

直肠癌保肛手术预防性回肠造口 相关并发症及其管理策略

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【摘要】 回肠预防性造口是低位直肠癌保肛手术防止出现严重吻合口并发症的重要桥接手术方式, 可以明显降低吻合口漏带来的盆腔感染风险。但是回肠造口对于吻合口漏的发生是否具有积极的临床价值, 目前尚存在较大争议。回肠预防性造口手术操作相对简便, 还纳过程较为便捷, 因此被广泛应用于临床。然而, 回肠造口作为一种创伤性手术, 本身亦可能引发一系列并发症。因此, 如何全面认识造口相关并发症, 优化处理策略, 并精准选择适宜的患者接受预防性回肠造口, 具有重要的临床意义。本文总结了预防性回肠造口的类型和应用, 探讨其常见并发症的管理和防治策略, 以期为临床外科医生在直肠癌保肛手术中优化造口管理、降低并发症风险提供重要的参考依据。

【关键词】 直肠肿瘤; 保肛手术; 预防性造口; 吻合口漏

Prevention of ileostomy-related complications and management of anal preservation surgery for rectal cancer

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【Abstract】 Protective ileostomy is an important bridging procedure in low anterior resection for rectal cancer, aimed at preventing severe anastomotic complications. It has been shown to significantly reduce the risk of pelvic infections resulting from anastomotic leakage. However, whether ileostomy plays a positive clinical role in preventing anastomotic leaks remains a subject of considerable debate. The procedure for creating a protective ileostomy is relatively simple and convenient, making it a commonly used approach in clinical practice. Nevertheless, as a traumatic surgical procedure, ileostomy itself may lead to a range of complications. Therefore, it is crucial to comprehensively understand the potential complications associated with ileostomy, develop optimized management strategies, and carefully select appropriate patients for preventive ileostomy, as these steps hold significant clinical value. This article provides a systematic review of the types, development, and application of preventive ileostomy, as well as the management and prevention strategies for common complications. The aim is to offer valuable guidance to clinical surgeons in optimizing stoma management and minimizing complications in rectal cancer sphincter-preserving surgery.

【Key words】 Rectal neoplasms; Sphincter-preserving surgery; Preventive stoma; Anastomotic leakage

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直肠癌是我国常见的恶性肿瘤之一,严重威胁着人们的健康^[1]。根治性手术切除仍然是目前非转移性直肠癌重要的治疗手段,为了保留患者肛门功能,避免永久性结肠造口,直肠癌保肛手术(sphincter-preserving surgery,SPS)是近年来治疗中低位直肠癌的常见选择^[2]。近些年,随着手术技术的进步,部分改良术式如拖出式结肠肛管吻合术、适形保肛手术(conformal sphincter-preservation operation,CSPO)^[3-5]以及经肛全直肠系膜切除术(transanal total mesorectal excision,taTME)^[6-7]等均可以更好地提高低位直肠癌的保肛率。尽管此类手术有助于提高患者的生活质量,但其在吻合口漏相关的并发症方面具有一定的临床挑战。预防性造口或保护性造口是低位直肠癌保肛术后常见的一种保护措施,可以降低直肠癌术后感染相关并发症的发生被广泛应用^[8-9]。其中由于预防性回肠造口的手术操作相对简便、造口闭合更为便捷、肠管血运良好,是目前临床较为常用的术式选择^[10]。虽然保护性回肠造口的应用,能够有效减轻术后吻合口漏导致的感染风险,但是由于其为创伤性手术操作,其本身可能导致诸多的造口相关并发症。因此,如何平衡术后并发症的预防与患者的生活质量,选择性地预防性回肠造口,是临床管理中必须关注的重点。本文对国内外研究进行系统性回顾,全面阐述直肠癌保肛术后预防性回肠造口的相关并发症种类、危险因素、防治和其管理策略,旨在为临床实践提供最新的证据和治疗建议。

一、中低位直肠癌保肛手术的选择

随着新辅助放化疗、免疫治疗及手术技术的发展,直肠癌治疗逐渐趋向个体化和精细化,精准保肛甚至超低位保肛成为可能。保肛手术从经典的 Dixon 手术到结肠肛管吻合术、经肛内镜微创手术及经括约肌间切除术(intersphincteric resection,ISR)等不断创新,保肛理念逐渐从依赖肛缘距离发展为综合评估肿瘤位置、恶性程度及肛门括约肌关系的多因素决策。这些变化使得保肛适应证逐步放宽^[11-12]。但也对预防性回肠造口的应用提出了新的挑战。

1.拖出式结肠肛管吻合术(改良 Bacon 术与 Parks 术):主要适用于无法吻合或吻合失败的极低位直肠癌患者。改良 Bacon 术通过将结肠拉出肛管作为临时转流通路,避免吻合口漏,且保留肛门解剖结构,有利于排便功能^[13]。与之相比,Parks 术操作简单,但对无张力吻合的要求较高,增加了吻合口漏和低位前切除综合征风险。因此,预防性回肠造口的必要性依然存在。

2.经括约肌间切除术(intersphincteric resection,ISR):通过分离括约肌间隙,延长肿瘤远端切缘,适用于肿瘤下缘接近肛提肌的患者。ISR 术后有 42% 的患者短期内会出现严重肛门功能障碍,但多数可逐渐恢复^[14]。因此,ISR 术后是否需要预防性回肠造口,仍取决于肛门功能恢复情况。

3.适形保肛手术(conformal sphincter-preservation operation,CSPO):在直视下确保远端切缘 ≥ 1 cm,适用于肿瘤下缘距齿状线 ≤ 2 cm 的直肠癌患者。与 ISR 不同,CSPO 不涉

及括约肌间隙,因此能更好地保留肛门功能,减少术后肛门功能障碍的发生率^[15]。然而,该手术可能因高张力吻合而增加吻合口漏的风险,是否进行预防性回肠造口仍需权衡。

4.经肛全直肠系膜切除术(taTME):采用“自下而上”方法,适用于骨盆解剖复杂的低位直肠癌患者。TaLaR 研究最新数据显示,从肿瘤学角度看,taTME 术后患者 3 年无病生存率(disease-free survival,DFS)不劣于腹腔镜 TME 手术^[6]。尽管 taTME 有助于提高肿瘤切除率,减少腹部切口,但由于其术后吻合口漏风险较高,是否需要常规实施预防性回肠造口仍有争议,建议根据术中情况,谨慎选择预防性造口^[16-18]。

二、回肠造口的应用

随着保肛手术技术的不断进步,预防性回肠造口的应用面临新挑战。部分手术(如改良 Bacon 术和 CSPO)在减少吻合口漏的同时,使得预防性回肠造口的必要性降低。虽然目前对于预防性回肠造口是否可以减轻吻合口漏的发生尚存在争议^[8,19-23]。但是可以肯定的是,预防性回肠造口在减少吻合口漏引起的严重盆腔感染和二次手术等方面起到了重要的作用^[8,19]。因此,随着临床需求的增加,回肠造口术的适应证和技术正在不断发展和完善^[24]。

(一)常见预防性回肠造口术的类型

1.袢式回肠造口术:是最常用的预防性造口方式,通过将一段回肠提出并与腹壁分层缝合,形成一个袢状造口。此方法创伤小,手术简便,且伤口感染率和切口疝的发生率较低,造口相关并发症也较少^[25]。

2.皮桥式回肠造口术:是通过在肠袢下放置皮瓣,形成“皮桥”以支撑和固定肠管。该方法可减少肠管与皮肤之间的缝隙,降低小肠液渗漏对皮肤的刺激,从而减少皮肤炎等并发症^[26]。笔者团队也积极开展了皮桥造口在直肠癌术后预防性造口的应用,结果显示,皮桥造口在手术时间、还纳手术造口切除时间及还纳手术造口切除出血量方面均存在明显优势^[27]。

3.“一针法”回肠造口术:通过在回肠末端提出后,将肠管与皮肤缝合,一针收紧缝线,完成造口。这种方法操作简单,耗时短,能有效减少造口相关并发症,如皮肤黏膜分离、粪水性皮炎和造口回缩等^[28]。

4.其他造口方法:为进一步简化操作、减少手术时间和术后并发症,学者们改进了回肠末端造口术,包括改良一针法^[29]、三针法^[30]及三针法联合新打结方式^[31]等。这些手术方式根据患者的具体病情和手术情况,需由有经验的手术团队充分评估后决定实施。

(二)预防性回肠造口术的优势

预防性回肠造口术是一种在特定手术中为预防可能出现的并发症而采取的手术方式,其优点主要包括以下几个方面。

1.保护吻合口:在低位或超低位直肠癌手术中,吻合口漏是一种严重的并发症^[32]。预防性回肠造口术通过转流粪便,减少肠内容物对吻合口的污染和机械刺激,从而显著降

低吻合口漏的发生率,为吻合口的愈合创造良好的局部环境^[33-34]。

2.降低感染风险:预防性回肠造口术可避免肠内容物在吻合口愈合期间进入远端肠道,可降低吻合口处肠腔压力,从而预防吻合口漏和严重腹腔感染的发生,有利于患者术后恢复^[35]。

3.促进病情恢复:由于预防性回肠造口术能降低吻合口漏及感染等严重并发症的发生风险,从而促进了术后恢复,住院时间相应缩短,也能更快地进行后续的康复治疗和功能锻炼,提高患者的生活质量,减少因并发症导致的再次手术或长期住院的痛苦和经济负担^[36]。

三、预防性回肠造口的常见并发症及处理

预防性回肠造口常见并发症包括造口周围皮炎和造口旁疝等,但是部分患者也存在罕见的造口相关并发症的发生,笔者结合国内外研究进展,系统地梳理了预防性回肠造口并发症的类型和处理措施,典型造口并发症见图1,造口并发症处理及预防措施见表1。

1.造口周围皮炎:是回肠造口术后常见的早期并发症之一^[37-38]。通常由富含蛋白水解酶的碱性肠液引起,破坏皮肤屏障并诱发皮炎^[39]。此外,造口位置不佳和造口袋使用不当也是其主要原因^[40]。术中选择腹部平坦区域并确保适当的造口高度(2~3 cm)可以有效预防此并发症。出现皮炎时,调整流出物渗漏后,受影响皮肤常可快速愈合^[40]。

2.皮肤黏膜分离:是回肠造口术后常见的并发症之一,通常与营养不良、糖尿病或造口感染等因素相关^[41-42]。处理方法包括用生理盐水清洗分离区域,使用皮肤屏障粉吸收渗

出物,并在较深分离区域采用藻酸盐或凝胶纤维填充^[43]。但对于部分皮肤黏膜分离患者,需密切观察警惕是否发生造口回缩^[44]。

3.造口感染:表现为周围红斑或蜂窝织炎,金黄色葡萄球菌为最常见病原^[45]。除蜂窝织炎外,造口感染还可引起脓肿,常见于克罗恩病患者^[46]。在临床工作中,引流造口周围脓肿时应注意选择合适的切口位置,以免影响造口袋粘贴。皮肤长期浸泡于粪便中可能会诱发造口周围真菌感染,临床表现多样,如丘疹、水疱、脓疱或糜烂等,确诊需依据皮疹刮片的病原学检测^[47-48]。局部抗真菌治疗可有效控制真菌感染,而顽固性感染可能需要口服抗真菌药物治疗^[48]。

4.造口缺血或坏死:造口缺血通常在术后24 h内出现,表现为皮肤黏膜交界处蓝紫色^[49]。随着水肿消退,颜色会恢复红润。造口坏死的主要原因包括过度牵拉肠系膜、血管结扎不当和造口周围肠系膜的过度切除和解剖^[50]。对于浅层坏死,定期观察即可;若坏死延伸到筋膜上方且长度超过2 cm,则建议翻修造口以避免其狭窄;若坏死延伸到筋膜以下,则需要立即手术切除缺血性肠段并重新造口^[51-52]。

5.造口回缩:是指造口下沉至皮肤表面以下,导致造口袋不贴合、内容物泄漏。常见原因包括渗漏、皮肤刺激以及皮肤黏膜分离等,并与肥胖、术后体质量增加等因素相关^[53]。通过优化造口技术、适当游离肠系膜及使用支撑棒可以减少回缩风险,但支撑棒使用需谨慎,因为其可能增加肠管坏死风险^[54]。因此,对于支撑棒的选择,需要结合系膜的血运及张力来综合决定。

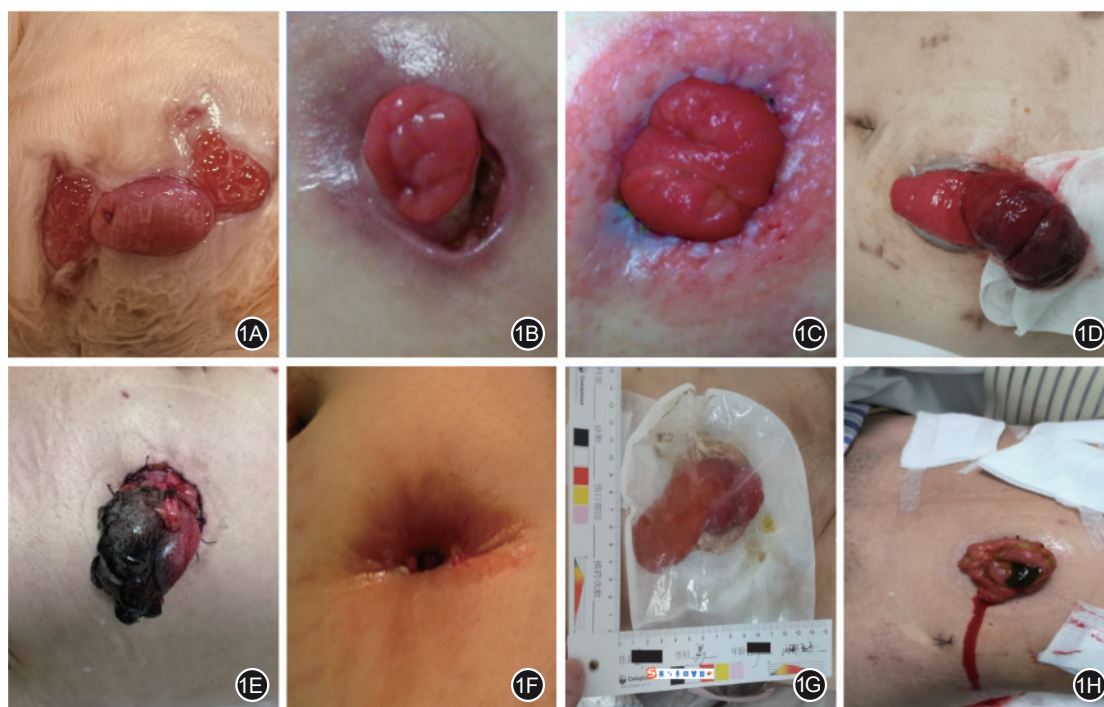


图1 常见造口并发症图示(由张雪娜、李银足和胡旭华提供图片) 1A.造口周围皮炎;1B.造口黏膜分离;1C.造口周围感染;1D.造口脱垂伴造口缺血;1E.造口坏死;1F.造口内陷;1G.造口脱垂;1H.造口出血

表 1 常见造口并发症的预防和治疗措施

常见造口并发症	预防措施	治疗措施
造口周围皮炎	1.屏障环或密封件、皮肤屏障粉、水胶体粉末 ^[81-82] ; 2.造口护理教育 ^[83] ; 3.造口部位标记 ^[84] ; 4.高度合适的造口 ^[82, 85]	1.度普利尤单抗 ^[37] ; 2. 2%利多卡因外用凝胶 ^[38] ; 3. 羧甲基纤维素钠纤维素纤维(SCCF)与水胶体敷料联合使用 ^[86]
皮肤黏膜分离	1.浆肌层缝合而非全层缝合 ^[44] ; 2.避免造口棒的使用 ^[87-88]	1.浅表黏膜分离通过局部伤口护理进行保守治疗 ^[89] ; 2.深部皮肤黏膜分离可使用藻酸盐或胶凝纤维填充深部间隙 ^[41, 89] ; 3.手术治疗适用于深部皮肤黏膜分离或浅表黏膜分离保守治疗失败者 ^[41, 90-91]
造口感染	1.适当的造口护理和维护,如合适的造口贴合和正确使用造口附件产品 ^[40, 92]	1.依据药敏结果使用抗生素治疗,严重感染者行清创治疗 ^[50] ; 2.如有造口周围脓肿者,选择合适的切口位置引流造口周围脓肿 ^[50, 93]
造口缺血或坏死	1.防止低灌注发生; 2.手术时防止造口肠系膜过分剥离 ^[94-95]	1.坏死位于浅表时,可不行治疗; 2.坏死延伸到筋膜以上 1~2 cm 时,建议早期翻修造口以防止造口狭窄; 3.坏死延伸到筋膜以下时,需要立即手术切除缺血肠管并重新造口 ^[94]
造口回缩	袢式造口支撑棒 ^[96] (但容易引起其他并发症)	造口修复手术 ^[41, 67]
造口相关液体和电解质失衡	1.术后严密监测体重、体液平衡、电解质及血生化 ^[56] ; 2.术后若发生肠梗阻,及时处理 ^[97]	静脉补充液体和电解质复苏 ^[98]
造口旁疝	1.控制腹压及使用造口腹带等固定装置可起到预防造口旁疝发生的作用; 2.造口方式的选择,腹膜外造口较腹膜内造口可降低造口旁疝的发生率 ^[99] ; 3.预防性应用补片 ^[100]	1.非手术治疗,对于无症状或仅有轻微症状的患者,可采取随访观察 ^[100] ; 2.手术治疗,包括组织修补术 ^[100] 、造口移位术 ^[101] 和补片修补术等 ^[102-103]
造口脱垂	1.增加造口直径 ^[104] ; 2.造口类型的选择,双腔造口较单腔造口可降低造口脱垂的发生率 ^[105] ; 3.造口方式的选择,腹膜外造口较腹膜内造口可降低造口旁疝的发生率 ^[99]	1.在肠管血运状况良好的情况下,可采取手法还纳 ^[106] ; 2.在肠管血运不良的情况下,可采取手术还纳 ^[106]
造口狭窄和梗阻	1.合适的造口: (1)推荐距回盲瓣 30 cm 处造口; (2)制作与肠管直径相符的腹壁切口,切除部分皮肤并去除皮下脂肪; (3)切开筋膜大小适当,约两横指,腹直肌较厚者可适当延长 ^[56, 73] ; 2.气腹放气后造口,消除造口出口管腔向内侧倾斜 ^[107] ; 3.避免系膜扭转 ^[108]	1.轻度狭窄者,可给予低渣饮食、补液、手指或扩肛器扩张造口等保守治疗; 重度狭窄者,可切开或切除造口周围瘢痕组织甚至游离腹腔内肠管后重建造口 ^[41, 73] ; 2.急性造口梗阻者,禁食并置入肛管减压,不能缓解者,按肠梗阻处置 ^[73]
造口出血	1.术中注意: (1)彻底止血; (2)预置支撑棒以及固定肠管时避免系膜血管损伤 ^[109] ; 2.积极治疗门脉高压等可能的合并症 ^[110]	1.造口黏膜渗血时,可给予压迫止血,必要时给予 1% 肾上腺素溶液湿敷或止血粉外敷进行压迫; 术中止血不彻底者则需缝扎、电凝等操作止血 ^[73] ; 2.疑似静脉曲张出血时,输注血管活性药物; 造口静脉曲张出血时需要血管造影干预,行经颈静脉肝内门体分流术(TIPS)、直接静脉曲张栓塞术、经皮经肝闭塞术(PTO)、球囊闭塞逆行经静脉闭塞术(BRTO)等 ^[70, 111]

6. 造口相关液体和电解质失衡: 回肠造口术后, 液体和电解质失衡较为常见, 主要原因是水样便的长期排泄导致液体和钠盐的过度丢失, 从而继发血浆醛固酮水平升高。长期醛固酮增多可能进一步引发低钾血症和低镁血症^[55]。高输出造口 (high output stoma, HOS) 是指造口液体排出量超过 1~2 L/d, 其发生率为 14%~24%^[56]。一旦发生 HOS, 需积极进行液体和电解质复苏, 以避免低血容量休克的发生。同时, 应避免摄入低渗液体, 并可适当使用止泻药或抗蠕动药物, 如洛哌丁胺和质子泵抑制剂等^[57-59]。近期的一项随机、双盲交叉研究表明, 基于蛋白质的口服补液溶液在回肠造口术患者中应用安全且耐受性良好^[55]。未来研究可进一步探讨其作为患者补液解决方案的潜力。

7. 造口旁疝: 是回肠造口的常见晚期并发症, 发病率因造口类型不同而在 3%~60% 之间^[41, 60-62]。肥胖、营养不良以及吸烟等因素是其危险因素^[61]。较轻微的造口旁疝通常临床表现不明显, 但是严重情况下, 可以发生肠梗阻、肠绞窄甚至穿孔^[61-62]。保守治疗无效的肠梗阻及嵌顿性造口旁疝是急诊手术的指征^[63-64]。

8. 造口脱垂: 是指肠管通过造口部位突出, 发生率为

2%~3%^[65]。高龄、肥胖以及腹内压增高等因素可增加其风险^[66-67]。若发生缺血性脱垂导致嵌顿或绞窄, 需紧急手术, 但文献报道手术后复发率为 10%^[68-69]。

9. 造口狭窄或梗阻: 造口狭窄是指造口通道变窄, 导致肠内容物排出不畅, 发生率为 2%~15%^[41, 66]。研究显示, 患者术后发生狭窄的危险因素包括造口部位缺血、坏死、收缩或瘻管形成^[41, 66]。造口狭窄患者如果处理不当, 会导致梗阻的风险。当患者出现梗阻时, 需要及时处理, 例如放置肠梗阻导管以及胃管, 若患者出现无法进食的情况时, 有必要接受手术治疗^[56]。

10. 造口出血: 早期造口出血与手术操作明显相关, 约 5% 的患者可能发生严重反复出血, 特别是在门静脉高压症患者中^[70]。如发生难治性出血, 可通过缝合或电凝止血, 同时治疗时应考虑患者是否存在出血性肝脏疾病^[71]。

四、回肠造口并发症的预防措施与管理

回肠造口相关并发症的预防需涵盖术前评估与教育、术中操作、术后护理和饮食指导等多个方面。

1. 术前健康评估: 对选择最佳造口部位和制定护理方案至关重要, 从而降低并发症发生的风险^[61]。术前教育则

帮助患者了解手术过程、潜在并发症及术后管理,增强患者的参与感和依从性,从而有助于术后康复并减少并发症的发生^[72]。同时,重视造口患者的心理问题,可以更好地应对术后挑战^[72]。

2. 术中操作:应严格按照标准化技术流程执行,确保解剖清晰、血管结扎得当,避免系膜扭转并充分游离肠管。造口部位应与肠管大小相匹配,确保腹壁完整性,正确粘贴造口袋并使用支撑棒以防止黏膜摩擦,可显著减少造口并发症^[73-74]。

3. 术后护理:术后护理同样至关重要,特别是对造口周围皮肤的保护。造口高排量或渗漏可能导致一系列皮肤问题,尤其在临时性回肠造口患者中较为常见^[61,75]。因此,合理使用皮肤保护剂可有效减少皮肤刺激,且应定期评估造口的颜色、形状和大小,以便及时发现潜在问题并加以解决。

4. 术后管理:饮食指导是术后管理的重要组成部分。饮食和水电解质失调常是回肠造口患者的并发症来源,包括脱水、梗阻、造口袋渗漏及电解质紊乱等^[76-77]。因此,术后应避免高纤维、辛辣和油炸食品,以减少造口高流量并发症的发生。此外,患者及家属应了解术后可能的并发症及其早期症状,做到及时识别并采取相应措施,防止病情恶化。特别是脱水,作为回肠造口术后常见的并发症,往往不易被患者识别,且可能导致电解质紊乱及肾功能损害,增加再入院率并造成不可逆损害^[78-80]。因此,应在住院期间加强脱水预防教育,定期补充电解质,并在门诊进行监测。同时,应积极观察与监测吻合口情况,在条件合适的情况下,尽早闭合回肠造口,从根源上杜绝并发症的发生。

五、小结

随着直肠癌保肛手术及回肠造口术的普及,相关并发症管理逐渐成为临床关注的重点。尽管已有诸多研究探讨了预防性回肠造口并发症的预防与治疗,但仍存在一定的研究空白。如何更有效地减少造口回缩、皮肤损伤以及液体电解质失衡等问题,仍亟需深入探索。未来手术技术的革新和新型分子材料的应用可能会显著减少造口并发症的发生,甚至减少预防性造口的实施。总之包含更精确的术前评估、更严密的术后护理及更及时的早期干预的全程管理模式可能是避免造口并发症发生及减少并发症带来严重伤害的关键方法。此外,加强跨学科团队协作,将有助于提升预防性回肠造口术后并发症的管理水平,从而改善患者的生活质量和手术预后。

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