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Efficacy and Prognosis of a Combined Three Mirror Surgical Protocol for Patients with Extrahepatic Biliary Stones

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Abstract: Objective: to analyze the surgical results and outcomes of patients with extrahepatic biliary calculi using a combination of three scopes (laparoscopy, duodenoscopy, and cholangioscopy).Methods: a total of 108 patients with extrahepatic biliary stones treated in our hospital were selected and divided into observation and control groups according to the different surgical methods, with 58 patients in the observation group and 50 patients in the control group. The control group was treated with conventional surgery, and the observation group was treated with a combination of three glasses to compare the treatment effects between the two groups. Results: surgical success was higher in the observation group than in the control group, with statistically significant differences ($P < 0.05$); No deaths occurred in the postoperative period in either group, intraoperative blood loss was significantly less in the observation group than in the control group, and the recovery time of gastrointestinal motility and time to ambulation were significantly shorter than in the control group ($P < 0.05$; The patients in the observation group had a significantly shorter postoperative fasting time, exhaust time, and abdominal drainage time than those in the control group, and visual analog scale (VAS) scores were significantly lower than those in the control group, all of which were statistically significant ($P < 0.05$).Conclusions: the treatment of gallbladder stones combined with extrahepatic bile duct stones using the combination of three mirror surgery has excellent outcomes, with a high success rate and a low residual stone rate, which obviously improves the postoperative prognosis effect and improves the surgical safety, and has an excellent application value.

1. Introduction

Biliary stones are relatively common in the clinic, due to many causes of biliary infection, cholestasis, and the patient symptom manifestations are mainly jaundice, abdominal pain, and fever [1].There is a close relationship between the production of the disease and the age of the patients, the higher the incidence is, and the female population has a higher incidence than the male

population, common bile duct smooth muscle expansion and spasm will often occur after the onset, at the same time, some degree of irritation will be formed to the gallbladder mucosa of the patients, then chronic or acute gallbladder inflammation will occur, and the severe patients will even develop gallbladder cancer,Therefore early treatment is necessary [2-3]. The three mirror technique that has gradually risen in recent years refers to laparoscopy, duodenoscopy, and cholangioscopy through minimally invasive treatment of the disease [4]. In this paper, we investigated the clinical efficacy and prognosis of combined triscopy and open surgery for extrahepatic biliary stone disease.

2. Materials and Methods

2.1 General Information

A total of 108 patients with extrahepatic biliary stones treated in our hospital from January 2019 to January 2020 were selected and randomly divided into two groups, an observation group consisting of 58 patients, 30 males and 28 females; The age ranged from 21 to 53 years, with a mean (41.22 ± 3.2) years.The control group consisted of 50 patients, 27 males and 23 females; The age ranged from 20 to 62 years, with a mean (43.12 ± 3.74) year.There was no significant difference in the general data such as gender or age between the two groups ($P > 0.05$) and they were comparable.

Inclusion criteria: all patients were diagnosed with extrahepatic biliary stones by imaging examination; None had contraindications to surgery; The patients and their family members agreed to this study, and signed the consent form; The hospital ethics committee was certified.Exclusion criteria: those with combined serious diseases such as tumor, heart, liver and kidney; Those with hearing, vision, or mental impairment; Major surgery performed on abdomen.

2.2 Method

In the control group, laparoscopy was used to display the operation with the operating system.The specific methods were as follows:

(1)A 1 cm transverse incision was made along the lower border of the umbilical fossa with an inlet abdominal needle, rotated to place 10 mm trocar under the midline xiphoid process, and 5 mm trocar under the right costal margin to establish a CO_2 pneumoperitoneum [5].

(2)The condition of abdominal cavity was observed, and the adherent tissue adjacent to free gallbladder was effectively revealed the gallbladder and its trigone, the cystic duct and the cystic artery were closed with titanium forceps, the gallbladder was cut off, the cystic duct was pulled, the common bile duct forearm was incised longitudinally, and a Cholangioscope was placed from the main operation hole under the xiphoid process to the bile duct, the stones were taken with a stone removal net, and the stones with a larger diameter were first fragmented with a mechanical stone basket and then with a net basket,The biliary tract was cleaned up and a T-tube was placed after choledochoscopy showed no stone residue, and absorbable lines were interrupted by suture incision [6].

(3)A postoperative indwelling drain was placed under the liver and was withdrawn after 1-2 D; Conventional anti infection.

In the observation group, three glasses (laparoscopy, duodenoscopy, cholangioscopy) combined with assistance were used to implement surgical treatment, and the specific methods were as follows:

(1)After general anesthesia, and establishment of pneumoperitoneum, dissection of the cystic duct, cystic artery, and titanium clip were performed, and the cystic artery was clipped and freed from the gallbladder bed; A subxiphoid cannula was passed and the fiberoptic Cholangioscope was

placed in the common bile duct, viewed from the direction of the hilum and ampulla, which was removed with a stone retrieval mesh after the stone was found [7-8].

(2)Gallstones were collected and pulled out of the abdomen; Exploration of the distal extremities is then visualised by duodenoscopy “T “ tube to try to choose the larger model, place the “T “ tube short arm into the common bile duct, place the suture needle with needle holder through the lower xiphoid sleeve, and suture the common bile duct incision above and below the “T “ tube [9].

(3)Finally, a luminal drain was placed, and routine surveillance and treatment with antibiotics, gastrointestinal decompression were implemented.

2.3 Outcome Measures

Surgical treatment effect: the operative time, intraoperative blood loss, hospital stay, and hospitalization cost of patients were recorded in detail.

Postoperative prognosis effect: We recorded the patients' postoperative fasting time, time of flatus, and time of abdominal drainage in detail.And the visual analog scale (VAS), which rates the degree of postoperative pain of patients, and its higher score, the more severe the pain [10].

Postoperative safety: incision infection, cholangitis, pulmonary infection, abdominal infection, biliary bleeding, acute pancreatitis and other complications occur.Complication rate = number of cases with complications present / number of total cases×100%.

2.4 Statistical Methods

SPSS13.0 statistical software was used to analyze, data comparison was performed using χ^2-test, and the metrology data were expressed as ($\bar{x} \pm s$), t-test was implemented.$P < 0.05$ was considered statistically significant.

3. Result

3.1 Procedure Success Rate, Net Stone Removal Rate Vs

The success rate of surgery in the observation group was higher than that in the control group, and the difference was statistically significant ($P < 0.05$); The net rate of stone removal in the observation group was slightly higher than that in the control group, and there was no significant difference ($P > 0.05$), see Table 1.

Table 1 Comparison of Procedural Success and Net Stone Removal Rates between the 2 Groups of Patients with Extrahepatic Cholangiolithiasis(%)

Group	Number of cases	Procedural success rate	Net stone removal rate
Control group	50	84(42/50)	92(46/50)
Observation group	58	98(49/50)	96(48/50)
χ^2		3.014	0.774
P value		0.013	0.387

3.2 Comparison of Perioperative Related Indexes between Two Groups

No deaths occurred in the postoperative period in either group, intraoperative blood loss was significantly less in the observation group than in the control group, and recovery time of gastrointestinal motility and time to ambulation were significantly shorter than in the control group,

with statistically significant differences (P < 0.05) (Table 2).

Table 2 Comparison of Perioperative Related Indexes between Two Groups($\bar{x} \pm s$)

Group	Number of cases	Intraoperative blood loss (ml)	When gastrointestinal motility recovered ask (h)	Time to ambulation (d)
Control group	50	83.69±10.01	17.81±10.13	8.81±4.55
Observation group	58	245.66±13.46	48.93±7.79	14.71±8.09
T value		10.325	8.337	5.581
P value		0.017	0.021	0.046

3.3 Comparison of Postoperative Outcomes between the Two Groups

Patients in the observation group had a significantly shorter postoperative fasting time, exhaust time, and abdominal drainage time than those in the control group, and the VAS scores were significantly lower than those in the control group, all of which were statistically significant (P < 0.05), see Table 3.

Table 3 Comparison of Postoperative Outcomes between the Two Groups(±s)

Group	Number of cases	Postoperative flatus time (h)	Abdominal drainage time(d)	VAS score
Control group	50	1.33±0.26	23.81±4.25	1.55±0.37
Observation group	58	3.31±0.82	42.03±9.61	3.25±1.02
T value		10.53	9.983	8.745
P value		0.000	0.000	0.000

4. Discussion

Extrahepatic bile duct stones are one of the complications of gallstones, which are mainly caused by stones with a smaller diameter in the gallbladder draining into the bile duct via the cystic duct to cause extrahepatic bile duct stones.Patients with gallstones are prone to cholangitis after complicated by external bile duct stones, and severe cases will have systemic infection, which seriously affects the life health of patients.

In recent years, the treatment of extrahepatic cholangiolithiasis has taken a big step forward due to the clinical application of fiberoptic cholangioscopy, which achieves a net stone removal rate of over 90% [10]. It is noted that 80% of extrahepatic bile duct stones can be cleared by this procedure clinically without escharotomy without anesthesia, and the efficacy is significant, which has become the first-line treatment for biliary stones.With the development of technology, duodenoscopic stone removal, placement of a nasobiliary duct and biliary stent were developed on the basis of retrograde cholangiopancreatography (a diagnostic technique based on endoscopic treatment without laparotomy) for extrahepatic bile duct stones [11].

Today with the high pace of scientific and technological development, duodenoscopy, cholangioscopy, laparoscopy (clinically as a three mirror combination therapy) in the treatment of extrahepatic cholangiolithiasis is widely used, which subverts the previous traditional treatment patterns and concepts. Three mirror combination therapy has obvious advantages, such as duodenoscopy without anesthesia, less trauma and low complication rate, laparoscopy can be performed under direct vision for cholelithiasis, and the combination can better understand the biliary situation and then optimize the treatment [12]. There have been reports of inferior outcomes associated with traditional surgical options, such as greater trauma and slower recovery after surgery, for the management of patients with extrahepatic biliary stones, which were better avoided with a combined triscopic protocol [13].This article aims to help clinicians choose the best surgical

option by analyzing the clinical efficacy as well as the prognosis situation produced by the combined three mirror surgery for patients with extrahepatic biliary stones.

In this study, only operation time was longer in the observation group than in the control group, and other indicators (operation success rate, total effective rate, blood loss, recovery time of gastrointestinal function, time to ambulation, complication rate, and quality of life) were better than in the control group, thereby suggesting that both clinical efficacy and safety were better in the observation group than in the control group.The net stone removal rate of the control group was comparable to that of the observation group, indicating that laparoscopic surgery alone for extrahepatic bile duct stones is equally able to achieve a high net stone removal rate [14]. Therefore, it is believed that the combination of three mirror surgery has a significant effect on the treatment of extrahepatic bile duct stones, and the advantages of this operation are mainly reflected in the following aspects: the common bile duct is not incised intraoperatively, complications such as common bile duct stenosis can be avoided; Surgical manipulation does not adversely affect sphincter function.

The success rate of combined triscopic surgery for hepatobiliary stones is generally > 95%, and it has now replaced most open surgical procedures.The results of this study showed that the intraoperative blood loss in the observation group was significantly less than that in the control group, and that the recovery time of gastrointestinal motility and the time to get out of bed activity were significantly shorter than those in the observation group ($P < 0.05$); The effectiveness rate of the observation group was 98%, which was significantly higher than the 84% rate of the control group ($P < 0.05$), suggesting that the combination of three mirror surgery had a significant effect in the treatment of hepatobiliary extra biliary stones.Care is needed to select the most appropriate treatment on a patient specific basis, avoiding the blind pursuit of minimally invasive but forced triscopic combination therapy, especially in patients with severe complications.

5. Conclusion

In summary, gallstones combined with extrahepatic cholangiolithiasis should be treated with the combination of three mirror surgery with excellent outcomes, high success rates, low residual stone rates, obviously improved postoperative outcomes, and improved surgical safety, with excellent application value.

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Clinical strategy of three-mirror combined therapy for elderly patients with cholelithiasis. 2018-WJZD066

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