volume bile leak postoperatively. The bile leak stopped after 72 hours. On follow-up, over a 1-year period, the patient has remained well, with normal liver function test results.

Six patients (9%) had postoperative, superficial wound infections at the subumbilical trocar site. These resolved with minimal intervention.

In 3 patients LC could not be completed. The rate of conversion to open cholecystectomy was 2.9% (2 out of 69). These 3 cases are described here.

A 37-year-old man had had a perforated peptic duodenal ulcer, 6 years previously, that required emergency surgery through an upper midline incision. Attempts at digital mobilization of periumbilical adhesions through the infraumbilical incision were unsuccessful. LC was abandoned, and open cholecystectomy was performed. Dense adhesions were noted in the epigastrium at open cholecystectomy.

A 63-year-old man was noted to have cirrhosis of the liver with evidence of portal hypertension at laparoscopic assessment. LC was considered unsafe. Through a subcostal incision, partial cholecystectomy was carried out.16 The portion of the gallbladder embedded in the gallbladder fossa was left in situ. The mucosa of the retained gallbladder wall was ablated by diathermy.

At initial laparoscopic assessment a 20-year-old woman was found to have a tumour (5 ¥ 3 cm) on the anterior margin of the right lobe of the liver just lateral to the insertion of the falciform ligament. This lesion had not been picked up on preoperative ultrasonography. The tumour appeared vascular. Laparoscopic cholecystectomy was postponed until further assessment of the tumour could be performed.

There were no perioperative deaths. Histopathologic examination of the gallbladder, in the majority of cases, showed chronic cholecystitis/cholelithiasis.

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Discussion

Since the first LC was performed in 1987 by Mouret and the first series of 60 laparoscopic cholecystectomies was published by Dubois in 1987, LC has become the operation of choice for

symptomatic cholelithiasis. Numerous publications, mostly from large surgical centres, have exhaustively dealt with the operative technique, complications and the benefits of LC.

The introduction of LC to a small rural hospital comes with specific problems that have to be addressed. These problems include the following.

- The cost-effectiveness of introducing the service. The relatively high start-up costs (the capital equipment, and training of medical and nursing staff) have to be considered in the context of a relatively low caseload.
- Dealing with the sequelae of major complications after LC, if and when they occur. Laparoscopy and LC are invasive procedures associated with a range of minor and major complications.17 Comparative statistical analysis of the incidence of damage to the major extrahepatic duct system during LC and open cholecystectomy have indicated a higher incidence of more extensive damage to the extrahepatic bile duct system during LC. Reconstructive surgery after LC-related bile duct injuries has correspondingly been more difficult.18–20 When major LC-related complications do occur, small rural surgical units could be vulnerable to the suggestion that LC should be performed in larger surgical units.

Patient safety during LC in our unit has been enhanced by the following: the routine use of an open technique to insert the (first) infraumbilical cannula and subsequent induction of pneumoperitoneum has eliminated iatrogenic injuries related to Veress needle or trocar introduction;1 selective cholecystocholangiography has been performed if a maximum of 10 to 15 minutes of dissection in the triangle of Calot has not identified the gallbladder–cystic duct junction and cystic duct.

Cholecystocholangiography has been safe and easy to perform and has provided adequate information. Cholecystocholangiography is probably safer than transcystic cholangiography. The case for selective cholangiography during LC is now widely accepted.12,21 Contrast studies during LC are indicated when the gallbladder–cystic duct junction and cystic duct cannot be positively identified or the relationship of the cystic duct to the common hepatic and common bile duct are uncertain. In these situations, what may appear to be the cystic duct may be the right hepatic duct, common hepatic duct or common bile duct. At least a lateral injury to a major bile duct will have occurred at cannulation for transcystic cholangiography, if the cannulated duct turns out not to be the cystic duct.15 This may result in duct stenosis in the future. The minimal complication rate in this consecutive series of 69 attempted LCs (2 "justifiable" conversions to open cholecystectomy, 66 successfully completed LCs associated with minor complications, and 1 LC postponed) compares favourably with results achieved in tertiary care centres.11,17 Similar results should be reproducible in comparable rural surgical units in Canada.

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