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·专题研究·

经皮经肝胆囊穿刺置管引流术后序贯腹腔镜胆囊切除术（LC）与一期LC治疗II级急性胆囊炎疗效的倾向性评分匹配比较

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摘　要

背景与目的：急性胆囊炎（AC）是普通外科常见疾病。腹腔镜胆囊切除术（LC）被公认为AC的“金标准”术式。东京指南2018（TG18）推荐将AC的严重程度分为I（轻度）、II（中度）、III（重度）级，手术治疗方案选择因分级而异。临床上对于I、III级AC治疗方案基本达成共识，然而，针对II级AC治疗策略仍存在争议，更多依赖于术者经验及就诊单位医疗平台决定。II级AC患者术中情况最为复杂，不适时宜的LC手术可能导致较高的并发症，如胆汁漏、腹腔内脓肿，甚至胆管损伤。经皮经肝胆囊穿刺置管引流术（PTGBD）能有效缓解胆囊炎症，减轻胆囊壁水肿和胆囊周围粘连，为择期手术创造“时间窗”。因此，本研究探讨评估PTGBD后择期LC手术策略在II级AC中的临床应用价值。

方法：回顾性分析2017年10月—2022年10月江苏大学附属宜兴医院205例依据TG18分级为II级AC患者临床资料。其中，42例行PTGBD序贯LC（PTGBD+LC组），163例行一期LC组（LC组）。采用倾向性评分（PSM）方法将两组进行1∶1匹配，比较匹配后两组间在ICU入住率、手术时间、术中出血量、术中放置引流率、中转开腹率、胆道损伤率、住院时间、住院总费用及手术相关并发症等临床指标的差异。

结果：42例接受PTGBD患者均未发生穿刺相关并发症，仅1例患者出现管道滑脱而接受重新置管；42例患者全部接受带管期间生活质量问卷调查，结果显示39例（92.8%）患者表示可以耐受。PSM匹配后，两组各38例，基线资料均衡可比。两组均无围手术期死亡；PTGBD+LC组较LC组手术时间短（64.4 min *vs.* 84.4 min）、术中出血量少（21.9 mL *vs.* 47.6 mL）、LC术后住院时间短（3.4 d *vs.* 5.3 d）、术后总并发症发生率低（5.3% *vs.* 23.7%），但住院总费用增加（29 239元 *vs.* 22 150元），差异均存在统计学意义（$P<0.05$）。两组术中中转开腹率（0 *vs.* 13.2%）、术中胆道损伤率（0 *vs.* 5.3%）、术中放置引流率（92.1% *vs.* 100%）及术后ICU入住率（0 *vs.* 5.3%）差异均无统计学意义（均$P>0.05$）。

结论：PTGBD术后序贯LC治疗TG18 II级AC虽然增加了患者医疗总费用，但是却显著降低了手术难度、减少了手术相关并发症发生率，值得在临床上个体化推广使用。

关键词　胆囊炎，急性；胆囊切除术，腹腔镜；经皮经肝胆囊穿刺置管引流；倾向性评分

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Propensity score matching comparison of sequential laparoscopic cholecystectomy (LC) after percutaneous transhepatic gallbladder drainage and urgent LC for grade II acute cholecystitis

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Abstract

Background and Aims: Acute cholecystitis (AC) is a frequently encountered disease in the general surgical practice. Laparoscopic cholecystectomy (LC) is currently recognized as the "gold-standard" treatment for AC. The severity of AC is recommended to be classified as grade I (mild), II (moderate) and III (severe) by the Tokyo guidelines 2018 (TG18), and the choice of surgical procedure varies according to the grade of disease. In clinical practice, the consensus has been achieved on the treatment of grade I and III AC. However, the treatment strategy for grade II AC is still controversial, which depends more on the surgeon's experience and the admitting medical provider. The intraoperative conditions are complicated in patients with grade II AC, for which inappropriate LC surgery may cause higher incidence of complications, such as bile leakage, abdominal abscess, and even bile duct injury. Percutaneous transhepatic gallbladder drainage (PTGBD) can effectively relieve the inflammation of the gallbladder, gallbladder wall edema and adhesions around the gallbladder, and also provide a "time window" for elective surgery. Therefore, this study was performed to evaluate the application value of sequential LC after PTGBD in the treatment of grade II AC.

Methods: The clinical data of 205 patients classified as grade II AC according to TG18 classification in Yixing Hospital Affiliated to Jiangsu University from October 2017 to October 2022 were analyzed retrospectively. Of the patients, 42 cases underwent PTGBD followed by elective LC (PTGBD+LC group) and 163 cases underwent urgent LC (LC group). The two groups of patients were matched using propensity score matching (PSM) at a 1∶1 ratio. After match, the differences in clinical indexes such as ICU admission rate, operative time, intraoperative blood loss, intraoperative drainage rate, open conversion rate, bile duct injury rate, length of hospital stay, total hospitalization cost and surgical complications were compared between the two groups of patients.

Results: No puncture-related complications occurred in the 42 patients who received PTGBD. Only one patient had catheter slippage and underwent catheter re-insertion. All the 42 patients received a questionnaire survey on the quality of life during indwelling catheterization, and the results showed that 39 patients (92.8%) tolerated the treatment. There were 38 patients in each group after match, with balanced and comparable baseline data. There was no perioperative death in both groups. In PTGBD+LC group, the operative time was shorter (64.4 min *vs.* 84.4 min), intraoperative blood loss was less (21.9 mL *vs.* 47.6 mL), length of hospital stay after LC was shorter (3.4 d *vs.* 5.3 d), and overall incidence of postoperative complications was lower (5.3% *vs.* 23.7%), but the total hospitalization cost was higher (29 239 yuan *vs.* 22 150 yuan) than those in LC group, and all differences had statistical significance (all $P<0.05$). There were no significant differences in rates of open conversion (0 *vs.* 13.2%), bile duct injury (0 *vs.* 5.3%), intraoperative drainage (92.1% *vs.* 100%) and postoperative ICU admission (0 *vs.* 5.3%) between the two groups ($P>0.05$).

Conclusion: Sequential LC after PTGBD in the treatment of TG18 grade II AC increases the total

medical cost, but significantly reduce the difficulty of surgery and the incidence of surgical-related complications. So, it is still suitable for individualized application in clinical practice.

Key words Cholecystitis, Acute; Cholecystectomy, Laparoscopic; Percutaneous Transhepatic Gallbladder Drainage; Propensity Score

CLC number: R657.4

随着腹腔镜技术的飞速发展，腹腔镜胆囊切除术（laparoscopic cholecystectomy，LC）作为腹腔镜技术在腹部外科的典型代表术式，其临床适应证逐步在扩大。从急性胆道感染 2013 东京指南（Tokyo Guideline 2013，TG13）中 LC 优于开腹胆囊切除手术（open cholecystectomy，OC）至 TG18 中 LC 完全替代了 OC，LC 已经成为急性胆囊炎（acute cholecystitis，AC）“金标准”术式[1]。然而，对于Ⅱ级 AC（中度 AC）患者治疗方案、手术时机的选择仍然存在争议[2]。因此，本研究回顾性分析了我院收治的Ⅱ级 AC 患者，比较评估经皮经肝胆囊穿刺置管引流（percutaneous transhepatic gallbladder drainage，PTGBD）序贯 LC 与一期 LC 的疗效差异。总结Ⅱ级 AC 诊疗经验，为 PTGBD 技术临床推广应用提供数据支持。

1　资料与方法

1.1　一般资料

回顾性分析 2017 年 10 月—2022 年 10 月在江苏大学附属宜兴医院收治的 AC 并最终接受腹腔镜手术治疗患者的临床资料。入组标准：参照 TG18 中Ⅱ级 AC 诊断标准[3]，AC 伴有任意以下情况之一：⑴ 白细胞计数升高（$>18\times10^9$/L）；⑵ 右上腹可触及压痛肿块；⑶ 持续时间超过 72 h；⑷ 明显的局部炎症（胆汁性腹膜炎、胆囊周围脓肿、肝脓肿、坏疽性胆囊炎、气肿性胆囊炎）。排除标准：⑴ 合并胆总管结石；⑵ 胆囊萎缩；⑶ 合并器官/系统功能障碍者（评估达Ⅲ级）。共纳入 205 例患者，其中 42 例行 PTGBD+ 择期 LC 组（PTGBD+LC 组），163 例行一期 LC 组（LC 组）。根据医学伦理委员会的规定，回顾性科研项目中仅仅使用患者临床数据及围术期客观临床检验结果，未因科研因素增加患者医疗费用或医学风险。所有参与者都获得书面知情同意书，符合免除知情同意申请。

1.2　手术方法

一期 LC 组（LC 组）：全身麻醉下，取常规 LC 体位，手术均由副主任医师以上高年资医生实施完成。采用三孔或者四孔法手术。术中尽量达到安全性关键术野（critical view of safety，CVS）暴露[4]，如胆囊三角肥厚，“三管”关系难以辨认者，则改行逆行切除；胆囊壁重度水肿或坏疽与肝床界限不清者，则行胆囊次全切除并黏膜电凝消融；若术中出现解剖结构不清、难以控制的出血甚至怀疑胆道损伤时及时转为开腹手术。术中胆管损伤主要依赖术中发现手术野存在胆汁、发现异常的解剖或是胆道造影结果显示造影剂外溢等异常影像特征。术后腹腔引流管引出胆汁样液体，或者患者术后出现腹腔感染表现经超声介入穿刺引流见胆汁样液体，可诊断为胆汁漏[5]。PTGBD+LC 组：选择 B 超或者 DSA 引导下 PTGBD。患者取平卧位，充分显露右侧肋间隙。经超声检查确定穿刺部位，通常选取右侧腋中线 7~10 肋间。2% 利多卡因行局部浸润麻醉，超声同轴引导下以 PTCD 套件（邦特，台湾），行一步法穿刺胆囊，穿刺成功后，留置 8~10 F 猪尾导管。常规留取胆汁行细菌培养及药敏试验。继续抗感染及支持治疗直至患者症状及体征消失后，予以带管出院。门诊随诊至术后 4~6 周，再次入院评估，行二期 LC。两组患者的相关图片见图 1–2。

1.3　观察指标

手术相关指标，包括手术时间、术中出血量、中转开腹率、术中胆管损伤发生率、ICU 入住率、术后住院时间及住院总费用（本次患病期间所产生的医疗总费用）。术后并发症，包括术后胆汁漏、腹腔内出血、切口感染等。

1.4　倾向性评分（propensity score matching，PSM）分析

为减少样本选择偏倚带来的混杂因素，采用 PSM 二分类 Logistic 回归分析[6]。选择变量包括年龄、性别、体质量指数（body mass index，

BMI）、体温、首发症状持续时间、右上腹压痛性包块、美国麻醉医师协会身体状况评分（The American Society of Anesthesiologists physical status，ASA-PS）分级、查尔森合并症指数（Charlson comorbidity index，CCI）评分、白细胞计数、糖尿病、既往上腹部手术史以及胆囊壁厚度等，采用最邻近匹配法进行两组间的1∶1匹配，卡钳值取0.02。

1.5 统计学处理

采用SPSS 26.0统计学软件对数据进行PSM 1∶1匹配后统计分析。计量资料以均数±标准差（$\bar{x} \pm s$）表示，采用独立样本t检验；计数资料以例数（百分比）[n（%）]表示，采用χ^2检验及Fisher检验。P<0.05为差异有统计学意义。

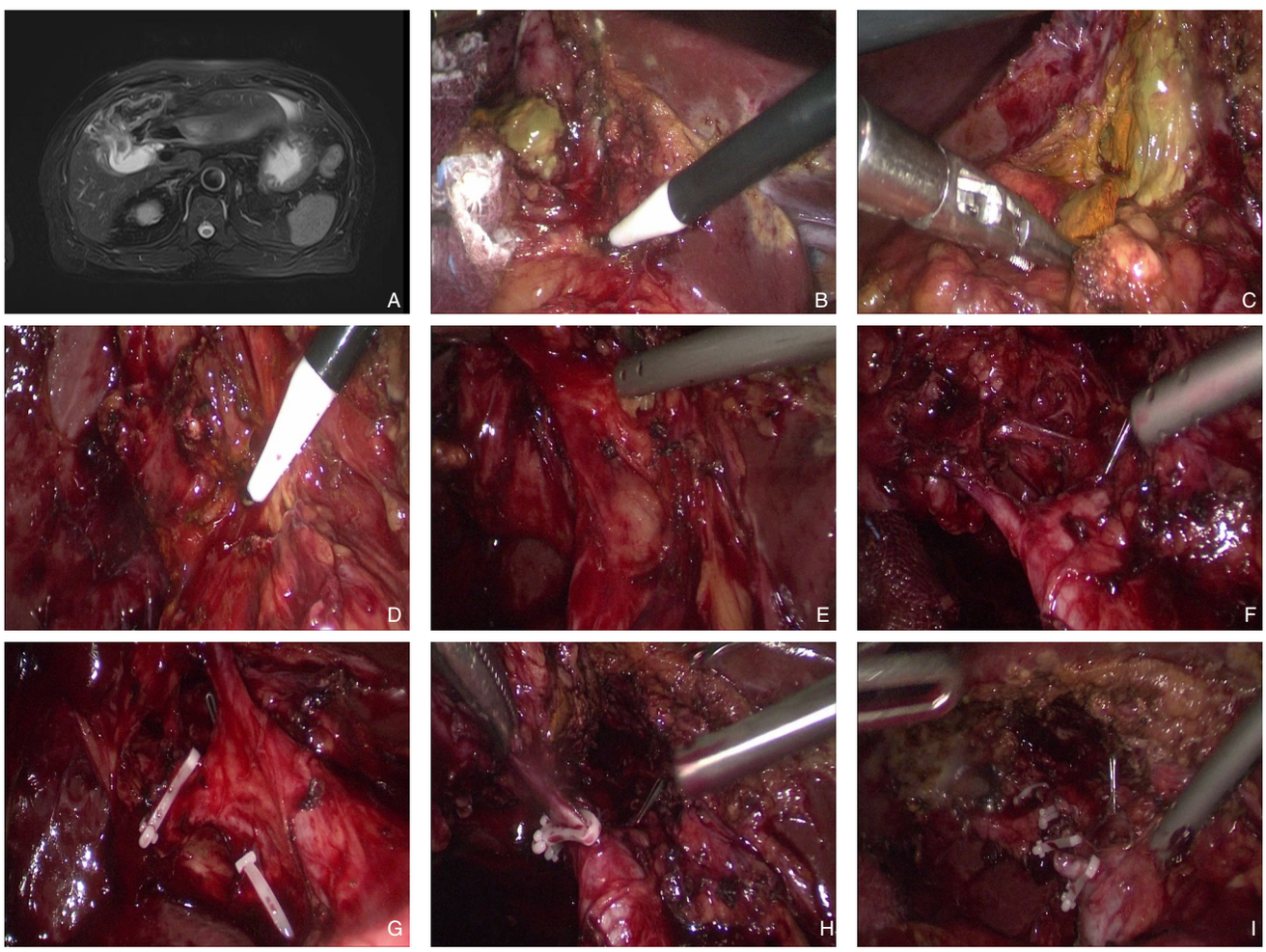

图1 LC组相关图片 A：术前MRCP提示胆囊积液周围结构紊乱；B-D：胆囊与周围网膜、结肠致密粘连，胆囊底部坏疽，胃窦-十二指肠与胆囊颈部间呈“亚急性”炎改变；E-G：初步显露胆囊三角，顿锐性打开胆囊三角浆膜，完成CVS解剖暴露；H-I：离断胆囊管，剥离胆囊，胆囊床创面充分止血，并检查无胆汁漏

Figure 1 **Relevant pictures of LC group** A: Preoperative MRCP showing cholecystic fluid collections and disorders of surrounding structures; B-D: Dense adhesions between the gallbladder and the surrounding omental tissue and colon, gangrenous lesions on the gallbladder fundus, and signs of "subacute" inflammation between the gastric antrum-duodenum and the neck of the gallbladder; E-G: Preliminary exposure of the Calot's triangle, and completing the anatomical exposure of CVS by combination of blunt and sharp cutting of the serosa over the Calot's triangle; H-I: Division of the cystic duct, gallbladder dissection the liver bed, the adequate hemostasis of the wound surface on the gallbladder bed, and confirmation of the absence of bile leakage

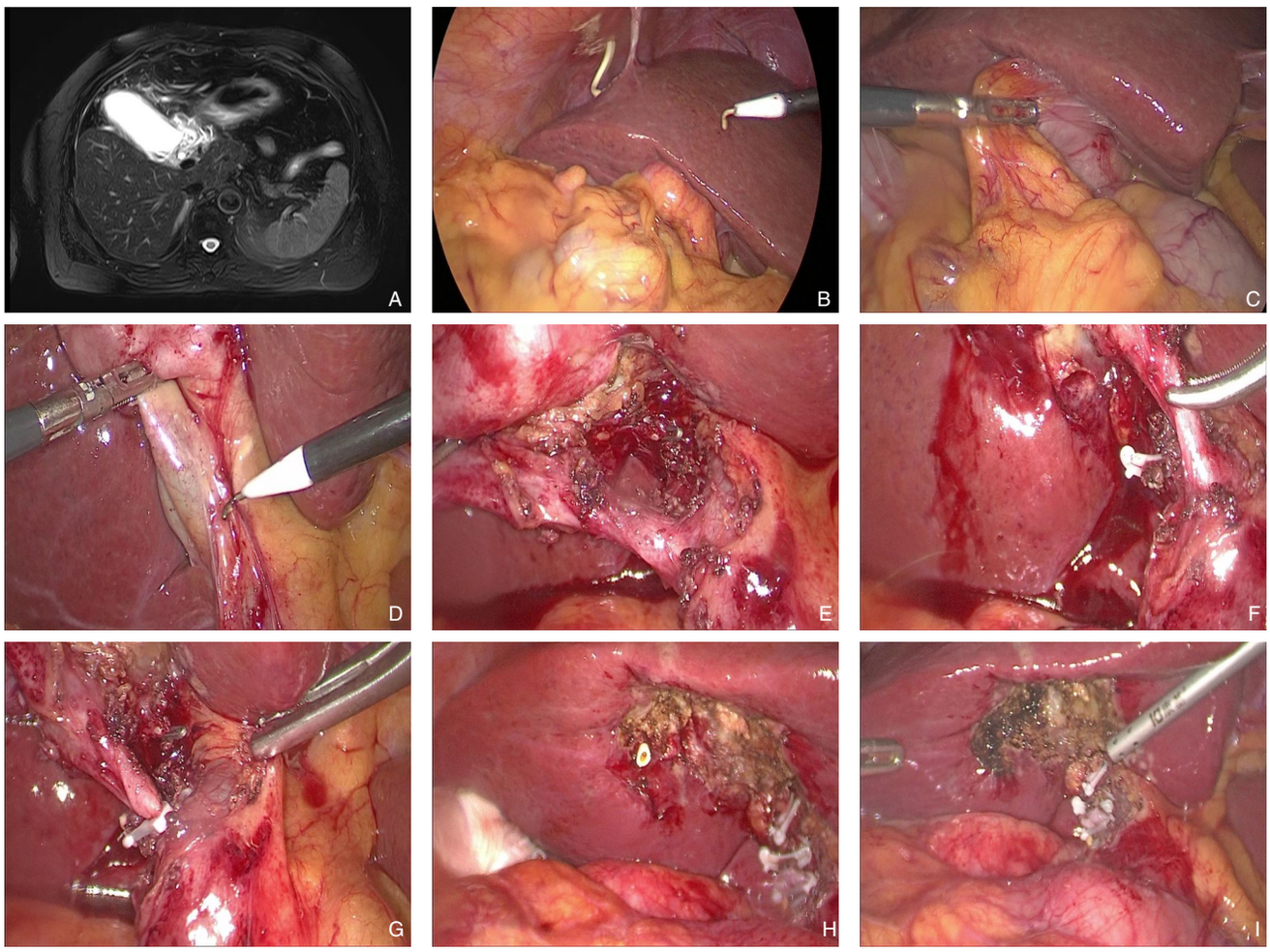

图2　PTGBD+LC组相关图片　A：术前MRCP提示胆囊积液，胆囊壁水肿，胆囊三角肥厚，周围结构紊乱；B–C：PTGBD穿刺术后4周，LC手术探查见，穿刺管经肝脏膈面穿入胆囊内，腹腔轻度粘连，胆囊慢性炎症改变；D–F：显露胆囊三角，顿锐性打开胆囊三角浆膜，完成CVS解剖暴露；G–I：离断胆囊管，剥离胆囊，胆囊床创面充分止血，并检查无胆汁漏

Figure 2　**Relevant pictures of PTGBD+LC group**　A: Preoperative MRCP showing cholecystic fluid collections, gallbladder wall edema, hypertrophy of the Calot's triangle, and disorders of surrounding structures; B–C: Surgical exploration during LC 4 weeks after PTGBD puncture showing the insertion of the catheter into the gallbladder through the diaphragmatic surface of the liver, mild adhesions in the abdominal cavity, and chronic inflammatory changes in the gallbladder; D–F: Exposure of the Calot's triangle, and completing the anatomical exposure of CVS by combination of blunt and sharp cutting of the serosa over the Calot's triangle; G–I: Division of the cystic duct, gallbladder dissection the liver bed, the adequate hemostasis of the wound surface on the gallbladder bed, and confirmation of the absence of bile leakage

2　结　果

2.1　一般资料

42例接受PTGBD穿刺患者，操作顺利，未有出血、胆汁漏等穿刺相关并发症发生。1例患者术后第5天出现管道堵塞，B超证实管道滑脱，24 h内再次超声引导下成功重置导管。42例患者二期住院手术后，接受带管期间生活质量问卷调查，39例（92.8%）患者表示能较好耐受带管生活。在PSM匹配前，两组的年龄、胆囊壁厚度差异有统计学意义（均P<0.05）。PSM匹配后，两组各获得38例患者，两组基线资料差异均无统计学意义（均P<0.05）（表1）。

2.2　PSM后两组围手术期指标比较

两组患者均未出现死亡病例。PTGBD+LC组较LC组手术时间短、术中出血量少、LC术后住院时间短；但是，住院总费用显著增加，差异均有统计学意义（均P<0.05）；PTGBD+LC组均顺利完成

LC术，安返病房，未有术中胆管损伤及中转开腹者，LC组5例中转开腹手术，2例术后转入ICU过渡治疗，2例术中发现术野胆汁外溢，诊断为胆管损伤。但是，两组以上指标差异无统计学意义（均P>0.05）。2例胆管损伤探查证实：1例为Bismuth I型肝总管横断损伤，术中及时行一期手术端端吻合修补，并放置T管支撑引流；1例为术中胆囊管汇合部撕裂伤，4-0可吸收线修补后，胆总管切开放置T管支撑减压引流。2例患者均顺利出院，短期随访良好。术后并发症方面：PTGBD+LC组出现1例胆汁漏并继发切口感染，给予保守通畅引流方案，2周后顺利拔出腹腔引流管后痊愈。另1例切口感染予换药处理后愈合。LC组术后9例出现并发症。具体为：1例胆汁漏合并术后出血及切口感染；2例出现术后胆汁漏，1例出现术后出血，5例出现术后切口感染。PTGBD+LC组并发症发生率方面显著减少（5.3% *vs.* 23.7%），有统计学差异（P<0.05）（表2）。

表1 PSM前后两组患者临床基线资料比较

Table 1 Comparison of the clinical baseline data between the two groups of patients before and after PSM

资料	匹配前		t/χ^2	P	匹配后		t/χ^2	P
	PTGBD+LC组(n=42)	LC组(n=163)			PTGBD+LC组(n=38)	LC组(n=38)		
年龄(岁,$\bar{x}\pm s$)	66.5±8.7	60.8±11.8	2.925	0.004	65.9±8.9	63.0±11.5	1.217	0.227
性别[n(%)]								
男	25(59.5)	83(50.9)	0.992	0.319	23(60.5)	21(55.3)	0.216	0.642
女	17(40.5)	80(49.1)			15(39.5)	17(44.7)		
BMI(kg/m^2,$\bar{x}\pm s$)	23.1±2.9	23.4±3.0	−0.618	0.537	23.5±2.7	22.8±2.7	1.105	0.273
体温≥37.8 ℃[n(%)]	29(69.0)	101(62.0)	0.722	0.395	25(65.8)	25(65.8)	—	1.000
首发症状持续时间(h,$\bar{x}\pm s$)	76.7±18.0	75.3±19.2	0.441	0.660	74.3±15.2	75.9±19.7	−0.411	0.683
右上腹压痛性包块[n(%)]	24(57.1)	97(59.5)	0.077	0.781	20(52.6)	19(50)	0.053	0.818
CCI评分	3.5±1.0	3.6±1.00	−0.749	0.455	3.5±1.03	3.6±1.00	−0.427	0.654
ASA-PS分级(≤II级/>II级)[n(%)]	33(78.6)	118(72.4)	0.657	0.418	29(76.3)	32(84.2)	0.748	0.387
白细胞计数(×10^9/L,$\bar{x}\pm s$)	16.9±3.5	16.9±3.2	−0.092	0.927	17.2±1.0	17.2±3.2	0.069	0.945
糖尿病史[n(%)]	24(57.1)	66(40.5)	3.76	0.052	20(52.6)	27(71.1)	2.732	0.098
上腹部手术史[n(%)]	6(14.3)	27(16.6)	0.128	0.720	5(13.2)	6(15.8)	0.106	0.744
胆囊壁厚度(mm,$\bar{x}\pm s$)	6.0±0.9	5.5±1.0	3.159	0.002	5.9±0.8	5.8±0.9	0.133	0.895

表2 PSM后两组术中、术后临床资料比较

Table 2 Comparison of the intraoperative and postoperative clinical variables between the two groups of patients after PSM

指标	PTGBD+LC组(n=38)	LC组(n=38)	t/χ^2	P
ICU入住[n(%)]	0(0.0)	2(5.3)	—	0.493
中转开腹率[n(%)]	0(0.0)	5(13.2)	—	0.054
手术时间(min,$\bar{x}\pm s$)	64.4±16.2	84.4±23.7	−4.295	<0.001
术中出血量(mL,$\bar{x}\pm s$)	21.9±23.3	47.6±41.3	−3.337	0.001
术中胆管损伤[n(%)]	0(0.0)	2(5.3)	—	0.493
术中放置引流[n(%)]	35(92.1)	38(100.0)	—	0.24
LC术后住院时间(d,$\bar{x}\pm s$)	3.4±0.7	5.3±0.8	−11.032	<0.001
住院总费用(元,$\bar{x}\pm s$)	29 239±1 797	22 150±2 384	14.639	<0.001
术后并发症[n(%)]	2(5.3)	9(23.7)		
胆汁漏	1(2.6)	2(5.3)		
切口感染	1(2.6)	6(15.8)	5.208	0.022
术后出血	0(0.0)	1(2.6)		

3　讨　论

AC是普通外科常见病，其发病率占所有急腹症的3%~10%。AC的病程若未得到控制，可出现胆囊周围脓肿、胆囊穿孔、胆汁性腹膜炎等引起复杂甚至危及生命安全的腹腔感染。部分保守治疗患者，出现炎症迁延不愈，远期甚至出现胆囊结肠瘘、胆囊十二指肠瘘、胆囊-胆管瘘等，严重影响患者生活质量[7-8]。TG18相较欧洲世界急诊外科协会（WSES）版指南而言，更适合我国国情。中国胆道外科学组参照TG18，也制定了急性胆道系统感染的诊断和治疗指南（2021版）[8]。我国版指南在II级AC诊断标准上，结合国内病例基数大、就医不及时等特点，删除了发病病程这一要素。各版指南在I、III级治疗意见上基本统一[9]。但在II级AC治疗上存在一定分歧。特别对于短期内反复发作、病程超过72 h患者，治疗策略偏差较大。Yamazaki等[10]研究发现II级高危患者[CCI≥6和（或）ASA分级≥III级]接受一期急诊LC，其术中及术后观察指标与PTGBD序贯LC的患者差异无统计学意义，提示急诊LC的安全性与PTGBD后选择性LC的安全性相当。我国指南参照TG18推荐：中度AC的治疗：⑴抗菌药物及全身支持治疗有效，且手术风险为低风险者[CCI≤5和（或）ASA分级≤II级]，在具备条件的医疗机构及时行胆囊切除术。⑵抗菌药物及全身支持治疗有效，但手术风险为高风险者[CCI≥6和（或）ASA分级≥III级]，暂时选择继续保守治疗[8]。然而，一期急诊手术的条件是“具备条件的医疗机构”，这一说法，相对比较模棱两可，其具体的硬件匹配及手术团队的具体临床技术要求，指南也并未详细阐述。因此，对于这部分患者的治疗，临床上存在一定的主观性，更多的是结合当地实际医疗条件及手术团队的经验而判断。笔者曾赴青海高原地区开展医疗支援，深刻感受到，东西部地区疾病谱差异。很多诊断为II级AC患者，就诊时病程多超过72 h，多有反复发作史，术中“困难三角”发生率远远高于东部发达地区[11]。这类患者接受一期急诊LC，一旦出现术后并发症，诸如胆管损伤，其后的补救手术及转诊条件都将面临巨大的困难。II级AC患者术中变数较大，术前较难准确预测，也是胆道损伤的“重灾区”[12]。本组数据显示，LC组中转开腹率达（13.2%），两组差异临界统计学意义（P=0.054）。笔者分析，这与术者的不同阶段的手术经验及心态相关。术者能力是LC术中中转开腹的独立保护因素[12]。外科医师的成长都经历了从兴奋-自负-惧怕-敬畏这样一个心理历程。针对复杂病例选择个体化方案是外科医师不同阶段规避风险的重要保障[13]。

早期祛除感染源，是外科治疗的首要任务。从病理学角度来分析，急性化脓性胆囊炎在72 h之内无纤维素性渗出，而当炎症持续时间>72 h后，病变累及胆囊壁全层，白细胞弥漫性浸润，浆膜出现纤维素样渗出并逐渐与大网膜、周围脏器形成粘连。部分患者胆囊因缺血坏死而萎缩变小甚至与胆囊床致密粘连，进入“亚急性炎症期”，甚至胆囊三角区呈“冰冻样”改变[7]。这种病理改变，往往会增加LC时解剖显露胆囊三角及剥离胆囊的难度。因此，大多数研究支持AC应在症状出现后72 h内实施LC（early LC）[1]。即使病程超过72 h的患者，及时早期手术治疗仍值得推荐。Cheng等[14]回顾分析了70例发病超过72 h的AC患者临床资料，发现适时LC是安全可行的，其不良事件的发生率和严重程度与早期LC组相似。然而，也有学者持不同观点，来自Blythe等[15]基于AC真实世界的队列研究结果提示，早期手术组（72 h内）、中期手术（10 d内）与传统延迟手术组（6~12周）及择期手术组（无症状组）相比仍具有较高的并发症发生率，并且随着时间的延迟并发症发生率呈现负相关趋势。因此，笔者认为AC后延迟手术治疗的患者与早期手术治疗的患者结果相似，甚至更好。笔者在临床中经常遇到这样的尴尬局面，很多急性发作患者，经过抗感染保守治疗症状缓解后，很快出现症状反复，而被迫接受紧急手术，甚至开腹手术[16]。因此，选择采取先行PTGBD处理，然后适时评估行二期LC。研究数据显示：PTGBD+LC组与LC组相比，术中出血量、手术时间、术后住院时间、并发症发生率均明显下降。

PTGBD应用于临床已有40年的时间[17]。实践证明PTGBD可以有效引流感染的胆汁，降低胆囊压力，改善患者局部感染症状。该项技术对设备及材料要求低，适用人群广，可在床旁安全实施。与胆囊切除术相比，PTGBD可以有效缓解胆囊急性炎症，出现不良事件风险较低，是高危AC患者有效的替代方案[18-19]。TG18推荐，对于中重度

AC及轻度AC内科保守治疗无效患者，建议首选PTGBD方案进行早期或紧急胆囊引流[20]。近年来，以外科为主导，微创理念为核心的多学科协作诊疗（multidiscipline team，MDT）管理模式日显突出[21]。越来越多的研究[22-23]验证了PTGBD序贯LC治疗AC的安全性及有效性。PTGBD的广泛开展给临床外科医生面临复杂中重度AC提供了另一种治疗选择。然而，PTGBD也存在一些缺陷[14]。(1) 穿刺相关并发症，如针道的出血、胆汁漏，甚至胆囊穿孔；(2) 治疗周期长，增加患者医疗总费用；(3) 延期LC术前患者长时间带管，生活质量下降。本研究中，42例接受PTGBD患者未有穿刺并发症，仅有1例患者带管出院后，出现管道滑脱，及时在24 h内再次调整置管。PTGBD+LC组总费用较LC组(29 239±1 797元 *vs.* 22 150±2 384元)，确实有所增加（P<0.05），对患者造成一定经济负担。但是，笔者认为，如果能进一步保障患者手术及生命安全，治疗费用一定程度上的提升，仍然契合“生命为本”“健康中国”的宗旨。因此，对42例患者开展了生活质量调查问卷，结果显示90%以上患者表示可以耐受带管生活。这个结果与Park等[24]研究相一致。Park等[24]对比分析了PTGBD+序贯LC（4~6周）患者与一期LC患者（7 d内）术前、术后生活质量变化。结果显示，与术前评估相比，两组患者术后功能和整体健康评分均有改善。两组患者术前后的总体健康状况评分差异无统计学意义，但PTGBD组的功能评分和情感评分明显好于非PTGBD组。这些发现为必要时选择PTGBD术式提供了重要依据。

目前，关于PTGBD术后何时进行LC，尚无统一标准[25-26]。多数研究[27]认为PTGBD术后在4~8周内行LC序贯治疗，患者获益更大。然而，近期有学者[25, 28]报道在PTGBD后7~26 d行LC可获得更好的手术结果。Lee等[29]认为在II级AC患者中，PTGBD后续LC的时机与手术困难程度或术后结果无关。因此，不建议PTGBD后续LC的时间间隔过长，以免增加医疗总费用，延长患者长时间带管带来的不便。参考文献[30-31]，本组二期LC时机选择在PTGBD后4~6周进行。术中发现有2例患者腹腔严重粘连，三角区呈“冰冻样”改变，手术难度仍然较大。回看手术录像及分析临床病史，发现这2例患者均存在较大结石嵌顿于壶腹部，病程反复发作均超过3个月。笔者认为，结石嵌顿于胆囊颈管部是AC的始发因素，PTGBD并未从根本上解决病因。这种类型患者，任何时期处理，都会存在较大困难。从社会经济学角度，只要患者身体状况评估可以耐受，及时的手术干预，都值得推荐。笔者下一步工作，将开展前瞻性临床对比研究，评估PTGBD术后早期（7~10 d）行LC的可行性及安全性。

综上所述，PTGBD序贯LC（4~6周）治疗II级AC，虽然增加了患者医疗总费用，但是却显著降低了手术风险、减少手术相关并发症发生率，且未导致患者生活质量下降。尤其，在广大基层医疗单位，为这类复杂患者，赢得了后期从容实施择期手术的机会，值得临床个体化推广及应用。但是，本项研究依然存在一定的局限性，本项目为回顾性研究，即使经PSM匹配，病例收集中仍不可避免存在术者主观经验选择导致的数据偏倚。其次，本项目纳入样本较少，仍需要进一步大样本、多中心研究，验证其实际临床应用价值。

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