Minicholecystectomy

A Safe, Cost-effective Day Surgery Procedure

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Objective: To document effectiveness of minicholecystectomy as a safe, cost-effective day surgery procedure with rapid return to work.

Design: Review of medical records.

Setting: Small community hospital.

Patients: A total of 1207 patients who underwent minicholecystectomies from January 1, 1986, through December 31, 1997.

Intervention: Minicholecystectomy.

Main Outcome Measures: Complications, length of hospital stay, cost, and time until return to work.

Results: Of the 1207 patients who underwent minicholecystectomy, 74% were admitted for day surgery, 88% of whom were discharged in less than 12 hours, 9.3% in 24 hours or less, and 1.7% in greater than 24 hours; 0.3% were readmitted within 2 weeks. The complication rate was 0.2%; 2 cases required laparotomy, with no common duct injuries. The cost of the procedure was $435; the average time it took working patients to return to work was 11.4 days.

Conclusions: Minicholecystectomy is a safe, inexpensive day surgery method of cholecystectomy with minimal time off work after surgery.

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Historically, cholecystectomy has been done through an 8- to 12-cm incision that cuts the majority of the rectus muscle. The introduction of laparoscopic cholecystectomy in 1989 by Dubois et al decreased both inpatient time and the time until return to work, but a significant number of complications resulted. In a review of 77,604 cases, Deziel et al reported a 1.2% instance of complications requiring laparotomy (0.6% rate of common duct injury). Fullertin and Bell showed complications requiring laparotomy in 2.4% of cases (0.6% bile duct injuries).

By decreasing the incision size to 4 to 7 cm, preserving the rectus muscle, and using headlights, we have reduced our operative morbidity at no increased risk to the patient. We refer to this procedure as a “minicholecystectomy.” Adding local anesthesia and long-acting dexamethasone acetate further improved patient tolerance, and we were able to begin day surgery cholecystectomies in 1986. Today, with the use of minicholecystectomy techniques, the majority of our cholecystectomies are done as day surgery, with patients returning to work in 12 to 14 days. Minicholecystectomy is also very economical, costing $435 per procedure in our hospital. In this study, we report our experience with minicholecystectomy from 1986 through 1997.

Results

Of 1207 cholecystectomies performed (Table 1), 898 (74.4%) were in patients admitted for day surgery; 88.9% were discharged within 12 hours, 9.3% were discharged between 12 and 24 hours, and 1.8% were discharged more than 24 hours after surgery (Table 2). Three hundred nine patients underwent surgery as inpatients. Of these, 36.9% were discharged within 24 hours, and 63.1% were discharged more than 24 hours after surgery (Table 3).

All cholecystectomies, acute or elective, inpatient or outpatient, were done by 1 of the 2 of us by means of the minicholecystectomy technique. We had no procedures that required incisions greater than 7 cm. None of our patients had sufficient blood loss to require transfusions. There were no intra-abdominal abscesses. Only patients who had common duct exploration underwent drainage. We had 2 com-
PATIENTS AND METHODS

We reviewed the records of all minicholecystectomies performed at West Calcasieu Cameron Hospital, Sulphur, La, between January 1, 1986, and December 31, 1997. We evaluated complications and length of stay in all cases. In procedures performed from January 1, 1991, through January 1, 1998, we also studied the time from surgery until the patient returned to work.

We perform minicholecystectomy much like an open cholecystectomy, except that we make a small incision, substituting retractors for hands, and preserve as much rectus muscle as possible. The surgery is done through a 4- to 7-cm incision. Essential tools for the surgery are retractors (Harrington-Pemberton 1.9- or 6.4-cm; Allegiance Healthcare Corp, Deerfield, Ill, and Deaver 2.5-cm; Allegiance Healthcare Corp), a headlight, X2.5 magnification loops, metal tonsil suck, cautery (with extension), and 20 mg of long-acting dexamethasone acetate in 0.25% bupivacaine hydrochloride with epinephrine (1 mL/kg). A transverse incision is used 2 to 3 fingers below the xiphoid process. The gallbladder is visualized, and laparotomy sponges (Medical Action Industries, Inc, Asheville, NC) are introduced to isolate the area. Harrington retractors are then introduced, placing the wide ends (1) superolaterally to elevate the liver off of Calot triangle, (2) superomedially to create traction across the common duct, and (3) in Morrison pouch to create traction along the length of the common duct. In very obese patients, the incision is extended to 7 cm to accommodate 6.4-cm Harrington retractors. Ninety-eight percent of the dissection is done with the cautery (coagulation mode) by means of a touch and push technique. If the gallbladder is distended, it is aspirated. The Calot triangular area is dissected, with identification of the cystic artery and the cystic duct. Unless there is questionable anatomy, the cystic artery is ligated and cut. The gallbladder is then taken down from the liver bed and the cystic duct is traced down to its juncture with the common duct. If the gallbladder is inflamed and no dissection plane can be developed between the gallbladder and the liver, the gallbladder is opened. The bile and stones are removed. The margins of the gallbladder are excised at the junction of the gallbladder bed and liver, leaving the gallbladder wall in the liver. The mucosa remaining in the liver bed is cauterized. If a cholangiogram is not indicated, the cystic duct is clipped 0.5 cm from its juncture with the common duct and the gallbladder is removed. Bupivacaine with dexamethasone is introduced into the area of the surgery and meticulously injected into the wound margins.

The current average cost per procedure was determined for minicholecystectomies.

Complications requiring reoperation. One patient had acute onset of abdominal pain 5 days postoperatively. She was returned to the operating room, where a leak at the site of the cystic and common duct juncture was noted. There was no residual cystic duct or clip present. A T-tube was positioned and eventually removed. The patient did well. The second patient developed pain 24 hours postoperatively. She was returned to surgery, and a similar bile duct leak was found. The site of the previous connection of the cystic duct to the common duct was sutured with two 3-0 chromic sutures. This patient also did well.

We compiled statistics on the time until the patient returned to work for patients treated since 1991. During this period there were 278 patients who worked regularly. The average time off work was 11.4 days (Table 4). The time it took for patients who performed heavy manual work to return to work was less than the time for nonmanual workers, which may indicate that desire and incentive are of equal importance or more important than surgical technique.

Our results confirm that the majority of minicholecystectomies can be done as outpatient surgeries. Operating room costs for laparoscopic cholecystectomy at Lake Charles Memorial Hospital averaged $1600. Those charges do not include the equipment necessary to perform laparoscopic surgery, such as scopes and cameras. Low operating room cost ($435 per procedure) for minicholecystectomy, with no increased hospital stay, results in a $1165 saving when compared to laparoscopic cholecystectomy. Our complication rate requiring laparotomy of 0.2% was significantly better than those reported by Deziel.
et al (1.2%) and Fullertin and Bell (2.4%). We had no common duct injuries and no deaths.

The majority of articles in the literature promote laparoscopic cholecystectomy as being cost-effective because of short hospital stay and earlier return to work. Since the hospital stay cannot be shorter than that for day surgery, and our average return to work was 11 days, the benefits of laparoscopic cholecystectomy are questionable. Complication rates and costs of laparoscopic cholecystectomy are also higher than those in our series of minicholecystectomy.

Companies that produce laparoscopic equipment market the laparoscopic technique as the newest and the best for the general population. We, as surgeons, should question why we have rushed to embrace a procedure that eliminates depth perception. Minicholecystectomy is safe, effective, and inexpensive, and should be considered for all cholecystectomies.

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REFERENCES


Table 4. Time Until Return to Work by Age

<table>
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<tr>
<th>Type of Work</th>
<th>Age, y</th>
<th>10-19</th>
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<th>30-39</th>
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<th>60-69</th>
<th>70-79</th>
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* Total number of patients working, 278; average time off, 11.4 days.

Invited Critique

Laparoscopic cholecystectomy has become the standard criterion for treatment of symptomatic gallbladder lithiasis in developed countries. No doubt about its advantages has been raised, and although biliary tract injuries are higher when compared with the open approach, they have no statistical significance. For developing countries (ie, most of the countries of the world), there is no information available whether cholecystectomies are always done through the laparoscopic route.

Seale and Ledet report their results with minicholecystectomy and explain its advantage, as a safe, cost-effective, day surgical procedure. A large series of cases is performed with virtually no complications and no common duct injuries, challenging and even surpassing all the results reported with the laparoscopic approach. Should this be the preferred approach for both rich and poor countries? Given the results reported, there can be no doubt that the surgical community worldwide could benefit from this kind of approach.

To demonstrate the advantage of one procedure over the other, prospective, controlled, randomized trials should be done. It is the only way to validate results and to convince the surgical community. Some of these studies have been conducted and their findings published, showing no differences between the laparoscopic and open approach. Nevertheless, regarding rehabilitation and postoperative outcome, the laparoscopic approach has always shown a slight advantage.

Whether the results obtained by Seale and Ledet are reproducible is another concern. Worldwide, there is an average incidence of biliary duct injury, a complication that cannot be overlooked. Every hospital has these kinds of risks. According to expectancy, no center can expect such impressive results. The same can also be addressed for their low frequency of common duct exploration (very low incidence of common duct stones), the very low frequency of abdominal wall infections, and also gallbladders with acute processes.

Results that are only valid and reproducible in one hospital of the world cannot be generalized in the surgical community. Seale and Ledet have to be congratulated and admired for their excellent results and skills in their personal series, but no recommendation and generalization of their results can be done, even for poor countries. Minicholecystectomy is an alternate choice for surgeons with special skills. However, if compared in prospective controlled randomized trials with laparoscopic and classical open cholecystectomy, probably no advantages would be shown.

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