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多镜联合·论著

腹腔镜联合胆道镜下胆总管探查术治疗 胆总管结石的临床疗效

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摘要: **目的** 探讨腹腔镜联合胆道镜下胆总管探查术治疗胆总管结石的临床疗效。**方法** 回顾性分析2022年1月—2024年4月该院收治的102例胆总管结石患者的临床资料, 按不同术式将患者分为腹腔镜组($n=52$, 行腹腔镜联合胆道镜下胆总管探查术)和开腹组($n=50$, 行开腹手术)。比较两组患者围术期指标、胃泌素族激素水平(血清胃泌素和胆囊收缩素)、肝功能(血清总胆红素和总胆汁酸)和术后并发症情况。**结果** 两组患者手术时间和结石清除率比较, 差异均无统计学意义($P>0.05$), 腹腔镜组术中出血量明显少于开腹组, 首次排气时间和术后住院时间明显短于开腹组, 差异均有统计学意义($P<0.05$); 术后3 d, 两组患者血清胃泌素水平明显低于术前1 d, 血清胆囊收缩素水平明显高于术前1 d, 差异均有统计学意义($P<0.05$); 术后3 d, 腹腔镜组血清胃泌素水平明显高于开腹组, 血清胆囊收缩素水平明显低于开腹组, 差异均有统计学意义($P<0.05$); 术后3 d, 两组患者血清总胆红素和总胆汁酸水平明显低于术前1 d, 且腹腔镜组明显低于开腹组, 差异均有统计学意义($P<0.05$); 腹腔镜组并发症发生率为7.69%, 明显低于开腹组的26.00%, 差异有统计学意义($P<0.05$)。**结论** 腹腔镜联合胆道镜下胆总管探查术治疗胆总管结石, 结石清除率与开腹手术相当, 但该术式有助于肝功能的快速恢复, 对胃泌素族激素的影响小, 还能降低并发症的发生风险, 加快术后康复进程。值得临床推广应用。

关键词: 腹腔镜; 胆道镜; 胆总管探查术; 胆总管结石; 结石清除率

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Clinical efficacy of laparoscopy combined with choledochoscopy for exploration common bile duct in treatment of calculus of common bile duct

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Abstract: **Objective** To explore the clinical efficacy of laparoscopy combined with choledochoscopy for exploration common bile duct in treatment of calculus of common bile duct. **Methods** A retrospective analysis was conducted on clinical data of 102 patients with calculus of common bile duct from January 2022 to April 2024. They were separated into laparoscopic group ($n=52$, who underwent laparoscopy combined with choledochoscopy for exploration common bile duct) and open group ($n=50$, who underwent open surgery) according to the different surgical methods used. Perioperative indicators, serum gastrin hormone levels [gastrin and cholecystokinin], liver function [serum total bilirubin and serum total bile acid], and postoperative complications were compared between the two groups. **Results** There were no statistically significant differences in surgical time and stone clearance rate

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between the laparoscopic group and the open group ($P > 0.05$), while intraoperative blood loss in laparoscopic group was less than that in open group, the first exhaust time and postoperative hospital stay in the laparoscopic group were shorter than those in open group, the differences were statistically significant ($P < 0.05$); On the third day after surgery, the serum gastrin levels in both groups were lower than those on the first day before surgery, and the serum cholecystokinin levels were higher than those on the first day before surgery, the differences were statistically significant ($P < 0.05$); On the third day after surgery, the serum gastrin level in the laparoscopic group was higher than that in open group, and the serum cholecystokinin level was lower than that in open group, the differences were statistically significant ($P < 0.05$); Three days after surgery, the levels of serum total bilirubin and serum total bile acid in both groups were lower than those 1 day before surgery, and both indicators in laparoscopic group were lower than those in open group, the differences were statistically significant ($P < 0.05$); The incidence of complications in laparoscopic group was 7.69%, lower than that in open group was 26.00%, the difference was statistically significant ($P < 0.05$). **Conclusion** The stone removal effect of laparoscopy combined with choledochoscopy for exploration common bile duct in patients with calculus of common bile duct is comparable to that of open surgery. However, compared with open surgery, this study's surgical procedure is more conducive to the rapid recovery of liver function, reduce the impact on gastrin hormones and the risk of complications, and accelerate the postoperative recovery process. It is worthy of clinical application.

Keywords: laparoscopy; choledochoscopy; exploration common bile duct; calculus of common bile duct; stone clearance rate

胆总管结石多见于胆总管下段, 其形成与胆汁排出受阻、胆道感染和胆囊结石等因素有关^[1]。该病症状多表现为上腹痛和黄疸等, 如果结石过大或过多, 可引起胆管梗阻, 并使肝脏受累, 易并发肝硬化。故需及时清除结石, 以免对健康造成更大的损害。胆总管结石的治疗以手术取石为主。开腹取石术为处理结石的传统术式, 其取石效果较好, 可使患者上腹痛等症状有效缓解^[2], 但该术式对机体创伤较大, 术后并发症, 如: 感染和胆瘘等, 发生风险高, 还会延长肝胆循环的恢复时间^[3]。近年来, 双镜联合手术, 即: 腹腔镜联合胆道镜下胆总管探查术, 因具有微创、定位精准

和病变清除彻底等优势, 已逐渐应用于胆总管结石的治疗中^[4]。本研究观察了腹腔镜联合胆道镜下胆总管探查术治疗胆总管结石的临床疗效。现报道如下:

1 资料与方法

1.1 一般资料

回顾性分析 2022 年 1 月—2024 年 4 月本院收治的 102 例胆总管结石患者的临床资料, 按手术方式不同将患者分为腔镜组 ($n = 52$) 和开腹组 ($n = 50$)。两组患者一般资料比较, 差异无统计学意义 ($P > 0.05$), 具有可比性。见表 1。

表 1 两组患者一般资料比较
Table 1 Comparison of general data between the two groups

组别	性别(男/女)/例	年龄/岁	体重指数/(kg/m ²)	胆总管直径/cm	结石数量(单发/多发)/例	胆囊结石/例	肝内胆管结石/例	高血压/例
腔镜组($n = 52$)	21/31	56.48±8.36	22.79±2.56	1.47±0.35	24/28	31	9	18
开腹组($n = 50$)	23/27	55.82±8.04	23.06±2.83	1.41±0.33	21/29	33	11	15
χ^2/t 值	0.33	0.41 [†]	0.51 [†]	0.89 [†]	0.18	0.45	0.36	0.25
P 值	0.567	0.686	0.614	0.376	0.673	0.505	0.551	0.618

注: [†]为 t 值。

纳入标准: 经影像学检查确诊为胆总管结石; 初次发病, 且有手术指征; 年龄 22~76 岁; 临床资料

完整。排除标准: 存在化脓性胆管炎等其他肝胆疾病; 既往接受过腹部手术; 有心、肺严重病变, 无法

耐受气腹和手术；围手术期使用抑酸药物和生长抑素类药物，影响结果判定；存在传染病；认知状态差，无法沟通。

1.2 方法

1.2.1 术前准备 术前均进行 CT 和 B 超等影像学检查，以及常规生化检查，由同一经验丰富的团队开展手术。

1.2.2 开腹组手术方法 行开腹手术。实施全身麻醉，患者取平卧位，于右肋下缘做一 9~15 cm 的斜切口，进入腹内后充分探查，切除胆囊后打开胆总管，完成取石操作，随后留置 T 管和引流管，关闭切口。

1.2.3 腹腔镜组手术方法 行腹腔镜联合胆道镜下胆总管探查术。实施全身麻醉，于脐下做一切口（截孔 10 mm）作为观察孔，建立气腹，压力控制在 13~15 mmHg，探查有无肠壁损伤和脏器粘连等情况；于剑突下 2 cm 做一小切口（10 mm）作为主操作孔，同时，于右侧锁骨中线肋缘下 3 cm 和腋前线，各做一 5 mm 小切口作为副操作孔。以顺逆结合的方式将胆囊切除，然后，于胆总管前壁做一约 10 mm 的纵切口，将胆道镜放入主操作孔内，胆道镜探查后，用无损伤钳将结石轻轻推出，再用石篮套取结石。完成取石操作后，充分探查胆总管，确保胆总管通畅，且无结石残留后，留置 T 管，关闭切口后，放置引流管，最后闭合 Trocar 孔。

1.2.4 术后处理 术后均适当补液，行抗感染治疗；术后 3 d 内以流食为主，并逐渐向半流食过渡，待症状缓解后拔除引流管，术后 2 周予以 T 管造影，如无结石残余，可在术后 4~6 周拔除 T 管。

1.3 观察指标

1.3.1 围手术期指标 包括：手术时间、术中出血量、首次排气时间、术后住院时间和结石清除率。术后胆管造影未发现结石残留，判定为结石清除。

1.3.2 胃泌素族激素 于术前 1 d 和术后 3 d 采集空腹静脉血，做离心处理，离心速度为 3 000 r/min，半径 12 cm，时间 10 min，获取上清后，采用酶联免疫吸附试验，分析胃泌素和胆囊收缩素水平。

1.3.3 肝功能 于术前 1 d 和术后 3 d，采用酶比色法测定血清总胆红素和总胆汁酸水平。

1.3.4 并发症 观察患者术后有无腹腔出血（存在呕血和黑便等症状，存在非心源性血流动力学失稳情况，引流管引流出血性液体，且引流量不低于 100 mL/d）、短期胆瘘（出现腹痛、黄疸和发热等症状后，通过瘘管造影做进一步判定）、感染（出现感染征象后，通过病原学检测确诊）和胆管狭窄（出现腹痛和黄疸等症状后，通过逆行胆道造影做进一步判定）等并发症发生，并计算两组并发症总发生率。

1.4 统计学方法

应用 SPSS 25.0 软件分析数据。计量资料以均数±标准差 ($\bar{x} \pm s$) 表示，组间比较，行独立样本 *t* 检验，组内比较，行配对样本 *t* 检验；计数资料以例 (%) 表示，比较行 χ^2 检验。 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 两组患者围手术期指标比较

两组患者手术时间和结石清除率比较，差异均无统计学意义 ($P > 0.05$)；腹腔镜术中出血量明显少于开腹组，首次排气时间和术后住院时间明显短于开腹组，差异均有统计学意义 ($P < 0.05$)。见表 2。

2.2 两组患者胃泌素族激素水平比较

术后 3 d，两组患者血清胃泌素水平明显低于术前 1 d，血清胆囊收缩素水平明显高于术前 1 d，差异均有统计学意义 ($P < 0.05$)；术后 3 d，腹腔镜血清胃泌素明显高于开腹组，血清胆囊收缩素明显低于开腹组，差异均有统计学意义 ($P < 0.05$)。见表 3。

2.3 两组患者肝功能比较

术后 3 d，两组患者血清总胆红素和总胆汁酸水平明显低于术前 1 d，且腹腔镜明显低于开腹组，差异均有统计学意义 ($P < 0.05$)。见表 4。

2.4 两组患者术后并发症比较

腹腔镜组并发症发生率为 7.69%，明显低于开腹组的 26.00%，差异有统计学意义 ($P < 0.05$)。见表 5。

表 2 两组患者围手术期指标比较

Table 2 Comparison of perioperative indicators between the two groups

组别	手术时间/min	术中出血量/mL	首次排气时间/d	术后住院时间/d	结石清除率 例(%)
腹腔镜组(<i>n</i> = 52)	111.79±18.89	43.61±6.74	1.87±0.45	7.06±1.98	50(96.15)
开腹组(<i>n</i> = 50)	107.47±15.06	98.45±9.27	2.52±0.79	10.47±2.34	49(98.00)
χ^2 / <i>t</i> 值	1.27 [†]	34.27 [†]	5.13 [†]	7.96 [†]	0.30
<i>P</i> 值	0.206	0.000	0.000	0.000	0.581

注: [†]为 *t* 值。

表 3 两组患者血清胃泌素族激素水平比较 ($\bar{x} \pm s$)

Table 3 Comparison of serum gastrin hormone levels between the two groups ($\bar{x} \pm s$)

组别	胃泌素/($\mu\text{mol/L}$)		胆囊收缩素/(pg/mL)	
	术前 1 d	术后 3 d	术前 1 d	术后 3 d
腹腔镜组(<i>n</i> = 52)	75.49±8.27	72.82±7.91 [†]	9.62±1.86	11.18±2.79 [†]
开腹组(<i>n</i> = 50)	74.16±8.03	68.49±6.78 [†]	10.05±2.24	13.05±2.56 [†]
<i>t</i> 值	0.82	2.96	1.06	3.52
<i>P</i> 值	0.412	0.004	0.293	0.001

注: [†]与术前 1 d 比较, 差异有统计学意义 ($P < 0.05$)。

表 4 两组患者肝功能比较 ($\mu\text{mol/L}$, $\bar{x} \pm s$)

Table 4 Comparison of liver function between the two groups ($\mu\text{mol/L}$, $\bar{x} \pm s$)

组别	血清总胆红素		血清总胆汁酸	
	术前 1 d	术后 3 d	术前 1 d	术后 3 d
腹腔镜组(<i>n</i> = 52)	71.67±6.19	22.84±4.35 [†]	50.26±5.43	19.64±3.86 [†]
开腹组(<i>n</i> = 50)	70.42±5.84	28.63±5.19 [†]	49.75±5.17	23.45±4.11 [†]
<i>t</i> 值	1.05	6.12	0.49	4.83
<i>P</i> 值	0.297	0.000	0.628	0.000

注: [†]与术前 1 d 比较, 差异有统计学意义 ($P < 0.05$)。

表 5 两组患者术后并发症比较 例(%)

Table 5 Comparison of postoperative complications between the two groups *n*(%)

组别	腹腔出血	短期胆瘘	感染	胆管狭窄	总发生率
腹腔镜组(<i>n</i> = 52)	1(1.92)	1(1.92)	2(3.85)	0(0.00)	4(7.69)
开腹组(<i>n</i> = 50)	3(6.00)	3(6.00)	6(12.00)	1(2.00)	13(26.00)
χ^2 值					6.15
<i>P</i> 值					0.013

3 讨论

3.1 手术治疗胆总管结石的现状

随着人们饮食结构的改变和生活节奏的加快, 因

胆总管结石就诊的病例逐渐增多。手术为处理结石最有效的手段, 通过将结石取出体外, 使胆管恢复通畅, 胆汁得以有效排泄, 相关症状得以解除^[5]。既往多以开腹手术治疗胆总管结石, 其具有视野直观和取

石效率高等优点,但破坏性大,术后发生感染等并发症的风险较高,且术后恢复缓慢^[6]。

3.2 腹腔镜联合胆道镜下胆总管探查术治疗胆总管结石的临床疗效

3.2.1 结石清除率方面 腹腔镜联合胆道镜下胆总管探查术是一种充分贯彻微创理念的新兴术式,近年来颇受临床医师的青睐。本研究观察了该术式用于胆总管结石治疗中的临床疗效,结果显示:腹腔镜组结石清除率为96.15%,与开腹组的98.00%比较,差异无统计学意义($P>0.05$),这与丁文辉等^[7]研究结果一致。这说明:腹腔镜联合胆道镜下胆总管探查术的结石清除效果和开腹手术相当。究其原因可能为:本研究中的术式,切口虽小,但利用胆道镜能将胆道探查视野和操作空间扩大,利于结石的套取和清除^[8]。

3.2.2 手术相关情况方面 本研究中,腹腔镜组术中出血量明显少于开腹组,首次排气时间和术后住院时间明显短于开腹组,这提示:本研究腹腔镜组在减少术中出血和加快术后康复进程方面均具有优势。腹腔镜联合胆道镜下胆总管探查术采用四孔法放置腹腔镜,并在剑突下主操作孔中放置胆道镜,通过胆道镜探查,可了解结石所在位置和数量,有助于精准开展取石操作,减少剥离所致的损伤,减少出血及其对生理功能的干扰,从而缩短了术后住院时间^[9]。喻海峰等^[10]研究发现,腹腔镜联合胆道镜下胆总管探查术的手术时间较开腹手术长。而在本研究中,腹腔镜组手术时间与开腹组无明显差异。这可能与本院已成功开展腹腔镜联合胆道镜下胆总管探查术多年,医疗团队已积累了丰富的手术经验,对该微创术式的操作较为熟练有关。

3.2.3 肝功能方面 血清总胆红素和总胆汁酸是反映肝脏内胆胆汁淤积情况的指标,两者水平越高,胆汁淤积愈严重^[11]。本研究中,腹腔镜组术后3 d血清总胆红素和总胆汁酸水平明显低于开腹组,这提示:腹腔镜联合胆道镜下胆总管探查术治疗胆总管结石,可有效地降低肝功能水平。究其原因可能为:术中双镜联合使用,可使腹腔情况清晰呈现,便于医师精准地分离粘连和高效地完成取石操作,并能减少对周围组织的损伤,利于胆汁快速排泄,从而使血清总胆红素和总胆汁酸水平迅速恢复正常^[10-12]。

3.2.4 血清胃泌素族激素水平方面 胃泌素和胆囊收缩素均为胃肠激素,前者可诱导胃酸分泌,促进胃肠蠕动,其低表达可提示胃肠动力障碍^[13];后者可诱导胆汁分泌,促进胆囊收缩,其水平过高可减弱胃肠动力,阻碍胃排空^[14]。本研究中,腹腔镜组术后3 d血清胃泌素水平高于开腹组,胆囊收缩素低于开腹组,这提示:腹腔镜联合胆道镜下胆总管探查术治疗胆总管结石,对患者胃肠动力的影响较小。考虑原因为:术中双镜联合应用可实现微创,减轻了手术应激和对胃肠功能的干扰,故患者胃泌素和胆囊收缩素的波动幅度较小^[15]。

3.2.5 并发症方面 本研究中,腹腔镜组并发症发生率为7.69%,明显低于开腹组的26.00%,这提示:腹腔镜联合胆道镜下胆总管探查术的安全性较高。

3.3 腹腔镜联合胆道镜下胆总管探查术治疗胆总管结石的优势

腹腔镜联合胆道镜下胆总管探查术,能减小腹壁切口,且在双镜下操作,能减轻对血管神经和胃肠功能的影响,避免过多损伤胆管功能,从而利于患者术后恢复^[16]。术中使用粗细适中的3-0线缝合切口,在保证松紧适宜和管壁平整的情况下,能减小拔管时胆管和窦道所受的牵拉力,从而减少感染和出血等并发症的发生^[17]。洪晓城等^[18]研究显示,腹腔镜联合胆道镜下胆总管探查术,有利于降低胆总管结石患者并发症发生率。但需注意的是,为了更好地保证患者的安全,在开展此术式时,尤其是在取石前,应将胆道镜调至理想位置,确保视野清晰,以防止操作时损伤周边组织和胆总管^[17-19]。

3.4 本研究的局限性

本研究纳入的样本量有限,未充分排除胆囊炎严重程度和是否合并胰腺炎等混杂因素的干扰,可能导致结果发生偏倚;且受研究设计的限制,未获取长期随访数据,尚不清楚远期复发情况,及其对患者生活质量的影响。故未来将适当增加样本量,进行长期随访,以充分了解腹腔镜术式的应用优势。

综上所述,腹腔镜联合胆道镜下胆总管探查术治疗胆总管结石,结石清除效果与开腹手术相近,但术中出血量和术后并发症较开腹手术少,且胃泌素族激素的波动幅度小,肝功能恢复快,住院时间短。值得临床推广应用。

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