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【临床研究】

胃癌腹腔镜辅助全胃切除术中不同食管-空肠吻合口加固方法的疗效及安全性比较

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摘要：　目的　比较胃癌腹腔镜辅助全胃切除术中 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口和 3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口的疗效及安全性。**方法**　选择 2019 年 10 月至 2020 年 10 月于新乡医学院第一附属医院普外科行腹腔镜辅助全胃切除术 + 食管-空肠 Roux-en-Y 手术治疗的 58 例胃癌患者为研究对象,根据食管-空肠吻合口加固方式将患者分为观察组($n=35$)和对照组($n=23$)。观察组患者应用 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口,对照组患者应用 3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口。比较 2 组患者的手术时间、食管-空肠吻合口加固时间、术中出血量、术后排气时间、住院时间以及术后出血、吻合口瘘、发热、切口感染、术后吻合口狭窄等并发症发生情况。**结果**　观察组患者食管-空肠吻合口加固时间为(6.37 ± 1.69)min,手术时间为(327.00 ± 49.82)min,术中出血量为(99.00 ± 8.90)mL;对照组患者食管-空肠吻合口加固时间为(14.95 ± 2.09)min,手术时间为(345.00 ± 32.64)min,术中出血量为(112.90 ± 9.59)mL;观察组患者食管-空肠吻合口加固时间短于对照组($t=16.200$,$P<0.01$);2 组患者的手术时间、术中出血量比较差异无统计学意义($t=1.450$、1.040,$P>0.05$)。观察组患者术后排气时间、住院时间分别为(3.06 ± 0.52)、(19.77 ± 4.18)d,对照组患者术后排气时间、住院时间分别为(3.36 ± 0.74)、(21.00 ± 4.51)d;2 组患者的术后排气时间、住院时间比较差异无统计学意义($t=1.710$、1.004,$P>0.05$)。观察组患者发生术后出血 1 例(2.9%)、吻合口瘘 3 例(8.6%)、发热 5 例(14.3%)、切口感染 2 例(5.7%);对照组患者发生术后出血 5 例(21.7%)、吻合口瘘 3 例(13.0%)、发热 4 例(17.4%)、切口感染 2 例(8.7%);观察组患者术后出血发生率显著低于对照组($\chi^2=5.335$,$P<0.05$);2 组患者术后吻合口瘘、发热、切口感染发生率比较差异无统计学意义($\chi^2=0.299$、0.102、0.192,$P>0.05$)。2 组患者术后均随访 13 个月,观察组患者复发转移 2 例(5.7%),对照组患者复发转移 2 例(8.7%);2 组患者复发转移率比较差异无统计学意义($\chi^2=0.192$,$P>0.05$)。**结论**　腹腔镜辅助全胃切除术中应用 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口与 3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口在降低食管-空肠吻合口瘘发生率方面效果相当,Spiral PDO 倒刺线连续全层加固吻合口在降低食管-空肠吻合口出血发生率、缩短食管-空肠吻合口加固时间方面更有优势。

关键词：　胃癌;腹腔镜;胃切除;食管-空肠吻合
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Comparison of the efficacy and safety of different esophagojejunostom reinforcement methods in laparoscopic assisted total gastrectomy for gastric cancer

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Abstract: Objective　To compare the efficacy and safety of continuous full-thickness reinforcement of the esophagus-jejunal anastomosis with Spiral PDO barbed thread and discontinuous full-thickness reinforcement of the esophagus-jejunal anastomosis with 3-0 absorbable antibacterial microfiber thread in laparoscopic assisted total gastrectomy for gastric cancer. **Methods**　A total of 58 patients with gastric carcinoma who underwent laparoscopic-assisted total gastrectomy + esophagus-jejunal Roux-en-Y surgery in the Department of General Surgery of the First Affiliated Hospital of Xinxiang Medical University from October 2019 to October 2020 were selected as the research objects. The patients were divided into the observation group ($n=35$) and the control group ($n=23$) according to the reinforcement method of esophagojejunal anastomosis. The patients in the observation group were applied with continuous full-thickness reinforcement of the esophagus-jejunal anastomosis with Spiral PDO barbed thread, and the patients in the control group were applied with discontinuous full-thickness reinforcement of the esophagus-jejunal anastomosis with 3-0 absorbable antibacterial microfiber thread. The operation time, esophagojejunostomy

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reinforcement time, intraoperative blood loss, postoperative exhaust time, hospitalization time and the incidence of complications including postoperative bleeding, anastomotic leakage, fever, incision infection, postoperative anastomotic stenosis of patients were compared between the two groups. **Results** The reinforcement time of esophagus-jejunal anastomosis was (6.37 ± 1.69) min, the operation time was (327.00 ± 49.82) min, and the intraoperative blood loss was (99.00 ± 8.90) mL of patients in the observation group; the reinforcement time of esophagus-jejunal anastomosis was (14.95 ± 2.09) min, the operation time was (345.00 ± 32.64) min, and the intraoperative blood loss was (112.90 ± 9.59) mL of patients in the control group; the reinforcement time of esophagus-jejunal anastomosis in the observation group was significantly shorter than that in the control group (t = 16.200, P < 0.01); there was no significant difference in the operation time and intraoperative blood loss of patients between the two groups (t = 1.450, 1.040; P > 0.05). The postoperative exhaust time and hospitalization time of patients in the observation group were (3.06 ± 0.52) d and (19.77 ± 4.18) d, respectively. The postoperative exhaust time and hospitalization time of patients in the control group were (3.36 ± 0.74) d and (21.00 ± 4.51) d, respectively. There was no significant difference in the postoperative exhaust time and hospitalization time of patients between the two groups (t = 1.710, 1.004; P > 0.05). In the observation group, postoperative bleeding occured in 1 case (2.9%), anastomotic leakage occured in 3 cases (8.6%), fever occured in 5 cases (14.3%), and incision infection occured in 2 cases (5.7%); in the control group, postoperative bleeding occured in 5 cases (21.7%), anastomotic leakage occured in 3 cases (13.0%), fever occured in 4 cases (17.4%), and incision infection occured in 2 cases (8.7%); the incidence of postoperative bleeding of patients in the observation group was significantly lower than that in the control group (χ^2 = 5.335, P < 0.05); there was no significant difference in the incidence of postoperative anastomotic leakage, fever and incision infection of patients between the two groups (χ^2 = 0.299, 0.102, 0.192; P > 0.05). The patients were followed up for 13 months in the two groups; there were 2 cases (5.7%) of recurrence and metastasis in the observation group and 2 cases (8.7%) of recurrence and metastasis in the control group. There was no significant difference in the rate of recurrence and metastasis of patients between the two groups (χ^2 = 0.192, P > 0.05). **Conclusion** The application of continuous full-thickness reinforcement of the esophagus-jejunal anastomosis with Spiral PDO barbed thread and discontinuous full-thickness reinforcement of the esophagus-jejunal anastomosis with 3-0 absorbable antibacterial microfiber thread in laparoscopic assisted total gastrectomy has the same effect in reducing the incidence of esophagojejunostomy leakage. Continuous full-thickness reinforcement of the esophagus-jejunal anastomosis with Spiral PDO barbed thread has more advantages in reducing the incidence of esophagojejunostomy bleeding and shortening the reinforcement time of esophagus-jejunal anastomosis.

Key words: gastric carcinoma; laparoscopy; gastrectomy; esophagojejunostomy

胃癌是常见的恶性肿瘤之一,其发病率在我国消化系统恶性肿瘤中居第2位[1]。以外科手术为基础的综合治疗是胃癌治疗的基本模式。随着腔镜技术的发展,腹腔镜辅助根治性全胃切除术、完全腹腔镜根治性全胃切除术等已经成为早期胃癌的主要手术方式[2]。食管-空肠吻合是腹腔镜胃癌手术中消化道重建的难点[3],术中可靠的食管-空肠吻合口加固对于预防术后发生吻合口瘘、吻合口出血等吻合口并发症至关重要。随着吻合器械、食管-空肠吻合方式及食管-空肠吻合口加固方式的进步,吻合口并发症的发生率已明显下降,但目前研究显示其并发症发生率仍然达1.2% ~14.6%[4]。临床上常用的食管-空肠吻合口加固方式包括悬吊法减少食管-空肠吻合口张力、Spiral PDO 倒刺线连续全层加固食管-空肠吻合口和3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口等,但目前关于 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口和3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口的疗效及安全性比较研究较少。本研究旨在比较 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口和3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口的临床效果及安全性,以期为临床选择更优的食管-空肠吻合口加固方式提供参考。

1 资料与方法

1.1 一般资料 选择2019年10月至2020年10月于新乡医学院第一附属医院普外科行腹腔镜辅助全胃切除术+食管-空肠 Roux-en-Y 手术治疗的58例胃癌患者为研究对象。病例纳入标准:(1)术前胃肿瘤活检病理诊断明确;(2)全腹部 CT、上消化道造影等影像学检查提示肿瘤分期 cT1N0M0-cT2N1M0;(3)术前胸部 CT 检查未见远处转移;(4)无上腹部手术史、外伤史;(5)术前无全身化学治疗、局部放射治疗等新辅助治疗个人史;(6)凝血功能正常;(7)未合并其他恶性肿瘤。排除标准:(1)患有重大基础疾病;(2)临床资料不完整。根据食管-空肠吻合口加固处理方式将患者分为观察组(n = 35)和对照组(n = 23)。观察组:男23例,女12例;年龄51 ~75(63.70 ± 6.33)岁;体质量指数(body mass index, BMI) 19.1 ~ 30.1 (22.70 ±

2.67)kg · m^{-2}。对照组:男 15 例,女 8 例;年龄 53 ~ 75(64.29 ± 6.65)岁;BMI 19.0 ~ 29.9(23.67 ± 3.36)kg · m^{-2}。2 组患者的年龄、性别、BMI 比较差异无统计学意义($P > 0.05$),具有可比性。本研究获得医院医学伦理委员会审核批准,患者或家属知情同意并签署知情同意书。

1.2　方法

1.2.1　术前准备　术前 2 d,2 组患者均给予清流质膳食,应用改善呼吸功能药物;术前 1 d 给予口服乳果糖、电解质散进行肠道准备;术前 6 ~ 8 h 禁食水,手术日清晨留置胃管。

1.2.2　腹腔镜下游离全胃、清扫淋巴结　2 组患者均在腹腔镜下完成全胃游离及淋巴结清扫:患者全身麻醉成功后,取水平仰卧头高"人"字型位,术区常规消毒,铺无菌巾。"五孔法"建立腹部操作空间,探查肝脏、胆囊、脾脏、小肠、结肠、大网膜腹壁及盆腔等无明显转移结节,腹腔镜游离全胃并依次清扫各组淋巴结(1、2、3、4、5、6、7、8a、9、11p、11d、12a 组,肿瘤侵及食管时 +19、20、110、111 组)。

1.2.3　辅助上腹部小切口肠道吻合重建　取上腹部正中切口,长约 8 cm,切开皮肤、皮下及腹壁各层进入腹腔,切口放置一次性切口保护器。距幽门远端 2 cm 应用直线切割闭合器切断十二指肠球部,十二指肠断端应用 3-0 可吸收抗菌微乔线间断浆肌层加固包埋。贲门上约 6 cm 处做食管侧预切线(距肿瘤近端 >4 cm),于食管侧预切线以荷包钳行荷包缝合并切断食管左侧 3/4,退出荷包钳,组织钳提起食管断端,将 25 mm 一次性圆形吻合器底座置入食管断端,牢靠固定吻合器底座后完全切断食管,将胃、各组淋巴结(1、2、3、4、5、6、7、8a、9、11p、11d、12a 组,肿瘤侵及食管时 +19、20、110、111 组)、大网膜、胃结肠韧带、肝胃韧带等一并取出。距屈氏韧带 15 cm处离断空肠,近端空肠置入一次性圆形吻合器底座,距远端空肠约 20 cm 切一小孔,经该孔置入一次性圆形吻合器主件并于 40 cm处穿出,行空肠与空肠端侧吻合,再经该孔置入一次性圆形吻合器主件经闭合后的空肠远断端穿出后行食管-空肠端端吻合。在以上操作的基础上,观察组患者采用 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口;对照组患者采用 8 根 3-0 可吸收抗菌微乔线等分间断全层加固食管-空肠吻合口。空肠侧孔以一次性切割闭合器予以闭合,3-0 可吸收抗菌微乔线间断浆肌层包埋各吻合口,关闭小肠系膜裂孔。营养管置入空肠-空肠吻合口远端 20 cm,胃管置于空肠-空肠端侧吻合口上方。检查各吻合口、闭合口无渗漏,手术视野无活动性出血,十二指肠残端旁、食管-空肠吻合口旁、脾窝各留置腹腔引流管,逐层关闭切口。

1.3　观察指标　观察 2 组患者手术时间、食管-空肠吻合口加固时间、术中出血量、术后排气时间、住院时间和术后出血、吻合口瘘、发热、切口感染、术后吻合口狭窄等并发症发生情况以及肿瘤复发转移情况。

1.4　统计学处理　应用 SPSS 19.0 软件进行统计学分析。计量资料以均数 ± 标准差($\bar{x} \pm s$)表示,2 组间比较采用 t 检验;计数资料以例数和百分率表示,2 组间比较采用 χ^2 检验;$P < 0.05$ 为差异有统计学意义。

2　结果

2.1　2 组患者手术情况　观察组患者食管-空肠吻合口加固时间为(6.37 ± 1.69)min,手术时间为(327.00 ± 49.82)min,术中出血量为(99.00 ± 8.90)mL。对照组患者食管-空肠吻合口加固时间为(14.95 ± 2.09)min,手术时间为(345.00 ± 32.64)min,术中出血量为(112.90 ± 9.59)mL。观察组患者食管-空肠吻合口加固时间短于对照组,差异有统计学意义($t = 16.200$,$P < 0.05$);2 组患者的手术时间、术中出血量比较差异无统计学意义($t = 1.450$、1.040,$P > 0.05$)。

2.2　2 组患者术后排气时间、住院时间比较　观察组患者术后排气时间、住院时间分别为(3.06 ± 0.52)、(19.77 ± 4.18)d,对照组患者术后排气时间、住院时间分别为(3.36 ± 0.74)、(21.00 ± 4.51)d;2 组患者的术后排气时间、住院时间比较差异无统计学意义($t = 1.710$、1.004,$P > 0.05$)。

2.3　2 组患者术后并发症发生率比较　观察组患者术后发生出血 1 例(2.9%)、吻合口瘘 3 例(8.6%)、发热 5 例(14.3%)、切口感染 2 例(5.7%);对照组患者术后发生出血 5 例(21.7%)、吻合口瘘 3 例(13.0%)、发热 4 例(17.4%)、切口感染 2 例(8.7%);观察组患者术后出血发生率显著低于对照组,差异有统计学意义($\chi^2 = 5.335$,$P < 0.05$);2 组患者术后吻合口瘘、发热、切口感染发生率比较差异无统计学意义($\chi^2 = 0.299$、0.102、0.192,$P > 0.05$)。

2.4　2 组患者术后肿瘤复发转移情况比较　2 组患者术后均随访 13 个月,随访期观察组复发转移 2 例(5.7%),对照组复发转移 2 例(8.7%);2 组患者复发转移率比较差异无统计学意义($\chi^2 = 0.192$,$P > 0.05$)。

3　讨论

既往研究显示,完全腹腔镜根治性全胃切除术的手术安全性不亚于腹腔镜辅助胃癌手术[5],且具有创伤小、术后恢复快的优势[6-7],但完全腹腔镜根

治性全胃切除术对手术团队配合要求高、肠道重建使用高值耗材多,因此,腹腔镜辅助全胃切除术依然是多数医院的首选。食管-空肠吻合是腹腔镜胃癌手术重要的操作步骤之一[8]。既往学者提出了多种食管-空肠吻合方式及食管-空肠吻合口加固方式,主要的食管-空肠吻合方式包括使用食管空肠管型或圆型吻合器的端侧吻合法(反穿刺法、Orvil 法)、食管空肠侧侧吻合(Overlap)法[9]、功能性端端吻合(FEEA)法、π 形食管空肠吻合法[10-11]和使用直线切割闭合器的三角吻合法,食管-空肠吻合口加固方式主要包括悬吊法减少食管-空肠吻合口张力、Spiral PDO 倒刺线连续全层加固食管-空肠吻合口和 3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口等。但目前仍无公认“最完美”的食管-空肠吻合方式及食管-空肠吻合口加固方式。

食管-空肠吻合口出血是胃癌术后常见的并发症之一。食管-空肠吻合口出血的主要原因包括术中选取吻合器种类及大小不当、激发吻合器作用力及作用时间不足、周围组织嵌入吻合口导致吻合口边缘的小血管闭合不牢靠等。本研究结果显示,观察组患者发生术后出血 1 例(2.9%),对照组患者发生术后出血 5 例(21.7%),观察组患者术后出血发生率显著低于对照组。分析其原因,使用 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口具有吻合口对合牢靠、作用力均匀、吻合口低张力等优点,与 3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口相比,延长了缝线对抗吻合口张力的时间[12],有效预防了激发吻合器作用力及作用时间不足、吻合口边缘小血管闭合不牢靠所导致的出血、创面渗血的发生,促进局部有效血液循环网的建立,加速吻合口愈合。另外,食管平滑肌为纵行肌层,使用 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口时免打结、提线作用力可控,可有效避免采用 3-0 可吸收抗菌微乔线间断全层加固吻合口打结时因用力不当造成食管平滑肌撕裂所引起的吻合口局部出血。

食管-空肠吻合口瘘是胃癌术后最严重的并发症之一。食管-空肠吻合口张力过高、局部供血不佳是吻合口瘘的常见原因[4],保证吻合口无张力或低张力以及良好的血运是预防吻合口瘘的关键。本研究结果显示,观察组患者术后吻合口瘘发生率(8.6%)低于对照组(13.0 %),但 2 组比较差异无统计学意义;说明 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口与 3-0 可吸收抗菌微乔线间断全层加固吻合口在降低食管-空肠吻合口瘘发生率方面效果相当。分析其原因可能为,Spiral PDO 倒刺线连续全层加固食管-空肠吻合口与 3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口均可有效对抗吻合口局部张力、增加吻合口局部血运以及加速微循环的重建,进而减少食管-空肠吻合口瘘的发生。

本研究患者术后规律随访 13 个月,患者均未发生吻合口狭窄,使用 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口不会增加术后近期吻合口狭窄的发生率,由于随访时间的限制,Spiral PDO 倒刺线连续全层加固食管-空肠吻合口术后远期吻合口狭窄的发生情况需要进一步随访研究。另外,本研究结果显示,观察组患者食管-空肠吻合口加固时间显著短于对照组,提示使用 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口较 3-0 可吸收抗菌微乔线间断全层加固吻合口具有操作时间短的优势。

综上所述,腹腔镜辅助全胃切除术中应用 Spiral PDO 倒刺线连续全层加固食管-空肠吻合口与 3-0 可吸收抗菌微乔线间断全层加固食管-空肠吻合口在降低食管-空肠吻合口瘘发生率方面效果相当,而 Spiral PDO 倒刺线连续全层加固吻合口在降低食管-空肠吻合口出血发生率、缩短食管-空肠吻合口加固时间方面更有优势。但由于本研究样本量较小,诊疗条件有限,且为单中心研究,尚需更多的临床研究加以证实。

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