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基于复合手术室的内镜逆行胰胆管造影术联合腹腔镜胆囊切除术同期治疗胆囊结石合并胆总管结石的效果

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摘要：目的 探讨在复合手术室中运用内镜逆行胰胆管造影术（ERCP）联合腹腔镜胆囊切除术（LC）同期治疗胆囊结石合并胆总管结石的临床疗效。**方法** 回顾性分析该院21例胆囊结石合并胆总管结石患者的临床资料，先在全凭静脉麻醉或静脉-吸入复合麻醉下完成ERCP胆管取石，接着完成LC。**结果** 18例顺利完成ERCP联合LC同期治疗，3例改行腹腔镜下胆总管切开探查术（LCBDE），无中转剖腹手术，术后并发高淀粉酶血症8例，无胰腺炎、消化道出血和穿孔等严重并发症。**结论** 复合手术室中运用ERCP联合LC同期治疗胆囊结石合并胆总管结石，简化了手术流程，是安全、可行的。

关键词： 胆囊结石；胆总管结石；内镜逆行胰胆管造影术（ERCP）；腹腔镜胆囊切除术（LC）；复合手术室
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Effect of endoscopic retrograde cholangiopancreatography combined with laparoscopic cholecystectomy one-stage approach based on hybrid operating room for the treatment of gallstones combined with calculus of common bile duct

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Abstract: Objective To investigate the use of endoscopic retrograde cholangiopancreatography (ERCP) combined with laparoscopic cholecystectomy (LC) one-stage approach in the treatment of gallstones complicated with calculus of common bile duct in a hybrid operating room. **Methods** 21 patients with gallstones complicated with calculus of common bile duct were selected to undergoing ERCP bile duct stone removal under total intravenous anesthesia or combined intravenous and inhalation anesthesia, followed by LC. **Results** 18 successfully completed the one-stage surgery of ERCP combined with LC, 3 were changed to laparoscopic common bile duct exploration (LCBDE), there was no laparotomy, 8 cases were complicated by hyperamylemia after surgery, and there were no serious complications such as pancreatitis, gastrointestinal bleeding and perforation. **Conclusion** It is safe and feasible to use ERCP combined with LC one-stage approach to treat gallstones complicated with calculus of common bile duct in the hybrid operating room, which simplifies the surgical process.

Keywords: gallstones; calculus of common bile duct; endoscopic retrograde cholangiopancreatography (ERCP); laparoscopic cholecystectomy (LC); hybrid operating room

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胆囊结石是外科的常见病和多发病，约20%合并有胆总管结石[1]，严重的可以导致重症胆管炎，死亡率甚至高达29%[2]。目前，常用的外科治疗方法有：腹腔镜下胆总管切开探查术（laparoscopic common bile duct exploration，LCBDE），以及腹腔镜胆囊切除术（laparoscopic cholecystectomy，LC）联合内镜逆行胰胆管造影术（endoscopic retrograde cholangiopancreatography，ERCP）等。临床关于LCBDE与ERCP联合LC的比较，表明：两者在手术安全性和胆管结石清除率上没有明显的差别[3-5]，但后者炎症反应更轻，恢复更快，住院时间更短，患者获益更多[6-7]。ERCP联合LC分为同期和分期两种方式，两者具有相似的疗效和安全性，但同期治疗在住院时间和经济性等方面更有优势[8-10]。LC联合ERCP，需要使用腹腔镜和ERCP两种不同的技术，在部分医院，需要在内镜中心与外科手术间之间转场[10-11]，增加了手术风险和程序上的复杂性。因此，两个手术能在同一个手术间完成显得尤为重要。目前，国内复合手术室多应用于心脑血管手术[12-13]，而在肝胆外科中运用较少。近年来，本院建立了集C形臂X线机、腹腔镜、十二指肠镜和胆道镜于一体的复合手术室，开展ERCP联合LC同期治疗胆囊结石合并胆总管结石，取得了较好的疗效。现报道如下：

1 资料和方法

1.1 一般资料

回顾性分析2022年11月—2023年11月，经B超、CT或磁共振胰胆管成像等影像学检查，确诊为胆囊结石合并胆总管结石的21例患者的临床资料。其中，男9例，女12例，年龄33～81岁，平均（58.6±14.7）岁。

纳入标准：年龄>30岁且<85岁；肝外胆管结石最大直径<1.5 cm；凝血功能正常；患者知情同意，自愿选择ERCP联合LC同期治疗。排除标准：合并急性胰腺炎或急性胆管炎；有胆道手术史；有胆肠吻合或胃肠吻合手术史；存在ERCP和腹腔镜手术禁忌证。

1.2 设备

肝胆外科专用复合手术室，配备有电子十二指肠镜一套（生产厂家：日本PENTEX，型号：ED-3490TK），移动式C形臂X线机一台（生产厂家：德国SIEMENS，型号：Cios select s5），纤维胆道镜（生产厂家：日本PENTEX，型号：FCN-15X），高清腹腔镜（生产厂家：德国STORZ，型号：N-90X0568-G），介入诊疗手术操作台一台（生产厂家：广西玉林市好邦医疗设备有限责任公司，型号：DC-2000j）。

1.3 方法

静脉-吸入复合麻醉，或先全凭静脉麻醉下完成ERCP后，改为静脉-吸入复合麻醉。患者先取左侧卧位，常规进镜至十二指肠降段，寻及十二指肠大乳头后，于X线下监视，斑马导丝引导下，行选择性胆管插管和造影。明确结石大小、数目和部位后，予以内镜十二指肠乳头括约肌切开术和/或内镜下十二指肠乳头球囊扩张术，用取石网篮和/或取石球囊行胆道取石，对于较大结石，先用取石网篮碎石后，再取石。造影证实结石取尽后，留置鼻胆引流管或胆管塑料支架。取石完成后，患者改平卧位，常规建立CO_2气腹，采用三孔法完成LC。

2 结果

2.1 手术情况

术中发现合并十二指肠乳头旁憩室15例（71.4%）。18例顺利完成ERCP联合LC同期治疗。1例因十二指肠乳头插管失败，即刻改行LCBDE，胆道镜取石后胆管内留置胆管塑料支架，胆管一期缝合；2例因ERCP术中取石困难，胆管内留置鼻胆引流管，即刻改行LCBDE，取尽结石后行胆管一期缝合。无中转剖腹手术。

2.2 术后处理

术后给予抗感染和补液治疗，监测血常规、血淀粉酶和肝功能等，观察鼻胆引流管引流情况。术后发生高淀粉酶血症8例，无死亡病例，无胰腺炎、消化道出血和穿孔等严重并发症。术中行胆管结石碎石取石者，术后常规用生理盐水冲洗2至3 d，术后48～72 h拔除鼻胆引流管，术后2～4 d出院。

3 讨论

胆石病为我国常见外科疾病，诊断并不困难。ERCP在治疗肝外胆管结石方面，具有巨大的微创优势：不用留置T型管，可保持胆道的完整性，患者接受度高，生理影响少。对于胆管扩张不明显的患者，

采用ERCP，避免了传统胆管切开取石术后胆管狭窄和胆漏等问题。ERCP可以观察胆道变异情况，取石后留置鼻胆引流管或胆管支架，可以减少术中胆管损伤、术后胆漏和胆管狭窄的发生；若胆管造影未发现胆管结石，可避免无效的胆道探查。先行ERCP，还可以发现术前影像学检查未能发现的乳头部病变。通过适当的乳头切开和扩张，解决了胆管开口胆汁流出道狭窄等问题，可以减少结石复发。同样，LC具有损伤小、恢复快等微创优势，其早已成为治疗胆囊结石的标准术式。但如何把这两个标志性微创技术结合起来，充分发挥两种微创技术的优势，目前仍无定论。

有研究[14]表明，ERCP术后24 h内行LC，中转开腹率较术后24～72 h明显降低，LC间隔的时间越长，中转开腹手术率越高，并且术后24 h内行LC，并不会增加手术死亡率和并发症发生率。有学者[15-19]探讨ERCP+LC的同期手术，以期将ERCP和LC两种微创手术的优势最大化，取得了不错的效果，但该手术大多需要在不同手术间转场，仍然存在一定的风险，也不利于手术效率的提高。

近年来，本院在外科手术室建立了集C形臂X线机、腹腔镜、十二指肠镜和胆道镜等设备的独立的复合手术间，由肝胆外科专科医生探索开展同期的ERCP+LC，以进一步简化手术流程，减少手术风险，提高手术效率。在同一麻醉小组麻醉管理下，先由肝胆外科医生完成ERCP胆管取石，然后翻转体位，同期由同一组医生完成LC。根据笔者经验，ERCP后延期行LC，术中通常会出现肝十二指肠韧带和胆囊三角区水肿，同期手术则可以避免此类水肿，不会增加手术操作难度；ERCP术后同期行LC时，通过腹腔镜探查，还可以进一步观察腹腔有无积血和消化液，腹膜后有无水肿、血肿和胆汁染色等，可以及时发现和处理ERCP导致的意外损伤，如：脾破裂和消化道穿孔等。由肝胆外科专科医生完成ERCP，可以根据术中情况，进行个体化操作，在遇到ERCP操作困难或十二指肠乳头插管不成功时，可及时改行LCBDE，避免了长时间和复杂的ERCP操作，减少了ERCP并发症的发生，避免微创变“巨创”[20]。在复合手术间的同一手术操作台上，由同一麻醉小组进行麻醉管理，同一手术组同时完成两个微创手术，患者更易接受。

同期手术的缺点为：ERCP若操作时间较长，伴随着肠蠕动，大量气体进入胃十二指肠和小肠，甚至是结肠，行LC时会使手术视野暴露困难，增加手术操作难度。因此，除了在退出十二指肠镜时需要尽量吸尽胃十二指肠的积气和积液外，也可以在术中置入胃管予以及时减压。

综上所述，由肝胆外科专科医生在复合手术间开展ERCP联合LC的同期手术，减少了患者在不同手术间转运的风险，缩短了两个术式手术间隙的等待时间，简化了手术流程，提高了手术安全性，是一种较为理想的治疗选择。但本研究样本量较少，尚需要多中心和大样本的研究进一步验证。

参 考 文 献：

[1] PRASSON P, BAI X L, ZHANG Q, et al. One-stage laproendoscopic procedure versus two-stage procedure in the management for gallstone disease and biliary duct calculi: a systemic review and Meta-analysis[J]. Surg Endosc, 2016, 30(8): 3582-3590.

[2] LAVILLEGRAND J R, MERCIER-DES-ROCHETTES E, BARON E, et al. Acute cholangitis in intensive care units: clinical, biological, microbiological spectrum and risk factors for mortality: a multicenter study[J]. Crit Care, 2021, 25(1): 49.

[3] 王财庆, 庄端明, 陈功. 胆总管结石合并胆囊结石行腹腔镜胆总管探查取石并LC与内镜ERCP/EST联合LC的疗效比较[J]. 当代医学, 2018, 24(22): 85-87.

[3] WANG C Q, ZHUANG D M, CHEN G. Common bile duct stone with gallbladder stone row of laparoscopic common bile duct exploration lithotomy and LC and compare the curative effect of endoscopic ERCP and EST combined LC[J]. Contemporary Medicine, 2018, 24(22): 85-87. Chinese

[4] 张有前, 齐伟, 钱小星, 等. 胆总管结石合并胆囊结石行ERCP术后进行腹腔镜胆囊切除手术时机选择[J]. 肝胆外科杂志, 2018, 26(2): 105-107.

[4] ZHANG Y Q, QI W, QIAN X X, et al. The timing of laparoscopic cholecystectomy after ERCP for choledocholithiasis combined with cholecystolithiasis[J]. Journal of Hepatobiliary Surgery, 2018, 26(2): 105-107. Chinese

[5] 蔡建荔, 宫红云. LC与ERCP同期手术对肝外胆管结石合并胆囊结石患者的疗效[J]. 临床医学研究与实践, 2018, 3(16): 63-64.

[5] CAI J L, GONG H Y. Effect of LC and ERCP on the patients with extrahepatic bile duct stones complicated with cholecystolithiasis[J]. Clinical Research and Practice, 2018, 3(16): 63-64. Chinese

[6] 张杨, 寇艳, 徐春梅, 等. LC联合ERCP治疗胆囊结石合并肝外胆管结石对患者术后肝功能及炎症反应的影响[J]. 川北医学院

学报, 2023, 38(8): 1053-1057.
[6] ZHANG Y, KOU Y, XU C M, et al. Effects of LC combined with ERCP on liver function and complications in cholecystolithiasis combined with extrahepatic bile duct stones[J]. Journal of North Sichuan Medical College, 2023, 38(8): 1053-1057 . Chinese
[7] CHANG Y R, WU C H, CHEN H W, et al. Optimal timing of cholecystectomy for patients with concurrent acute cholecystitis and acute cholangitis after successful biliary drainage by interventional endoscopic retrograde cholangiopancreatography[J]. J Clin Med, 2022, 11(21): 6603.
[8] NIE S M, FU S Y, FANG K Y. Comparison of one-stage treatment versus two-stage treatment for the management of patients with common bile duct stones: a Meta-analysis[J]. Front Surg, 2023, 10: 1124955.
[9] TAN C, OCAMPO O, ONG R, et al. Comparison of one stage laparoscopic cholecystectomy combined with intra-operative endoscopic sphincterotomy versus two-stage pre-operative endoscopic sphincterotomy followed by laparoscopic cholecystectomy for the management of pre-operatively diagnosed patients with common bile duct stones: a Meta-analysis[J]. Surg Endosc, 2018, 32(2): 770-778.
[10] 赵硕, 王均蒙, 胡志恒, 等. ERCP联合LC一期治疗胆囊结石合并胆总管结石在加速康复外科中的应用[J]. 中国现代普通外科进展, 2023, 26(3): 234-238.
[10] ZHAO S, WANG J M, HU Z H, et al. Application of ERCP combined with LC in one-stage treatment of cholecystolithiasis with choledocholithiasis in accelerated rehabilitation surgery[J]. Chinese Journal of Current Advances in General Surgery, 2023, 26(3): 234-238. Chinese
[11] 姚维杰, 马泽, 彭波, 等. 同期ERCP联合LC与LCBDE治疗胆囊结石合并肝外胆管结石的效果分析[J]. 宁夏医学杂志, 2021, 43(12): 1076-1079.
[11] YAO W J, MA Z, PENG B, et al. Analysis on the efficacy of single-stage ERCP plus LC and LCBDE in the treatment of concomitant gallstones and extrahepatic bile duct stones[J]. Ningxia Medical Journal, 2021, 43(12): 1076-1079. Chinese
[12] 中国医学装备协会护理装备与材料分会手术装备与材料专业委员会. 数字减影血管造影复合手术室管理专家共识[J]. 中国医学装备, 2023, 20(1): 141-145.
[12] Special Committee Member of Surgical Equipment and Material of Nursing Equipment and Material Branch of China Association of Medical Equipment. Expert consensus on the management of DSA comprehensive operation room[J]. China Medical Equipment, 2023, 20(1): 141-145. Chinese
[13] 辛在海, 薛立洋, 范医鲁. 全数字一体化复合手术室的规划设计与建设[J]. 中国医疗设备, 2021, 36(3): 155-158.
[13] XIN Z H, XUE L Y, FAN Y L. Planning, design and construction of digital integrated hybrid operation room[J]. China Medical Devices, 2021, 36(3): 155-158. Chinese
[14] FRIIS C, ROTHMAN J P, BURCHARTH J, et al. Optimal timing for laparoscopic cholecystectomy after endoscopic retrograde cholangiopancreatography: a systematic review[J]. Scand J Surg, 2018, 107(2): 99-106.
[15] LU J, XIONG X Z, CHENG Y, et al. One-stage versus two-stage management for concomitant gallbladder stones and common bile duct stones in patients with obstructive jaundice[J]. Am Surg, 2013, 79(11): 1142-1148.
[16] GANTOIS D, GOUDARD Y, BOURGOUIN S, et al. One-stage laparoscopic procedure versus two-stage procedure in the management of common bile duct stones in patients aged 75 and more[J]. J Visc Surg, 2020, 157(2): 99-106.
[17] PIZZICANNELLA M, BARBERIO M, LAPERGOLA A, et al. One-stage approach to cholecystocholedocholithiasis treatment: a feasible surgical strategy for emergency settings and frail patients[J]. Surg Endosc, 2022, 36(11): 8560-8567.
[18] MATTILA A, MRENA J, KELLOKUMPU I. Cost-analysis and effectiveness of one-stage laparoscopic versus two-stage endolaparoscopic management of cholecystocholedocholithiasis: a retrospective cohort study[J]. BMC Surg, 2017, 17(1): 79.
[19] ZHANG X P, LI G Q, PAN L, et al. The efficacy and safety of one-stage endoscopic treatment for ascending acute cholangitis caused by choledocholithiasis with severe comorbidities[J]. Surg Endosc, 2020, 34(9): 3963-3970.
[20] 许兆龙, 龚兵, 田兴梦, 等. 内镜逆行胰胆管造影术取石失败后即行腹腔镜胆总管探查术的临床观察[J]. 中国内镜杂志, 2016, 22(3): 98-100.
[20] XU Z L, GONG B, TIAN X M, et al. Clinical observation of early laparoscopic common bile duct exploration continue to failed endoscopic bile duct stone extraction[J]. China Journal of Endoscopy, 2016, 22(3): 98-100. Chinese

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XU Z L, CHEN Z M, SUN F D, et al. Effect of endoscopic retrograde cholangiopancreatography combined with laparoscopic cholecystectomy one-stage approach based on hybrid operating room for the treatment of gallstones combined with calculus of common bile duct[J]. China Journal of Endoscopy, 2024, 30(8): 85-88. Chinese