

# Efficacy of Laparoscopic Cholecystectomy in Acalculous Gallbladder Disease: Long-term Follow-up

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## ABSTRACT

**Objective:** Our aim was to determine the efficacy of laparoscopic cholecystectomy in symptomatic patients with ultrasound negative and abnormal gallbladder ejection fractions; Patients with gallbladder ejection fractions less than 35% on hepatobiliary scan were offered laparoscopic cholecystectomy.

**Methods:** Between January 1995 and January 2001, 1564 patients underwent laparoscopic cholecystectomy at our institution: 256 were confirmed to have acalculous gallbladder disease by pathology report and reconfirmation of abnormal hepatobiliary scan data. A 30-day postoperative follow-up was obtained by retrospective medical record review. For this study, we contacted all 256 patients by mail questionnaire and followed up on non-responders with telephone interviews; we also reviewed hospital records to verify preoperative symptom patterns. The survey was completed by 154 patients (60%): 48 (31%) by mail and 106 (69%) by telephone interviews. The study included 115 (75%) female and 39 (25%) male patients, and the average age was 42 years (range, 13 to 95). All hepatobiliary laboratory parameters were normal pre- and postoperatively. The survey was completed in December 2001, 1 to 5 years postoperatively (mean 3years).

**Results:** Preoperatively, 142 patients (92%) had right upper quadrant pain, 114 (74%) had nausea, 88 (57%) had vomiting, 120 (73%) had heartburn, and 118 (77%) had food intolerance. In a 30-day postoperative period, these numbers had reduced to 48 (37%), 14 (9%), 8 (5%), 22 (14%), and 34 (22%), respectively.

The patient responses documented for this survey (mean 3 years postoperatively) were as follows: 93% had no recurrence of symptoms, 96% were satisfied that they

had laparoscopic cholecystectomy, and 95% stated that they would recommend laparoscopic cholecystectomy to other patients.

**Conclusion:** This study shows that patients with acalculous gallbladder disease benefit from laparoscopic cholecystectomy.

**Key Words:** Laparoscopy, Gallbladder, Cholecystectomy, Biliary dyskinesia.

## INTRODUCTION

One of the difficult surgical management problems is deciding whether a patient suffering from biliary symptoms, such as right upper quadrant abdominal pain, nausea, and vomiting, with a documented lack of gallstones by ultrasound should undergo removal of the gallbladder. These kinds of patients are characterized as having biliary symptoms clinically, but repeated investigation of the gallbladder with ultrasound or cholecystography fail to show a cause. Cholescintigraphy using  $^{99m}\text{Tc}$  enables the study and understanding of biliary dynamics, providing a noninvasive test to identify patients suffering from abnormal gallbladder emptying manifested by a low ejection fraction. Several studies have shown that cholecystokinin cholescintigraphy is a useful test in identifying patients with biliary dyskinesia who will benefit from cholecystectomy.<sup>1,2</sup> This medical entity coined as biliary dyskinesia has been attributed to abnormalities of motor function in the biliary drainage system. The aim of this study was to determine the efficacy of laparoscopic cholecystectomy in symptomatic patients with ultrasound negative for gallstones and abnormal gallbladder ejection fractions. Patients with a gallbladder ejection fraction less than 35% over 20 minutes on hepatobiliary scan were offered laparoscopic cholecystectomy.

## METHODS

A retrospective analysis was conducted to review the records of all patients who underwent laparoscopic cholecystectomy at North Oakland Medical Centers during a 6-year period between, January 1995 and January

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2001. This institution is a 360-bed community hospital serving Oakland County and Southeast Michigan. At this institution, 1564 patients underwent laparoscopic cholecystectomy. Ultrasound, pathology reports, and reconfirmation of abnormal hepatobiliary scan data confirmed that 256 patients had acalculous gallbladder disease. Preoperative and postoperative laboratory data were obtained. Data are expressed as mean  $\pm$  standard error of the mean. Also, 30-day, 1-year, and 5-year (mean 3 yrs) postoperative data were obtained that compared the symptoms, ie, pre- and postoperative pain, nausea, vomiting, heartburn, and food intolerance.

For this study, we contacted all 256 patients by mail questionnaire and followed up with nonresponders with telephone interviews: we also reviewed hospital records to verify preoperative symptom patterns. The survey was completed by 154 patients. All patients were asked about the type, severity, and frequency of symptoms that they were having after the cholecystectomy and queried about whether this procedure improved their quality of life.

For statistical analysis, the chi-square test was used. A normal ejection fraction was defined as greater than 35% on hepatobiliary scan. An ejection fraction of  $\leq 35\%$  was considered abnormal.

## RESULTS

A 6-year retrospective review identified 256 patients who underwent removal of the gallbladder in which the pathological report indicated acalculous gallbladder. Of 154 patients included in the study, 115 (75%) were females and 39 (25%) were males.

The average age of the patients was 42 years (range, 23 to 90). Of the 154 patients who underwent laparoscopic cholecystectomy, 11 (7.14%) were converted to an open procedure. The average length of stay was 2.08 days (range, 1 to 6). No mortality occurred among the patient population. All laboratory parameters were normal preoperatively and postoperatively as outlined in **Table 1**.

**Figure 1** illustrates that a dramatic reduction occurred in right upper quadrant pain, nausea, vomiting, heartburn, and food intolerance 30 days postoperatively. Gross pathology and histological diagnosis of specimens showed acute inflammation in 8 (5.19%) and a chronic process in 146 (94.81%). The wall thickness in all specimens ranged from 0.1 cm to 0.5 cm, with a mean value of  $0.24 \pm 0.02$  cm (SEM).

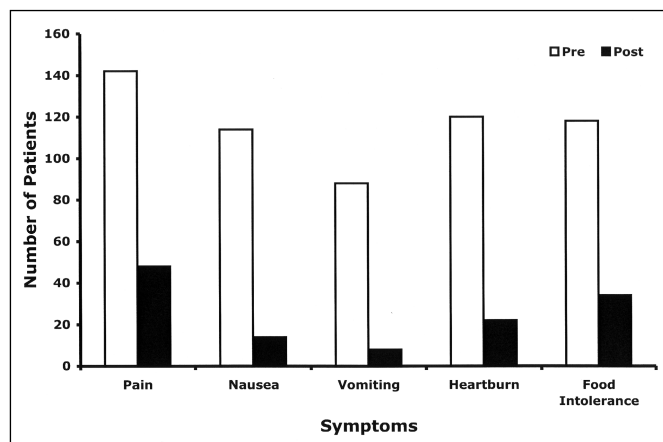
The responses documented for this survey 1 to 5 years postoperatively with a mean of 3 years were that even fewer patients experienced right upper quadrant pain, nausea, vomiting, heartburn, and food intolerance as documented in **Figure 2**.

A 3-year postoperative inquiry about patient satisfaction including symptom improvement and whether patients would recommend the surgery to friends and family showed a very high percentage rate of satisfaction with the procedure: 143 patients (93%) had no recurrence of symptoms, 148 patients (96%) were satisfied that they had laparoscopic cholecystectomy, and 146 (95%) stated that they would recommend laparoscopic cholecystectomy to other patients. Complications were encountered by 2 patients (1.29%) who had wound infection, 28 (18.1%) who had atelectasis, 5 who had (3.25%) pneumonia, 12 (7.81%) who had biloma, and 3 (1.45%) who had common bile duct injury.

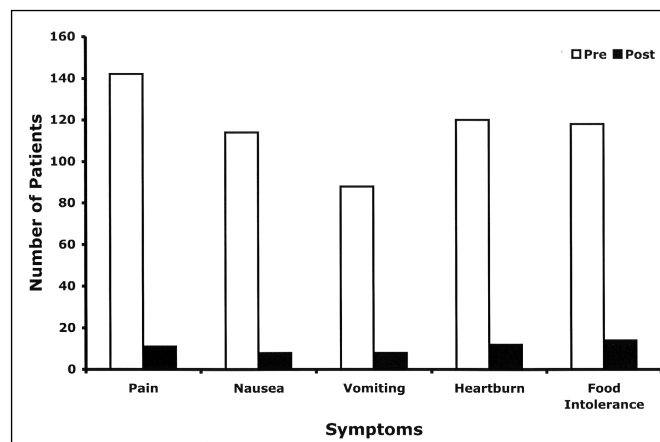
## DISCUSSION

Biliary dyskinesia is defined as a gallbladder motility problem. The pathophysiology of this disorder is not clearly understood. Most of the patients with biliary dyskinesia complain of "biliary symptoms," such as epigastric or right upper quadrant pain, or both, nausea, and vomiting. Sometimes these symptoms are associated with

	Preoperative	Postoperative
White Blood Count	7.84 $\pm$ 0.27	8.82 $\pm$ 0.39
Hemoglobin	13.35 $\pm$ 0.21	12.48 $\pm$ 0.30
Hematocrit	39.60 $\pm$ 0.51	36.90 $\pm$ 0.85
Platelets	266.19 $\pm$ 8.62	258.34 $\pm$ 10.23
Creatinine	1.01 $\pm$ 0.17	1.27 $\pm$ 0.47
Blood Urea Nitrogen	11.97 $\pm$ 0.89	6.56 $\pm$ 0.72
Calcium	8.99 $\pm$ 0.15	8.22 $\pm$ 0.57
Bilirubin	0.53 $\pm$ 0.05	0.73 $\pm$ 0.10
Amylase	54.62 $\pm$ 3.70	72.00 $\pm$ 15.52
Lipase	131.18 $\pm$ 30.25	182.75 $\pm$ 70.03
Alkaline Phosphatase	101.74 $\pm$ 9.14	92.22 $\pm$ 8.74
Lactate Dehydrogenase	163.37 $\pm$ 10.76	155.87 $\pm$ 11.97
Serum Glutamic Oxaloacetic Transaminase	55.83 $\pm$ 18.88	48.75 $\pm$ 9.77



**Figure 1.** Preoperative and 30-day postoperative data.



**Figure 2.** Preoperative and 1-5 year (mean, 3 years) postoperative data.

food intake. These symptoms can be caused by other diseases, such as peptic-ulcer disease, gastroesophageal reflux disease, and irritable bowel. Most often, the diagnosis of biliary dyskinesia is not initially considered in the diagnosis, and the patient undergoes an extensive workup before the diagnosis of biliary dyskinesia is entertained. Cholecystokinin cholescintigraphy is a useful test in identifying those patients with biliary dyskinesia or acalculous cholecystitis who will benefit from cholecystectomy.<sup>1-3</sup>

However, the role of cholecystectomy for treatment of biliary dyskinesia remains controversial. According to some authors,<sup>4,5</sup> cholecystectomy for an acalculous gallbladder had a good outcome in patients suffering from biliary symptoms. Our results demonstrate that patients who undergo a cholecystectomy for the diagnosis of biliary dyskinesia improve irrespective of the findings on histological examination. Ninety-three percent of our patients had no recurrence of symptoms, 96% were satisfied with the procedure, and 95% said that they would recommend it to others who had diagnosed biliary dyskinesia. These results are on a long-term follow-up (mean 3 years). On a mean 3-year postoperative follow-up, only 5% of patients had nausea and vomiting and only 7% had pain. It is essential for the clinician to realize that treatment of biliary dyskinesia by cholecystectomy does not ensure symptomatic improvement,<sup>6,7</sup> and other possibilities should be entertained if the patient continues to have persistent symptoms.

Although in the past, cholecystectomy was reserved for patients with complicated gallstone disease, the proven safety and efficacy of laparoscopic cholecystectomy warrants consideration of early cholecystectomy for gallbladder dysfunction.<sup>8-10</sup> The complication rate and the conversion rate of laparoscopic cholecystectomy in our series compares favorably with the national average.<sup>11</sup> This follow-up study suggests that patients clinically suffering from biliary symptoms, such as abdominal pain, nausea, vomiting, and food intolerance with ultrasound negative for gallstones and with abnormal gallbladder ejection fraction (<35%) benefit from cholecystectomy. In the current climate of cost containment, these excellent results would obviate the need for extensive and expensive medical testing before surgical therapy is recommended.

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