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Role of laparoscopic cholecystectomy in treating gallbladder polyps

K. Kubota, Y. Bandai, Y. Otomo, A. Ito, M. Watanabe, H. Toyoda, Y. Idezuki

Second Department of Surgery, Faculty of Medicine, University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo 113, Japan

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Abstract. Since the application of laparoscopic cholecystectomy (Lap C) to gallbladder polyps has not yet been fully evaluated, we performed Lap C on 26 patients with gallbladder polyps. Pathological examinations showed adenocarcinoma in three patients, adenoma in two, and cholesterol polyp in 21. Preoperative diagnoses of the cases with adenocarcinoma were a cholesterol polyp in one patient and an adenoma in two. Adenocarcinoma was confirmed to reside in the mucosa without any invasion of lymphatic ducts or small vessels in the three patients. This procedure was considered to be sufficient for this grade of cancer, and, therefore, no additional operations were performed. At present, our policy is to resect by Lap C a gallbladder polyp having a maximum size larger than 10 mm and a tendency to grow or presenting with suspicion of adenoma. When cancer is suspected by preoperative examinations, however, traditional surgery may be recommended.

Key words: Gallbladder polyp – Gallbladder cancer – Laparoscopic cholecystectomy

Since the introduction of laparoscopic cholecystectomy (Lap C) for the treatment of gallbladder stones, Lap C has spread rapidly as a treatment modality replacing traditional cholecystectomy [1, 7, 8]. The most significant characteristic of the procedure is its minimal invasiveness, which contributes to a short hospital stay [8]. The mortality and morbidity of Lap C have also been reported to be low, confirming its safety [3, 8]. Indications of Lap C include several diseases such as gallstones, adenomyomatosis, and polyps. With respect to gallbladder polyps, postoperative pathological examinations occasionally demonstrate adenocarcinoma even though preoperative examinations do not suggest its existence. Therefore, the application of Lap C to gallbladder polyps remains controversial.

In an effort to shed further light on this controversy, the role of Lap C in treating gallbladder polyps is discussed herein with special attention given to polypoid cancer.

Correspondence to: K. Kubota

Patients and methods

Patients. Twenty-six patients with gallbladder polyps were included in this study. They consisted of 15 males and 11 females with a mean age of 49.7 years (range: 26–68 years). All patients underwent Lap C between November 1990 and January 1993.

Criteria for indication of Lap C for gallbladder polyps. Polyps highly suspected as being malignant were excluded for the indication of Lap C. A polyp with a maximum size larger than 10 mm and a tendency to grow was considered to be a candidate for Lap C. A polyp with a maximum size smaller than 10 mm was also considered to be a candidate for Lap C when it did not have a stalk, had a tendency to grow, or was suspected to be an adenoma. Other types of polyps including a cholesterol polyp were followed carefully.

Preoperative examinations. All patients underwent ultrasonography and drip infusion cholangiography for gallbladder polyps. Endoscopic retrograde cholangiography (ERC) was performed when it was considered to be necessary.

Operative procedure. The four-puncture technique was used in all patients [1]. Pneumoperitoneum was established with CO_2 insufflation, and intraabdominal pressure was maintained at approximately 12 mmHg by means of a high-flow insufflator. In the first 21 patients, the gallbladders were dissected in the connective tissue layers (standard Lap C), although in the latest five patients, the gallbladder bed was dissected in the deeper tissue plane to remove whole connective tissue layers, which resulted in exposing the liver surface (Lap C by full-thickness dissection).

Intraoperative ultrasonography. Since a probe (Aloka, 7.5 MHZ) for intraoperative ultrasonographic examination during Lap C has become available, ultrasonographic examinations were performed for all polyp cases. The polyps were examined through the liver or through the gallbladder wall and their ultrasonographic character was evaluated in detail.

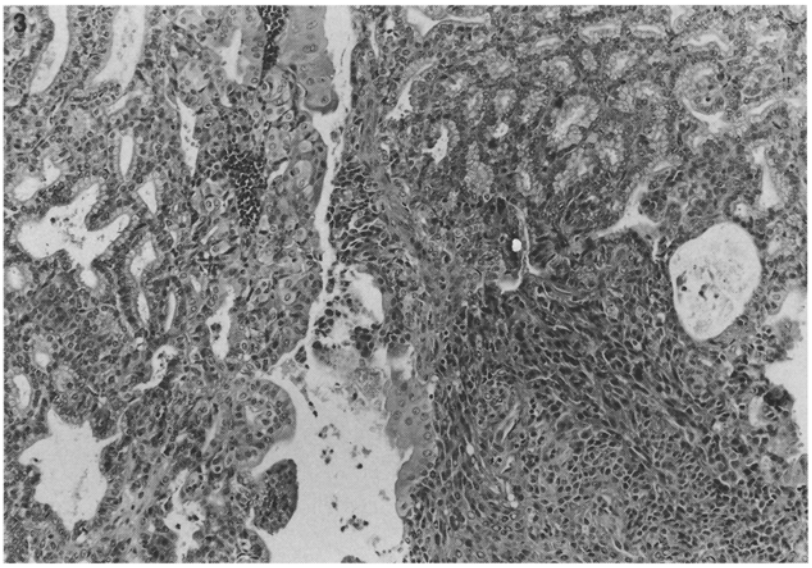


Fig. 1. Preoperative ultrasonographical findings of the polyps of the first patient with adenocarcinoma. The examination demonstrated two polyps with high echogenicity, suggesting cholesterol polyps. One graduation is one centimeter

Fig. 2. Macroscopic findings of the polyps shown in Fig. 1. Adenoma was suspected macroscopically

Fig. 3. Microscopic findings of the same patient (H & E, ×165). Papillotubular adenocarcinoma was observed

Pathological examinations. A total of 26 gallbladders with polyps were evaluated pathologically. The obtained specimens were embedded in paraffin, stained according to routine methods, and subjected to light microscopy.

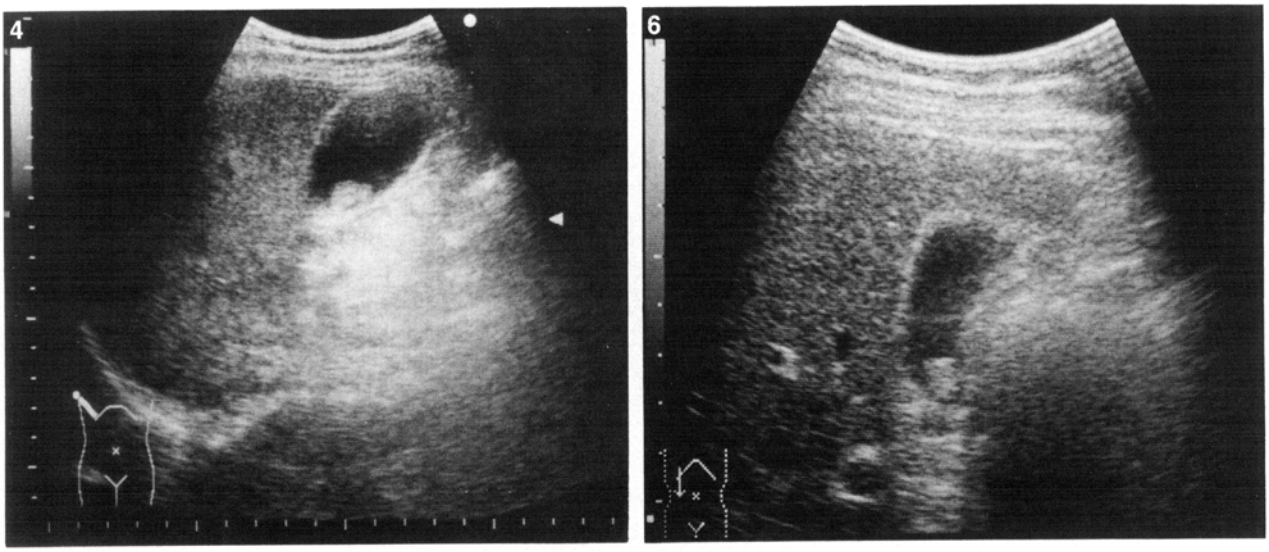
Results

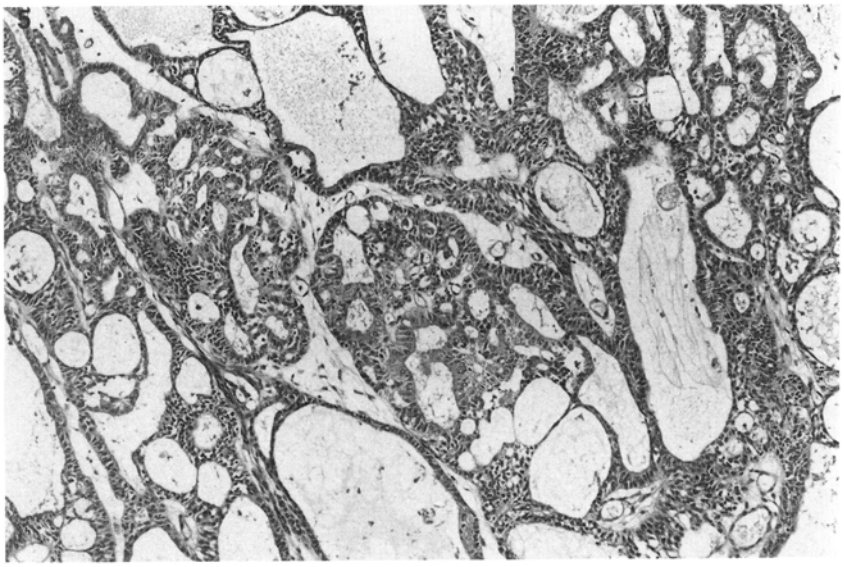
Adenocarcinoma

Adenocarcinoma was diagnosed in three patients, all of whom underwent Lap C because of the size of polyps (>10 mm) and their tendency to grow. In the first patient, preoperative ultrasonographic examination showed two polyps, which were suspected to be cholesterol polyps (Fig. 1). Standard Lap C was performed and the two polyps were diagnosed macroscopically as adenoma (Fig. 2). The pathological examination, however, demonstrated adenocarcinoma within the mucosa (Fig. 3). There were no signs of invasion to the lymphatic ducts or small vessels. Since this operation was considered to be sufficient, no additional operation was warranted.

The polyp of the second patient was suspected to be an adenoma by preoperative ultrasonographic examination (Fig. 4). and standard Lap C was employed. Adenocarcinoma within the mucosa was demonstrated pathologically (Fig. 5), although no invasion to the lymphatic ducts or small vessels was detected either. This surgery was also considered to be sufficient for this grade of adenocarcinoma of the gallbladder.

The last patient had cholecystitis due to gallstones and was found by ultrasonographic examination to have a polyp. Although standard Lap C was performed and the polyp was considered macroscopically to be an adenoma, a pathological examination revealed a diagnosis of adenocarcinoma within the mucosa. Cancer cells were observed neither in the lymphatic ducts nor in the small vessels, and therefore standard Lap C was considered to be sufficient for this grade of cancer as in the other two cases.





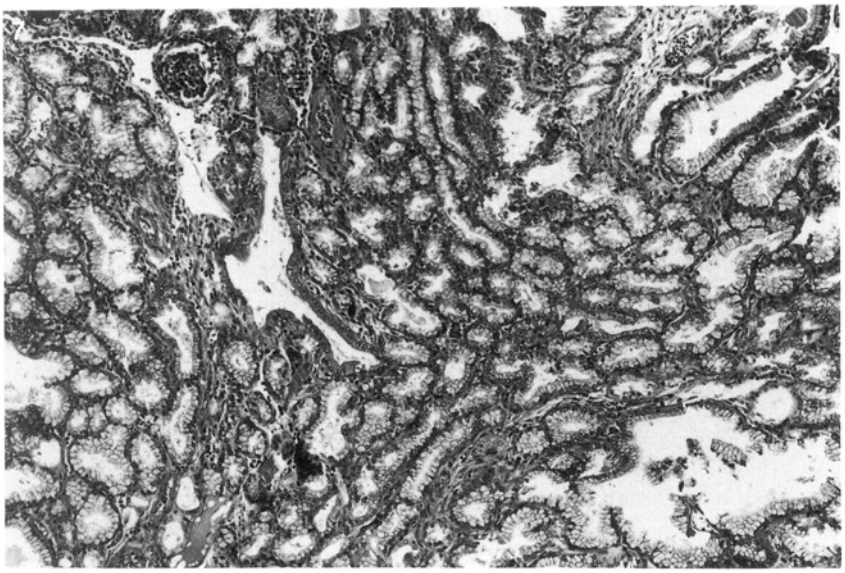
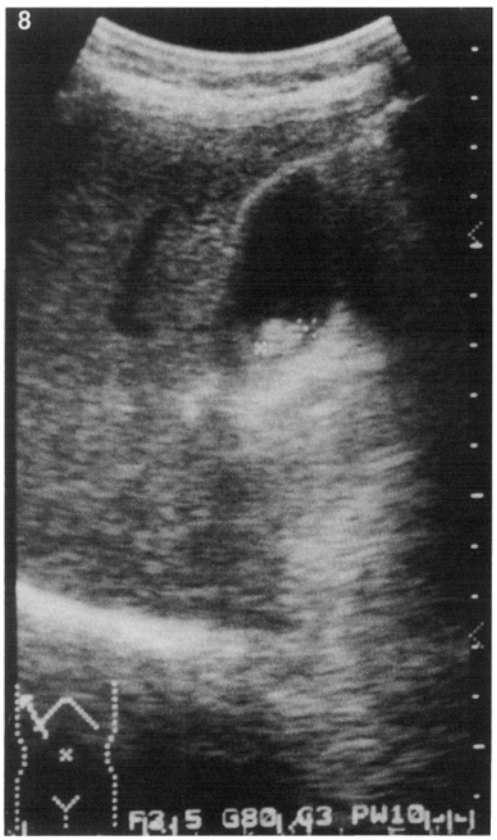


Fig. 4. Preoperative ultrasonographical findings of the polyp of the second patient with adenocarcinoma. An adenoma was suspected ultrasonographically

Fig. 5. Microscopic findings of the polyp shown in Fig. 2 (H & E ×125). Papillotubular carcinoma forming many lumens was observed

Fig. 6. Ultrasonographic findings of the patient with a polyp which was subsequently confirmed to be an adenoma

Fig. 7. The polyp in Fig. 6 was pathologically diagnosed to be an adenoma (H & E, ×125)



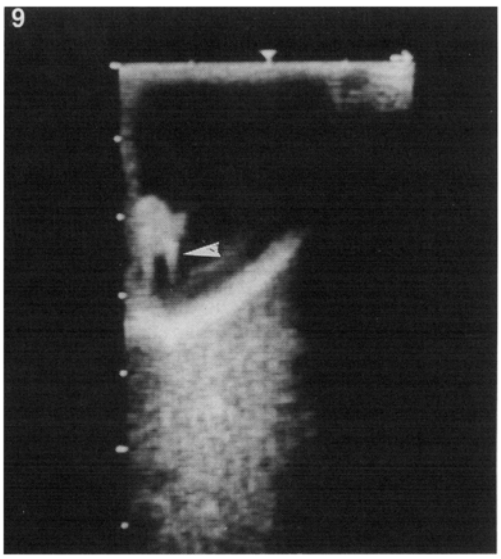


Fig. 8. Preoperative ultrasonographic findings of a polyp, which was pathologically diagnosed to be a cholesterol polyp

Fig. 9. Intraoperative ultrasonographic findings of the same polyp as shown in Fig. 8. Comet sign (*arrowhead*), which was not observed by the preoperative ultrasonographic examination, was visualized by the intraoperative ultrasonographic examination

All three patients were carefully followed at our outpatient clinic and no signs of recurrence were observed 11–17 months postoperatively.

Adenoma

Two patients were confirmed to have an adenoma pathologically. The first patient was suspected to have an adenoma as a result of a preoperative ultrasonographic examination (Fig. 6) and underwent standard Lap C. Macroscopic diagnosis presented an adenoma which was subsequently confirmed pathologically (Fig. 7). In the second patient, an adenoma was also suspected ultrasonographically and standard Lap C was performed. Adenoma was also diagnosed pathologically.

Cholesterol polyp

Cholesterol polyp was diagnosed pathologically in 21 patients. All patients underwent Lap C because of the continuing growth of the polyps having a maximum diameter exceeding 10 mm. Standard Lap C was performed in 16 patients and Lap C by full-thickness dissection was employed in the latest five patients. It was occasionally difficult to differentiate a cholesterol polyp from an adenoma by preoperative ultrasonographic examination when the size of the former exceeded 10 mm. Intraoperative ultrasonographic examinations were thus performed in four patients to yield a clearer visualization of the morphological characteristics of the polyps (Figs. 8 and 9), and were considered to be effective for evaluating intraoperatively the quality of the polyp.

Discussion

Although laparoscopic cholecystectomy has now become the first choice of treatment for gallstones [1, 3, 7, 8], application of Lap C to gallbladder polyps has yet to be fully evaluated. Gallbladder polyps are classified into benign and malignant diseases. The most-encountered gallbladder polyp is the cholesterol polyp [5]. When a gallbladder polyp having a diameter less than 10 mm is suspected to be a cholesterol polyp or another type of benign polyp, it should be followed carefully. The gallbladder polyp should be resected [5] when the polyp has a tendency toward growth and a size larger than 10 mm, the polyp is suspected to be an adenoma, or the polyp is not defined completely as being benign. Following these criteria, we applied Lap C to gallbladder polyps in the present study. When preoperative examinations led to a suspicion of a gallbladder cancer, however, traditional surgery — specifically, open cholecystectomy — was employed in those cases.

Although adenocarcinoma was diagnosed by postoperative pathological examinations in three of 26 patients, their preoperative diagnoses were a cholesterol polyp in one patient and an adenoma in two. The remarkable point is that adenocarcinoma of the gallblad-

der may recur following surgery. This fact indicates the necessity to carefully follow up patients with gallbladder polyps. The pathological examinations revealed that the cancer cells remained within the mucosa and did not invade the lymphatic ducts or small vessels in the three patients. This grade of gallbladder cancer may be classified as early stage, producing a good prognosis [12].

Bergdahl [2] investigated gallbladder carcinoma first diagnosed by microscopic examination of gallbladders removed for presumed benign disease and concluded that although a good prognosis was obtained by simple cholecystectomy in gallbladder cancer invading only the mucosa or submucosa, radical cholecystectomy, including a wedge resection of liver tissue and dissection of the regional lymph nodes, was recommended even in these cases. There are also other reports [10,13] that have asserted the necessity of additional operation after simple cholecystectomy for gallbladder cancer within the mucosa. However, Yoshida [12] reported in detail that simple cholecystectomy was performed in 68 of 95 patients with gallbladder cancer confined to the mucosa or proper muscle layer and that there were no deaths from recurrence within 5 years. Yoshida concluded that when early cancer is diagnosed by histological examination, a second-look operation is not necessary in the case of mucosal cancer if the cut margin is negative. Nevin et al. [6] also described simple cholecystectomy as sufficient for gallbladder cancer within the mucosa.

At our department, we have experienced six cases of gallbladder cancer within the mucosa between May 1977 and January 1992 with a 5-year survival rate of 100%. Based on our experience and the results of other reports, we therefore decided not to perform any subsequent operative procedures on the three patients. When cancer cells invade into proper muscle or into lymphatic ducts or small vessels, however, extensive surgery by laparotomy may be recommended.

In 21 of 26 patients, a cholesterol polyp was diagnosed pathologically. When ultrasonographic examination reveals that a polyp has a stalk with a high echogenicity and a surface like a mulberry, a cholesterol polyp is most probable. Confusion arises, however, in that a cholesterol polyp also has a tendency to grow and is occasionally difficult to differentiate from other types of gallbladder polyps, especially when it is larger than 10 mm. In such cases, the gallbladder may best be resected.

Pathological examinations showed adenoma in two of 26 patients. Carcinoma in adenoma is occasionally observed [4], and, in fact, two of the three patients with adenocarcinoma were diagnosed preoperatively as having an adenoma. Therefore, we consider that a gallbladder polyp with suspicion of adenoma should be resected.

We thus occasionally encountered adenocarcinoma in the early stage when performing Lap C, and accordingly decided to perform Lap C by full-thickness dissection in the gallbladder polyp cases — that is, by dissecting the gallbladder wall in the deeper layer to expose the liver surface. Dissection of the gallbladder bed is usually performed in the connective tissue layer by standard Lap C. This procedure may be sufficient for adenocarcinoma in the early stage, as in our cases, but we consider Lap C by full-thickness dissection to be more adequate when adenocarcinoma resides in the gallbladder.

Our results also showed that preoperative ultrasonographic examinations were not always reliable. Recently, a probe for intraoperative ultrasonographic examination during Lap C has become available, and it is being applied to gallbladder polyps. Unluckily, this probe was not available to use for three cases with adenocarcinoma. We found that this intraoperative examination, however, is effective in visualizing the polyps in detail. We believe that this may help to differentiate between polyps with and without adenocarcinoma in subsequent patients.

In conclusion, Lap C can also be the first choice of treatment for gallbladder polyps. When a gallbladder polyp resected by Lap C is diagnosed to be adenocarcinoma residing in the mucosa without any concomitant invasion to lymphatic ducts or small vessels, Lap C may be sufficient to yield curability. However, careful follow-up at an outpatient clinic is essential.

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