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经脐单孔与常规腹腔镜胆囊切除术对结石性胆囊炎患者肠胃功能、肝功能及免疫学指标的影响*

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摘要 目的:探讨经脐单孔与常规腹腔镜胆囊切除术(LC)对结石性胆囊炎患者肠胃功能、肝功能及免疫学指标的影响。**方法:**选取2016年3月~2019年12月间我院收治的157例结石性胆囊炎患者,根据手术方式分为三孔组($n=85$,常规三孔LC治疗)和单孔组($n=72$,单孔LC治疗),比较两组围术期指标、肠胃功能、肝功能及免疫学指标,并记录两组并发症发生情况。**结果:**单孔组住院时间短于三孔组,视觉疼痛模拟量表(VAS)评分低于三孔组($P<0.05$),单孔组手术时间长于三孔组($P<0.05$),两组术中失血量比较无差异($P>0.05$)。单孔组肠鸣音恢复时间、肛门排气时间、排便时间、进食时间短于三孔组($P<0.05$)。两组术后1d谷氨酰基转移酶(GGT)、天冬氨酸氨基转移酶(AST)、总胆红素(TBIL)水平均升高,但单孔组低于三孔组($P<0.05$)。两组术后1d免疫球蛋白M(IgM)、免疫球蛋白A(IgA)、 $CD3^+$ 、 $CD4^+/CD8^+$ 均降低,但单孔组高于三孔组($P<0.05$)。两组术后并发症发生率对比,差异未见统计学意义($P>0.05$)。**结论:**与常规三孔LC相比,经脐单孔LC治疗结石性胆囊炎,可有效减轻对机体肝功能、免疫学的影响,促进肠胃功能改善,减轻术后疼痛感,缩短住院时间。

关键词:经脐单孔;腹腔镜胆囊切除术;结石性胆囊炎;肠胃功能;肝功能;免疫学指标

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Effects of Transumbilical Single Port Laparoscopic Cholecystectomy and Conventional Laparoscopic Cholecystectomy on Gastrointestinal Function, Liver Function and Immunological Indexes in Patients with Calculous Cholecystitis*

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ABSTRACT Objective: To investigate the effects of transumbilical single port and conventional laparoscopic cholecystectomy (LC) on gastrointestinal function, liver function and immunological indexes in patients with calculous cholecystitis. **Methods:** 157 patients with calculous cholecystitis who were treated in our hospital from March 2016 to December 2019 were selected, and they were divided into three hole group ($n=85$, treated with conventional three hole LC) and single hole group ($n=72$, treated with single hole LC) according to the operation mode. The perioperative indexes, gastrointestinal function, liver function and immunological index of the two groups were compared, and the incidence of complications in the two groups was recorded. **Results:** The length of stay in the single hole group was shorter than that in the three hole group, the visual analogue scale (VAS) score was lower than that in the three hole group ($P<0.05$), and the operation time in the single hole group was longer than that in the three hole group ($P<0.05$). There was no difference in intraoperative blood loss between the two groups ($P>0.05$). The recovery time of bowel sounds, anal exhaust time, defecation time and eating time in the single hole group were shorter than those in the three hole group ($P<0.05$). The levels of glutamyl transferase (GGT), aspartate aminotransferase (AST) and total bilirubin (TBIL) in the two groups increased 1 day after operation, but the levels in the single well group were lower than those in the three hole group ($P<0.05$). The levels of immunoglobulin M (IgM), immunoglobulin A (IGA), $CD3^+$, $CD4^+/CD8^+$ in the two groups were significantly lower than those in the three well group ($P<0.05$). There was no significant difference in the incidence of postoperative complications between the two groups ($P>0.05$). **Conclusion:** Compared with the conventional three port LC, transumbilical single port LC in the treatment of calculous cholecystitis can effectively reduce the impact on liver function and immunology, promote the improvement of gastrointestinal function, reduce postoperative pain and shorten hospital stay.

Key words: Transumbilical single port; Laparoscopic cholecystectomy; Calculous cholecystitis; Gastrointestinal function; Liver function; Immunological index

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前言

结石性胆囊炎是指胆囊颈或胆囊内结石阻塞胆囊管引发的疾病,临床主要表现为腹痛、腹胀、恶心呕吐等症状^[1,2]。随着饮食结构和生活习惯的改变,结石性胆囊炎的发病率呈逐年上升趋势,且其发病率随年龄增长而增加^[3,4]。目前临床主要通过手术治疗结石性胆囊炎,随着微创技术的发展及进步,腹腔镜胆囊切除术(LC)已成为临床治疗结石性胆囊炎的经典术式^[5,6]。既往临床多采用三孔实施手术操作,虽也属于微创性,但操作孔较多,术后创伤仍不可避免^[7]。基于此,经脐单孔 LC 逐渐应用于临床,该手术方式利用人体天然疤痕-脐部作为切口,不仅可减少手术创伤,还可满足人们手术减少残留疤痕的需求^[8]。现临床有关经脐单孔 LC 和三孔 LC 治疗结石性胆囊炎的疗效仍存在一定的争议,本研究就此展开探讨,以期临床结石性胆囊炎的术式选择提供参考。

1 资料与方法

1.1 一般资料

选取 2016 年 3 月~2019 年 12 月期间我院收治的 157 例结石性胆囊炎患者,纳入标准:(1)诊断标准参考《实用外科学》^[9];(2)均符合手术指征者,手术由同一组医师完成操作;(3)经腹部 CT 或 B 超检查证实为结石性胆囊炎;(4)临床病例资料完整,完成本次研究者。排除标准:(1)存在胆囊恶性病变指征;(2)合并全身性感染者;(3)合并凝血功能障碍者;(4)处于妊娠期或哺乳期的女性者;(5)合并心肺等重要脏器功能障碍者;(6)既往有上腹部手术史者。根据手术方式的不同将患者分为三孔组(n=85)和单孔组(n=72),其中三孔组男 48 例,女 37 例,平均年龄(39.67±4.82)岁;平均病程(5.42±1.19)月;平均体质指数(23.17±1.26)kg/m²。单孔组男 42 例,女 30 例,平均年龄(38.93±4.53)岁;平均病程(5.73±1.26)月;平均体质指数(23.39±1.42)kg/m²。两组一般资料对比无统计学差异($P>0.05$),具有可比性。本次研究经我院伦理学委员会批准同意。

1.2 手术方法

术前常规禁食 8 h、禁饮 6 h,术前 30 min 肌注阿托品 0.5 mg、鲁米那 100 mg。单孔组采取经脐单孔 LC 治疗,患者气管插管全麻、仰卧,于脐上缘作一弧形切口,大小 2~3 cm 左右,直视状态下逐层切开腹壁,构建人工气腹,腹内压 10~12 mmHg,二氧

化碳流量为 40 L/min,插入三通道套管,置入单孔分离钳、腹腔镜、单孔抓钳,将胆囊颈牵拉向前外侧,暴露胆囊三角并解剖,游离胆囊管与胆囊动脉,夹闭胆囊管近远端,以电凝钩分离胆囊,创面止血。自胆囊床逆行结合顺行剥离胆囊,自脐孔取出,逐层缝合伤口。三孔组采取三孔 LC 治疗,患者气管插管全麻、仰卧,于脐缘下(切口 1 cm)、剑突下(切口 1.2 cm)、右锁骨中线肋缘下(切口 0.5 cm)分别穿刺,建立气腹,腹内压 10~12 mmHg,二氧化碳流量为 40 L/min,腹腔镜及手术器械均通过手术操作孔置入,游离胆囊三角区组织,可吸收夹夹闭,切除整个胆囊并取出,逐层缝合,完成手术。两组术后均给予常规抗生素进行抗感染治疗。并给予常规镇痛、水电解质平衡调节等辅助治疗,术后 6 h 可开始进流质食物,并按时回院复查肝胆彩超。

1.3 观察指标

(1)手术相关指标:记录两组住院时间、术中失血量、手术时间、术后 24 h 疼痛评分。其中术后疼痛评分采用视觉疼痛模拟量表(VAS)^[10]评定,VAS 评分 0~10 分,分数越高,疼痛感越强烈。(2)肠胃功能:记录两组患者肛门排气时间、肠鸣音恢复时间、排便时间及进食时间。(3)肝功能、免疫学指标:抽取患者术前、术后 1 d 常规采集患者肘静脉血样,低温下充分凝血、离心后(3700 r/min 离心 12 min,离心半径 11 cm)提取上层血清待测。选用武汉华美生物科技有限公司试剂盒,采用酶联免疫吸附法检测谷氨酰基转移酶(GGT)、天冬氨酸氨基转移酶(AST)、总胆红素(TBIL)。采用免疫比浊法检测免疫球蛋白 M(IgM)、免疫球蛋白 A(IgA)水平。采用美国 BD 公司生产的 FACSC alibur 流式细胞仪检测 CD3⁺、CD4⁺、CD8⁺,计算 CD4⁺/CD8⁺。(4)并发症:记录并发症情况。

1.4 统计学方法

应用 SPSS27.0 软件进行统计学分析,围术期指标、肠胃功能恢复情况指标等计量资料以($\bar{x} \pm s$)表示,两组采用 t 检验。性别比例等计数资料以百分比表示,采用 χ^2 检验。 $P<0.05$ 为差异具有统计学意义。

2 结果

2.1 围术期指标比较

单孔组住院时间短于三孔组,VAS 评分低于三孔组($P<0.05$),单孔组手术时间长于三孔组($P<0.05$),两组术中失血量比较无差异($P>0.05$),见表 1。

表 1 两组围术期指标比较($\bar{x} \pm s$)
Table 1 Comparison of perioperative indexes between the two groups($\bar{x} \pm s$)

Groups	Operation time(min)	Intraoperative blood loss (mL)	Length of stay(d)	VAS(scores)
Three hole group (n=85)	42.31± 5.14	19.47± 2.57	4.74± 0.38	3.42± 0.36
Single hole group (n=72)	53.79± 6.38	18.82± 3.26	2.29± 0.37	2.79± 0.33
t	12.484	1.396	40.742	11.349
P	0.000	0.165	0.000	0.000

2.2 两组肠胃功能恢复情况比较

单孔组肛门排气时间、排便时间、肠鸣音恢复时间、进食时间短于三孔组($P<0.05$),见表 2。

2.3 两组肝功能指标比较

两组术前 GGT、AST、TBIL 水平比较,差异未见统计学意义($P>0.05$),两组术后 1d GGT、AST、TBIL 水平均升高,但单

孔组低于三孔组($P<0.05$),见表3。

降低,但单孔组高于三孔组($P<0.05$),见表3。

2.4 两组免疫学指标比较

两组术前 IgM、IgA、CD3⁺、CD4⁺/CD8⁺ 比较,差异未见统计学意义($P>0.05$),两组术后 1 d IgM、IgA、CD3⁺、CD4⁺/CD8⁺ 均

2.5 两组并发症发生率比较

两组术后并发症发生率对比,差异未见统计学意义($P>0.05$),见表5。

表2 两组肠胃功能恢复情况比较($\bar{x}\pm s, h$)

Table 2 Comparison of gastrointestinal function recovery between the two groups($\bar{x}\pm s, h$)

Groups	Anal exhaust time	Recovery time of bowel sounds	Defecation time	Eating time
Three hole group (n=85)	17.44± 2.11	15.37± 2.26	28.01± 3.19	32.86± 2.52
Single hole group(n=72)	13.03± 2.68	11.28± 2.29	22.73± 3.16	26.05± 2.63
t	11.530	11.230	10.379	16.538
P	0.000	0.000	0.000	0.000

表3 两组肝功能指标比较($\bar{x}\pm s, U/L$)

Table 3 Comparison of liver function indexes between the two groups($\bar{x}\pm s, U/L$)

Groups	GGT		AST		TBIL	
	Before operation	1 d after operation	Before operation	1 d after operation	Before operation	1 d after operation
Three hole group (n=85)	17.29± 2.32	33.71± 2.83*	21.39± 2.26	36.08± 2.39*	15.16± 2.29	26.34± 2.44*
Single hole group (n=72)	17.45± 2.17	25.12± 2.65*	21.27± 2.37	29.12± 2.28*	14.97± 2.41	19.02± 2.37*
t	0.443	19.509	0.324	18.568	0.506	18.978
P	0.658	0.000	0.746	0.000	0.614	0.000

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

表4 两组免疫学指标比较($\bar{x}\pm s$)

Table 4 Comparison of immunological indexes between the two groups($\bar{x}\pm s$)

Groups	IgM(g/L)		IgA(g/L)		CD3 ⁺ (%)		CD4 ⁺ /CD8 ⁺	
	Before operation	1 d after operation	Before operation	1 d after operation	Before operation	1 d after operation	Before operation	1 d after operation
Three hole group (n=85)	2.27± 0.19	1.73± 0.17*	2.31± 0.24	1.69± 0.21*	49.41± 5.49	36.79± 5.32*	1.78± 0.16	1.28± 0.13*
Single hole group(n=72)	2.31± 0.22	1.96± 0.14*	2.35± 0.22	1.98± 0.25*	49.35± 5.38	42.07± 6.25*	1.73± 0.21	1.47± 0.19*
t	1.222	9.148	1.081	7.900	0.069	5.719	1.691	7.400
P	0.223	0.000	0.281	0.000	0.945	0.000	0.093	0.000

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

表5 两组并发症发生率比较[例(%)]

Table 5 Comparison of the incidence of complications between the two groups [n(%)]

Groups	Urinary retention	Incision hematoma	Incision fat liquefaction	Total incidence
Three hole group (n=85)	2(2.35)	1(1.18)	1(1.18)	4(4.71)
Single hole group(n=72)	1(1.39)	0(0.00)	0(0.00)	1(1.39)
χ^2				1.391
P				0.238

3 讨论

结石性胆囊炎是指胆囊颈部和胆囊内发生的结石,而结石形成的主要原因有以下几点:胆汁中胆固醇过饱和,导致胆汁

酸盐分泌过少形成结石;胆汁中成核因子异常等^[11,12]。当胆囊内部存在结石时,胆囊管被阻塞,引起胆汁淤积、细菌感染而引起急性炎症^[13]。针对结石性胆囊炎患者,若无重症急性胰腺炎、急性胆囊穿孔等急腹症时,通常采取禁食、抗感染、维持水电解质平衡等保守治疗,待炎症控制后再行手术治疗^[14-16]。但当上述保守治疗无效或病情呈进行性恶化时,则应考虑急诊胆囊切除术。LC引起具有术中创伤小、术后恢复快、并发症少等优点而受到广大医师患者的青睐,广泛应用于临床^[17,18]。而LC治疗也经历了从经典的四孔法手术到微型腹腔镜手术、三孔法、二孔法甚至单孔法手术等阶段,现如今国内现阶段多采用三孔法^[19]。单孔LC就是微创外科技术不断提高、器械不断完善的结果^[20]。但由于该手术所用器械均由脐部置入,术中视野暴露不清晰,且器械间干扰较大,因此手术难度较大,值得临床进一步探索。

本次研究结果显示,单孔组住院时间短于三孔组,VAS评分低于三孔组,胃肠道功能恢复情况优于三孔组,可能原因在于,单孔组的患者操作孔仅有1个,且位于下腹部,术后损伤轻。其次,经脐切口本身就较大,可顺利将胆囊取出而无需再行机械性扩张,可有效减少术中损伤,减少患者术后疼痛,利于患者恢复^[22,23]。此外,腹部手术患者受手术创伤、麻醉、术中操作等多种刺激,易引起肠道功能紊乱。既往也有临床研究证实,切口越大者的肠胃功能紊乱可能性越大。单孔组中仅留有一个操作孔也可顺利将胆囊取出,对腹壁损伤小,利于胃肠道功能快速恢复^[24]。但本研究中显示单孔组的手术时间长于三孔组,且在术中失血量方面优势不显著,可能是因为经脐单孔技术要求高,部分医师临床经验不足,导致手术时间长,在术中出血量方面不占明显优势。由于LC手术的进行需建立人工气腹,而随着气腹腹压升高,二氧化碳进入血液,刺激机体产生内分泌激素,加重肝动脉、门静脉缺血,肝功能受到影响。同时外科手术可对机体造成不同程度的刺激,影响机体稳定的内环境而引起免疫抑制,其中T淋巴细胞亚群可反映免疫调节能力,其特异性免疫改变与创伤程度息息相关;细胞免疫作为免疫功能的重要组成部分,手术对免疫球蛋白有过度消耗和抑制合成这一双重作用。本研究结果中,经脐单孔LC治疗结石性胆囊炎,可有效减轻对机体肝功能、免疫学的影响。经脐单孔LC经由脐部入路,手术操作不会影响胃肠道中空腔脏器,故对机体肝功能几乎无影响。同时单孔实施操作,肋缘及剑突处并不需要作切口,腹壁组织、神经损伤减轻,应激反应程度降低,可有效减轻免疫抑制^[25,26]。另两组术后并发症发生率对比未见明显差异,可能与两种手术均属于微创手术,本身即具备安全、微创的特点有关。目前经脐单孔仍处于起步阶段,技术难点在于器械交叉拥挤、直线视野、腹腔漏气等,局限性也较为显著。期待随着后续手术经验积累,上述问题可逐一解决。

综上所述,与常规三孔LC相比,经脐单孔LC治疗结石性胆囊炎,可有效减轻对机体肝功能、免疫功能的影响,促进肠胃功能改善,疼痛轻,术后并发症少。

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