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Laparoscopic Surgery in Acute Cholecystitis in General Surgery

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Abstract: Acute cholecystitis (AC) is an inflammatory gallbladder disease caused by cystic duct obstruction and bacterial invasion. Studies have found that more than 90% of AC patients are associated with gallstones, cholelithiasis and other factors. The incidence rate of AC increases with age. For older people, the most common cause of AC emergency abdominal surgery is the higher mortality and morbidity of po-stoperative AC in elderly patients, and the need for in-patient observation. Although laparoscopic cho-lecystectomy (LC) in general surgery may increase the risk of conversion to open surgery in most eld-erly patients with AC, it is more effective that LC can quickly relieve the complications caused by inf-lammation within 48-72 hours. In this paper, we compared the laparoscopic surgery with the traditional open cholecystectomy in order to explore the safety and feasibility of the operation and other more pra-ctical features. Methods: 80 patients with acute cholecystitis treated in our hospital recently were selec-ted as the experimental objects. These patients were randomly divided into two groups, including 40 cases of abdominal microsurgery group (operation group), and the remaining 40 cases of open resectio-n group (sample group). Finally, the intraoperative blood loss, operation time, recovery time and pain degree of the two groups were analyzed and compared. Through the experimental comparison of the above four variables, abdominal microsurgery in general surgery for patients with acute cholecystecto-my, with less bleeding, shorter operation time, faster gastrointestinal recovery and less pain in the proc-ess of operation, is a safe, feasible and more minimally invasive medical operation.

1. Introduction

In 1882, German surgeons completed the first cholecystectomy, which has promoted the development of biliary surgery for more than 100 years [1]. With the development of science and

technology and people's continuous pursuit of minimally invasive surgery, abdominal microscope technology in general surgery came into being. In 1987, muret, France, completed the first case of laparoscopic cholecystectomy (LC) in general surgery, which was gradually popularized in the world. Since it was developed in China in 1991, it has been popularized all over the country. Abdominal microsurgery in general surgery has the unique advantages of small trauma, low cost and quick recovery in acute cholecystectomy, which is accepted by the majority of doctors and patients and has become the "gold standard" for the treatment of benign gallbladder disease [2]. In biliary surgery, LC accounts for more than 90%. Therefore, the medical academician said that biliary surgery has entered the era of LC. With the aging of population, the change of diet structure and the improvement of diagnostic technology, the incidence rate and detection rate of acute gallbladder diseases are on the rise, reaching 5.6%. Because of the huge amount of LC operation, its complications have attracted more and more attention. Among them, bile duct injury (BDI) is one of the most important and serious complications, and the consequences to patients can be described as catastrophic [3]. It is reported that the incidence of bile duct injury in LC is 0.1% - 1.5%, which is significantly higher than that of open cholecystectomy (0.1% - 0.2%).

Acute cholecystitis is one of the most common acute in surgery. There are usually two types: calculous cholecystitis and non calculous cholecystitis. Among them, 91% - 96% were caused by gallstones and 4% - 9% were non calculous cholecystitis. The main pathogenesis is bacterial infection and inflammation caused by cystic duct obstruction [4]. The clinical manifestations were severe upper abdominal colic, abdominal muscle stiffness, abdominal tenderness, vomiting, fever, nausea and other gastrointestinal symptoms. In the late stage of the disease, with the migration of the disease, patients will have high fever, chills, jaundice, and even lymphadenopathy. There is no unified conclusion on the pathogenesis of acute cholecystitis. Most medical researchers believe that there are three main reasons for acute cholecystitis: chemical inflammation, which is caused by the chemical action of phospholipase; and mechanical inflammation, which causes high pressure in the gallbladder, leading to high pressure of the gallbladder wall. Gallbladder wall ischemia and gallbladder wall mucositis can change the egg phosphorus lipid in the gallbladder wall, leading to chemical gallbladder inflammation. Third, bacterial inflammation. Many scholars support this view, mainly because a large number of harmful bacteria invade the gallbladder, such as Escherichia coli, Streptococcus, Staphylococcus, Klebsiella and so on. The invasion of these bacteria will lead to gallbladder inflammation. According to the relevant literature survey, more than 50% - 80% of acute cholecystitis is caused by bacterial inflammation.

The pathological basis of acute cholecystitis is cholecystitis and gallbladder obstruction. If inflammation and obstruction are not alleviated, the pressure in the gallbladder will continue to rise and the condition will worsen. Finally, infection, dilatation and ischemia will lead to further deterioration of the condition, such as gallbladder suppurative, gallbladder wall necrosis, perforation and so on. At present, in view of the treatment of acute cholecystitis mainly by surgery, to reduce inflammation and eliminate obstruction for the purpose of treatment, ordinary abdominal surgery microscope mostly uses commonly used drugs of minimally invasive surgery, which has the characteristics of small trauma, rapid recovery, incision infection, etc., and has less advantages. Compared with traditional open surgery, it has obvious advantages, and has become the preferred solution for gallbladder surgery without taboo in clinical practice. However, the timing of operation for acute cholecystitis remains controversial. It has been widely used in the treatment of acute calculous cholecystitis and has become the first choice for the treatment of calculous cholecystitis without surgical contraction. However, the timing of emergency surgery for acute calculous cholecystitis remains controversial. Clinically, the operation time of emergency cholecystectomy is generally set as 72 hours after the onset of the disease: surgical treatment is carried out within 72 hours; after 72 hours, when conditions permit, it is best to take temporary conservative treatment.

Cholecystectomy should be performed on a selective basis. If it is effective after conservative treatment, cholecystectomy is recommended. If the patient's condition is critical or conservative treatment is ineffective, cholecystostomy or emergency open cholecystectomy should be performed.

In this paper, we will compare the laparoscopic surgery of general surgery with the traditional open cholecystectomy [5], to explore the safety and feasibility of the operation introduced in this experiment compared with other acute cholecystectomy and other more practical features. In this experiment, 80 cases of patients with acute cholecystitis treated in our hospital recently were selected as the experimental objects, and these patients were randomly divided into two groups, 40 cases of which were abdominal microsurgery group (operation group), and the remaining 40 cases were open resection group (sample group). By observing the 80 cases of patients in this acute cholecystectomy in the use of two different resection methods in the operation and patient performance, and finally the two groups of patients with intraoperative blood loss, operation time, patient recovery time, patient pain and other conditions were analyzed and compared. Through the experimental comparison of the above four variables, for patients, laparoscopic surgery in general surgery in acute cholecystectomy has the advantages of less bleeding, shorter operation time, faster gastrointestinal recovery and less pain in the process of operation. It is a safe, feasible and more minimally invasive medical operation. With the rapid development of science and technology in the medical field, medical technology is constantly improving, all kinds of medical equipment are constantly updated, the application of abdominal cavity microscope surgery in general surgery is more common, compared with the traditional acute cholecystectomy, the operation has a good promotion value. In addition, the minimally invasive celiac microsurgery in general surgery has irreplaceable application in many types of cases such as high biliary tract surgery [6], intrahepatic bile duct stones [7].

2. Theoretical Research Based on General Surgery Abdominal Cavity Microscope Surgery

2.1. Brief history of Laparoscopic Cholecystectomy in General Surgery

Langenbuch has completed cholecystectomy (OC) for the first time since the 19th century. Cholecystectomy has become an important surgical treatment for gallbladder diseases. With the appearance of celiac microscope and the development of minimally invasive technique, Murray carried out the first laparoscopic cholecystectomy (LC) in the world in 1987, which received wide attention and brought the surgical treatment of gallbladder diseases into a new era. Since then, the letter of credit has been further promoted in the world and set off a wave of letter of credit in the world. The first LC case was carried out in China by Xun zuwu in 1991, and then surgeons in Beijing and Tianjin developed corresponding techniques. Because of its advantages of small trauma, less bleeding, rapid recovery and less interference with immune function, it has been widely spread in hospitals at all levels in China. LC has been continuously improved in more than 100 years of clinical development. From the original porous abdominal micro cholecystectomy to the single hole abdominal micro cholecystectomy, the number of abdominal puncture holes has been continuously reduced; endoscopic equipment and instruments have gradually developed to miniaturize, further reducing the size of puncture holes; and the number of abdominal puncture holes has been gradually reduced; Surgery has gradually developed into 3D laparoscopic cholecystectomy [8], robot assisted cholecystectomy and remote-control robot cholecystectomy have been successfully implemented; the operation time gradually develops from waiting for surgery in hospital to daytime laparoscopic cholecystectomy or outpatient laparoscopic cholecystectomy, which can save medical resources and minimize medical treatment on the premise of ensuring safety and effective cost. The progress and development of LC technology has greatly promoted the popularization of LC technology, improved its recognition among doctors and patients, and made it become the "gold standard" for

the treatment of benign gallbladder diseases.

2.2. Use of Energy Instruments in LC

In minimally invasive surgery, energy instruments are often needed to perform cutting, separation, hemostasis and other operations, thus changing the traditional basic surgical methods. Clinical common energy devices include unipolar electrocoagulation, bipolar electrocoagulation, ultrasonic scalpel, Liga sure, high-energy bipolar electrotome (Baike forceps), argon knife, water knife, etc. Unipolar coagulation and ultrasonic scalpel are the most commonly used in LC. The principle is to convert electric energy or ultrasonic energy into heat energy, which can produce effects on tissues, so as to achieve cutting and blocking effects. The study shows that ultrasonic scalpel has a good therapeutic effect in LC. Unipolar electrocoagulation has the advantages of high efficiency and less bleeding, but it is necessary to fully master its working principle and skills to make LC operation safer. Besides protein coagulation, working under high temperature will often cause burning, produce a lot of smoke, affect vision and produce a lot of eschar, also affect tissue healing, and adhesion occurs after local tissue necrosis. The ultrasonic scalpel has the advantages of reliable hemostasis, low inflammatory reaction and less smoke. It is more suitable for endoscopic surgery and has good closure effect on small bile duct. Due to its low local temperature (about 80-100 °C, much lower than that of unipolar coagulation (400-500 °C), short heat conduction time, almost no heat conduction damage and no damage to surrounding tissues. Some scholars have pointed out that ultrasonic scalpel can significantly improve the operation speed, increase the safety of operation and reduce bile duct injury.

2.3. Risk Factors and Types of LC Complications

Risk factors: LC complications are related to many factors. Correlation analysis showed that there was a significant correlation between the incidence of complications and the thickness of gallbladder wall, disease stage of emergency operation, adhesion of gallbladder triangle, adhesion of surrounding tissues, operation history, gall bladder neck stones, diabetes mellitus and anatomical variation. In elderly patients, the resistance of external body to boundary stimulation is reduced, which is often related to basic diseases such as hypertension, diabetes mellitus and coronary heart disease. The stage of gallbladder disease determines whether the patient needs emergency surgery or selective surgery. In patients undergoing emergency surgery, this condition is often serious, such as acute suppurative cholecystitis, acute gangrenous cholecystitis, perforated cholecystitis, and gallbladder, often accompanied by severe traffic congestion, edema, gallbladder wall thickness, often greater than 5 mm, gallbladder wall color is dark red, showing ischemia, gallbladder surface is covered with cellulose exudate or pus coating, and more in cholecystitis exudate, The texture of the tissue is brittle, easy to bleed, bleeding has more operation period, affect the operation, the operation time is increased, when hemostasis and separation, it can cause vascular and bile duct damage, and the original ischemic tissue may further postoperative blood shortage, necrosis, postoperative bleeding, bile leakage and other complications, increased intraoperative bleeding, postoperative abdominal infection; In acute stage of gallbladder disease, thickening of gallbladder wall means severe inflammation and severe adhesion around gallbladder.

However, in patients with chronic or atrophic gallbladder disease, due to long-term chronic inflammatory stimulation, the gallbladder becomes hard, the wall is thickened, the volume is reduced, and the surrounding adhesions, the "frozen" change of the gallbladder triangle or the formation of miliz syndrome are found. The triangle of gallbladder refers to the triangle structure formed by cystic duct, common hepatic duct and lower edge of liver. When the tissue is fibrotic, the elasticity of tissue is weakened, and the tissue will fall off and shift after using titanium clip. When

trigeminal adhesion of gallbladder occurs, it is difficult to separate the common hepatic duct, cystic duct and common bile duct. Forced separation may lead to bile duct injury. Failure to accurately determine the cystic artery can lead to right hepatic artery injury, and the incidence of complications will increase. Intraperitoneal adhesion may be due to serious abdominal inflammation or abdominal surgery history. For many years, abdominal surgery is still followed by abdominal adhesions, forming adhesions around. The peritoneum, liver and gastrointestinal tract are equivalent to gallbladder. During the process of separation, the adhesion changes to the anatomical position, and the intraoperative anatomical structure is difficult to identify, which can cause vascular, biliary and visceral injuries. Gallstone is also one of the risk factors, because the gall bladder neck stone can cause internal pressure, gallbladder ischemia and necrosis, increase the possibility of gallbladder gangrene and perforation. At the same time, the gallbladder neck can also appear due to the stone squeezing ischemia, congestion and edema of the cystic duct, blood flow disorder, which may lead to death after operation. The gall bladder neck stones may break and shift in the process of clamping and appear in the cystic duct in the distance they even fall into the common bile duct with secondary bile duct stones. In patients with diabetes, the immune capacity is poor, and the hyperglycemia environment is easy to infect, and the injury site is not easy to heal, resulting in a significant increase in the incidence of complications.

Table 1. Common types of complications

Serial number	1	2	3	4	5	6
Type	Infected	Incisional hernia	Diaphragmatic injury	Lumbago	Subcutaneous emphysema	Thromboembolism

Shown as Table 1, Types of complications: although LC has obvious advantages, its mortality is significantly lower than that of OC, but its adverse consequences cannot be ignored. Various complications are still important factors affecting the efficacy and safety of LC. The complication rate of LC was 0.5-0.98%. Complications include infection, incisional hernia, diaphragmatic injury, low back pain, subcutaneous emphysema, thromboembolism, etc. the common serious complications include bleeding, gastrointestinal injury, residual stones of bile duct, bile leakage, bile duct injury, etc. The incidence of infection after LC was 0. Abdominal infection often occurs in patients with gallbladder rupture and underlying diseases. The accumulation of ascites could be seen under the liver, showing fever and poisoning symptoms after operation. Abdominal imaging showed ascites. Patients with gallbladder rupture are often complicated with abdominal wall infection, accompanied by severe inflammation of underlying diseases, residual foreign bodies in the mouth, bile pollution caused by rupture of gallbladder during operation, and infection when bile overflow is difficult to remove. The causes of incisional hernia were related to abdominal wall weakness, abdominal wall infection, gender, high body mass index, improper suture, high postoperative abdominal pressure and diabetes mellitus. Diaphragmatic injury is relatively rare, which can cause pneumothorax, postoperative chest tightness, dyspnea, imaging examination showed typical pneumothorax, the reason is that the diaphragm was injured by excessive movement during the operation. Postoperative low back pain is a common disease in abdominal microsurgery. Carbon dioxide gas was injected into abdominal cavity to stimulate phrenic nerve. Indwelling abdominal drainage tube can reduce the occurrence of such complications.

2.4. Delayed Bile Leakage after LC

At present, there is no clear concept of delayed bile leakage after LC [9]. Chinese scholars defined delayed bile leakage after LC as bile leakage occurred within 72 hours after LC, which should be distinguished from immediate bile leakage within 72 hours after LC. Patients generally had no obvious symptoms and signs within 72 hours after LC, and no positive findings were found

by B-ultrasound or laboratory examination. Sudden abdominal pain mainly occurred within 72 hours after operation. Finally, bile leakage was confirmed by various ways. Because LC has the characteristics of small trauma and quick recovery, patients are often discharged from hospital within a short time, mostly within 3 days. Under the treatment concept of fast track surgery, the hospitalization time of patients tends to be shortened. The "adverse reaction" after discharge can be considered as a normal postoperative phenomenon, patients can not get close medical observation, only choose to see a doctor when the symptoms are serious, resulting in delayed diagnosis of biliary fistula and further aggravation of the disease. Abdominal symptoms similar to "biliary colic" appear in a short time after cholecystectomy, which may lead to missed diagnosis and misdiagnosis. Therefore, the prognosis of bile leakage during hospitalization may be different from that after discharge. The gastrointestinal tract further adapts to the changes of dietary structure, the amount of bile secretion increases, and the pressure in the bile duct increases. This change may make the closed leakage open in the original pressure state or promote the formation of leakage.

LC can be used in a variety of gallbladder diseases, such as gallstones, cholecystitis and gallbladder protuberant lesions, mainly chronic cholecystitis and atrophic cholecystitis. Delayed bile leakage after LC can occur in all age groups. According to the relevant literature, the age is 12-88 years old, but mainly middle-aged. No bile duct injury and bile leakage were found during the operation. The patients recovered well after the operation, and no obvious effusion was found in the abdominal drainage tube, which was cured and discharged in a short time. It often occurs without obvious incentives, but some patients may be due to eating greasy food, eggs, meat or eating a lot of food. Delayed bile leakage is more common in 4-10 days, but it still needs a long time to be vigilant after operation. The longest diagnosis time was 8 weeks. The first symptom is usually sudden and unexplained severe abdominal pain, colic, knife cut or laceration abdominal pain. Signs of peritonitis may be limited due to omental limitation and a small amount of bile, especially in the right upper abdomen. Sometimes, due to the large amount of bile or not limited by the omentum, bile flows to the right paracolonic sulcus or omental sac, resulting in right lower abdominal pain or middle upper abdominal pain; bile can stimulate the visceral nerve, and patients can also have right back pain symptoms. Fever, chills, nausea, vomiting, bloating and other discomfort are also common. Jaundice is common in patients with long-term biliary stricture and bile leakage.

Abdominal drainage and biliary decompression are the key factors in the treatment of delayed biliary fistula [10]. There are many treatment methods for delayed biliary fistula after laparoscopic cholecystectomy, including classic operation and abdominal drainage. Ultrasound guided puncture drainage and PTCD are the most representative minimally invasive treatment methods. ERCP + ENBD, biliary stent placement and drainage, and endoscopic intervention of papillary sphincterotomy are the combination of diagnosis and treatment. The actual clinical treatment also includes surgical treatment, minimally invasive treatment and endoscopic therapy combined with two or three treatment methods. These treatments are more and more used in clinic and play an important role. The choice of operation mode should be decided according to the patient's condition and the technical level of each unit. The leakage position is particularly important in the treatment process. When the amount of leakage is small and there is mild bile leakage (such as cholecystitis capillary leakage, vagus bile duct leakage, right hepatic duct leakage), abdominal symptoms are not serious, and the general condition is good. The ascites was limited or have formed a mass. After the diagnosis of ultrasound-guided abdominal puncture, abdominal drainage tube and endoscopic treatment can be retained [11]. Studies have shown that 70% to 80% of patients have achieved satisfactory results. Due to the small amount of leakage and small amount of bile leakage, the leakage will gradually close under continuous drainage. However, due to the formation of postoperative adhesions and separation, some patients may need repeated puncture and catheter

drainage. The catheter should be placed in the lowest, deepest, relatively safe place with effusion to ensure adequate drainage and avoid side effects on surrounding organs. Female patients with local effusion in the lower abdomen and pelvis can also be punctured and drained through the posterior fornix tube, while maintaining the semi recumbent position for drainage [12].

3. Experimental Study of Laparoscopic Surgery in Acute Cholecystitis

3.1. General Information

In this paper, 80 cases of acute cholecystitis treated in our hospital in recent years were retrospectively analyzed, and abdominal microsurgery and open cholecystectomy were performed simultaneously after the onset. The intraoperative blood loss, operation time, recovery time and pain degree of the two groups were analyzed and compared. In this study, standardized 3-hole trocar technique was used for gallbladder triangle dissection [13], and blunt separation technology was used for gallbladder triangle dissection. It was completed by the attending physician with more than 5 years' experience. Acute cholecystitis was defined according to Tokyo standard: the symptoms during physical examination were right upper abdominal pain, positive Murphy sign, fever, elevated serum infection parameters (C-reactive protein or white blood cells), and gallbladder ultrasound was diagnosed as acute cholecystitis [14].

3.2. Inclusion Criteria and Exclusion Criteria

Case inclusion criteria: early group, delayed operation group and selective operation group were all treated in our hospital. Chronic cholecystitis with a clear history of acute cholecystitis and recurrent acute cholecystitis were also discussed as the first time. In order to exclude patients with only biliary colic and no abdominal symptoms, the starting time of acute cholecystitis was calculated from the time when the patient complained of correct upper abdominal pain or under the xiphoid process > 2 hours. There were clear abdominal symptoms: right upper abdominal tenderness, Murphy and positive signs; blood routine examination: the proportion of leukocytes and neutrophils increased; B-ultrasound showed cholecystitis, gallstones, and no abnormality in the common bile duct. The exclusion criteria were as follows: (1) acute obstructive suppurative cholangitis; (2) jaundice; (3) severe cardiac and pulmonary insufficiency; (4) cirrhosis and portal hypertension; (5) severe hemorrhagic disease or severe coagulation dysfunction; (6) history of upper abdominal surgery with severe local adhesions; (7) chronic calculous cholecystitis without history of acute cholecystitis; (3) severe cardiopulmonary insufficiency; (4) cirrhosis and portal hypertension; and; (5) Severe hemorrhagic disease or severe coagulation dysfunction; (6) history of upper abdominal surgery and severe local adhesion; (7) chronic calculous cholecystitis without history of acute cholecystitis; (8) acute pancreatitis.

3.3. Surgical Methods

All patients were intubated under general anesthesia, using the traditional "three holes methods" into the abdomen. "Four holes methods" can be used for those with high adhesion, difficult separation and poor exposure. The specific operation steps are as follows: puncture the umbilicus (above or below the umbilicus) with a 10 mm incision to establish pneumoperitoneum. The pneumoperitoneum pressure is maintained at about 12-14 mmHg. A 10 mm trocar and a lumen lens were placed in the umbilicus. Then a 10 mm incision was made under the xiphoid process, and the trocar and endoscope were placed. In addition, a 5mm incision was made under the right rib arch and the junction of the middle clavicle, and the trocar and endoscope were placed. If the four holes

methods be used, a 5mm incision is added at the junction of right rib arch and anterior axillary, and trocar and endoscope are placed. Most of the operations were performed preoperatively and partly postoperatively. He-o-lok cut off the cystic duct and cystic artery and cut them off. Electrocautery was used for accurate hemostasis in gallbladder bed [15]. After cholecystectomy, it was wrapped in a collection bag and removed through the xibiid incision. All operations were performed with oblique incision under the right rib, and gallbladder was removed anterograde or retrograde.

3.4. Postoperative Care

(1) Pain management: communicate with patients more and implement effective pain treatment for patients. According to the patient's pain, real-time control of pain, targeted pain treatment. For patients with mild pain, oral non-steroidal drugs can be used or combined with sedative drugs. If the pain is severe, pethidine hydrochloride or opioids can be used for a short time. For patients with severe preoperative pain or sensitive to pain, postoperative analgesia pump is a reasonable choice.

(2) Inflammation control: perioperative complications such as systemic inflammatory response, stress response, deep venous thrombosis of lower limbs, postoperative bile leakage and so on will occur in patients with acute cholecystitis. Reducing and controlling postoperative inflammatory response is the most important treatment for accelerating rehabilitation surgery. Postoperative inflammatory control measures can be carried out from the following aspects: first, to avoid intraoperative hypothermia. Generally, if the body temperature is lower than 36 ℃, the patient's abdomen is exposed for a long time, the liquid temperature and the temperature stored in the injected blood are very low, and the peritoneal lavage fluid is not heated, the temperature, etc., these operations will lead to the occurrence of patients with low and medium temperature. Once the patient's temperature drops, the patient's immune function will decline. Therefore, from the concept of accelerated rehabilitation surgery, for patients with acute cholecystitis, attention should be paid to keeping warm during and after operation, for example, the temperature in the operating room is appropriate, intravenous drip should be preheated before infusion, and warm saline should be used for peritoneal lavage during operation. Thick quilt should be covered to keep warm after operation.

(3) Fasting and exercise were performed early after operation. According to the different conditions of patients, it is suggested that patients should take a small amount of water to wake up after anesthesia. If there is no obvious discomfort, the dosage can be increased gradually. Fluid diet can be used 12 hours after operation. Early drinking and eating can stimulate the secretion of gastrointestinal hormones and promote the recovery of gastrointestinal function. After acute cholecystitis surgery, encouraging patients to get up early can promote the recovery of cardiopulmonary function. At the same time, early exercise can avoid the occurrence of deep venous thrombosis and reduce the occurrence of abdominal adhesion.

(4) Nursing of abdominal drainage tube. Pay attention to observe the color, nature and quantity of drainage fluid. If the peritoneal drainage fluid is serous, less than 5ml, the drainage tube can be removed.

3.5. Statistical Methods

SPSS 17.0 statistical software was used to process the data. Intraoperative blood loss, operation time, recovery time and pain were compared. In this paper, the measured data were represented by $x + s$, the mean value was compared by two-way ANOVA; the incidence rate among groups was compared by chi square test, $P < 0.05$ was considered to be statistically significant.

4. Results and Discussion

4.1. Comparison of Operation Completion Effect

Shown as Figure 1, we randomly divided the 80 cases of acute cholecystitis into the sample group (40 cases) and the operation group (40 cases). The patients in the sample group underwent open cholecystectomy, while the operation group underwent abdominal microsurgery. Through the investigation of the patients' cure after the operation, it was found that 25 cases of 40 cases of acute cholecystitis were completely healed, 10 cases were effective healing, only 5 cases were incomplete healing. Compared with open cholecystectomy, the experimental data obtained from this operation account for a larger proportion of the number of healed patients. The comparison of these data highlights the feasibility of abdominal microsurgery in acute cholecystectomy.

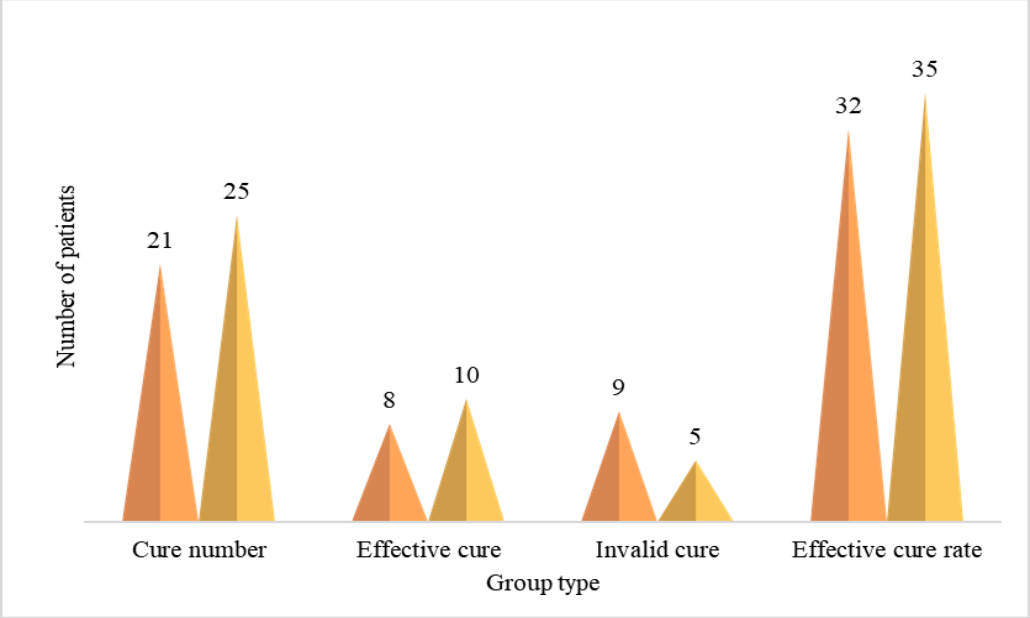

Figure 1. Comparison chart of operation completion effect

4.2. Comparison of Average Hospitalization Expenses

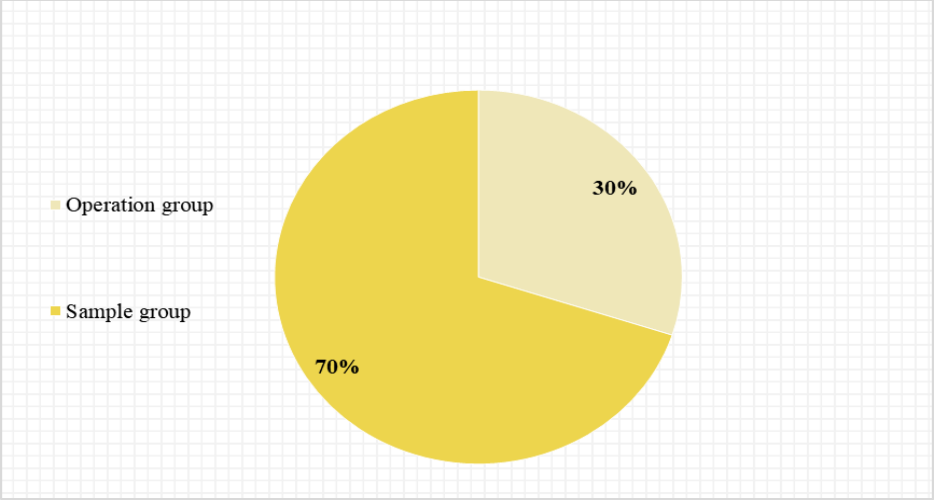

Figure 2. Comparison of average hospitalization expenses

Shown as Figure 2, we have made statistics on the treatment cost of these 80 patients (operation group and sample group) in the operation of acute cholecystitis. The average cost of 40 patients with open acute cholecystectomy during hospitalization is about 286800, while the average cost of patients treated with laparoscopy in general surgery is about 11500 yuan. Through the comparison of this group of data, it is found that patients in the acute cholecystitis resection surgery, the use of general surgery abdominal cavity microscope surgery costs less, which greatly reduces the economic burden of patients, for some patients with weak economic strength, general surgery abdominal cavity microscope surgery provides better treatment conditions for them.

4.3. Comparison of Postoperative Recovery of Patients

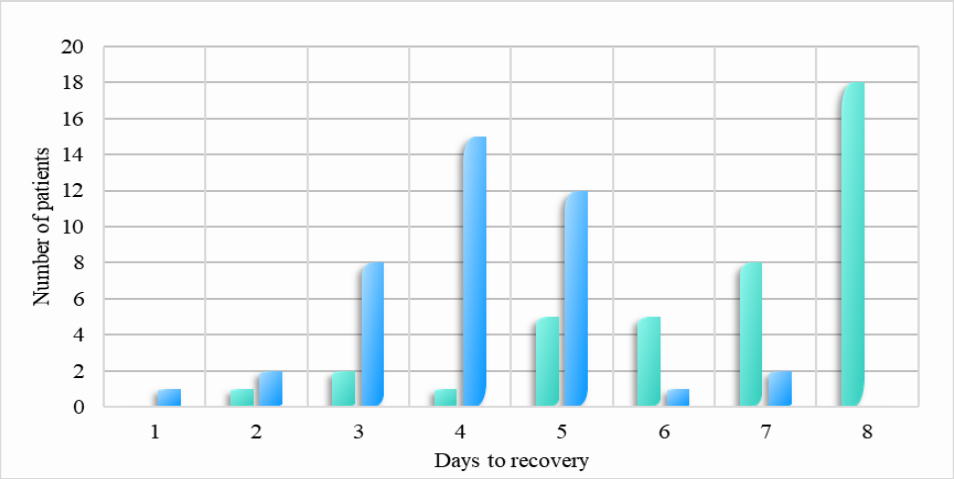

Figure 3. Comparison of postoperative response time

Shown as Figure 3, by observing the recovery of 80 patients in this experiment, it is found that the results obtained by using two different operations are quite different. For acute cholecystectomy, most patients gradually recovered in 6-8 days, but most of the patients who were treated with laparoscopy in general surgery recovered within 3-5 days. It can be seen that the operation described in this experiment has the advantages of small trauma and fast recovery time for patients with acute cholecystitis, which can greatly reduce the pain of patients.

4.4. Comparison of Other Symptoms after Hand

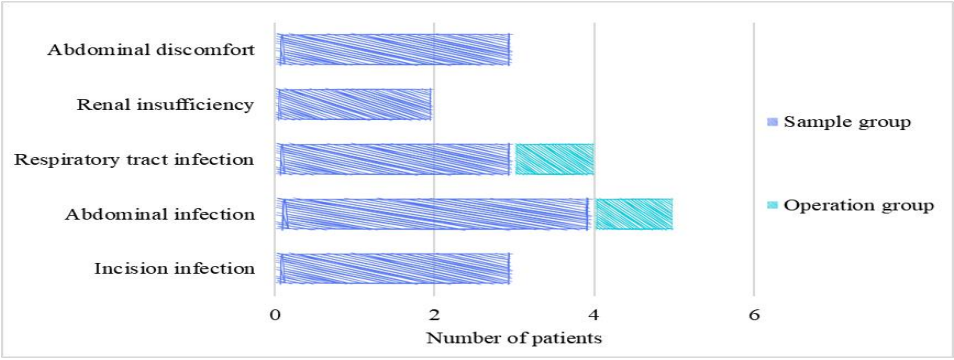

Figure 4. Comparison of other symptoms after operation

Shown as Figure 4, we investigated whether 80 patients in this study had other adverse

symptoms after acute cholecystectomy. The statistical results showed that there were several cases of postoperative complications such as upper abdominal discomfort, renal insufficiency, incision infection, respiratory tract infection and abdominal infection in the patients with open cholecystectomy. However, for the patients who used abdominal cavity microscope in general surgery, only one patient had respiratory tract infection and one patient had abdominal infection. According to the above statistical data, it is found that the use of abdominal microscope surgery for acute cholecystitis in general surgery can reduce the incidence of postoperative complications and is more conducive to the recovery of patients.

5. Conclusion

The emergence of abdominal microsurgery in general surgery provides more convenient and effective medical conditions for social medicine. At the same time, the continuous improvement of medical technology provides a better medical environment for patients. Acute cholecystitis resection is a kind of sudden disease, which has a high incidence rate in the middle-aged and elderly population. It has a good advantage to apply the abdominal cavity microscopy in Department of general surgery to the operation of acute cholecystitis. This paper systematically introduces the practical degree of this operation in acute cholecystitis resection. 80 cases of acute cholecystitis in our hospital were treated with abdominal cavity microscope operation (operation group) and traditional open cholecystectomy (sample group). At the same time, some situations of these two groups of patients were observed and analyzed. The experimental results show that the operation has many advantages, such as less blood loss, faster recovery of abdominal cavity, lower operation cost, higher cure rate and less postoperative symptoms. Compared with the traditional open cholecystectomy, the operation greatly reduces the discomfort of patients in the process of treatment, and shortens the recovery time of patients, providing a more comfortable treatment environment for patients. In addition, as a minimally invasive operation, abdominal microsurgery in general surgery can be applied to many types of cases, such as high biliary tract surgery, intrahepatic bile duct stones and so on. With the improvement of medical level and the continuous updating of medical equipment, the operation will provide more effective reference value for the treatment of various difficult and miscellaneous diseases in medicine.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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