

doi: 10.13241/j.cnki.pmb.2021.18.035

直肠癌切除术患者永久性与临时性造口术后生活质量变化 及其与排便症状的相关性研究*

陈艳玲¹ 黄玉莲¹ 罗琳¹ 陈梅珠² 汪艳清² 林冬颜³

(1 中南大学湘雅医学院附属海口医院手术室 海南 海口 570208; 2 中南大学湘雅医学院附属海口医院麻醉科 海南 海口 570208;

3 海南省人民医院胃肠外科 海南 海口 570311)

摘要 目的:探讨直肠癌切除术患者永久性与临时性造口术后生活质量变化,并分析其生活质量与排便症状的相关性。**方法:**纳入我院 2017 年 4 月~2020 年 4 月收治的直肠癌切除术患者 110 例,所有纳入者均行造口术。根据造口方式,分成永久性造口组(简称永久组, n=41)、临时性造口组(简称临时组, n=69)。记录两组造口并发症发生率,分别在患者术后 1、3、6 个月,采用简明生活质量量表(SF-36)评估其生活质量,采用排便症状量表评估患者排便症状的变化。经 Pearson 线性相关分析患者生活质量评分与排便症状评分的相关性。**结果:**临时组造口并发症发生率(8.90%)与永久组(12.20%)比较无差异($P>0.05$)。两组术后 3、6 个月 SF-36 各维度评分均高于术后 1 个月,术后 6 个月各评分高于术后 3 个月,且临时组术后 3 个月 SF-36 各维度评分高于永久组($P<0.05$),但两组术后 6 个月各评分比较无差异($P>0.05$)。两组术后 3、6 个月大便症状各评分均低于术后 1 个月,术后 6 个月的排便紧迫感、排便费力、里急后重评分及总分低于术后 3 个月,且临时组术后 3 个月的排便紧迫感、排便费力、里急后重评分及总分低于永久组($P<0.05$),但两组术后 6 个月排便症状各评分比较未见差异($P>0.05$)。Pearson 线性相关分析显示,排便症状总分与机体疼痛、躯体功能、躯体角色受限、情感角色受限、心理健康、社会功能、总体健康评分呈负相关($P<0.05$)。**结论:**直肠癌切除术患者临时性造口能够进一步促进术后 3 个月生活质量、排便功能的改善,在术后 6 个月,永久性造口患者的生活质量、排便功能基本达到临时性造口患者的状态,且排便功能与生活质量具有相关性。

关键词:直肠癌;永久性造口;临时性造口;生活质量;排便症状

中图分类号:R735.37 **文献标识码:**A **文章编号:**1673-6273(2021)18-3559-05

The Changes of Quality of Life after Permanent and Temporary Colostomy in Patients with Rectal Cancer Resection and Their Correlation with Defecation Symptoms*

CHEN Yan-ling¹, HUANG Yu-lian¹, LUO Lin¹, CHEN Mei-zhu², WANG Yan-qing², LIN Dong-yan³

(1 Department of Operation Room, Haikou Hospital Affiliated to Xiangya Medical College of Central South University, Haikou, Hainan, 570208, China; 2 Department of Anesthesiology, Haikou Hospital Affiliated to Xiangya Medical College of Central South University, Haikou, Hainan, 570208, China; 3 Gastrointestinal Surgery, Hainan Provincial People's Hospital, Haikou, Hainan, 570311, China)

ABSTRACT Objective: To investigate the changes of quality of life in patients with rectal cancer after permanent and temporary colostomy, and to analyze the correlation between quality of life and defecation symptoms. **Methods:** From April 2017 to April 2020, 110 patients with rectal cancer resection in our hospital were enrolled. All the patients underwent stoma. According to the stoma method, they were divided into permanent stoma group (abbreviated as permanent group, n=41) and temporary stoma group (abbreviated as temporary group, n=69). The incidence of ostomy complications was recorded in the two groups. The concise quality of life scale (SF-36) was used to evaluate the quality of life of the patients at 1, 3, and 6 months after operation, and the bowel symptom scale was used to evaluate the changes in defecation symptoms. Pearson linear correlation analysis was used to analyze the correlation between the patient's quality of life score and the defecation symptoms score. **Results:** The incidence rate of stoma complications in the temporary group (8.90%) was not different from that in the permanent group (12.20%) ($P>0.05$). The scores of each dimensions of SF-36 in the two groups at 3 and 6 months after operation were higher than that at 1 month after operation, and the scores at 6 months after operation were higher than that at 3 months after operation, and the scores of each dimensions of SF-36 in the temporary group at 3 months after operation were higher than the permanent group ($P<0.05$), but there was no difference in the scores at 6 months after operation ($P>0.05$). The scores of stool symptoms in the two groups at 3 and 6 months after operation were lower than that at 1 month after operation. The scores and total scores of urgency of defecation, effort to defecate and tenesmus at 6 months after operation were lower than those of 3 months after operation,

* 基金项目:海南省卫生计生行业科研项目(1801032869A2004)

作者简介:陈艳玲(1982-),女,本科,主治医师,研究方向:胃肠外科,E-mail: wscyl5858@163.com

(收稿日期:2020-12-21 接受日期:2021-01-17)

the scores and total scores of urgency, effort to defecate and tenesmus in the temporary group at 3 months after operation were lower than those in the permanent group ($P<0.05$), but there was no difference in the scores of defecation symptoms between the two groups at 6 months after operation ($P>0.05$). Pearson's linear correlation analysis showed that the total score of defecation symptoms were negatively correlated with body pain, physical function, physical role limitation, emotional role limitation, mental health, social function, and overall health score ($P<0.05$). **Conclusion:** Temporary stoma in patients undergoing rectal cancer surgery can further improve the quality of life and defecation function at 3 months after operation. At 6 months after operation, the quality of life and defecation function of patients with permanent stoma basically reach the status of temporary stoma patients, and bowel function is related to quality of life.

Key words: Rectal cancer; Permanent stoma; Temporary stoma; Quality of Life; Defecation symptoms

Chinese Library Classification(CLC): R735.37 **Document code:** A

Article ID: 1673-6273(2021)18-3559-05

前言

直肠癌是全球患病率、死亡率均较高的一种恶性肿瘤,大部分为低位直肠癌,常用治疗方法为手术、放疗、化疗等,其中手术切除是治疗这类疾病的关键,可将癌肿切除,对周围淋巴结进行清扫,控制肿瘤复发风险,提升患者的生命质量^[1]。然而,直肠癌切除术后可能引起并发症,如吻合口漏、肛门失禁、便秘、便频等,导致术后患者的生活质量受到严重影响^[2]。为了控制并发症风险,临床针对行保肛手术者通常主张进行预防性造口,通过转流大便,减少吻合口漏发生风险,避免诱发更严重的并发症,此外,对切除肛门的患者需行永久性造口术^[3]。既往研究认为,预防性造口可提高直肠癌切除术患者的生活质量^[4],但永久性造口对其生活质量的影响能否达到预防性造口的效果尚不可知,临床与之相关报道较少。有学者发现,结直肠癌术后生活质量的影响因素包括手术方式、经济状况、年龄等^[5],而临床关于排便症状与生活质量的相关性尚不明确。为了进一步了解直肠癌手术患者永久性临时性造口术后生活质量的变化,并分析生活质量与排便症状的相关性,本研究纳入了 110

例直肠癌切除术患者进行研究,现报告如下。

1 资料与方法

1.1 一般资料

纳入我院 2017 年 4 月~2020 年 4 月收治的直肠癌切除术患者 110 例,纳入标准:(1)年龄大于 18 岁,经内镜活检诊断证实为直肠癌,并行直肠癌切除术;(2)行预防性造口或永久性乙状结肠造口;(3)肿瘤下缘与肛缘间距 ≤ 12 cm;(4)病例资料齐全;(5)认知功能良好,精神状态正常;(6)知情同意本次研究。排除标准:(1)心、肝、肾等重要脏器严重衰竭者;(2)行姑息性切除术者;(3)术前血糖、血压控制欠佳者;(4)重度营养不良者;(5)已出现远处转移者;(6)自身免疫性疾病者;(7)患其他原发性肿瘤者;(8)凝血障碍者;(9)患肠穿孔、肠梗阻等急症者。患者均行造口术。根据造口方式,分成永久性造口组(简称永久组,n=41)、临时性造口组(简称临时组,n=69)。两组基线资料比较无差异($P>0.05$),见表 1,研究方案获得我院伦理委员会批准。

表 1 两组基线资料比较

Table 1 Comparison of baseline data between the two groups

Groups	Gender(n)		Age(years)	Basic diseases(n)		Distance between tumor and anal margin (cm)	TNM staging(n)			Operation mode(n)		Neoadjuvant chemotherapy(n)
	Male	Female		Hyper-tension	Dia-betes		Phase I	Phase II	Phase III	Laparo-scope	Open	
Temporary group(n=69)	36	33	60.04± 8.87	13	15	7.13± 2.14	19	28	22	43	26	23
Permanent group(n=41)	25	16	59.83± 8.99	7	10	7.05± 2.03	11	16	14	29	12	17
t/ χ^2	0.807		0.111	0.054	0.103	0.193	0.061		0.805			0.735
P	0.369		0.911	0.816	0.748	0.847	0.970		0.370			0.391

1.2 手术方法

两组均在手术前行常规的结肠镜、影像学、血生化等检查,经肛门指诊确定肿瘤部位,术前 2 周禁烟酒,术前 2 d 食用半流食,术前 1 d 给予泻药口服,使用肠道消炎药物,在术前 30 min 预防性使用抗生素。两组行腹腔镜或开腹手术,在距离肿瘤上缘约 8~10 cm、下缘约 2 cm 处将病灶切除,术后根据患者

情况行永久性临时性造口。永久组:行永久性乙状结肠造口,术前进行全麻。针对左下腹外侧腹膜外隧道行游离,对乙状结肠系膜进行调整,将其于隧道入口部位固定。在左侧下腹部进行造口,提前行戳卡辅助口,设计圆形切口(直径 2.5 cm)。将皮下组织、腹直肌前鞘切开,对肌肉予以钝性分离,选取腹直肌后鞘、腹横筋膜切开,在腹膜外进行钝性分离,通过隧道将乙状结

肠拖出,隧道长 4 cm。经可吸收线固定结肠浆肌层,确定止血充分,且未见乙状结肠系膜扭转,则可将伤口缝合。临时组:行临时性造口,术前行全麻。于右下腹造口定点部位行圆形切口,长度约 2 cm,将皮下筋膜、腹横筋膜等组织依次切开达腹腔,选取距离回盲约 30~40 cm 处,提出回肠达腹壁外,使支撑管穿过直肠系膜,经可吸收线对肠壁(或腹膜、系膜)、腹外斜肌腱膜进行对称缝合、固定。将肠壁切开、外翻,对切口行间断缝合,术毕。在 3~6 个月后,根据情况行造口还纳。两组手术均由同 1 名主治医师操作,患者术后根据医嘱定期复查。

1.3 观察指标

各评分量表分别在患者术后 1、3、6 个月发放,由发放人员简单介绍量表内容与填写方法,患者独立作答,针对不具备填写能力者,由发放人员口述量表内容,患者独立做出选择。(1)造口并发症评估:记录两组术后 6 个月内造口皮肤并发症、造口脱垂、造口狭窄、造口旁疝、缝合处分离、造口回缩的发生率。(2)生活质量评估:利用简明生活质量量表(The medical outcomes study 36-item short-form, SF-36)^[6]进行评价。该量表包括 8 个维度,分别为机体疼痛、躯体功能、活力、躯体角色受限、情

感角色受限、心理健康、社会功能、总体健康。共计条目 36 个,经标准评分法将各维度分值转化成 0~100 分,分值越高,生活质量越好。该量表分半信度为 0.94,各维度 Cronbach's α 系数为 0.70~0.91 间。(3)排便症状评估:参考《肛肠外科并发症防范与处理》^[7]设计排便症状量表,内容包括排便紧迫感、排便费力、里急后重、排便次数、排便时间,每项计 0~10 分,分值越高,提示排便功能越差。

1.4 统计学方法

经 SPSS20.0 软件行数据分析,计数资料用百分比(%)表示,行 χ^2 检验或连续校正卡方检验。计量资料以均数 $\pm$ 标准差($\bar{x}\pm s$)表示,两两比较行 t 检验,多时点比较行方差分析。经 Pearson 线性相关分析患者生活质量评分与排便症状评分的相关性。 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组造口并发症发生率比较

临时组造口并发症发生率为 8.90%,与永久组的 12.20%比较无差异($P>0.05$),见表 2。

表 2 两组造口并发症发生率比较[n(%)]

Table 2 Comparison of stoma complications between the two groups[n(%)]

Groups	n	Skin complications of stoma	Prolapse of stoma	Stricture of stoma	Parastomal hernia	Suture separation	Retraction of stoma	≥ 2 kinds of complications	Total
Temporary group(n=69)	69	2(2.90)	1(1.45)	1(1.45)	2(2.90)	0(0.00)	2(2.90)	2(2.90)	6(8.90)
Permanent group(n=41)	41	3(7.32)	2(4.88)	0(0.00)	0(0.00)	2(4.88)	2(4.88)	4(9.76)	5(12.20)
χ^2								1.204 ^①	0.069 ^①
P								0.273	0.793

Note: ^① continuity correction chi square test was performed.

2.2 两组术后 SF-36 评分比较

两组术后 1 个月 SF-36 的各维度评分比较无差异($P>0.05$),两组术后 3 个月、6 个月各维度评分均高于术后 1 个月,且术后 6 个月各评分高于术后 3 个月($P<0.05$)。临时组术后 3 个月 SF-36 各维度评分高于永久组($P<0.05$),但术后 6 个月各指标比较无差异($P>0.05$),见表 3。

2.3 两组术后排便症状评分比较

两组术后 1 个月排便症状各指标评分比较无差异($P>0.05$),两组术后 3 个月、6 个月各指标评分均低于术后 1 个月,且术后 6 个月的排便紧迫感、排便费力、里急后重评分及总分低于术后 3 个月($P<0.05$)。临时组术后 3 个月的排便紧迫感、排便费力、里急后重评分及总分低于永久组($P<0.05$),但组间排便次数、排便时间评分比较无差异($P>0.05$)。两组术后 6 个月各项评分比较均无差异($P>0.05$),见表 4。

2.4 造口患者生活质量与排便症状评分的相关性分析

经 Pearson 线性相关分析提示,排便症状总分与机体疼痛、躯体功能、躯体角色受限、情感角色受限、心理健康、社会功能、总体健康评分呈负相关($r=-0.625$ 、 -0.544 、 -0.539 、 -0.698 、 -0.714 、 -0.682 、 -0.619 , $P=0.000$ 、 0.012 、 0.025 、 0.000 、 0.000 、 0.000 、

0.000),与活力评分未见明显相关性($r=-0.410$, $P=0.059$)。

3 讨论

在直肠癌切除术患者中,约 75% 的患者能够行保肛术治疗,为了减少术后并发症发生,临床主张对这类患者行预防性造口,然而还有 25% 的患者需将肛门切除,并接受永久性造口,即通过腹部肠造口,将大便排出^[8,9]。有学者发现,辅助造口能减少吻合口漏发生率,可通过保护吻合口,降低并发症风险,改善生活质量^[10,11],但也有研究认为,造口会引起相关并发症,可能导致患者术后生活质量、排便功能受影响^[12]。由此可见,相关研究中关于造口术对患者生活质量的影响还存在争议。此外,目前临床尚未明确不同造口方式对其生活质量的影响,仍需对此加强观察与研究。

造口术后常见的并发症为周围皮肤感染、造口狭窄、造口脱垂等^[13-15]。本结果显示,临时性造口与永久性造口患者的术后并发症率比较未见差异。这提示本研究采用的两种造口方式安全性接近,并发症率均较低。通过观察两组 SF-36 评分,发现两组术后 3、6 个月的生活质量均升高,且临时组术后 3 个月的 SF-36 评分高于永久组。预防性造口作为一种临时造口方式,对

表 3 两组术后 SF-36 评分比较(分, $\bar{x} \pm s$)
Table 3 Comparison of SF-36 scores between the two groups after operation(scores, $\bar{x} \pm s$)

Groups	Time	Body pain	Somatic function	Vitality	Physical role limitation	Emotional role limitation	Mental health	Social function	General health
Temporary group (n=69)	1 month after operation	41.94± 5.64	43.09± 4.17	44.93± 5.74	40.27± 6.02	43.83± 4.42	44.66± 5.52	41.94± 6.63	47.42± 5.07
	3 months after operation	47.41± 6.13	48.33± 5.89	52.01± 5.53	48.32± 5.41	59.10± 5.67	50.38± 6.41	50.52± 5.41	55.46± 4.72
		° °	° °	° °	° °	° °	° °	° °	° °
	6 months after operation	55.03± 5.52	57.31± 4.46	59.38± 4.41	56.49± 6.38	65.32± 4.78	58.94± 5.57	58.93± 6.11	62.15± 4.89
		° °	° °	° °	° °	° °	° °	° °	° °
	F	89.598	148.745	130.241	128.187	339.605	104.227	135.122	156.613
P		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Permanent group (n=41)	1 month after operation	40.15± 4.72	41.95± 4.84	43.85± 4.87	41.22± 5.53	41.99± 4.62	43.74± 4.86	40.67± 5.62	46.67± 4.88
	3 months after operation	44.53± 5.41	45.12± 4.73	48.13± 5.04	45.01± 4.46	53.46± 5.52	47.45± 4.78	46.34± 4.28	51.72± 5.03
		°	°	°	°	°	°	°	°
	6 months after operation	53.91± 5.88	55.63± 5.42	57.45± 5.32	55.49± 5.92	63.78± 5.19	56.77± 5.41	57.35± 6.03	60.93± 5.02
		° °	° °	° °	° °	° °	° °	° °	° °
	F	70.580	83.896	76.825	78.585	185.570	73.193	102.565	86.527
P		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: compared with 1 month after operation, ° $P < 0.05$; compared with 3 months after operation, ° $P < 0.05$; compared with permanent group, ° $P < 0.05$.

表 4 两组术后排便症状评分比较(分, $\bar{x} \pm s$)
Table 4 Comparison of defecation symptom scores between the two groups(scores, $\bar{x} \pm s$)

Groups	Time	Urgency of defecation	Effort to defecate	Tenesmus	Defecation frequency	Defecation time	Total scores
Temporary group(n=69)	1 month after operation	5.53± 1.16	6.02± 0.46	5.41± 0.72	5.19± 0.68	6.13± 1.13	28.28± 5.47
	3 months after operation	2.76± 0.65° °	4.36± 0.38° °	3.62± 0.45° °	3.25± 0.56°	3.86± 0.62°	17.85± 3.24° °
	6 months after operation	1.93± 0.53° °	2.64± 0.43° °	1.75± 0.38° °	3.11± 0.52°	3.74± 0.56°	13.17± 2.89° °
	F	359.005	1093.131	801.263	267.375	190.055	253.954
	P	0.000	0.000	0.000	0.000	0.000	0.000
Permanent group (n=41)	1 month after operation	5.49± 1.42	5.98± 0.51	5.39± 0.68	5.23± 0.61	6.10± 1.18	28.19± 4.93
	3 months after operation	3.34± 0.50°	4.91± 0.44°	3.91± 0.52°	3.27± 0.49°	3.91± 0.57°	19.34± 3.51°
	6 months after operation	1.90± 0.46° °	2.69± 0.37° °	1.80± 0.44° °	3.18± 0.54°	3.78± 0.52°	13.35± 2.34° °
	F	162.016	586.517	432.186	182.640	105.150	162.843
	P	0.000	0.000	0.000	0.000	0.000	0.000

Note: compared with 1 month after operation, ° $P < 0.05$; compared with 3 months after operation, ° $P < 0.05$; compared with permanent group, ° $P < 0.05$.

肠屏障、肠功能恢复具有促进作用,可预防内毒素移位,减少肠道细菌定植,从而下调炎症因子表达,减轻机体炎症^[16-18]。有学者发现,临时造口可控制二次手术风险,提升保肛率,降低吻合口漏发生率,且在术后 3 个月便能还纳,操作过程比较简单^[19],这可能是临时性造口提高患者术后生活质量的重要原因。而永久性造口患者术后恢复更慢,在术后 3 个月,部分患者对排便

方式尚未习惯,适应度低,导致生活质量降低。李秀娟等^[20]研究也显示,临时性造口者的社会、身体适应维度优于永久性造口者,佐证了本文的结论。术后 6 个月,两组 SF-36 评分比较未见差异,表明永久性造口患者在该阶段已逐渐适应排便,生活质量提升。

本研究结果提示,两组术后 3、6 个月的排便症状评分均低

于术后1个月,且临时组术后3个月的排便紧迫感、排便费力、里急后重评分及总分较永久组更低。这表明两种造口方式均能改善患者的排便症状,其中临时造口术后3个月的改善效果更显著。直肠癌患者术后排便功能改善主要与盆腔神经反射、肛门括约肌恢复程度有关,在术后早期,患者的“新直肠”顺应性较差,短时间内无法适应,粪便存储功能差^[21-23]。对于永久性造口患者而言,在切除肛门后行乙状结肠造口,术后早期适应度更差,排便次数增加,排便功能恢复更缓慢。临时造口患者术后1个月时“新直肠”感觉功能未能完全建立,排便症状较重,而在术后3个月,“新直肠”感觉功能逐渐改善,从而进一步改善排便功能^[24-26]。此外,本研究发现,两组术后6个月的排便症状比较无差异,提示在术后6个月,两种造口方式均能被患者适应,排便功能明显改善。本研究显示,排便症状总分与机体疼痛、躯体功能、躯体角色受限、情感角色受限、心理健康、社会功能、总体健康评分呈负相关,即排便症状越重,生活质量越低。研究表明,直肠癌术后大便失禁、排便次数增加是影响患者生活质量的重要因素,可导致患者社交能力下降,并且影响其机体活动以及心理健康^[27-29]。姜红涛等^[30]认为,排便不规律会影响结肠造口患者的生活质量。这进一步提示,造口患者生活质量与排便功能密切相关。曾彩红等^[31]针对直肠癌造口患者加强保健指导后,生活质量显著提升。基于此,临床需注重对这类患者进行排便训练,加强健康宣教。

综上所述,与直肠癌永久性造口相比,临时性造口可以更显著地提升患者术后3个月的生活质量与排便功能,但永久性造口者术后6个月的生活质量、排便症状改善效果与临时性造口者接近,且排便功能对生活质量影响较大。此外,本研究也有局限性,如观察时间仅6个月,未来还需要延长观察时间,分析不同造口方式对患者远期生活质量的影响。

参考文献(References)

- [1] Koedam TWA, Helbach MV, Ven PMVD, et al. Transanal total mesorectal excision for rectal cancer: evaluation of the learning curve [J]. *Tech Coloproctol*, 2018, 22(2): 1-9
- [2] Wang XT, Lei L, Kong FB, et al. Surgical-related risk factors associated with anastomotic leakage after resection for rectal cancer: a meta-analysis[J]. *Jpn J Clin Oncol*, 2020, 50(1): 20-28
- [3] Chudner A, Gachabayov M, Dyatlov A, et al. The influence of diverting loop ileostomy vs. colostomy on postoperative morbidity in restorative anterior resection for rectal cancer: a systematic review and meta-analysis[J]. *Langenbeck Arch Surg*, 2019, 404(2): 129-139
- [4] 朱汉建, 汤东, 王道荣. 预防性造口在低位直肠癌保肛术中的应用进展[J]. *国际外科学杂志*, 2019, 46(8): 563-566
- [5] 马宁, 张倩. 结直肠癌术后病人生活质量现状及影响因素分析[J]. *实用老年医学*, 2018, 32(8): 763-765
- [6] 玉山, 樊文洁, 俞婉琦, 等. SF-36量表应用于城市化居民生命质量评价的信度和效度分析 [J]. *中华流行病学杂志*, 2016, 37(3): 344-347
- [7] 张书信. 肛肠外科并发症防范与处理 [M]. 北京: 人民军医出版社, 2012: 68-70
- [8] Mitul AR. Global variation in anastomosis and end colostomy formation following left-sided colorectal resection [J]. *Brit J Surg*, 2019, 3(3): 403-414
- [9] Park J, Angenete E, Bock D, et al. Cost analysis in a randomized trial of early closure of a temporary ileostomy after rectal resection for cancer (EASY trial)[J]. *Surg Endosc*, 2020, 34(1): 69-76
- [10] 庄静, 胡春颖, 李娇, 等. 直肠癌保肛术后吻合口漏的影响因素和预后分析[J]. *中国现代普通外科进展*, 2019, 22(8): 663-666
- [11] 樊林, 廖新华. 直肠癌新辅助放疗和吻合口漏相关性及其对策[J]. *中国实用外科杂志*, 2020, 40(3): 329-334
- [12] 陈微, 胡海燕, 王婷, 等. 持续质量改进对老年直肠癌造口患者术后生活质量的干预效果 [J]. *现代生物医学进展*, 2015, 15(28): 5472-5474, 549
- [13] Suwanabol PA, Hardiman KM. Prevention and management of colostomy complications: retraction and stenosis [J]. *Dis Colon Rectum*, 2018, 61(12): 1344-1347
- [14] Martin K, Tsvetomir I, Grigor G, et al. Novel Application of the EK Glove Port for Single-Incision Diverting Sigmoid Loop Colostomy in Advanced Rectal Cancer[J]. *JSLs*, 2020, 24(2): e2020.00001
- [15] Hashida H, Kita R, Kondo M, et al. Internal hernia of the stomach associated with colostomy after laparoscopic surgery for rectal cancer: a case report[J]. *Surg Case Rep*, 2020, 6(1): 127
- [16] Hung H, You J, Chiang J, et al. Clinicopathological characteristics and outcomes of metachronous rectal cancer in patients with a history of cervical cancer with and without remote radiotherapy: Reports of 45 cases[J]. *Medicine (Baltimore)*, 2020, 99(30): e21328
- [17] Mäkinen J, Uhlir EJ, Klintrop KHB, Vierimaa MT, et al. Prospective, Randomized Study on the Use of Prosthetic Mesh to Prevent a Parastomal Hernia in a Permanent Colostomy: Results of a Long-term Follow-up[J]. *Dis Colon Rectum*, 2020, 63(5): 678-684
- [18] Jung WB, Shin JY, Park JK. Comparison of short-term outcome between diverting colostomy and colonic stent as a bridge to surgery for left colonic malignant obstruction[J]. *Medicine (Baltimore)*, 2020, 99(14): e19557
- [19] 师文聪, 王楠, 尹智渊, 等. 预防性造口对腹腔镜直肠癌低位前切除术短期生活质量的影响 [J]. *中国普通外科杂志*, 2018, 27(4): 420-426
- [20] 李秀娟, 李玲妍, 李夏, 等. 临时性造口患者与永久性造口患者适应度对比[J]. *昆明医科大学学报*, 2018, 39(2): 108-111
- [21] Creavin B, Ryan EJ, Kelly ME, et al. Minimally invasive approaches to the management of anastomotic leakage following restorative rectal cancer resection[J]. *Colorectal Dis*, 2019, 21(12): 1364-1371
- [22] Saadat LV, Mahvi DA, Jolissaint JS, et al. Discharge destination following rectal cancer resection: an analysis of preoperative and intraoperative factors[J]. *Int J Colorectal Dis*, 2020, 35(2): 249-257
- [23] Hopkins MB, Geiger TM, Bethurum AJ, et al. Comparing pathologic outcomes for robotic versus laparoscopic Surgery in rectal cancer resection: a propensity adjusted analysis of 7616 patients [J]. *Surg Endosc*, 2020, 34(6): 2613-2622
- [24] Yaegashi M, Otsuka K, Kimura T, et al. Early renal dysfunction after temporary ileostomy construction [J]. *Surg Today*, 2020, 50 (7): 703-710
- [25] van Heinsbergen M, Leijtens JW, Slooter GD, et al. Quality of Life and Bowel Dysfunction after Transanal Endoscopic Microsurgery for Rectal Cancer: One Third of Patients Experience Major Low Anterior Resection Syndrome[J]. *Dig Surg*, 2020, 37(1): 39-46 (下转第3519页)

- natal asphyxia: a systematic review and meta-analysis [J]. *Eur J Pediatr*, 2018, 177(10): 1425-1434
- [6] Gan J, Zhou X. Comparison of urine neutrophil gelatinase-associated lipocalin and interleukin-18 in prediction of acute kidney injury in adults[J]. *Medicine (Baltimore)*, 2018, 97(39): e12570
- [7] Siddiqui K, Joy SS, Al-Rubeaan K. Association of urinary monocyte chemoattractant protein-1 (MCP-1) and kidney injury molecule-1 (KIM-1) with risk factors of diabetic kidney disease in type 2 diabetes patients[J]. *Int Urol Nephrol*, 2019, 51(8): 1379-1386
- [8] Tanase DM, Gosav EM, Radu S, et al. The Predictive Role of the Biomarker Kidney Molecule-1 (KIM-1) in Acute Kidney Injury (AKI) Cisplatin-Induced Nephrotoxicity [J]. *Int J Mol Sci*, 2019, 20(20): 5238
- [9] Westhoff JH, Seibert FS, Waldherr S, et al. Urinary calprotectin, kidney injury molecule-1, and neutrophil gelatinase-associated lipocalin for the prediction of adverse outcome in pediatric acute kidney injury [J]. *Eur J Pediatr*, 2017, 176(6): 745-755
- [10] Akcan-Arikan A, Zappitelli M, Loftis LL, et al. Modified RIFLE criteria in critically ill children with acute kidney injury [J]. *Kidney Int*, 2007, 71(10): 1028-1035
- [11] Geier L, Menzel C, Germund I, et al. RACHS-1 score as predictive factor for postoperative ventilation time in children with congenital heart disease[J]. *Cardiol Young*, 2020, 30(2): 213-218
- [12] Nishida M, Kubo S, Morishita Y, et al. Kidney injury biomarkers after cardiac angiography in children with congenital heart disease[J]. *Congenit Heart Dis*, 2019, 14(6): 1087-1093
- [13] 张毅, 谢坚, 刘亚琼, 等. 影响儿童重症病房新生儿发生急性肾损伤及预后相关因素分析 [J]. *现代生物医学进展*, 2016, 16(24): 4698-4701
- [14] 肖燕燕, 郑建勇, 姚勇, 等. 婴幼儿先天性心脏病体外循环术后急性肾损伤早期预警的临床研究 [J]. *中华儿科杂志*, 2013, 51(10): 765-770
- [15] 杨宇齐, 袁立英, 陈爽, 等. 先天性心脏病患儿术后急性肾损伤相关因素分析[J]. *中华医学杂志*, 2019, 99(22): 1717-1721
- [16] Lee SH, Kim SJ, Kim HJ, et al. Acute Kidney Injury Following Cardiopulmonary Bypass in Children- Risk Factors and Out comes [J]. *Circ J*, 2017, 81(10): 1522-1527
- [17] Jang WS, Kim WH, Choi K, et al. Incidence, risk factors and clinical outcomes for acute kidney injury after aortic arch repair in paediatric patients[J]. *Eur J Cardiothorac Surg*, 2014, 45(6): e208-e214
- [18] Moreira R, Jacinto T, Neves P, et al. Predictors of Acute Kidney Injury Associated with Cardiopulmonary Bypass [J]. *Rev Port Cir Cardiorac Vasc*, 2019, 26(2): 109-115
- [19] Pickering JW, James MT, Palmer SC. Acute kidney injury and prognosis after cardiopulmonary bypass: a meta-analysis of cohort studies [J]. *Am J Kidney Dis*, 2015, 65(2): 283-293
- [20] Xu S, Liu J, Li L, et al. Cardiopulmonary bypass time is an independent risk factor for acute kidney injury in emergent thoracic aortic surgery: a retrospective cohort study[J]. *J Cardiothorac Surg*, 2019, 14(1): 90
- [21] Newland RF, Baker RA, Woodman RJ, et al. Predictive Capacity of Oxygen Delivery During Cardiopulmonary Bypass on Acute Kidney Injury[J]. *Ann Thorac Surg*, 2019, 108(6): 1807-1814
- [22] Buonafina M, Martinez-Martinez E, Jaisser F. More than a simple biomarker: the role of NGAL in cardiovascular and renal diseases[J]. *Clin Sci (Lond)*, 2018, 132(9): 909-923
- [23] Abella V, Scotece M, Conde J, et al. The potential of lipocalin-2/NGAL as biomarker for inflammatory and metabolic diseases[J]. *Biomarkers*, 2015, 20(8): 565-571
- [24] Shang W, Wang Z. The Update of NGAL in Acute Kidney Injury[J]. *Curr Protein Pept Sci*, 2017, 18(12): 1211-1217
- [25] Lippi I, Perondi F, Meucci V, et al. Clinical utility of urine kidney injury molecule-1 (KIM-1) and gamma-glutamyl transferase (GGT) in the diagnosis of canine acute kidney injury [J]. *Vet Res Commun*, 2018, 42(2): 95-100
- [26] 闫芳, 刘艳兵, 邢蓓蓓, 等. KIM-1 及 NGAL 在婴幼儿复杂先心病术后早期肾功能损伤中的预测作用 [J]. *临床小儿外科杂志*, 2016, 15(03): 231-234
- [27] Seibert FS, Sitz M, Passfall J, et al. Prognostic Value of Urinary Calprotectin, NGAL and KIM-1 in Chronic Kidney Disease [J]. *Kidney Blood Press Res*, 2018, 43(4): 1255-1262
- [28] Mosa OF. Prognostic Significance of Serum NGAL and Troponin I against Acute Kidney Injury in Egyptian ICU Patients after Open Heart Surgery: A Pilot Study[J]. *Kidney Dis (Basel)*, 2018, 4(4): 246-254
- [29] Lee CC, Chang CH, Chen SW, et al. Preoperative risk assessment improves biomarker detection for predicting acute kidney injury after cardiac surgery[J]. *PLoS One*, 2018, 13(9): e0203447
- [30] 温昱鹏, 李宗斌, 常斌, 等. 尿 NGAL 和 KIM-1 对儿童体外循环心脏术后 AKI 的诊断意义 [J]. *中华危重病急救医学*, 2017, 29(12): 1112-1116

(上接第 3563 页)

- [26] Lee GC, Bordeianou LG, Francone TD, et al. Superior pathologic and clinical outcomes after minimally invasive rectal cancer resection, compared to open resection[J]. *Surg Endosc*, 2020, 34(8): 3435-3448
- [27] Bohlok A, Mercier C, Bouazza F, et al. The burden of low anterior resection syndrome on quality of life in patients with mid or low rectal cancer[J]. *Support Care Cancer*, 2020, 28(3): 1199-120
- [28] Kim JC, Lee JL, Kim CW, et al. Mechanotechnical faults and particular issues of anastomotic complications following robot-assisted anterior resection in 968 rectal cancer patients[J]. *J Surg Oncol*, 2019, 120(8): 1436-1445
- [29] Turco LC, Scaldaferrì F, Chiantera V, et al. Long-term evaluation of quality of life and gastrointestinal well-being after segmental colo-rectal resection for deep infiltrating endometriosis (ENDO-RE-SECT QoL)[J]. *Arch Gynecol Obstet*, 2020, 301(1): 217-228
- [30] 姜红涛, 张宇, 杨洋, 等. 结肠造口患者生活质量现状及影响因素研究[J]. *中国护理管理*, 2018, 18(6): 127-132
- [31] 曾彩红, 刘晓辉. 延续性保健指导对老年直肠癌造口术患者院外生活质量的影响[J]. *实用临床医药杂志*, 2016, 20(4): 111-114