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内镜下乳头括约肌切开术联合不同时长气囊扩张术治疗胆总管结石的疗效观察*

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摘要 目的:探讨内镜下乳头括约肌小切开术(endoscopic sphincterotomy, EST)联合不同时长持续时间十二指肠乳头气囊扩张术(Endoscopic papillary balloon dilatation, EPBD)对胆总管结石患者治疗效果差异。**方法:**选择2018年1月至2018年12月于我院接受EST联合EPBD治疗的92例胆总管结石患者为研究对象,按照术中气囊扩张时间的不同将其分为A组(46例,扩张时间20 s)、B组(46例,扩张时间40 s),对比两组患者一次净石率、机械碎石率、操作时间及X线暴露时间,对比两组患者术前及术后肝功能指标,术后12 h血淀粉酶,对比两组患者术后胰腺炎、消化道出血、胆道感染、穿孔等并发症的发生率。**结果:**(1)对比显示两组患者一次净石率、机械碎石率、操作时间、X线暴露时间及12 h血淀粉酶对比差异不具有统计学意义($P>0.05$);(2)术前两组患者总胆红素(Total bilirubin, TBIL)、谷氨酸转氨酶(Glutamate aminotransferase, ALT)、碱性磷酸酶(alkaline phosphatase, ALP)对比差异不具有统计学意义($P>0.05$),术后两组患者上述指标均较治疗前出现明显的下降,但组间比较无差异($P>0.05$);(3)A组患者术后各类并发症发生率为4.35%(2/46),B组患者术后各类并发症发生率为17.39%(8/46),两组对比差异具有统计学意义($P<0.05$)。**结论:**EST联合EPBD对胆总管结石具有较好的治疗效果,术中不同气囊扩张时间不会对手术成功率、手术时间等指标造成影响,但长时间扩张存在增加术后出血的风险,建议在能够正常实施手术的情况下尽量控制术中气囊扩张时间。

关键词:经内镜逆行胰胆管造影;乳头气囊扩张术;不同时间;胆总管结石

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Observation of Therapeutic Effect of Endoscopic Sphincterotomy Combined with Different Duration of Endoscopic Papillary Balloon Dilatation on Patients with Common Bile Duct Stones*

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ABSTRACT Objective: To explore the Endoscopic sphincterotomy combined with different durations of endoscopic papillary balloon dilatation in patients with common bile duct stones. **Methods:** A total of 92 patients with common bile duct stones who underwent EST combined with EPBD in our hospital from January 2018 to December 2018 were selected as the study subjects. They were divided into group A according to the intraoperative balloon dilation time (46 patients, dilatation expansion time 20 s), group B (46 patients, dilatation expansion time 40 s), compared the two groups of patients with a net stone rate, mechanical lithotripsy rate, operation time and X-ray exposure time, compared the two groups of patients with liver function indicators before and after surgery The blood amylase at 12 hours after operation was compared with the incidence of complications such as pancreatitis, gastrointestinal bleeding, biliary infection, and perforation in the two groups. **Results:** (1) The comparison showed that there was no statistically significant difference between the two groups of patients in the rate of clean stones, mechanical lithotripsy, operating time, X-ray exposure time, and 12 h blood amylase ($P>0.05$). (2) The differences in TBIL, ALT, and ALP between the two groups of patients before surgery were not statistically significant ($P>0.05$). The above indicators in the two groups of patients showed a significant decrease compared with that before treatment, but there was no difference between the groups ($P>0.05$). (3) The incidence of various postoperative complications in group A was 4.35 % (2/46), and the incidence of various postoperative complications in group B was 17.39 % (8/46). The difference between the two groups was statistically significant ($P<0.05$). **Conclusion:** EST combined with EPBD has a good therapeutic effect on common bile duct stones. Different balloon inflation times during the operation will not affect the success rate and operation time, but long-term expansion will increase the risk of postoperative bleeding. In the case of surgery, try to control the balloon dilation time during the operation.

Key words: ERCP; EPBD; Different time; Bile duct stones

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前言

胆管结石是我国胆道疾病中较为常见的一种,是一种容易反复发作的良性疾病,根据其发病位置的差异可将其分为肝外胆管结石和肝内胆管结石^[1-3]。临床研究指出,随着我国社会老龄化趋势的显现以及肥胖、饮食结构等相关因素的改变,胆管结石的患病率出现了明显升高^[4,5]。数据显示我国胆管结石的患病率约为 4%~11%,其中肝外胆管结石约占 15.3%~31.7%,肝外胆管结石即胆总管结石患者的典型临床表现包括腹痛、寒颤、高热、黄疸等,部分病情严重患者还会出现败血症、休克等症,对居民正常生活造成了严重影响^[6,7]。ERCP 作为微创诊治手段,已广泛应用于胆系疾病尤其是胆总管结石的诊治过程中,而十二指肠乳头切开术(Endoscopic Sphincterotomy, EST)联合十二指肠乳头气囊扩张术(Endoscopic papillary balloon dilatation, EPBD)已经成为临床上胆总管结石标准治疗手段,EPBD 是 ERCP 中常见操作,对降低术后并发症具有积极效果,但当前关于气囊扩张时间尚存在一定争议^[8,9]。我们通过研究发现,EST 联合 EPBD 对胆总管结石具有较好的治疗效果,术中不同气囊扩张时间不会对手术成功率、手术时间等指标造成影响,但长时间扩张存在增加术后出血的风险,建议在能够正常实施手术的情况下尽量控制术中气囊扩张时间,现详述如下。

1 资料与方法

1.1 一般资料

选择 2018 年 1 月至 2018 年 12 月于我院接受 EST 联合 EPBD 治疗的 92 例胆总管结石患者为研究对象,按照其术中气囊扩张时间的不同将其分为 A 组(46 例,扩张时间 20 s)、B 组(46 例,扩张时间 40 s)。

纳入标准:(1)入组患者均经临床诊断确诊为胆总管结石;(2)意识清晰能够配合实施调研;(3)病历资料齐全;(4)调研经

医院伦理学会批准实施;(5)患者签署知情同意书;(6)胆总管结石直径 ≤ 2 cm 者。

排除标准:(1)合并精神疾患者;(2)存在明显手术禁忌症者;(3)合并恶性肿瘤者;(4)胆管明显狭窄者;(5)凝血功能障碍者;(6)既往 EST 或 EPBD 手术史者。

1.2 方法

两组患者入院后均接受常规术前护理,手术当天患者俯卧位,将十二指肠镜插入十二指肠降段,经主乳头开口插管实施胆管造影,待造影清晰显示胆管结石位置后,在导丝引导下将乳头做 0.5 cm 切口。此时按照分组对两组患者实施不同操作,A 组患者在接受内镜乳头括约肌小切开后实施气球囊扩张术,时间维持 20 s,B 组患者与 A 组操作一致,但气球扩张术时间为 40 s,术后常规留置鼻胆管引流,术后 3-5 d 使用鼻胆管造影检查有无残留结石,并视情开展二次手术,对直径较大或取石困难的结石,首先予以机械碎石,而后进行常规取石操作。

1.3 观察指标及评测标准

重点观察指标为两组患者的一次净石率、机械碎石率、操作时间、X 线暴露时间,以及两组患者术前、术后 48 h 肝功能指标,术后 12 h 后血淀粉酶,和两组患者术后胰腺炎、消化道出血、胆道感染、穿孔等并发症发生率。

1.4 统计学方法

应用 SPSS19.0 对采集的数据实施分析,计数资料以率(%)的形式表示,采用卡方检验,计量资料以 $(\bar{x} \pm s)$ 的形式表示,采用 t 检验,以 $P < 0.05$ 为差异有统计学意义^[10]。

2 结果

2.1 一般资料

经对比分析发现,研究组患者与对照组患者一般临床资料包括平均年龄、性别比例、结石平均直径等对比差异不具有统计学意义($P > 0.05$),具有可比性,具体数据如表 1 所示。

表 1 两组患者一般临床资料对比

Table 1 Comparison of general clinical data between two groups of patients

Groups	n	Male / female	Average age (years)	Stone average diameter (mm)
A group	46	26/20	56.09 $\pm$ 2.99	10.19 $\pm$ 2.09
B group	46	25/21	55.98 $\pm$ 3.12	10.21 $\pm$ 2.21

2.2 两组患者一般手术指标对比

经评估对比发现,两组患者一次净石率、机械碎石率、操作

时间、X 线暴露时间及 12 h 血淀粉酶基本类似,对比差异不具有统计学意义($P > 0.05$),具体数据如表 2 所示。

表 2 两组一般手术指标对比

Table 2 Comparison of general surgical indicators between the two groups

Groups	n	One-time net stone rate	Mechanical gravel rate	Operate time (min)	X-ray exposure time (min)	12 h blood amylase (U/L)
A group	46	45(97.83)	2(4.35)	36.98 $\pm$ 4.33	3.43 $\pm$ 0.34	89.15 $\pm$ 20.12
B group	46	44(95.65)	3(6.52)	37.01 $\pm$ 4.23	3.41 $\pm$ 0.39	90.12 $\pm$ 20.14

2.3 两组患者术前及术后 48 h 肝功能对比

经评估对比发现,术前两组患者 TBIL、ALT、ALP 对比差异不具有统计学意义($P > 0.05$),术后两组患者上述指标均较治

疗前出现明显的下降,但组间比较无差异($P > 0.05$),具体数据如表 3 所示。

2.4 两组患者术后并发症发生率对比

经评估对比发现,A组患者术后各类并发症发生率为4.35% (2/46),B组患者术后各类并发症发生率为17.39% (8/46),两组对比差异具有统计学意义($P<0.05$),具体数据如表4所示。

表3 两组术前及术后48 h肝功能对比($\bar{x} \pm s$)Table 3 Comparison of liver function before and after 48 h between the two groups ($\bar{x} \pm s$)

Groups	n	TBIL($\mu\text{mol/L}$)		ALT(U/L)		ALP(U/L)	
		Preoperative	48 h postoperative	Preoperative	48 h postoperative	Preoperative	48 h postoperative
A group	46	43.98 $\pm$ 10.21	16.76 $\pm$ 4.07*	79.87 $\pm$ 9.23	23.27 $\pm$ 4.32*	121.87 $\pm$ 41.82	69.12 $\pm$ 10.28*
B group	46	43.87 $\pm$ 10.24	18.27 $\pm$ 5.21*	78.76 $\pm$ 9.27	23.32 $\pm$ 4.29*	123.44 $\pm$ 40.92	70.02 $\pm$ 10.12*

Note: Compared with the same group preoperative, * $P<0.05$.

表4 两组患者术后并发症发生率对比[例(%)]

Table 4 Comparison of the incidence of postoperative complications between the two groups of patients [n (%)]

Groups	n	Pancreatitis	Gastrointestinal bleeding	Biliary infection	Perforation	Total incidence
A group	46	1(2.17)	0(0.00)	1(2.17)	0(0.00)	2(4.35)*
B group	46	2(2.17)	4(8.70)	2(4.35)	0(0.00)	8(17.39)

Note: Compared with the same B group, * $P<0.05$.

3 讨论

随着近些年我国居民饮食结构的改变,胆管结石的发病率也有了逐年递增趋势,胆管结石是指发生因胆管内出现结石而引起不同程度病理改变而产生的相应临床症状,部分严重患者会出现典型的腹痛、黄疸和发热三联症^[11-13]。近些年人口老龄化和各类影像学检查技术的进步使该病的检出率不断提高,目前国内的一项调研显示胆管结石发病率约为10%左右,国外一项调研显示发病率约为10%-33%^[14-16]。按照胆管结石的发病部位可将胆管结石区分为肝内胆管结石和肝外胆管结石,按照结石成分可将其分为胆固醇结石、胆色素结石和混合型结石^[17,18]。胆管结石会对患者正常生活产生明显影响,临床上建议及早实施手术治疗,传统胆管结石的治疗手段为腹部手术,此类术式包括开腹胆囊切除、胆总管切开取石、T管引流术,是较为经典的胆管结石治疗手段,具有较为确切的疗效^[19,20]。但临床研究显示,传统开腹手术创伤大、术后患者愈合时间长且并发症高发,因而目前已逐渐被微创治疗方式术代替,成为微创治疗方式术失败后的最终选择^[21,22]。

ERCP是临床上常用的胆总管结石微创治疗手段手术之一,相比于传统的外科手术术式具有较明显的优势,有研究指出,行ERCP术的患者正逐渐呈现年轻化趋势,甚至有儿童也实施了ERCP术,一项回顾性研究指出,对于直径大于12 mm的结石,在未使用机械碎石的情况下,ERCP对胆总管结石一次清除率达95.3%,提示该技术已经较为成熟且在临床上得到了广泛应用^[23,24]。近些年随着对ERCP技术研究的深入,越来越多的研究指出,联合EST联合EPBD有助于提高取石成功率,分析其原因为EPBD能够使结石患者的乳头括约肌松弛、乳头开口出现暂时性的扩大,这样就有助于快速取出胆管结石^[25,26]。当前临床上关于联合治疗的争议主要集中于EPBD术维持时间上,有研究指出,实施气囊扩张术存在损伤十二指肠乳头括约肌和胰管口周围组织的风险,会影响胰液的正常排泄,诱发急性胰腺炎的发生^[27]。还有学者指出,球囊扩张会对胰管产生压迫,导致胰腺内压力升高,不利于患者病情转归^[28]。

本文作者通过设立不同分组的方式,就EST联合不同时间联合EPBD在治疗胆总管结石中的疗效进行了分析,结果显示,ERCP术中实施20 s气囊扩张的A组患者和实施40 s气囊扩张的B组患者其一次净石率、机械碎石率、操作时间、X线暴露时间及12 h血淀粉酶等对比差异不具有统计学意义,与Park JS^[29]等人的研究类似,分析其原因认为,上述结果提示结石的一次净石率同气囊扩张时间不存在明显的相关性。机械碎石一般用于处理直径较大的结石,用于提高结石清除率,避免术中对患者造成较大的伤害,本文中两组患者机械碎石率差异不明显,分析其原因与两组患者结石直径差异不大有关。而操作时间和X线暴露时间同样也提示气囊扩张时间不会对手术的进行产生影响。

黄疸和肝功能异常都是胆总管结石患者常见的临床表现之一,患者多出现明显的总胆红素或直接胆红素水平升高,ALT、ALP等指标异常,去除结石能够解决胆管梗阻情况,减轻患者黄疸程度,对改善患者肝功能也具有积极意义^[30]。本文中的结果显示,A、B两组患者在术后肝功能指标都出现了明显的改善,提示ERCP能够缓解胆管结石患者肝功能损伤,而术后48 h肝功能指标对比差异不明显则说明不同的气囊扩张时间并不会影响肝功能的恢复。最后对两组患者术后并发症发生率的对比显示,A组患者术后各类并发症发生率为4.35%,B组患者术后各类并发症发生率为17.39%,差异明显,与Dong^[31]等人的研究一致,分析其原因为术中气囊扩张术一定程度上对乳头括约肌产生了明显的牵拉,时间较短的情况下并不会影响其肌肉功能,但长时间扩张可能导致了肌肉损伤,进而增加了术后消化道出血的风险^[32],但这需要进一步大样本量研究来证实。

综上所述,EST联合EPBD对胆总管结石具有较好的治疗效果,术中不同气囊扩张时间不会对手术成功率、手术时间等指标造成影响,但长时间扩张存在增加术后出血的风险,建议在能够正常实施手术的情况下尽量控制术中气囊扩张时间。

参考文献(References)

- [1] Shen YH, Yang LQ, Yao YL, et al. Dilation Time in Endoscopic Papil-

- lary Balloon Dilation for Common Bile Duct Stones [J]. Surgical Laparoscopy, 2017, 27(5): 351-355
- [2] 吕立升,魏妙艳,汤朝晖.肝胆管结石成因及分型[J].中国实用外科杂志, 2016, 36(3): 348-350
- [3] Ozcan N, Kahriman G, Karabiyik O, et al. Percutaneous management of residual bile duct stones through T-tube tract after cholecystectomy: A retrospective analysis of 89 patients [J]. Diagn Interv Imaging, 2017, 98(2): 149-153
- [4] Zhou XD, Chen QF, Zhang YY, et al. Outcomes of endoscopic sphincterotomy vs open choledochotomy for common bile duct stones[J]. World J Gastroenterol, 2019, 25(4): 485-497
- [5] Kedarisetty CK, Katukuri GR, Venkataraman J. Saline Irrigation for Residual Common Bile Duct Stones: Is It Indicated for All?[J]. Am J Gastroenterol, 2019, 114(3): e536
- [6] He M Y, Zhou X D, Chen H, et al. Various approaches of laparoscopic common bile duct exploration plus primary duct closure for choledocholithiasis: A systematic review and meta-analysis [J]. Hepatobiliary & Pancreatic Diseases International, 2018, 30(3): 1-4
- [7] Huang C, Cai XB, Guo LL, et al. Drug-eluting fully covered self-expanding metal stent for dissolution of bile duct stones in vitro [J]. World J Gastroenterol, 2019, 25(26): 3370-3379
- [8] Tsai TJ, Chan HH, Lai KH, et al. Gallbladder function predicts subsequent biliary complications in patients with common bile duct stones after endoscopic treatment?[J]. BMC Gastroenterol, 2018, 18(1): e32
- [9] Kim KY, Han J, Kim HG, et al. Late Complications and Stone Recurrence Rates after Bile Duct Stone Removal by Endoscopic Sphincterotomy and Large Balloon Dilation are Similar to Those after Endoscopic Sphincterotomy Alone[J]. Clin Endosc, 2013, 46(6): 637-642
- [10] Kato S, Chinen K, Shinoura S, et al. Predictors for bile duct stone recurrence after endoscopic extraction for naïve major duodenal papilla: A cohort study[J]. PLoS One, 2017, 12(7): e0180536
- [11] Akashi T, Tachibana Y, Matsuo S, et al. Worsening of Acute Cholangitis Caused by a Bile Duct Stone After Hospitalization: A Case Series[J]. Gastroenterology Res, 2018, 11(1): 58-61
- [12] Zimmer V. Gastrointestinal: Spontaneous air versus dye cholangiogram in bile duct stone disease [J]. J Gastroenterol Hepatol, 2018, 33(2): e337
- [13] Tian Q, Wang G, Zhang Y, et al. Endoscopic radiofrequency ablation combined with fully covered self-expandable metal stent for inoperable periampullary carcinoma in a liver transplant patient: A case report[J]. Medicine (Baltimore), 2017, 96(5): e5790
- [14] Shi SH, Feng XN, Wang ZY. Pyogenic liver abscess related to intrahepatic bile duct stones: Difficulties in infectious control and diagnosis of concomitant cholangiocarcinoma [J]. J Gastroenterol Hepatol, 2018, 33(5): 1092-1099
- [15] Ozcan N, Kahriman G, Karabiyik O, et al. Percutaneous management of residual bile duct stones through T-tube tract after cholecystectomy: A retrospective analysis of 89 patients [J]. Diagn Interv Imaging, 2017, 98(2): 149-153
- [16] He MY, Zhou XD, Chen H, et al. Various approaches of laparoscopic common bile duct exploration plus primary duct closure for choledocholithiasis: A systematic review and meta-analysis[J]. Hepatobiliary Pancreat Dis Int, 2018, 30(3): 183-191
- [17] Zimmer V. Transpapillary passage of a giant bile duct stone after endoscopic papillary large balloon dilation and short-term stenting[J]. Clin Res Hepatol Gastroenterol, 2017, 41(5): 503-504
- [18] Park BK, Seo JH, Jeon HH. A nationwide population-based study of common bile duct stone recurrence after endoscopic stone removal in Korea[J]. J Gastroenterol, 2017, 53(5): 670-678
- [19] Penprapai Hongsisuwan, Nonthalee Pausawasdi, Varayu Prachayakul. The Utility of Endoscopic Ultrasonography in Common Bile Duct Dilatation of Unknown Etiology Detected from Cross-Sectional Imaging [J]. Gastroenterology, 2017, 152(5): S426-S427
- [20] Yang J, Zhang F, Du X. Laparoscopic hepatectomy combined with endoscopic papillary balloon dilation for complex bile duct stones: LH with EPBD for complex bile duct stones[J]. ANZ J Surg, 2017, 88(6): E522-E525
- [21] Koo JY, Kim KH, Kim TN. Primary large cell neuroendocrine carcinoma of the common hepatic duct mimicking a Klatzkin tumor[J]. Korean J Intern Med, 2018, 34(2): 452-453
- [22] Tyberg A, Nieto J, Salgado S, et al. Endoscopic Ultrasound (EUS)-Directed Transgastric Endoscopic Retrograde Cholangiopancreatography or EUS: Mid-Term Analysis of an Emerging Procedure[J]. Clin Endosc, 2016, 50(2): 185-190
- [23] Farah M, McLoughlin M, Byrne MF. Endoscopic retrograde cholangiopancreatography in the management of benign biliary strictures[J]. Curr Gastroenterol Rep, 2008, 10(2): 150-156
- [24] Hyeon U Jo, Hae Kyung Kim, Won Seok Choi, et al. Subcapsular Hepatic Hematoma after Endoscopic Retrograde Cholangiopancreatography[J]. Medicine, 2017, 94(26): e1041
- [25] Zhang ZF, Duan ZJ, Wang LX. Aggressive Hydration with Lactated Ringer Solution in Prevention of Postendoscopic Retrograde Cholangiopancreatography Pancreatitis[J]. J Clin Gastroenterol, 2017, 53(4): e17-e26
- [26] Sisk JM, Choi MD, Casabianca AB, et al. Two Cardiac Arrests Because of Venous Air Embolism During Endoscopic Retrograde Cholangiopancreatography: A Case Report[J]. A A Case Rep, 2017, 8(3): 47-50
- [27] Garg R, Mohan BP, Krishnamoorthi R, et al. Pre-endoscopic retrograde cholangiopancreatography (ERCP) administration of rectal indomethacin in unselected patients to reduce post-ERCP pancreatitis: A systematic review and meta-analysis [J]. Indian J Gastroenterol, 2018, 37(2): 120-126
- [28] Haneke T, Widmer AJ, Metting A. Splenic abscess complicating endoscopic retrograde cholangiopancreatography[J]. Proceedings, 2018, 31(3): 317-318
- [29] Park JS, Jeong S, Bang BW, et al. Endoscopic Papillary Large Balloon Dilation Without Sphincterotomy for the Treatment of Large Common Bile Duct Stone: Long-Term Outcomes at a Single Center [J]. Digestive Diseases and Sciences, 2016, 61(10): 3045-3053
- [30] Shao XD, Qi XS, Guo XZ. Endoscopic retrograde cholangiopancreatography with double balloon enteroscope in patients with altered gastrointestinal anatomy: A meta-analysis [J]. Saudi J Gastroenterol, 2017, 23(3): 150-160
- [31] Dong Shao, Jian Ping Chen. Comparison of endoscopic papillary balloon dilatation with conventional endoscopic sphincterotomy for peripapillary choledochoduodenal fistula with bile duct stones[J]. Internat J Clin Experim Med, 2015, 8(5): 8025-8028
- [32] Jin L, Dai M, Dun SS, et al. Efficacy of negative pressure nasobiliary drainage in acute obstructive cholangitis after endoscopic retrograde cholangiography[J]. World J Gastroenterol, 2017, 25(26): 2394-2400