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腹腔镜胆囊切除术与开腹胆囊切除术对胆囊结石患者手术疗效、肝肾功能及机体应激的影响*

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摘要 目的:探讨腹腔镜胆囊切除术(LC)与开腹胆囊切除术(OC)对胆囊结石患者手术疗效、肝肾功能及机体应激的影响。**方法:**选取2015年3月~2018年7月期间我院收治的胆囊结石患者125例为研究对象。根据随机数字表法将患者分为对照组(n=62)和研究组(n=63),对照组给予OC治疗,研究组给予LC治疗,比较两组各项临床指标,检测两组术前、术后肝肾功能指标及机体应激指标水平,记录两组术后并发症发生情况。**结果:**研究组手术时间、术后住院时间、排气时间均短于对照组,术中出血量少于对照组($P<0.05$)。与术前比较,两组患者术后1d总胆红素(TBIL)、丙氨酸氨基转移酶(ALT)、天冬氨酸转氨酶(AST)水平均升高,但研究组低于对照组($P<0.05$)。与术前比较,两组患者术后1d Alb/UCr、NAG/UCr升高,且研究组高于对照组($P<0.05$);与术后1d比较,两组患者术后3d白蛋白(Alb)/尿肌酐(UCr)、N-乙酰-β-D-氨基葡萄糖苷酶(NAG)/UCr降低($P<0.05$),但研究组与对照组比较差异无统计学意义($P>0.05$);两组患者术前、术后1d、术后3d血清尿素氮(BUN)、血清肌酐(SCr)比较差异无统计学意义($P>0.05$)。与术前比较,两组患者术后1d超氧化物歧化酶(SOD)水平降低,且研究组低于对照组($P<0.05$),丙二醛(MDA)、C-反应蛋白(CRP)水平升高,但研究组低于对照组($P<0.05$)。研究组并发症发生率低于对照组($P<0.05$)。**结论:**LC治疗胆囊结石患者安全有效,临床相关指标改善程度优于OC术式,术后肾功能恢复更快,且对患者肝功能、机体应激程度影响较轻。

关键词:腹腔镜胆囊切除术;开腹胆囊切除术;胆囊结石;疗效;肝肾功能;应激

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The Effect of Laparoscopic Cholecystectomy and Open Cholecystectomy on the Curative Effect, Liver and Kidney Function and Body Stress in Patients with Cholelithiasis*

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ABSTRACT Objective: To investigate the effects of laparoscopic cholecystectomy (LC) and open cholecystectomy (OC) on the operative efficacy, liver and kidney function and body stress in patients with cholelithiasis. **Methods:** 125 cases of patients with cholelithiasis who were treated in our hospital from March 2015 to July 2018 were selected as the research subjects. The patients were randomly divided into control group (n=62) and research group (n=63), the control group was treated with OC, and the research group was treated with LC. The clinical indexes of the two groups were compared. The liver and kidney function and body stress indexes of the two groups were compared before and after operation. Postoperative complications were recorded in the two groups. **Results:** The operation time, postoperative hospital stay and exhaust time of the research group were shorter than those of the control group, and the intraoperative blood loss was less than that of the control group ($P<0.05$). Compared with before operation, the levels of total bilirubin (TBIL), alanine aminotransferase (ALT) and aspartate transaminase (AST) at 1 d after operation increased in both groups, but the research group was lower than the control group ($P<0.05$). Compared with before operation, the Alb/UCr and NAG/UCr at 1 d after operation increased in two groups, and the research group was higher than the control group ($P<0.05$). Compared with 1 d after operation, the albumin (Alb)/creatinine (UCr), N-acetyl-β-D-glucosaminidase (NAG)/UCr at 3d after operation decreased in both groups ($P<0.05$). However, there was no significant difference between the research group and the control group ($P>0.05$). There were no significant differences in serum urea nitrogen (BUN) and creatinine (SCr) between the two groups before operation, 1 d after operation and 3 d after operation ($P>0.05$). Compared with before operation, the levels of superoxide dismutase (SOD) at 1d after operation decreased in the two groups, and the research group was lower than the control group ($P<0.05$). The levels of malondialdehyde (MDA) and C-reactive protein (CRP) increased, but the research group was lower than the control group ($P<0.05$). The incidence of complications in the research group was lower than

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that in the control group ($P < 0.05$). **Conclusion:** LC is better than OC in improving the clinical parameters of patients with cholecystolithiasis. The renal function can be rapidly restored after operation. It has a slight effect on liver function and body stress, it has safe and effective.

Key words: Laparoscopic cholecystectomy; Open cholecystectomy; Cholecystolithiasis; Curative effect; Liver and kidney function; Stress

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前言

胆囊结石是指原发于胆囊内的结石,主要由胆汁淤滞所致,临床多表现为右上腹部不适、胀痛,严重者可发展至胆绞痛、胆囊积液等^[1-3]。据统计^[4],我国胆囊结石的发病率在 8%~10%,女性明显多于男性,且随着年龄地增长,发病率呈不断上升的趋势。目前临床上主要采用手术治疗胆囊结石,传统的开腹胆囊切除术(Open cholecystectomy, OC)存在术野不够清晰、创伤较大、术后恢复慢等缺陷,临床应用存在一定的局限性^[5,6]。随着微创外科技术的发展,腹腔镜胆囊切除术(Laparoscopic cholecystectomy, LC)已逐渐开始应用于胆囊结石的治疗中^[7]。LC 可借助腹腔镜获得更为清晰的视野,具有安全性高、术后恢复快、创伤较小等优势^[8]。本研究通过探讨 LC 与 OC 术式对胆囊结石患者肝肾功能及机体应激的影响,以期为临床治疗提供参考。

1 资料与方法

1.1 一般资料

选取 2015 年 3 月~2018 年 7 月期间我院收治的胆囊结石患者 125 例为研究对象。纳入标准^[9]:(1)所有患者均经 B 超或者 CT 等检查确诊为胆囊结石;(2)均具备手术指征且耐受手术者;(3)美国麻醉医师协会(ASA)分级 I~II 级者;(4)患者及其家属知情本次研究并已签署知情同意书。排除标准:(1)合并心肝肾等脏器功能障碍者;(2)伴有免疫性疾病者;(3)合并高血压、糖尿病者;(4)既往有胆囊结石手术史者;(5)伴有凝血功能障碍者;(6)妊娠或哺乳期妇女。根据随机数字表法将患者分为对照组($n=62$)和研究组($n=63$),其中对照组男 25 例,女 37 例,年龄 29~68 岁,平均(39.32 ± 4.39)岁;病程 7~29 月,平均(18.37 ± 2.38)月;体质量指数 $19\sim 25\text{ kg/m}^2$,平均(22.68 ± 1.05) kg/m^2 ;单发结石 32 例,多发结石 30 例;ASA 分级: I 级 35 例, II 级 27 例。研究组男 23 例,女 40 例,年龄 32~67 岁,平均(40.38 ± 4.41)岁;病程 5~30 月,平均(19.46 ± 3.29)月;体质量指数 $20\sim 24\text{ kg/m}^2$,平均(21.91 ± 0.96) kg/m^2 ;单发结石 28 例,多发结石 35 例;ASA 分级: I 级 33 例, II 级 30 例。两组患者临床基本资料比较无统计学差异($P > 0.05$),存在可比性。我院伦理委员会已批准本次研究。

1.2 治疗方法

对照组给予 OC 术式治疗,具体操作如下:采用全身麻醉或硬膜外麻醉,取右上腹肋缘下作一切口,长约 10 cm,依次解剖各层进腹,分离相应组织,采用顺切法切除胆囊,具体为解剖胆囊三角,依次离断结扎胆囊管、胆囊动脉,摘除胆囊,后用电动凝刀止血,逐层缝合伤口,术后行常规引流。研究组给予 LC 术

式治疗,具体操作如下:采用全身麻醉,患者呈仰卧位,常规构筑二氧化碳气腹,气腹压力维持在 12~15 mmHg 左右,采用常规四孔法技术操作切除胆囊,在脐下缘、腹正中剑突下方右侧、腋前线、右肋缘下方腋中线等部位进行穿刺,穿刺成功后在腹腔镜下探查病变胆囊以及胆囊三角区,使胆囊管、胆囊动脉充分暴露,于其近端、远端等处以钛夹进行关闭,间断胆囊管、胆囊动脉,采用电凝钩完整剥离胆囊,止血并采用氯化钠注射液冲洗创面,逐层缝合伤口,术后行常规引流。术后两组患者均给予常规抗感染治疗。

1.3 观察指标

1.3.1 临床指标 记录两组患者术中出血量、手术时间、术后住院时间、排气时间。

1.3.2 肝功能 于术前、术后 1 d 抽取患者清晨空腹静脉血 6 mL, 3000 r/min 离心 10 min,离心半径 8 cm,取上清液,置于 -40 摄氏度冰箱中待测。采用 Sysmex XE-2100 全自动血细胞分析仪检测肝功能指标,包括总胆红素(Total bilirubin, TBIL)、丙氨酸氨基转移酶(Alanine aminotransferase, ALT)、天冬氨酸转氨酶(Aspartate aminotransferase, AST)。

1.3.3 肾功能 于术前、术后 1 d、术后 3 d 抽取患者清晨空腹静脉血 6 mL,采用日立 7600 全自动生化分析仪检测血清尿素氮(Blood urea nitrogen, BUN)、血清肌酐(Serum creatinine, SCr),同时于术前、术后 1 d、术后 3 d 留取患者尿液标本,采用免疫散射速率比浊法检测白蛋白(Albumin, Alb)、N-乙酰- β -D-氨基葡萄糖苷酶(N-acetyl- β -D-glucosaminidase, NAG)、尿肌酐(Urinary creatinine, UCr)含量,计算 Alb/UCr、NAG/UCr 比值。

1.3.4 机体应激 于术前、术后 1 d 抽取患者清晨空腹静脉血 2 mL,采用 0.109 mol/L 枸橼酸钠 1:9 抗凝,2800 r/min 离心 8 min,离心半径 12 cm,分离血浆,置于 -40 摄氏度冰箱中待测。采用比色法检测丙二醛(Malondialdehyde, MDA)水平,采用酶速率法检测超氧化物歧化酶(Superoxide dismutase, SOD)水平,采用酶联免疫吸附法检测 C-反应蛋白(C-reactive protein, CRP)水平,试剂盒均购自武汉博士德生物科技有限公司,严格遵守试剂盒说明书进行操作。

1.3.5 并发症 观察两组术后并发症发生情况,包括切口感染、胆道感染、腹腔出血等。

1.4 统计学方法

采用 SPSS25.0 统计学软件进行统计分析,计量资料以($\bar{x} \pm s$)表示,采用 t 检验,计数资料以率(%)表示,采用 χ^2 检验, $P < 0.05$ 表明差异具有统计学意义。

2 结果

2.1 两组各项临床指标对比

术中出血量少于对照组,组间比较差异具有统计学意义($P<0.05$)。

研究组手术时间、术后住院时间、排气时间均短于对照组, 详见表 1。

表 1 两组各项临床指标对比($\bar{x} \pm s$)

Table 1 Comparison of clinical indicators between the two groups($\bar{x} \pm s$)

Groups	n	Intraoperative blood loss(mL)	Operation time(min)	Postoperative hospital stay(d)	Exhaust time(h)
Control group	62	49.23± 8.47	78.12± 15.92	9.65± 1.48	41.48± 8.48
Research group	63	32.59± 9.59	43.24± 10.17	7.87± 1.12	29.51± 11.09
t	-	10.276	14.621	7.590	6.771
P	-	0.000	0.000	0.000	0.000

2.2 两组肝功能指标比较

义($P>0.05$);与术前比较,两组患者术后 1 d TBIL、ALT、AST

术前两组患者 TBIL、ALT、AST 水平比较差异无统计学意义,水平平均升高,但研究组低于对照组($P<0.05$)。详见表 2。

表 2 两组肝功能指标比较($\bar{x} \pm s$)

Table 2 Comparison of liver function indexes between the two groups($\bar{x} \pm s$)

Groups	TBIL(μmol/L)		ALT(U/L)		AST(U/L)	
	Before operation	1d after operation	Before operation	1d after operation	Before operation	1d after operation
Control group(n=62)	9.53± 2.38	29.38± 5.69*	18.50± 5.35	41.39± 6.17*	20.24± 5.39	39.45± 6.02*
Research group(n=63)	9.48± 2.42	21.43± 6.31*	18.39± 6.28	32.31± 5.08*	19.28± 5.42	30.05± 5.87*
t	0.116	7.394	0.105	8.988	0.993	8.839
P	0.907	0.000	0.916	0.000	0.323	0.000

Note: compared with before operation, * $P<0.05$.

2.3 两组肾功能指标比较

究组与对照组比较差异无统计学意义($P>0.05$);两组患者术后

术前两组患者 BUN、SCr、Alb/UCr、NAG/UCr 比较差异无统计学意义($P>0.05$);与术前比较,两组患者术后 1 d Alb/UCr、NAG/UCr 升高,且研究组高于对照组($P<0.05$);与术后 1 d 比较,两组患者术后 3 d Alb/UCr、NAG/UCr 降低($P<0.05$),但研

3 d Alb/UCr、NAG/UCr 与术前比较差异无统计学意义($P>0.05$);两组患者术后 1 d、术后 3 dBUN、SCr 水平比较差异无统计学意义($P>0.05$)。详见表 3。

表 3 两组肾功能指标比较($\bar{x} \pm s$)

Table 3 Comparison of renal function indexes in the two groups($\bar{x} \pm s$)

Groups	BUN(mmol/L)			SCr(μmol/L)			Alb/UCr(mg/mol)			NAG/UCr(U/mol)		
	Before operation	1 d after operation	3 d after operation	Before operation	1 d after operation	3 d after operation	Before operation	1 d after operation	3 d after operation	Before operation	1 d after operation	3 d after operation
Control group(n=62)	3.81± 0.32	3.94± 0.50	3.88± 0.46	67.82± 8.57	68.84± 8.60	68.04± 9.32	2.60± 0.32	3.42± 0.41*	2.67± 0.48*	0.82± 0.24	1.61± 0.26*	0.94± 0.12*
Research group(n=63)	3.85± 0.85	3.99± 0.61	3.94± 0.53	68.25± 10.21	69.09± 7.68	68.86± 8.93	2.62± 0.41	3.95± 0.52*	2.72± 0.63*	0.84± 0.19	2.08± 0.38*	0.91± 0.22*
t	0.347	0.501	0.676	0.255	0.171	0.502	0.304	6.321	0.499	0.517	8.058	0.944
P	0.729	0.617	0.501	0.799	0.864	0.616	0.762	0.000	0.619	0.606	0.000	0.347

Note: compared with before operation, * $P<0.05$; compared with 1 d after operation, # $P<0.05$.

2.4 两组应激反应指标比较

低于对照组($P<0.05$)。详见表 4。

术前两组患者 SOD、MDA、CRP 水平比较差异无统计学意义($P>0.05$);与术前比较,两组患者术后 1 d SOD 水平降低,且研究组低于对照组($P<0.05$),MDA、CRP 水平升高,但研究组

2.5 两组术后并发症发生情况比较

对照组术后发生切口感染 7 例、胆道感染 7 例、腹腔出血 5 例,并发症发生率为 30.65%(19/62),研究组术后发生切口感

染 2 例、胆道感染 3 例、腹腔出血 2 例, 并发症发生率为 $P=0.007$)。
11.11%(7/63), 研究组并发症发生率低于对照组($\chi^2=7.238$,

表 4 两组应激反应指标比较($\bar{x} \pm s$)Table 4 Comparison of stress response indexes in the two groups($\bar{x} \pm s$)

Groups	SOD(U/L)		MDA(U/mL)		CRP(mg/L)	
	Before operation	1 d after operation	Before operation	1 d after operation	Before operation	1 d after operation
Control group(n=62)	44.59± 5.21	39.25± 4.74*	2.68± 0.79	3.94± 0.89*	5.41± 0.87	38.86± 6.36*
Research group(n=63)	45.40± 4.10	32.47± 5.46*	2.73± 0.71	3.11± 0.83*	5.39± 1.12	26.31± 5.57*
t	0.967	7.409	0.372	5.393	0.111	11.742
P	0.336	0.000	0.710	0.000	0.912	0.000

Note: compared with before operation, * $P<0.05$.

3 讨论

胆囊结石是胆道系统中常见疾病之一, 主要由于胆固醇与胆汁酸浓度比例变化进而引起胆汁淤滞, 形成胆结石^[10,11]。该病发病过程中常伴有恶心、呕吐、腹胀等症状, 严重影响患者生活质量^[12,13]。目前临床针对胆囊结石的治疗主要是手术切除, OC 虽有一定治疗效果, 但容易破坏胆囊功能, 且手术过程中的创伤、出血量、疼痛均能引起患者不同程度的应激反应^[14,15]。患者手术后免疫功能存在一定下降, 强烈的应激反应会影响手术治疗效果, 减缓患者康复进程^[16]。LC 作为近年来新兴的微创术式, 因其伤口较小、术后恢复快等优势已逐渐应用于临床^[17]。现临床实践中有研究发现经 LC 术式治疗后可出现暂时的肝肾功能异常现象^[18], 而 OC 也有此种情况发生^[19]。

本次研究结果显示, 研究组术后各项临床指标均优于对照组, 提示 LC 术式治疗优势明显, 这主要是由于 LC 术中视野清晰, 彻底暴露病变部位, 利于手术进行, 有效缩短手术时间, 减少机体应激, 且术后创口较小, 腹壁神经损伤较轻, 利于患者早日康复^[20]。对比两组肝功能指标发现, 术后肝功能指标均升高, 但研究组低于对照组, 提示 OC、LC 术式均会对患者肝功能造成一定影响, 但 LC 的影响程度小于 OC。闫长红等^[21]学者认为, LC 术中需行二氧化碳气腹, 致使机体肝脏血流动力学改变, 肝动脉、门静脉血流量减少, 进而影响肝功能, 且气腹压力越高, 对肝功能影响更为显著。而 OC 对肝功能的损害主要与术中的牵拉、麻醉药品、挤压以及应激反应等对肝脏血流的影响有关^[22]。本研究中 LC 影响较轻的原因可能在于气腹压力维持在低气压, 且术中视野清晰, 可避免切除邻近正常组织, 维持机体稳态, 对肝功能影响进一步减小。对比两组肾功能指标发现, 由于 BUN、SCr 水平通常在肾脏达到严重损害的时候才会出现急剧升高情况, 而 Alb/UCr、NAG/UCr 可反映早期肾损害程度^[23]。本次研究中 BUN、SCr 术前术后比较无统计学差异, 而 Alb/UCr、NAG/UCr 呈现先升高后降低的趋势, 表明两种术式均可对机体肾功能产生一过性损害, 且 LC 影响更大, 但术后 3d 均可恢复至正常水平。LC 对肾脏的损害主要来源于术中二氧化碳气腹压力对肾脏血管、肾组织产生压迫, 进而引起肾血流量减少, 引起暂时性的肾损害现象^[24,25]。对比两组应激反应指标发现, 两组患者术后 1 d SOD 降低, 且研究组低于对照组, MDA、CRP 升高, 但研究组低于对照组。其中 SOD 存在于氧细

胞中, 可有效清除氧自由基^[26], MDA 为反应脂质过氧化的终产物, 可反映组织中自由基含量以及脂质过氧化损伤程度^[27], CRP 是一种急性时相反应蛋白, 可反映早期机体炎症反应严重程度^[28]。LC 术式引起的机体应激反应更轻的原因可能在于多种应激源如术后疼痛、手术创伤、麻醉效应、出血等引发的应激反应相对较轻所致^[29]。另外, 研究组并发症发生率低于对照组。这与马雪等人^[30]研究结果基本一致, 表明 LC 术式可显著减少术后并发症发生率。

综上所述, 相比于 OC 术式, LC 术式优势显著, 虽然会对患者肾功能造成一过性伤害, 但术后可迅速恢复, 且可减轻机体肝功能、应激反应的影响, 术后并发症发生率少, 临床应用价值较高。

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