

· 论著 ·

倒刺缝线在腹腔镜直肠癌根治术中加固吻合口的应用价值

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【摘要】 目的 探讨倒刺缝线在腹腔镜直肠癌根治术中加固吻合口的应用价值。**方法** 采用回顾性队列研究方法。收集 2016 年 3 月至 2018 年 12 月上海交通大学医学院附属仁济医院收治的 215 例腹腔镜直肠癌根治术患者的临床病理资料;男 122 例,女 93 例;年龄为 (62.3 ± 0.7) 岁,年龄范围为 20~75 岁。215 例患者中,86 例腹腔镜直肠癌根治术中采用倒刺缝线缝合吻合口,设为倒刺缝线组;129 例腹腔镜直肠癌根治术中吻合口未行任何加固缝合,设为传统组。观察指标:(1)术中情况。(2)术后情况。(3)随访情况。采用门诊和电话方式进行随访,了解患者术后并发症情况、吻合口愈合以及通畅情况。随访时间截至 2019 年 5 月。正态分布的计量资料以 $\bar{x} \pm s$ 表示,组间比较采用 t 检验;偏态分布的计量资料以 M (范围)表示。计数资料以绝对数或百分比表示,组间比较采用 χ^2 检验。等级资料采用非参数检验。**结果** (1)术中情况:两组患者均完成腹腔镜直肠癌根治术,无中转开腹。倒刺缝线组患者术中出血量、手术时间、吻合口距齿状线距离、辅助切口长度分别为 (127 ± 9) mL、 (160.2 ± 3.8) min、 (3.56 ± 0.15) cm、 (4.12 ± 0.11) cm;传统组上述指标分别为 (114 ± 6) mL、 (128.9 ± 2.4) min、 (3.67 ± 0.12) cm、 (4.25 ± 0.09) cm。两组患者手术时间比较,差异有统计学意义($t = 7.33, P < 0.05$),其余指标比较,差异均无统计学意义($t = 1.32, 0.61, 0.94, P > 0.05$)。(2)术后情况:倒刺缝线组患者术后首次肛门排气时间、术后住院时间分别为 (72.5 ± 2.2) h、 (8.1 ± 0.5) d,传统组上述指标分别为 (76.2 ± 1.7) h、 (8.0 ± 0.5) d,两组患者上述指标比较,差异均无统计学意义($t = 1.33, 0.87, P > 0.05$)。(3)随访情况:215 例患者均获得随访,随访时间为 6~12 个月,中位随访时间为 8 个月。倒刺缝线组患者术后吻合口漏、尿潴留、伤口感染、肠梗阻、术后 6 个月排便功能障碍例数分别为 2、5、6、4、3 例,而传统组上述指标分别为 13、15、11、8、9 例。两组患者吻合口漏比较,差异有统计学意义($\chi^2 = 4.77, P < 0.05$),两组患者尿潴留、伤口感染、肠梗阻、术后 6 个月排便功能障碍比较,差异均无统计学意义($\chi^2 = 2.07, 0.17, 0.22, 1.26, P > 0.05$)。两组患者肠镜检查结果显示肠道均通畅。**结论** 倒刺缝线在腹腔镜直肠癌根治术中加固吻合口安全、有效,能够降低吻合口漏发生率。

【关键词】 直肠肿瘤; 治疗; 消化道重建; 倒刺缝线; 吻合口漏; 腹腔镜检查

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Application value of barbed suture in reinforcing anastomosis during laparoscopic radical resection of rectal cancer

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【Abstract】 Objective To investigate the application value of barbed suture in reinforcing anastomosis during laparoscopic radical resection of rectal cancer. **Methods** The retrospective cohort study was conducted. The clinicopathological data of 215 patients with rectal cancer who underwent laparoscopic radical resection in the Renji Hospital Affiliated to Shanghai Jiaotong University School of Medicine from March 2016 to December 2018 were collected. There were 122 males and 93 females, aged (62.3 ± 0.7) years, with a range from 20 to 75 years. Of 215 patients, 86 patients undergoing laparoscopic radical resection of rectal cancer with barbed suture for anastomosis were allocated into barbed suture group, and 129 patients undergoing laparoscopic radical resection of rectal cancer without reinforced anastomosis were allocated into traditional group, respectively. Observation indicators: (1) intraoperative situations; (2) postoperative situations; (3) follow-up. Follow-up using outpatient

examination and telephone interview was performed to detect postoperative complications, anastomotic healing and patency of patients up to May 2019. Measurement data with normal distribution were represented as $Mean \pm SD$, and comparison between groups was analyzed using the t test. Measurement data with skewed distribution were described as M (range). Count data were described as absolute numbers or percentages, and comparison between groups was analyzed using the chi-square test. Ordinal data were analyzed using the Friedman non-parametric test.

Results (1) Intraoperative situations: patients in the two groups underwent laparoscopic radical resection of rectal cancer successfully, without conversion to open laparotomy. The volume of intraoperative blood loss, operation time, distance between the anastomosis and dentate line, length of auxiliary incision of the barbed suture group were (127 ± 9) mL, (160.2 ± 3.8) minutes, (3.56 ± 0.15) cm, (4.12 ± 0.11) cm, respectively, versus (114 ± 6) mL, (128.9 ± 2.4) minutes, (3.67 ± 0.12) cm, (4.25 ± 0.09) cm of the traditional group. There was a significant difference in the operation time between the two groups ($t = 7.33, P < 0.05$), but no significant difference in the other indicators between the two groups ($t = 1.32, 0.61, 0.94, P > 0.05$). (2) Postoperative situations: the time to first flatus after surgery and duration of postoperative hospital stay of the barbed suture group were (72.5 ± 2.2) hours and (8.1 ± 0.5) days, respectively, versus (76.2 ± 1.7) hours and (8.0 ± 0.5) days of the traditional group, showing no significant difference between the two groups ($t = 1.33, 0.87, P > 0.05$). (3) Follow-up: 215 patients were followed up for 6–12 months, with a median follow-up time of 8 months. In the barbed suture group, 2 patients had postoperative anastomotic leakage, 5 had urinary retention, 6 had incision infection, 4 had intestinal obstruction, 3 had bowel dysfunction in 6 months after operation. In the traditional group, 13 patients had postoperative anastomotic leakage, 15 had urinary retention, 11 had incision infection, 8 had intestinal obstruction, 9 had bowel dysfunction in 6 months after operation. There was a significant difference in the anastomotic leakage between the two groups ($t = 4.77, P < 0.05$), but no significant difference in the urinary retention, incision infection, intestinal obstruction, bowel dysfunction in 6 months after operation between the two groups ($t = 2.07, 0.17, 0.22, 1.26, P > 0.05$). Patients in the two groups showed unobstructed intestinal tract on enteroscopy. **Conclusion** The barbed suture for reinforcing anastomosis in radical resection of rectal cancer is safe and feasible, which can reduce the incidence of anastomotic leakage.

【Key words】 Rectal neoplasms; Treatment; Digestive reconstruction; Barbed suture; Anastomotic leakage; Laparoscopy

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腹腔镜手术较传统开腹手术具有创伤小、恢复快、手术效果与传统开腹手术相同或相似等优点,目前已在直肠癌手术中广泛应用^[1-10]。直肠癌的治疗理念也从传统的根部淋巴结清扫+全直肠系膜切除术(total mesorectal excision, TME)逐渐发展为在肿瘤根治的前提下尽可能保护自主神经、降低术后并发症、提高患者术后生命质量等^[11-12]。吻合口漏是直肠癌术后常见且严重影响患者术后康复和生命质量的并发症^[13-15]。吻合口漏的发生与吻合口的血供情况、吻合技术水平、吻合口张力和肠腔内压等密切相关,其发生率为 2.6%~19.0%^[16-18]。本研究回顾性分析 2016 年 3 月至 2018 年 12 月我科收治的 215 例行腹腔镜直肠癌根治术患者的临床病理资料,探讨倒刺缝线在腹腔镜直肠癌根治术中加固吻合口的应用价值。

1 资料与方法

1.1 一般资料

采用回顾性队列研究方法。收集 215 例行腹腔镜直肠癌根治术患者的临床病理资料;男 122 例,女 93 例;年龄为 (62.3 ± 0.7) 岁,年龄范围为 20~75 岁;

BMI 为 (22.00 ± 0.23) kg/m²;TNM 分期为 I 期 40 例、II 期 121 例、III 期 54 例。其中 86 例患者腹腔镜直肠癌根治术中采用倒刺缝线(3-0 V-LOCTM 倒刺缝线)缝合吻合口,设为倒刺缝线组;对照组按照 1:1.5 进行匹配,129 例患者腹腔镜直肠癌根治术中吻合口未行任何加固缝合,设为传统组。两组患者性别、年龄、BMI、肿瘤长径、TNM 分期一般资料比较,差异均无统计学意义($P > 0.05$),具有可比性。见表 1。本研究符合《赫尔辛基宣言》的要求。患者及家属均签署知情同意书。

1.2 纳入标准和排除标准

纳入标准: (1) 电子结肠镜及病理学检查诊断为直肠癌。(2) 首次接受手术治疗。(3) 同一医疗组完成的腹腔镜直肠癌根治术。(4) 年龄为 18~75 岁。(5) 临床病理资料完整。

排除标准: (1) 术前 CT、MRI 等检查结果示有远处转移(IV 期)或合并其他恶性肿瘤。(2) 腹腔镜 Hartmann 手术或腹会阴联合切除术或临时性末端回肠造口患者。(3) 合并严重心脑血管等疾病,影响患者预后。(4) 临床病理资料缺失。

表 1 倒刺缝线组 and 传统组直肠癌患者的一般资料比较

组别	例数	性别(例)		年龄($\bar{x} \pm s$, 岁)	体质量指数($\bar{x} \pm s$, kg/m ²)	肿瘤长径($\bar{x} \pm s$, cm)	TNM 分期(例)		
		男	女				I 期	II 期	III 期
倒刺缝线组	86	51	35	62.8 $\pm$ 1.0	22.1 $\pm$ 0.3	4.3 $\pm$ 0.2	14	50	22
传统组	129	71	58	60.7 $\pm$ 1.0	21.9 $\pm$ 0.3	4.6 $\pm$ 0.2	26	71	32
统计值		$\chi^2 = 0.38$		$t = 1.65$	$t = 0.31$	$t = 1.22$	$Z = 0.524$		
P 值		>0.05		>0.05	>0.05	>0.05	>0.05		

注:倒刺缝线组患者腹腔镜直肠癌根治术中采用倒刺缝线缝合吻合口;传统组患者腹腔镜直肠癌根治术中吻合口未行任何加固缝合

1.3 治疗方法

所有患者术前按同一标准进行术前准备,由同一手术团队施行手术。患者取截石位,头低右高位,常规全身麻醉、消毒、铺巾后 5 孔法进腹;遵循肿瘤根治原则,在腹腔镜直视下完成直肠游离和淋巴结清扫,并在肿瘤下缘 2~4 cm 处离断远端直肠(图 1A~1C);管状吻合器在腹腔镜下完成乙状结肠-直肠端端吻合(图 1D)。传统组直接于盆底放置负压球后逐层关腹;倒刺缝线组使用倒刺缝线对吻合口远端的直肠与近侧的结肠肠壁进行连续缝合,关闭吻合口后方直肠系膜与结肠系膜之间的空隙以及“猫耳朵区域”(断离直肠的直线切割与结肠-直肠端端吻合的圆形切线所形成的交角区),见图 2。其余手术步骤以及围术期处理均相同。患者术后常规使用静脉自控镇痛泵维持 24 h,术后留置肠道减压管。

1.4 观察指标和评价标准

观察指标包括(1)术中情况:手术完成情况、术中出血量、手术时间、吻合口距齿状线距离、辅助切口长度。(2)术后情况:术后首次肛门排气时间、术

后住院时间。(3)随访情况:患者随访例数、随访时间、术后吻合口漏、尿潴留、伤口感染、肠梗阻、术后 6 个月排便功能障碍。

吻合口漏诊断标准:骶前引流管内见粪汁样物质,腹部 CT 检查证实存在盆腔脓肿或积液、积液,并经造影、内镜检查等证实,同时合并发热、腹膜炎、脓毒血症等临床表现。尿潴留诊断标准为术后 3~5 d 拔出导尿管后出现排尿困难,即患者腹下区可触及充盈的膀胱,但不能排空膀胱。

1.5 随访

采用门诊和电话方式进行随访,了解患者术后并发症情况、吻合口愈合以及通畅情况。随访时间截至 2019 年 5 月。

1.6 统计学分析

应用 SPSS 22.0 统计软件进行分析。正态分布的计量资料以 $\bar{x} \pm s$ 表示,组间比较采用 t 检验;偏态分布的计量资料以 M (范围)表示。计数资料以绝对数或百分比表示,组间比较采用 χ^2 检验。等级资料采用非参数检验。 $P < 0.05$ 为差异有统计学意义。

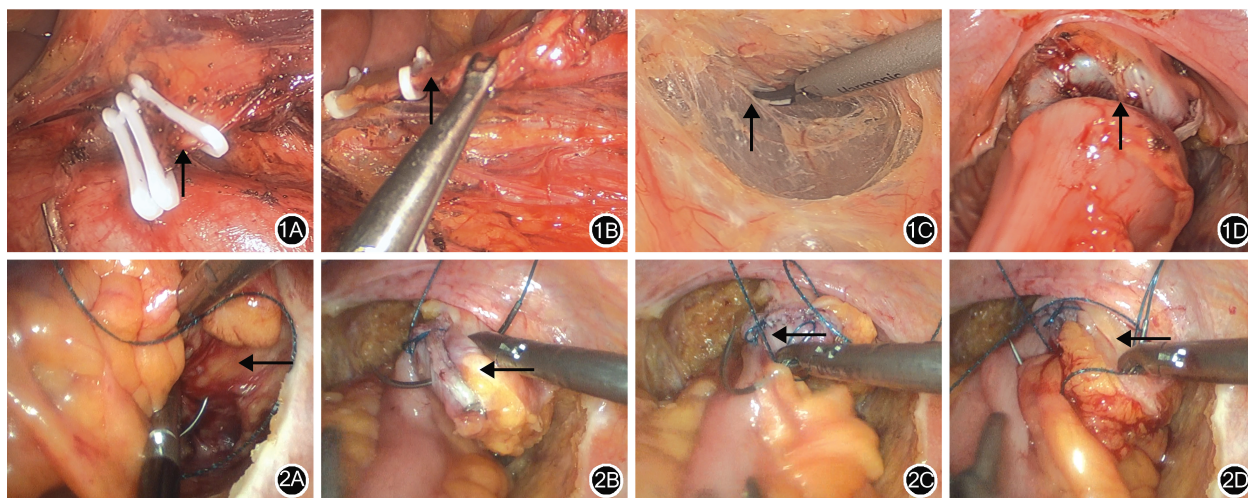


图 1 腹腔镜直肠癌手术步骤 1A:离断肠系膜下动脉(↑);1B:离断肠系膜下静脉(↑);1C:直肠全系膜切除(↑);1D:直肠-乙结肠端端吻合(↑) 图 2 倒刺缝线连续缝合加固吻合口 2A:倒刺缝线缝合口周围系膜(←);2B:倒刺缝线加固吻合口侧壁(←);2C:倒刺缝线加固吻合口前壁(←);2D:倒刺缝线缝合吻合口周围系膜(←)

2 结果

2.1 术中情况

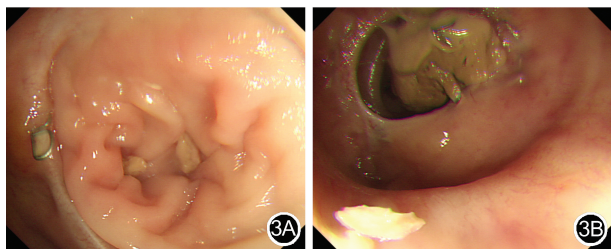
两组患者均完成腹腔镜直肠癌根治术,无中转开腹。倒刺缝线组患者术中出血量、手术时间、吻合口距齿状线距离、辅助切口长度分别为 (127 ± 9) mL、 (160.2 ± 3.8) min、 (3.56 ± 0.15) cm、 (4.12 ± 0.11) cm;传统组上述指标分别为 (114 ± 6) mL、 (128.9 ± 2.4) min、 (3.67 ± 0.12) cm、 (4.25 ± 0.09) cm。两组患者手术时间比较,差异有统计学意义($t = 7.33, P < 0.05$),其余指标比较,差异均无统计学意义($t = 1.32, 0.61, 0.94, P > 0.05$)。

2.2 术后情况

倒刺缝线组患者术后首次肛门排气时间、术后住院时间分别为 (72.5 ± 2.2) h、 (8.1 ± 0.5) d,传统组上述指标分别为 (76.2 ± 1.7) h、 (8.0 ± 0.5) d,两组患者上述指标比较,差异均无统计学意义($t = 1.33, 0.87, P > 0.05$)。

2.3 随访情况

215 例患者均获得随访,随访时间为 6~12 个月,中位随访时间为 8 个月。倒刺缝线组患者术后吻合口漏、尿潴留、伤口感染、肠梗阻、术后 6 个月排便功能障碍例数分别为 2、5、6、4、3 例,而传统组上述指标分别为 13、15、11、8、9 例。两组患者吻合口漏比较,差异有统计学意义($\chi^2 = 4.77, P < 0.05$),两组患者尿潴留、伤口感染、肠梗阻、术后 6 个月排便功能障碍比较,差异均无统计学意义($\chi^2 = 2.07, 0.17, 0.22, 1.26, P > 0.05$)。两组患者肠镜检查结果显示肠道均通畅(图 3)。



倒刺缝线组患者腹腔镜直肠癌根治术中采用倒刺缝线缝合吻合口;传统组患者腹腔镜直肠癌根治术中吻合口未行任何加固缝合

图 3 倒刺缝线组和传统组患者术后 6 个月肠镜检查吻合口通畅情况 3A:倒刺缝线组肠镜检查结果显示吻合口通畅;3B:传统组肠镜检查结果显示吻合口通畅

3 讨论

3.1 吻合口漏发生因素的分析

吻合口漏是直肠癌手术的常见严重并发症之一,其危害主要是肠内容物通过破裂的吻合口进入

腹腔后,导致顽固性腹腔感染、盆腔脓肿,甚至影响患者术后生命质量和长期预后^[19-20]。导致吻合口漏直接原因包括吻合口血供情况、吻合技术水平、吻合口张力和肠腔内压等。有研究结果显示:影响直肠癌手术后吻合口漏发生的相关危险因素较多,如肿瘤位置(肿瘤位置越低吻合口的位置也越低,发生吻合口漏的可能性就越大),患者年龄,性别,体型(肥胖、骨盆窄小等),基础疾病(糖尿病、营养状况差)以及术者的操作熟练程度等^[21-26]。

在众多因素中,术中肛管降低了直肠腔内压力,避免因压力过大对吻合口造成的破裂作用^[27]。此外,直肠癌手术过程中保留左结肠动脉可为吻合口提供更加充分的血液灌注,尤其是对于合并有糖尿病等血管病变的直肠癌患者,保留左结肠动脉可以降低吻合口漏发生率^[28-29]。此外,预防性末端回肠造口可以极大减轻术后吻合口漏带来的危害^[30]。术后携带造口袋严重影响患者生命质量;同时,造口回纳需要二次入院治疗,可能引起切口疝、肠梗阻等其他造口相关的并发症^[31-33]。因此,笔者并不赞成常规行预防性末端回肠造口术。

3.2 倒刺缝线在临床中的应用

倒刺缝线是一种具有与缝合方向相反的单股倒刺缝线,20 世纪 60 年代,有学者设计倒刺缝线,但由于材料、技术等方面限制,研究处于停滞状态^[34-35]。单向倒刺可吸收线是一种新型缝合装置,具有全程无需打结、缩短缝合时间、减少术中出血量等优点^[36-37]。Angioli 等^[38]的研究结果显示:倒刺缝线在缝合切口过程中可快速稳固闭合创口,可以减少缝合子宫壁缺陷所需时间以及术中出血量,并明显降低手术操作难度。在腹腔镜手术中,倒刺缝线常用来关闭肠系膜或腹壁以及进行胆总管切开取石的一期缝合^[39-40]。

3.3 缝合吻合口降低吻合口漏的原因分析

多项研究结果显示:“猫耳朵区”是结肠-直肠双吻合器吻合过程中形成的组织薄弱区,该区域易发生炎性水肿,成为术后发生吻合口漏的危险区^[41-42]。TME 手术行结肠-直肠端端吻合时,结肠系膜和直肠系膜之间存在空隙,术后容易出现延迟愈合,加重吻合口漏的发生、发展^[43]。因此,加固缝合可降低吻合口张力,有助于改善局部血供,避免术后吻合口局部出现裂隙,这对降低术后吻合口漏发生率具有重要意义。本研究结果显示:倒刺缝线加固吻合口可以降低吻合口漏的发生率。笔者认为:其原因为加固“猫耳朵区域”以及关闭直肠系膜和

结肠系膜之间的间隙,可以阻止 A 级和 B 级吻合口漏的发生,从而降低吻合口漏发生率。但对于临床上 C 级吻合口漏,吻合口加固缝合的效果还有待进一步验证。本研究中的吻合口漏总体发生率低于已有文献报道水平(10.08%比 12.23%)^[18]。笔者分析原因:一方面纳入研究的直肠癌患者是由笔者团队完成,入组条件更严格;另一方面,笔者团队改良了传统肛管的手术操作,在一定程度上降低了吻合口漏发生率。

3.4 笔者团队经验总结

本研究结果显示:腹腔镜直肠癌手术中倒刺缝线的使用延长手术时间。但笔者认为:随着腹腔镜操作越来越熟练以及 4K 显示器的使用,手术时间会极大缩短。笔者对倒刺缝线加固乙结肠-直肠吻合口体会如下:(1)倒刺缝线尾带一圆环,可以先将缝针穿过圆环后再进入腹腔进行缝合加固。(2)缝合直肠和结肠浆膜的边距不宜过短,通常距吻合口 0.5 cm 左右,针距通常为 1~2 cm。(3)尽量缝合远端直肠系膜和近端结肠系膜,一方面可以避免因加固缝合造成的吻合口缺血、减少吻合口张力,另一方面有利于系膜包裹吻合口(尤其是直肠后壁),促进周围的毛细血管滋养吻合口。(4)避免使用手术器械钳夹缝线,导致锯齿结构的破坏,缝合结束后可用 Hem-o-lok 夹闭缝线。(5)对于吻合口位置腹膜返折以上,可以直接进行缝合加固;位于腹膜返折以下的吻合口,通常助手使用拳头将肛门向盆腔顶起,可使吻合口位置上移 2~3 cm,有助于吻合口的显露。

综上,倒刺缝线在腹腔镜直肠癌根治术中加固吻合口安全、有效,能够降低吻合口漏发生率。

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