· 论著 ·

改良 Overlap 法在全腹腔镜根治性全胃切除术消化道重建中的应用价值

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【摘要】 **目的**　探讨改良 Overlap 法在全腹腔镜根治性全胃切除术消化道重建中的应用价值。**方法**　采用回顾性队列研究方法。收集 2016 年 1—12 月第四军医大学附属唐都医院收治的 50 例采用 Overlap 法行全腹腔镜根治性全胃切除术胃癌患者的临床病理资料。26 例患者采用传统 Overlap 法行全腹腔镜根治性全胃切除术，设为传统 Overlap 组；24 例患者采用改良 Overlap 法行全腹腔镜根治性全胃切除术，设为改良 Overlap 组。两组患者均行 D_2 淋巴结清扫术。传统 Overlap 组消化道重建行全腹腔镜食管空肠顺蠕动侧侧吻合术。改良 Overlap 法行消化道重建时，吻合前暂不离断食管，利用胃底牵引充分显露食管下段。逆时针旋转食管，于食管左后侧壁预离断处开孔。距屈氏韧带 25 cm 处离断空肠，于远端空肠距断端 6 cm 对系膜缘处开孔。采用 60 mm 直线吻合器将食管和远端空肠行侧侧吻合术，横向关闭共同开口，同时离断食管。(1)术中及术后恢复情况：总手术时间、食管空肠吻合时间、术中出血量、淋巴结清扫数目、术后肛门首次排气时间、术后并发症情况、术后住院时间。(2)随访及生存情况：患者术后无瘤生存及肿瘤复发、转移情况。采用门诊和电话方式进行随访，了解患者术后无瘤生存及肿瘤复发、转移情况。随访时间截至 2017 年 3 月。正态分布的计量资料以 $\bar{x}\pm s$ 表示，组间比较采用独立样本 t 检验。计数资料比较采用 χ^2 检验或 Fisher 确切概率法。**结果**　(1)术中及术后恢复情况：50 例患者均成功采用 Overlap 法完成全腹腔镜根治性全胃切除术，无中转开腹。传统 Overlap 组患者总手术时间、食管空肠吻合时间分别为(278.6±14.9) min、(46.5±4.4) min，改良 Overlap 组分别为(253.3±12.8) min、(20.4±2.3) min，两组上述指标比较，差异均有统计学意义(t=5.459，22.482，P<0.05)。传统 Overlap 组患者术中出血量、淋巴结清扫数目、术后肛门首次排气时间、术后并发症例数、术后住院时间分别为(73±25) mL、(34±6)枚、(2.7±1.0) d、2 例、(9.7±1.6) d，改良 Overlap 组分别为(71±22) mL、(35±5)枚、(2.6±1.3) d、2 例、(9.8±1.5) d，两组上述指标比较，差异均无统计学意义(t=0.175，−0.616，0.293，−0.217，P>0.05)。传统 Overlap 组 2 例并发症患者分别为食管空肠吻合口瘘和胰液漏，改良 Overlap 组 2 例并发症患者分别为肺部感染和皮下气肿，均予对症处理后好转。(2)随访及生存情况：50 例患者中，41 例获得术后随访，其中传统 Overlap 组 20 例，改良 Overlap 组 21 例。随访时间为 3~15 个月，中位随访时间为 7 个月。随访期间，患者均无瘤生存，无肿瘤复发、转移发生。**结论**　与传统 Overlap 法比较，改良 Overlap 法可简化吻合过程，缩短手术时间，吻合效果可靠，是全腹腔镜根治性全胃切除术简单有效的消化道重建方式。

【关键词】 胃肿瘤；　根治术；　食管空肠吻合；　腹腔镜检查

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Application value of the modified Overlap method in digestive tract reconstruction of totally laparoscopic total gastrectomy　*Wang Nan, Zheng Bobo, Zhai Yulong, Yang Ying, Zhou Shuai, Zhang Zhansheng, Wu Tao, Qiao Qing, He Xianli. Department of General Surgery, Tangdu Hospital, Fourth Military Medical University, Xi'an 710038, China*

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【**Abstract**】 **Objective**　To investigate the application value of the modified Overlap method in digestive tract reconstruction of totally laparoscopic total gastrectomy (TLTG). **Methods**　The retrospective cohort study was conducted. The clinicopathological data of 50 patients with gastric cancer who underwent TLTG with Overlap anastomosis between January 2016 and December 2016 in the Tangdu Hospital of the Fourth Military Medical University were collected. Twenty-six patients using classic Overlap method and 24 patients using modified Overlap method were respectively allocated into the classic Overlap group and modified Overlap group. All the patients underwent D_2 lymph node dissection. Patients in the classic Overlap group underwent totally laparoscopic catastalsis side-to-side esophagojejunostomy. During digestive tract reconstruction in the modified Overlap group,

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there was no esophageal transection before anastomosis, and gastric fundus traction fully exposed to the lower esophagus. Esophagus was spun anticlockwise, and a hole was opened at the left posterior esophageal wall. Transection of jejunum was 25 cm away from Treitz ligment, and opening a hole at mesenteric margin was 6 cm away from distal jejunum to transected end of jejunum. Esophagus-distal jejunum side-to-side anastomosis was done using 60 mm linear stapler, and then laterally closing openings and transecting esophagus. Observation indicators: (1) intra-and post-operative recovery: total operation time, time of esophagus-jejunum anastomosis, volume of intraoperative blood loss, number of lymph node dissected, time to anal exsufflation, cases with complications and duration of postoperative hospital stay; (2) follow-up and survival. Follow-up using outpatient examination and telephone interview was performed to detect the postoperative tumor-free survival and tumor recurrence or metastasis up to March 2017. Measurement data with normal distribution were represented as $\bar{x}\pm s$ and comparison between groups was analyzed using the independent-sample t test. Comparison of count data was analyzed using the chi-square test or Fisher exact probability. **Results** (1) Intra- and post-operative recovery: all the 50 patients underwent successful TLTG using Overlap method, without conversion to open surgery. Total operation time and time of esophagus-jejunum anastomosis were respectively (278.6±14.9) minutes, (46.5±4.4) minutes in the classic Overlap group and (253.3±12.8) minutes, (20.4±2.3) minutes in the modified Overlap group, with statistically significant differences between the 2 groups (t=5.459, 22.482, P<0.05). Volume of intraoperative blood loss, number of lymph node dissected, time to anal exsufflation, cases with complications and duration of postoperative hospital stay were respectively (73±25) mL, 34±6, (2.7±1.0) days, 2, (9.7±1.6) days in the classic Overlap group and (71±22) mL, 35±5, (2.6±1.3) days, 2, (9.8±1.5) days in the modified Overlap group, with no statistically significant difference between the 2 groups (t=0.175, -0.616, 0.293, -0.217, P>0.05). Two patients in the classic Overlap group were respectively complicated with esophagus-jejunum anastomotic fistula and pancreatic leakage, 2 patients in the modified Overlap group were respectively complicated with pulmonary infection and subcutaneous emphysema, and they were improved by symptomatic treatment. (2) Follow-up and survival: 41 of 50 patients were followed up for 3-15 months, with a median time of 7 months, including 20 in the classic Overlap group and 21 in the modified Overlap group. During follow-up, patients had tumor-free survival, without tumor recurrence and metastasis. **Conclusion** Compared with classic Overlap method, the modified Overlap method can simplify the anastomotic procedures, shorten operation time and achieve similar efficacy, and it is also a simple and effective method for digestive tract reconstruction after TLTG.

【**Key words**】 Gastric neoplasms; Radical resection; Esophagojejunostomy; Laparoscopy

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腹腔镜胃癌根治术已逐步趋于成熟，其手术适应证已从早期胃癌发展到局部进展期胃癌[1-2]。近年来，随着胃上部癌、胃体癌发病率逐步升高，腹腔镜根治性全胃切除术越来越受关注。腹腔镜根治性全胃切除术在腹段食管显露、食管胃结合部及食管下段周围淋巴结清扫具有优势，但消化道重建难度较大，其方式据手术路径分为小切口辅助应用圆形吻合器、经口抵钉座置入装置法（OrVil™法）和全腹腔镜下应用直线吻合器，各中心经验和推荐方式不尽相同[3-17]。其中，全腹腔镜下采用直线吻合器行食管空肠吻合因视野好、不受患者体型限制、创伤小等优点更受推崇。2010 年，Inaba 等[18]提出名为“Overlap”的全腹腔镜食管空肠顺蠕动侧侧吻合术。笔者团队在临床实践中对该方法加以改进，简化了操作步骤。本研究回顾性分析 2016 年 1—12 月我科收治的 50 例采用 Overlap 法行全腹腔镜根治性全胃切除术胃癌患者的临床病理资料，探讨改良 Overlap 法在全腹腔镜根治性全胃切除术消化道重建中的应用价值。

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 50 例采用 Overlap 法行全腹腔镜根治性全胃切除术胃癌患者的临床病理资料，男 38 例，女 12 例；年龄 43～70 岁，平均年龄 67 岁。26 例患者采用传统 Overlap 法行全腹腔镜根治性全胃切除术，设为传统 Overlap 组；24 例患者采用改良 Overlap 法行全腹腔镜根治性全胃切除术，设为改良 Overlap 组。两组患者性别、年龄、BMI、肿瘤 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。肿瘤 TNM 分期依据美国癌症联合会（AJCC）第 7 版分期标准。本研究通过我院伦理委员会审批。患者及家属术前均签署手术知情同意书。

1.2　纳入标准和排除标准

纳入标准：(1)年龄≤70 岁。(2)肿瘤位于胃体中上部或胃底。(3)术前影像学检查结果证实肿瘤无远处转移和肿大淋巴结融合成团。(4)经术后病理学检查明确诊断为胃癌。(5)临床病理资料完整。

表 1　传统 Overlap 组和改良 Overlap 组胃癌患者一般资料比较

组别	例数	性别(例)		年龄($\bar{x}\pm s$,岁)	BMI($\bar{x}\pm s$,kg/m^2)	肿瘤 TNM 分期(例)			
		男	女			Ⅰ B 期	Ⅱ A 期	Ⅱ B 期	Ⅲ A 期
传统 Overlap 组	26	20	6	64±6	22.0±2.5	2	11	11	2
改良 Overlap 组	24	18	6	65±5	21.8±2.7	3	7	12	2
统计值		$\chi^2=0.025$		$t=-0.576$	$t=0.348$		$\chi^2=1.054$		
P 值		>0.05		>0.05	>0.05		>0.05		

注:传统 Overlap 组患者采用传统 Overlap 法行全腹腔镜根治性全胃切除术,改良 Overlap 组患者采用改良 Overlap 法行全腹腔镜根治性全胃切除术;肿瘤 TNM 分期依据美国癌症联合会(AJCC)第 7 版分期标准

排除标准:(1)年龄>70 岁。(2)Ⅱ型食管胃结合部腺癌或肿瘤侵及齿状线以上。(3)临床病理资料缺失。

1.3　手术方法

采用气管插管全身麻醉。患者取仰卧分腿位,头侧略高。术者站于患者左侧,助手站于患者右侧,扶镜手站于患者两腿之间。于脐下置入 12 mm Trocar 作为观察孔,于左侧腋前线肋缘下 2 cm 和左侧锁骨中线平脐上 2 cm 分别置入 12 mm Trocar,右侧对应部位分别置入 5 mm Trocar。完成 D_2 淋巴结清扫术和全胃游离后,打开膈肌食管裂孔正前方及左膈肌脚,充分游离下段食管,采用直线吻合器离断十二指肠,准备行消化道重建。

传统 Overlap 法[18]:采用腹腔镜直线吻合器离断食管,于食管断端左侧开一小孔。距屈氏韧带 25 cm 处离断空肠,采用超声刀于远端空肠距断端 6 cm 对系膜缘处开一小孔。上提远端空肠,从术者左侧的 12 mm Trocar 置入 60 mm 直线吻合器,行食管空肠侧侧吻合术。采用镜下手工缝合关闭共同开口。从术者右侧的 12 mm Trocar 置入 60 mm 直线吻合器,距食管空肠吻合口远侧 50 cm 处行空肠空肠侧侧吻合术。

改良 Overlap 法:暂不离断食管,采用丝带捆扎胃底,利用胃作为牵引(图 1A)下拉食管。将食管逆时针旋转 45°,于食管左后侧壁预离断处开一小孔。距屈氏韧带 25 cm 处离断空肠,于远端空肠距断端 6 cm 对系膜缘处开一小孔。上提远端空肠,食管空肠侧侧吻合术同传统 Overlap 法(图 1B),查看吻合口情况(图 1C)。采用 3 针缝线将食管空肠侧侧吻合术形成的共同开口提起,并向右侧牵引。从左侧肋缘下 Trocar 置入 60 mm 直线吻合器,横向关闭此共同开口(图 1D,1E),尽可能垂直于食管长轴方向,同时离断食管(图 1A~1E)。空肠空肠侧侧吻合术同传统 Overlap 法。术后 1 周行上消化道造影检查确认吻合良好(图 1F)。

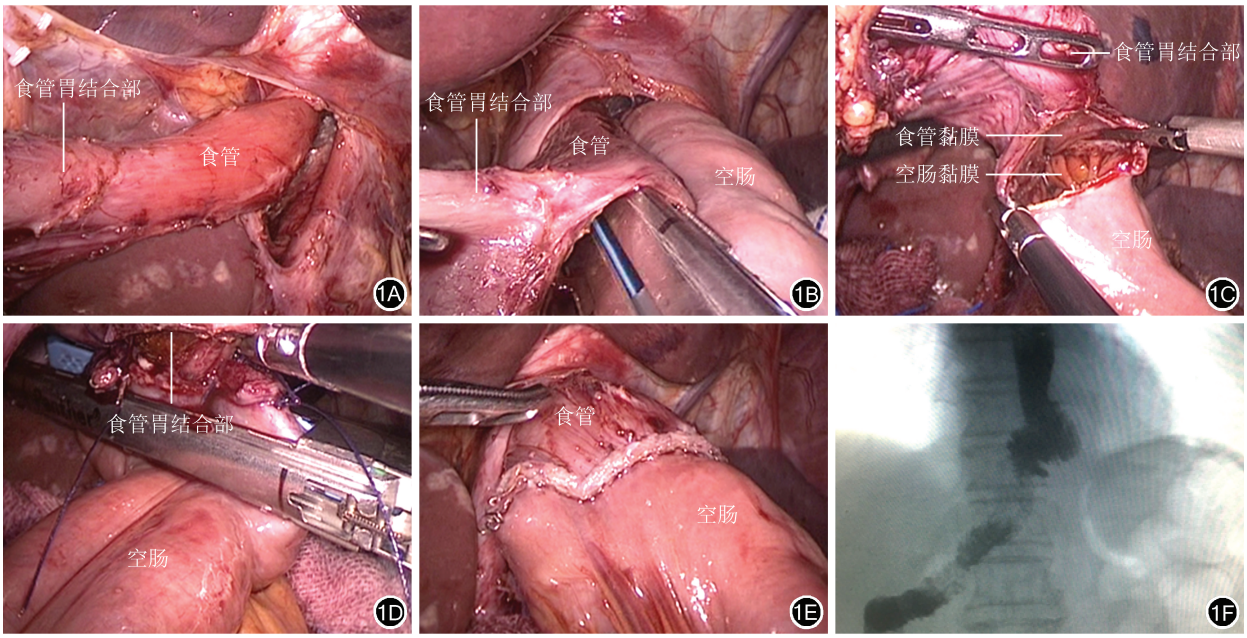

图 1　全腹腔镜改良 Overlap 吻合法　1A:暂不离断食管,利用胃作为牵引;1B:上提远端空肠,采用直线吻合器行食管空肠侧侧吻合术;1C:查看食管空肠侧侧吻合口情况;1D:采用直线吻合器横向关闭食管空肠共同开口;1E:关闭食管空肠共同开口后;1F:术后 1 周行上消化道造影检查确认吻合良好

1.4　观察指标

(1)术中及术后恢复情况:总手术时间、食管空肠吻合时间、术中出血量、淋巴结清扫数目、术后肛门首次排气时间、术后并发症情况、术后住院时间。(2)随访及生存情况:患者术后无瘤生存及肿瘤复发、转移情况。

1.5　随访

采用门诊和电话方式进行随访,了解患者术后无瘤生存及肿瘤复发、转移情况。随访时间截至 2017 年 3 月。

1.6　统计学分析

应用 SPSS 17.0 统计软件进行分析。正态分布的计量资料以 $\bar{x}\pm s$ 表示,组间比较采用独立样本 t 检验。计数资料比较采用 χ^2 检验或 Fisher 确切概率法。$P<0.05$ 为差异有统计学意义。

2　结果

2.1　术中及术后恢复情况

50 例患者均成功采用 Overlap 法完成全腹腔镜根治性全胃切除术,无中转开腹。两组患者总手术时间、食管空肠吻合时间比较,差异均有统计学意义($P<0.05$);而两组患者术中出血量、淋巴结清扫数目、术后肛门首次排气时间、术后并发症例数、术后住院时间比较,差异均无统计学意义($P>0.05$)。见表 2。传统 Overlap 组 2 例并发症患者分别为食管空肠吻合口瘘和胰液漏,改良 Overlap 组 2 例并发症患者分别为肺部感染和皮下气肿,均予对症处理后好转。

2.2　随访及生存情况

50 例患者中,41 例获得术后随访,其中传统 Overlap 组 20 例,改良 Overlap 组 21 例。随访时间为 3~15 个月,中位随访时间为 7 个月。随访期间,患者均无瘤生存,无肿瘤复发、转移发生。

3　讨论

全腹腔镜根治性全胃切除术消化道重建按照吻合途径可分为手工缝合、圆形吻合器和直线吻合器 3 种方式[19]。全腹腔镜手工缝合行食管空肠吻合术花费时间长,且技术难度要求高。全腹腔镜采用圆形吻合器行食管空肠端侧吻合术指食管残端的荷包缝合和抵钉座置入均在腹腔镜下完成,因食管断端常回缩至膈肌平面以上,完成荷包缝合和抵钉座置入均非常困难。反穿刺法和 OrVil™ 法也较为常用。反穿刺法是利用固定在抵钉座中心杆上的针线引出预先置入食管的抵钉座并抽紧,然后采用直线吻合器在抵钉座下方闭合离断食管。OrVil™ 法则是先横断食管,由麻醉医师协助经口置入 OrVil™ 胃管,利用胃管引导将抵钉座穿出食管断端完成置入。反穿刺法和 OrVil™ 法无需在腹腔镜下行荷包缝合,但均需经腹部辅助小切口完成吻合,且 OrVil™ 法有在气管分叉水平损伤食管黏膜的风险[2,20]。

经临床实践比较,笔者认为:全腹腔镜采用直线吻合器行食管空肠侧侧吻合术可避免荷包缝合和抵钉座置入过程,无需扩大腹部切口,吻合过程更为简单可靠。采用直线吻合器行食管空肠 Roux-en-Y 吻合术主要包括功能性端端吻合术和顺蠕动侧侧吻合术两种方法。1999 年,Uyama 等[21]提出食管空肠功能性端端吻合术,即将直线吻合器置入空肠和食管断端后完成食管空肠侧侧吻合;吻合时空肠位于食管右侧,并采用直线吻合器关闭共同开口。后续有研究将食管空肠功能性端端吻合术进行了改良,如将空肠置于食管左侧进行吻合,以充分利用空间;采用三角吻合技术关闭食管空肠共同开口等[22]。Inaba 等[18]报道的 Overlap 法与食管空肠功能性端端吻合术不同,Overlap 法使食管与空肠的生理蠕动方向一致,且避免了空肠系膜的折叠。随后,不同研究报道了相似的改良 Overlap 法:在不离断空肠的

表 2　传统 Overlap 组和改良 Overlap 组胃癌患者采用 Overlap 法行全腹腔镜根治性全胃切除术中及术后恢复情况比较($\bar{x}\pm s$)

组别	例数	总手术时间(min)	食管空肠吻合时间(min)	术中出血量(mL)	淋巴结清扫数目(枚)	术后肛门首次排气时间(d)	术后并发症例数(例)	术后住院时间(d)
传统 Overlap 组	26	278.6±14.9	46.5±4.4	73±25	34±6	2.7±1.0	2	9.7±1.6
改良 Overlap 组	24	253.3±12.8	20.4±2.3	71±22	35±5	2.6±1.3	2	9.8±1.5
统计值		$t=5.459$	$t=22.482$	$t=0.175$	$t=-0.616$	$t=0.293$	-	$t=-0.217$
P 值		<0.05	<0.05	>0.05	>0.05	>0.05	>0.05[a]	>0.05

注:传统 Overlap 组患者采用传统 Overlap 法行全腹腔镜根治性全胃切除术,改良 Overlap 组患者采用改良 Overlap 法行全腹腔镜根治性全胃切除术;[a]采用 Fisher 确切概率法

情况下,将空肠襻上提完成食管空肠侧侧吻合后,于食管空肠吻合口近端离断空肠,但不离断空肠系膜,在距食管空肠吻合口下方 50 cm 处完成空肠空肠侧侧吻合[7,23-24]。该方法虽简化了消化道重建过程,但仍存在反复夹持食管壁、损伤食管肌层的可能,从而增加吻合口瘘发生风险,且不离断空肠系膜可能增加食管空肠吻合口张力。

本研究采用改良 Overlap 法的优势如下:(1)吻合前通过胃的牵拉,可充分向下牵引腹段食管,避免传统 Overlap 法因直接夹持食管壁造成食管肌层损伤风险。(2)吻合前将食管逆时针旋转 45°,于食管左后壁打孔,吻合时从更符合食管长轴方向的左侧副操作孔置入直线吻合器,完成食管空肠侧侧吻合术。共同开口的方向从而转向右前方,利于后续关闭共同开口时直线吻合器的方向调整。(3)利用直线吻合器关闭共同开口,能明显缩短消化道重建时间,进而缩短手术时间。(4)采用 3 针缝线关闭共同开口时,中间一针采用水平 U 形缝合,利于对合空肠壁和食管壁。(5)将共同开口悬吊后,利用可旋转直线吻合器(60 mm 钉仓)直视下尽量垂直于食管长轴关闭,能够达到三角吻合的效果,有效避免吻合口狭窄及吻合口下方空肠缩窄。笔者认为:Overlap 法是目前较为理想的全腹腔镜食管空肠吻合方法,其不足之处在于需保留较长的食管下端,使其切除高度受限,不适用于侵及齿状线 2 cm 以上的食管胃结合部腺癌。

综上,采用改良 Overlap 法行全腹腔镜根治性全胃切除术安全可行,与传统 Overlap 法比较,其能够提供更好的手术视野,缩短总手术时间和食管空肠吻合时间,近期疗效较好,是全腹腔镜根治性全胃切除术理想的消化道重建方式。

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王楠, 郑波波, 翟玉龙, 等.改良 Overlap 法在全腹腔镜根治性全胃切除术消化道重建中的应用价值[J].中华消化外科杂志, 2017, 16(9): 949-954. DOI:10.3760/cma.j.issn.1673-9752.2017.09.014.

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·读者·作者·编者·

本刊可直接使用英文缩写词的常用词汇

本刊将允许作者对下列比较熟悉的常用词汇直接使用英文缩写词, 即在论文中第 1 次出现时, 可以不标注中文全称。

AFP	甲胎蛋白	FITC	异硫氰酸荧光素	MODS	多器官功能障碍综合征
Alb	白蛋白	GAPDH	3-磷酸甘油醛脱氢酶	MTT	四甲基偶氮唑蓝
ALP	碱性磷酸酶	GGT	γ-谷氨酰转移酶	NK 细胞	自然杀伤细胞
ALT	丙氨酸氨基转移酶	HAV	甲型肝炎病毒	$PaCO_2$	动脉血二氧化碳分压
AST	天冬氨酸氨基转移酶	Hb	血红蛋白	PaO_2	动脉血氧分压
AMP	腺苷一磷酸	HBV	乙型肝炎病毒	PBS	磷酸盐缓冲液
ADP	腺苷二磷酸	HBeAg	乙型肝炎 e 抗原	PCR	聚合酶链反应
ATP	腺苷三磷酸	HBsAg	乙型肝炎表面抗原	PET	正电子发射断层显像术
ARDS	急性呼吸窘迫综合征	HCV	丙型肝炎病毒	PLT	血小板
β-actin	β-肌动蛋白	HE	苏木素-伊红	PT	凝血酶原时间
BMI	体质量指数	HEV	戊型肝炎病毒	PTC	经皮肝穿刺胆道造影
BUN	血尿素氮	HIFU	高强度聚焦超声	PTCD	经皮经肝胆管引流
CEA	癌胚抗原	IBil	间接胆红素	RBC	红细胞
Cr	肌酐	ICG R15	吲哚菁绿 15 min 滞留率	RFA	射频消融术
CT	X 线计算机体层摄影术	IFN	干扰素	RT-PCR	逆转录-聚合酶链反应
DAB	二氨基联苯胺	Ig	免疫球蛋白	TACE	经导管动脉内化疗栓塞术
DAPI	4,6-二脒基-2-苯基吲哚二盐酸	IL	白细胞介素	TBil	总胆红素
		抗-HBc	乙型肝炎核心抗体	TC	总胆固醇
DBil	直接胆红素	抗-HBe	乙型肝炎 e 抗体	TG	甘油三酯
DMSO	二甲基亚砜	抗-HBs	乙型肝炎表面抗体	TGF	转化生长因子
DSA	数字减影血管造影术	LC	腹腔镜胆囊切除术	TNF	肿瘤坏死因子
ECM	细胞外基质	LDH	乳酸脱氢酶	TP	总蛋白
ELISA	酶联免疫吸附试验	MMPs	基质金属蛋白酶	WBC	白细胞
ERCP	内镜逆行胰胆管造影	MRCP	磁共振胰胆管成像	VEGF	血管内皮生长因子
EUS	内镜超声	MRI	磁共振成像		