



# 一期缝合与T管引流在腹腔镜胆总管探查术后应用的研究进展

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**摘要:** 腹腔镜胆总管探查术后一期缝合被认为是患者创伤与负担更小的治疗方式,且手术安全性较T管引流无显著差异,在目前快速康复治疗及个体化精准治疗的模式下显示出更多优势,然而其在实际应用中也受到诸多限制,不同病人选择何种手术方式不可一概而论,在保证患者安全与长期获益的情况下如何选择最佳手术方式仍是临床医生的争论之重心,笔者就此综合了国内外腹腔镜胆总管探查术后T管引流与一期缝合术的相关研究,以便为临床工作提供理论参考。

**关键词:** 胆总管结石 腹腔镜胆总管探查 一期缝合 T管引流

**中图分类号:** R657.4 **文献标识码:** A **文章编号:** 1009-5187 (2018) 09-315-06

**基金项目:** 湖南省自然科学基金(2018JJ6126);湖南省发改委项目(2060403)

## Research progress of primary closure and T-tube drainage after laparoscopic common bile duct exploration

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**Abstract:** One stage suture after laparoscopic common bile duct exploration is considered to be a less invasive treatment for patients. There was no significant difference in the safety of the operation compared with the T tube drainage, too. More advantages are shown in the current mode of rapid rehabilitation and individualized precision treatment. While one stage suture was bounded by practical application, which operation method to be choosed cannot be generalized when faced with different patients. What has been a key point of contention is how to select the best way of surgical procedure, at the same time it could also ensure patients' safe as well as long-term benefits. In order to provide theoretical reference for clinical work, the relevant studies on T tube drainage and primary suture after laparoscopic common bile duct exploration from home and abroad were summarized in this article.

**Key words:** Choledocholithiasis; Laparoscopic common bile duct exploration; Primary closure; T-tube drainage

胆结石是世界范围内分布的疾病,据统计世界上将近20%的人有此类疾病,其中胆总管结石(common bile duct Stones, CBDS)的发生率占有胆结石疾病的10%~33%<sup>[1]</sup>。目前手术治疗为CBDS的有效干预措施,在过去的一个世纪,胆总管切开探查取石后T管引流为治疗CBDS的标准术式。近年来,随着各中心大量的临床研究,发现在腹腔镜胆总管探查术(laparoscopic common bile duct exploration, LCBDE)后行一期缝合,不但具有术后恢复快及术后并发症少等优点,而且无T管引流的固有弊端,各中心尝试在LCBDE术后行一期缝合<sup>[2]</sup>。对于LCBDE术后是T管引流还是行一期缝合,目前国内外专家仍未达成共识<sup>[3]</sup>。相关研究报道指出<sup>[4]</sup>两者在手术时间、术后住院时间、腹腔引流时间等方面具有明显的区别。因此,深入了解T管引流和一期缝合的优势及弊端、掌握其相应的适应症,具有重要意义。本文综合了国内外此类手术的相关报道,以便为临床医生根据具体情况选择恰当的手术方式提供参考。

### 1 LCBDE术后T管引流的简介

1889年瑞士学者Kehr第一次成功实施了开腹胆总管切开取石术及术后T管引流,从此该术式成为了当时治疗CBDS的标准术式。随着腹腔镜和胆道镜的设备及技术迅速发展,1990年起Mooney、Memon及Ivanov等人<sup>[5-7]</sup>先后报道了开展LCBDE、胆道镜取石及T管引流相关经验。随后国内学者张诗诚及牛军等人<sup>[8,9]</sup>亦先后开展了LCBDE及术后T管引流。LCBDE及术后T管引流因其保持了Oddi括约肌完整性、微创、及一次完成胆总管取石和胆囊切除等优点逐渐被外科医生接受,得到迅速发展<sup>[10]</sup>。有学者认为<sup>[11,12]</sup>, LCBDE术后T管引流的目的是:

(1) 支撑胆管,防止胆道切开处因黏连而引起胆道狭窄;(2) 胆道引流,通过引流胆汁降低胆道内压力,防止因胆道压力增高而引起胆漏等相关并发症的发生;(3) 为术后T管造影及取出残余结石提供

通道。王国军等人认为<sup>[13]</sup>, T管引流可明显降低胆道压力。但是, T管需要留置的时间较长,而且,拔除T管时胆漏发生率较高,其原因是:(1) LCBDE术相对来说创伤小,创面粘连少,窦道形成的时间相对延长<sup>[14]</sup>;(2) 胆总管因电刀切开后血运稍差,愈合延迟。病人术后需要长时间带T管生活,不仅给患者生活带来诸多不便,而且增加了患者的社会心理压力。更重要的是,留置T管引流具有其固有的弊端<sup>[15,16]</sup>:(1) 可能发生T管滑出,从而引起胆漏、胆道损伤及胆汁性腹膜炎;(2) T管作为一种异物可能引起胆道狭窄、胆道梗阻或腹腔内粘连;(3) T管压迫胆管壁影响胆管血运,可能引起胆管壁缺血坏死;(4) 经T管引流胆汁大量丢失导致水电解质酸碱紊乱、精神不振及食欲欠佳;(5) 拔除T管时可能发生出血、胆漏以及窦道延迟愈合甚至不愈合;(6) T管引流可能引起胆道逆行感染及腹腔感染。

(7) T管作为一种异物,可能诱发结石形成<sup>[17]</sup>。为此国内外学者进行了大量相关研究,学者Wu等人<sup>[18]</sup>在动物模型上进行相关研究,得出结论:LCBDE术后一期缝合是动物模型中胆总管切开后术后的首选术式,有必要进一步进行相关临床研究;学者Yin等<sup>[19]</sup>纳入了来自12项研究的956名患者进行Meta分析,结果显示,在接受LCBDE治疗CBDS的患者中,无论是在术后并发症和胆道特异性并发症,还是在手术时间和住院时间上,胆总管的一期缝合更优于T管引流;汤建军等<sup>[20]</sup>人回顾总结了100例成功实施LCBDE患者的临床资料,他们认为,在术者掌握了手术适应证的前提下,LCBDE术后一期缝合的方法是安全可行的,充分体现了快速康复外科的理念,值得在临床上推广应用。

### 2 LCBDE术后胆总管一期缝合的可行性分析

文献报道发现<sup>[21]</sup>,在目前所有的胆道手术案例中,约有60%~80%探查过胆总管,而探查结果平均约有30%~50%为阴性,这说明了相当一部分LCBDE术后患者并不需要再次取石,也让部分学者<sup>[22]</sup>对所有患者均需常规行T管引流产生质疑,他们提出新的理论——LCBDE术后胆总管一期缝合,并对其进行了深入研究。Podda等<sup>[23]</sup>对包含1770名患者的4个随机对照研究和12个回顾性队列研究进行Meta分析,结果显示,腹腔镜胆总管探查术后一期缝合的患者术后胆汁性腹膜炎发生率为0%,而T管引流的患者为2.3%,在术后并发症总发生率、胆道特异性并发症发生率、胆漏发生率、结石残留率等方面,一期缝合与T管引流无统计学差异,并且前者手术时

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间、术后住院时间、住院费用明显少于后者。Wang等<sup>[24]</sup>调查研究了LCBDE术后使用一期缝线和T管引流的免疫学变化,认为腹腔镜一期缝合技术可以通过减少胆总管结石患者的手术创伤来减少免疫应激反应。由此可看出,相比于所有患者LCBDE术后均常规行T管引流,一期缝合更符合现代医学快速康复治疗的理论<sup>[25]</sup>,且后者的术后护理、对患者产生的心理、身体和经济负担更小。

同时作为一种新的手术方式,除了手术疗效、效益,术中安全性及术后并发症也是临床医生的关心之重。根据目前的文献报道,一期缝合术后并发症主要有胆漏、结石复发、胆道狭窄、残留结石等<sup>[26]</sup>。其中,术后最常见并发症为胆漏,发生率约为3.8%<sup>[27]</sup>。有学者<sup>[28]</sup>认为术后可能发生Oddi括约肌水肿或功能失调、胆总管末端狭窄,一期缝合不能持续引流出大量胆汁,可能会引起胆总管内部压力进一步增高导致胆漏。而索运生等人<sup>[29]</sup>经过相关研究认为LCBDE术后一期缝合,胆道内压力无明显变化,此术式并不会引起胆道压力过高而致胆漏。Liu等人<sup>[30]</sup>对行LCBDE的患者进行回顾性队列研究,通过逻辑回归确定胆汁渗漏的危险因素,包括人口统计学因素,术前状况和手术细节,其在2012年2月至2016年6月期间,共实施265例LCBDE手术,141例行一期缝合的患者纳入本研究,发现在这些患者中胆漏的发生率为11.3%(16/141),而在细长的胆总管患者中胆漏的发生率更高,Liu认为细长的胆总管和缺乏经验的外科医生是LCBDE术后一期缝合后发生胆汁泄漏的高危因素。饶尚锐等人<sup>[31]</sup>对115例患者行一期缝合术后胆漏的多因素分析显示,一期缝合适应症把握不严、术者腹腔镜下缝合技术欠佳、助手配合不到位及缝合材料使用不当是术后发生胆漏的主要原因,其中因术者经验欠缺,术中操作不到位,使得术后胆漏发生率偏高(12.5%)。并且,Hua等<sup>[27]</sup>对LCBDE术后胆漏的单因素分析显示,胆漏只与结石取尽和胆总管直径有关,而与一期缝合手术本身无关,在熟练的腹腔镜手术医生和合适的患者中,术后胆漏的发生率更低。臧志涛等<sup>[32]</sup>认为熟练的胆道镜操作及缝合技术是预防术后胆漏、结石残留和胆道狭窄的关键。作为一种新兴手术方式,应严格把握手术适应症,由具备丰富手术经验的医师带头开展,可显著减少术后胆漏的发生。Kemp Bohan、Teitelbaum等人认为<sup>[33,34]</sup>加强对临床医师腹腔镜技术训练对LCBDE的成功实施显得尤为重要。由于胆总管切开取石的原则是取尽结石,因而一期缝合术后结石残留率很低,综合各文献报道为0%~3.4%<sup>[22]</sup>。若术后发现残留结石,可行内镜下乳头切开术<sup>[35]</sup>。针对一期缝合的另一并发症胆道狭窄,Khaled等<sup>[36]</sup>对2002年10月至2012年10月期间接受LCBDE术后一期缝合的120名连续患者(81名女性)进行的回顾性分析。在39.2(2~82)个月的随访中,死亡率为0%,发病率8.3%,术后胆漏率为2.5%,术后CBDS复发率为3.3%以及胆道狭窄率为0.8%,且胆道狭窄无明显临床症状。多数文献报道未见胆道狭窄并发症出现。学者AA El-Geidie<sup>[37]</sup>认为,如果胆总管探查一切顺利,下端通畅无阻,无残存结石和感染的后顾之忧,胆总管壁又不薄,且管径够粗,尽量行一期缝合术。并且,Estellés Vidagany等人<sup>[38]</sup>回顾性分析2001年1月至2012年12月间160例行LCBDE术后一期缝合的患者,总并发症发生率为15%,胆道并发症发生率为7.5%,据报道11名患者(6.8%)发生胆漏,在一半以上的案例中(63.6%),不需要采取进一步行动,胆漏自发地愈合,再次手术6例(3.75%),胆汁性腹膜炎2例,腹腔积血4例,结石清除成功率为96.2%,死亡率和CBD狭窄率分别为0%,Estellés Vidagany认为在LCBDE术后行胆道镜或术中胆管造影确定CBDS完全清除后,行一期缝合是一种非常安全的技术。同时,Parramembrives等<sup>[39]</sup>回顾性分析LCBDE术后予以T管引流、支架植入或一期缝合的146名患者,结果显示:T管引流组9例(17.3%),支架植入组5例(8.6%),一期缝合组1例(2.8%)发生Dindo-Clavien $\geq 3$ 并发症,T管引流组、支架植入组和一期缝合组的胆漏发生率分别为3.8%,8.6%和16.7%,T管移除导致21.1%的患者发生不良事件,与支架直接相关的并发症发生率为9.6%。Parramembrives认为支架植入或T管引流不能为胆总管切开闭合提供任何附加价值,还会产生特定的并发症。相反,尽管一次缝合后

胆汁漏出更频繁,但它们的临床后果很小,可以在门诊治疗。另外,随着近年随着腹腔镜及胆道镜等设备、手术技术及器械、相关手术材料的改进等,腹腔镜胆总管切开取石术后行一期缝合的成功例数越来越多且术后并发症更少<sup>[23]</sup>。如今,一期缝合术正被越来越多的医生所接受。Zhang W J、Wen、Abellán、Cai及Zhang W等人<sup>[40-44]</sup>分别进行临床研究,认为LCBDE术后一期缝合在技术上是可行的,安全性较T管引流更高,对于合适的病例完全可以替代T管引流,在临床上值得推广。

### 3 LCBDE术后一期缝合与留置T管的选择原则

LCBDE术后胆总管一期缝合可以保持胆管正常的解剖生理、维持正常的肝肠循环,防止因胆汁体外引流而导致水、电解质紊乱。虽然,Gurusamy等<sup>[45]</sup>的研究显示,相当于T管引流,术后行一期缝合是安全可行的,而且可在一定程度上降低感染性并发症的发生率并且缩短住院时间。Jameel等<sup>[46]</sup>人更是认为LCBDE术后一期缝合将是今后微创外科发展的必然趋势。但是目前在临床上,LCBDE术后一期缝合仍未形成一个统一的标准<sup>[47]</sup>。Ahmed等<sup>[48]</sup>报道,在术前明确无肝内胆管结石、胆道无明显狭窄及无急性化脓性胆管炎表现,且术中确认胆总管无结石残留、下端开口通畅及未进行长时间胆道探查等情况下可以考虑行一期缝合术。Zhang LD等<sup>[49]</sup>也明确指出,只有在严格掌握一期缝合适应症及缝合技术的前提下,LCBDE术后一期缝合才是安全可行的。所以,明确手术适应症是LCBDE术后一期缝合的必要前提<sup>[50]</sup>。综合目前的相关研究<sup>[43,51-53]</sup>,一期缝合适应症主要由以下几点构成:1)有胆总管结石,且无多发肝内胆管结石的患者;2)胆总管内径在1.0 cm以上的患者,以防发生术后胆管狭窄;3)胆总管内结石在2.0 cm以下的患者,单发且易取;4)术中取净结石,胆道内无残留残石;5)无明显梗阻性黄疸,胆总管下段无梗阻;6)胆管壁无明显损伤、炎症及水肿等情况,无脓性胆汁。另有学者报道<sup>[54]</sup>,对比研究显示:糖尿病和低蛋白血症的患者胆总管一期缝合术后的胆漏率相对较高,因此除上述适应症外,我们对于低蛋白及糖尿病患者选择胆总管一期缝合时要特别谨慎,应在术前及术后尽量调节好白蛋白及血糖。此外,要想保证LCBDE术后一期缝合的安全性,仅依靠程序化的掌握其手术适应症是不够的,医生对临床经验的灵活应用也起到关键作用<sup>[55]</sup>。在Liu等<sup>[30]</sup>人最新的研究中就指出,外科医生丰富的临床经验是降低LCBDE术后一期缝合胆漏发生的几率、从而保证其安全性的重要因素。手术前,医生根据患者的一般情况、相关影像学检查结果、病情的缓急轻重等作出初步的诊断。手术过程中,根据胆汁颜色、结石种类、胆总管直径,水肿程度等决定是否可行一期缝合术式<sup>[50]</sup>。同时,准确把握手术要领也非常关键。胆漏以及胆总管狭窄是影响一期缝合术后恢复的主要因素。术中动作轻柔,可以减少对胆管黏膜的损伤。术中严密细致的缝合可减少胆漏发生。Lee及Yokoyama等<sup>[56,57]</sup>指出术中选择单向刺带式V-Loc缝线,可以减轻对组织的损伤,防止切口愈合形成瘢痕,进而避免胆管炎症、狭窄。术中可在胆管切口缝合处喷涂医用蛋白胶以预防术后组织粘连、降低胆漏的发生风险<sup>[58]</sup>。术后应常规放置腹腔引流管,引流减压防止胆漏发生,同时也可以早期发现胆漏,并尽早予以相关干预。可见,我们对于手术适应症的理解不能固化,张秋涛等<sup>[59]</sup>人表示随着外科医生经验的积累,在确保胆总管下端通畅的前提下,LCBDE术后行一期缝合的适应症也可相应扩大。但是因为患者病情的动态变化、以及胆道情况的复杂性,一期缝合不可能适用于所有胆总管结石患者,部分患者在LCBDE术后仍需留置T管用以降低胆管压力和再次取尽残余结石。所以对于出现下列任意情况的患者<sup>[60]</sup>:1)肝内多发结石或胆总管残余结石;2)胆总管狭窄需T管支撑;3)梗阻性黄疸;4)多次探查胆管,十二指肠大乳头水肿较严重;5)肝功能严重受损;6)化脓性胆管炎,胆管壁水肿较重;7)全身基本情况较差,合并低蛋白血症;8)胆源性胰腺炎;9)胆囊或胆道恶性肿瘤。LCBDE术后应常规放置T管引流,而不是一味追求微创行一期缝合术式。另有学者也认为<sup>[61]</sup>,在患者病情较重时,LCBDE术后放置T管引流是安全有效的。



#### 4 讨论

目前很多临床研究认为, LCD术后一期缝合与T管引流相比, 前者无论在患者疾病诊治过程中, 还是在医生操作的技术要求上都占有一定优势<sup>[62]</sup>。但是实际情况下, T管引流较一期缝合更容易受到青睐, 因为更多时候, 医生与患者做出选择的时候表现得更加保守。但是, 具体术式选择不应该如此保守。我们认为, LCBDE术后一期缝合术是安全、有效的<sup>[63]</sup>, 其不仅可以有效避免留置T管引起的诸多相关并发症及社会心理影响, 而且能较大幅度缩短住院时间及减少住院花费<sup>[64, 65]</sup>, 更加充分体现了微创外科的优越性, 具有良好的临床应用价值。当然, 不可一概否定留置T管引流的好处, 对于部分胆道炎症较重、病情危重的病例, T管引流的安全性较高<sup>[61]</sup>。对于临床中术式的选择, 临床医师应在术前完善相关检查并仔细分析, 严格掌握这两种术式的适应证及禁忌症; 术后不断随访及总结, 为更好地服务于患者, 而不断完善相应的术式。

此外, 目前国内外均有大量报道指出<sup>[66-68]</sup>, 在LCBDE术后胆总管内放置自行脱落胆道支架引流并行胆总管一期缝合, 避免了T管引流的弊端, 又提高了一期缝合的安全性, 是治疗CBDS较理想的方法。所以, 对其进一步深入探究, 可能对LCBDE术后一期缝合术式的成熟起到至关重要的作用。

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