

# 结直肠癌外科治疗进展

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## 摘要

结直肠癌作为世界范围内最常见的恶性肿瘤之一, 发病率和病死率居高不下并呈上升趋势。结直肠癌的外科治疗仍是结直肠癌患者首选的治疗方式, 术后辅助化疗及靶向治疗。近年来, 随着人们对结直肠解剖认识深入、手术器械的研发、腹腔镜等微创技术的发展, 结直肠癌外科治疗手段也在不断进步。因此, 本文针对结直肠癌外科治疗手段的进展加以综述, 旨在对结直肠外科治疗的发展发挥推动作用。

## 关键词

结直肠癌, 外科治疗, 进展

# Progress in Surgical Treatment of Colorectal Cancer

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## Abstract

Colorectal cancer, as one of the most common malignant tumors in the world, has a high incidence rate and mortality which are on the rise. Surgical treatment for colorectal cancer remains the preferred treatment option for colorectal cancer patients, with postoperative adjuvant chemotherapy and targeted therapy. In recent years, with the deepening of people's understanding of colorectal

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anatomy, the development of surgical instruments, and the development of minimally invasive technologies such as laparoscopy, surgical treatment methods for colorectal cancer have also been continuously improving. Therefore, this article reviews the progress of surgical treatment methods for colorectal cancer, with the aim of promoting the development of colorectal surgical treatment.

## Keywords

Colorectal Cancer, Surgical Treatment, Progression

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## 1. 引言

结直肠癌目前是世界范围内最常见的恶性肿瘤之一，全球结直肠癌的发病率和病死率呈上升趋势[1][2]。随着癌症的早期筛查，医学诊断技术的不断提高，外科手术方式以及分子靶向药物等技术的出现，结直肠癌的诊断及治疗水平有了长足的进步，其中检出率 10 年间提高了 18% [3] [4]，癌症患者总生存率逐渐提高，多数发达国家结直肠癌患者 5 年生存率达 60% 以上；来自中国的报道结果有所不同，地区差异明显，总体 5 年生存率约 50% [5]。手术切除一直是公认的结直肠癌的主要治疗方法。随着人们对结直肠解剖认识的深入、手术器械的研发、腹腔镜技术的广泛应用，结直肠癌手术治疗不断发展。本文综述了全结肠系膜切除术、D3 根治术，腹会阴联合切除术及其改良术式，以及“微创”手术的应用进展，对结直肠癌外科治疗提供经验总结，对结直肠癌外科治疗的发展具有推进意义。

## 2. 全结肠系膜切除术、D3 根治术

目前认为结肠肿瘤通过血液、淋巴和周围神经浸润等途径发生转移，而淋巴管在解剖学上与动脉走行一致。现行的标准是切除淋巴引流区域组织以及可疑的转移淋巴结，从而获取精确肿瘤分期以[6]，而目前的争论主要集中在淋巴结清除的程度上。部分文献报道广泛切除淋巴血管组织较传统手术方式更能使患者获益。

### 2.1. 传统结肠癌根治术

传统结肠切除术是对原发肿瘤的完整切除，包括“充分的近端和远端切缘以及清晰的环周切缘(这可能需整块切除腹壁或其他器官)和解剖意义上的肠系膜淋巴结蒂。”以往观点认为淋巴结整体切除不仅是为了更好的分期(肿瘤播散发生于肿瘤产生的早期)，也是为了减轻肿瘤负荷(肿瘤转移是逐步发展的)[7]。目前研究更倾向于认为淋巴血管组织切目的是更精确的分期，以指导术后化疗。

### 2.2. 全结肠系膜切除术

鉴于全结肠系膜切除术成为治疗直肠癌的手术金标准，有学者对全系膜切除是否适用于结肠癌手术进行研究。2009 年，Hohenberger 等[8]首次提出全结肠系膜切除(complete mesocolic excision, CME)的概念，包括中央血管结扎(central vascular ligation, CLV)和系膜平面剥离，即直视下连续锐性分离，将脏层筋膜层从壁层分离，获得被脏层筋膜层完全包被的整个结肠系膜，保证安全地暴露并结扎供血动脉起始部。这种手术方式改善了手术效果：R0 切除率达到 97%，术后 5 年局部复发率由 6.5% 降至 3.6%，单纯

手术技术的进步使5年生存率至少提高18%。West等[9]将结肠癌的CME手术与标准手术进行对比研究,发现两者在肿瘤距血管结扎处最短距离(131 mm vs 90 mm)、结肠系膜面积(19657 mm<sup>2</sup> vs 11829 mm<sup>2</sup>)、结肠系膜平面(92% vs 40%)、中位淋巴结获得数量(30枚 vs 18枚)等方面的差异均有统计学意义。而丹麦的前瞻性对比研究结果表明CME淋巴结获取量提高9%(24.5枚 vs 26.7枚, P=0.0095),同时,CME并没有增加手术并发症风险[10]。此项研究的后续研究显示,与传统手术相比,I~II期结肠癌患者行CME+CLV的4年无病生存率显著增高,4年DFS为85.8% vs 75.9%。分期比较分别为:I期:100% vs 89.8%;II期:91.9% vs 77.9%;III期:73.5% vs 67.5% [11]。

沿组织胚胎学平面进行手术解剖的思路早在100多年前就已经提出。无论是West等[12]提出的“结肠系膜平面手术”的概念,还是Hohenberger等[8]提出的CME的概念,都只是一个新的术语,在技术上与“国际公认良好的手术”几乎没有差别[6]。事实上,Hohenberger等在提出CME概念时强调的是CME并血管高位结扎可作为最佳的肿瘤学清扫技术,但并未说明它是一项新的技术。但是它强调对手术医生在手术观念和技术上的进一步强化,使结肠癌手术标准化,获得更高质量的肿瘤学标本[13]。

### 2.3. 日本D3根治术

与欧洲倡导的CME全结肠系膜切除术不同,日本学者则推崇D3根治术,即淋巴清扫范围为肠旁、中间及中央淋巴结3站。从手术的命名上我们可以发现日本学者强调的是淋巴结的清扫,而欧洲重视的是结肠系膜的完整切除。但都强调4个概念:中央入路,根部结扎,清扫外周组、中间组和中央组淋巴结,结肠系膜完整切除。日本D3手术与CVL+CME基于相似的原则[14],研究证实能改善肿瘤预后,尤其III期结肠癌。文献报道行D3根治术的右半结肠癌术后获取淋巴结达31枚,5年总生存率和无病生存率分别为77.6%、83.5% [15]。West与Kobayashi等[15]把来自德国的CME与来自日本标准D3结肠癌手术标本进行了评价和比较,结果显示两者在遵循结肠系膜解剖平面、血管根部结扎方面表现皆佳,CME标本肠管明显长于D3标本,考虑东西方体重指数差异,因此导致前者获取的淋巴结数目更多,但二者的阳性淋巴结数目相当。

CME+CVL和D3根治术两种术式手术技术要求高,能够切除更多的系膜和淋巴血管组织。虽然淋巴结总数增加,但是阳性淋巴结数目却没有增加,右半结肠癌中央淋巴结转移因肿瘤的位置和T分期而异,其总体转移率为1%~22%,跳跃性转移风险为0%~9%,当对III期结肠癌患者单独分析时,此转移率会更高[15],且欧洲报道的CME手术的并发症率达到20% [8]。此外,日本报道D3根治术后发现中央组淋巴结转移率仅有3.0% (11/370) [14],过度强调中央组淋巴结清扫并没有增加阳性淋巴结的清除率。I、II期病人行CME手术,其理论基础在于认为清扫越多的阴性淋巴结预后越好,也有学者认为III期病人更能从CME和D3根治术中获益,局部淋巴结彻底清扫更能有效达到肿瘤一期根治的目的,从而提高5年生存率,降低局部复发率。目前尚无定论,笔者认为术前分期及术中淋巴结送检病理,甚或前哨淋巴结的研究对实施CME手术可能更有意义,可能有助于判别哪些病人适用于CME和D3根治术。

### 3. 腹会阴联合切除术及其改良术式

腹会阴联合切除术(abdominoperineal resection, APR)多年来不仅是低位直肠癌的标准术式,也是直肠末端、肛管或骶前恶性肿瘤治疗的主要手段,是Miles于1908年在Lancet杂志上发表提出[16]。而随着肠道吻合重建技术的发展、保留括约肌术和全直肠系膜切除(total mesorectal excision, TME)的流行,人们逐渐摒弃了“完整切除整直肠、肛门和会阴”的思维方式,并产生新的概念:前切除(anterior resection, AR)和低位前切除(low anterior resection, LAR) [17] [18];同时,APR的范围也发生了缩减[19]。由于缺乏准确的定义和严格的标准以实施腹会阴联合切除术的会阴手术部分[20],导致文献报道穿孔率,阳性切缘

以及局部复发率各不相同[21]。近年来,结合会阴及骨盆底解剖解构,依据患者肿瘤部位特征,产生一些改良术式。

### 3.1. Inter-Sphincteric APR

1971年 Kasai 等[22]首先报道内括约肌切除术在先天性巨结肠治疗中的应用。Schiessel 等[23] 1994年首次推荐将用于低位直肠癌。针对距肛缘 5 cm 以下的超低位直肠癌,经腹游离后再经肛门途径在肛门外括约肌之间的间隙中分离并切除部分或全部内括约肌,以获得足够的 RO 远端切缘并得以保留肠道的连续性(结肛吻合),将直肠连同内括约肌整块从腹部移除,将近端结肠或结肠储袋与肛管齿状线行端端吻合。其本质上仍属于前切除术范畴。切除全部内括约肌,不进行吻合时,又称为括约肌内腹会阴联合切除术, Inter-sphincteric APR [24]。这种术式主要适用于术前尿失禁病史以及吻合口瘘高风险的患者[24]。

保留括约肌的手术既保证足够的切除范围,又保住肛门,大大提高了患者术后的生活质量[18]。Rullier 等[25]前瞻性随机对照研究显示,保留括约肌手术的 5 年总生存率和无瘤生存率分别为 81%和 70%; 2 年局部复发率为 2%, 5 年生存率和局部复发率与腹会阴联合切除手术比较差异无显著性。Yamada 等[26]报道 107 名低位直肠癌患者接受保留括约肌手术,所有肿瘤均未侵犯肛提肌或括约肌, T2/T3 肿瘤距齿状线大于 2 cm, T1 肿瘤距离齿状线大于 1 cm。其中 19 例患者行全括约肌切除,术后并发症 25%,且没有发生需要手术肿瘤的并发症。I, II 和 III 患者 5 年无病生存率分别为 100%, 83.5%和 72.0%; 术后 5 年复发率为 2.5%。且发现年龄是术后肛门失禁的危险因素。鉴于其手术方式,文献报道此种术式术后肛门功能较差,肛门失禁风险较高[27]。此外,局部复发的问題也尽如人意, Meta 分析报道术后复发率为 9.5% (0%~31%) [18], 而淋巴结阳性的患者术后复发高达 40% [28]。此种术式因切除内括约肌往往导致术后出现会阴收缩、肛门失禁等症状以及术后复发等情况,限制其广泛应用。有学者认为 T1、T2 无淋巴结转移的年轻患者可选择性行切除内括约肌的腹会阴联合切除术[29]。目前缺乏多中心、前瞻性、大样本的随机对照临床研究论证其适应症。

### 3.2. Extralevator-APR

在 TME 技术治疗直肠癌的时代,“标准、传统” APR 被认为增加了标本穿孔、切缘阳性等情况,导致预后不良[19] [30]。Holm 等[31]于 2007 年报道了一种改良的 APR 术式,即又被称肛提肌外腹会阴联合直肠切除的手术方式(Extralevator-APR, ELAPE)。该术式未将直肠系膜从盆壁的肛提肌上分离下来,而经会阴途径完整切除包绕直肠系膜的肛提肌,可避免 APR 切除造成的外科腰并可降低环周阳性率及术中肠管穿孔率。此种术式的要点是腹部操作分离直肠系膜不需要分离到达盆底、耻骨直肠肌,而是背侧止于骶尾连接部,两侧仅超过下腹下神经丛,前方止于精囊下或宫颈下。经会阴途径切除包裹直肠系膜的全部肛提肌。值得注意的是,此时会阴部切除的皮肤及坐骨直肠窝脂肪组织少于 Miles 所描述的手术切除范围[24]。按此种方式切除术后切除标本因为肛提肌仍覆着在直肠周围形成袖口样结构,从而避免“外科腰”的形成,大体标本呈柱状。此种手术方式又称为柱状腹会阴联合切除术(cylindrical-APR)。但是,目前尚无明确的手术解剖平面。此后欧洲学者提出了 APR 会阴区操作沿着肛提肌外侧这个解剖平面游离的重要性,并认为不需切除坐骨直肠窝的脂肪组织[32] [33]。因此, Extralevator-APR 比 Cylindrical-APR 的概念更精确,强调了层次是“肛提肌之外”。

Holm 等[31]最初的研究表明柱状切除术后的 CRM 率为 6.9% (2/29)。West 等[30]研究欧洲多中心经验发现 Extralevator-APR 手术比传统 APR 能切除更多的直肠外组织,更低的术中穿孔率和切缘阳性率。Meta 分析结果均显示 ELAPE 的术中穿孔率环周切缘阳性率及局部复发率均低于传统的 APR [34] [35]。但是也有相关研究报道认为 ELAPE 并不优于传统 APR。Asplund 等[36]研究表明 ELAPE 的术中穿孔率、



切缘阳性率及局部复发率均未明显低于传统 APR，且术后切口感染率反而更高。Krishna 等[37]通过分析 6 项临床研究发现 ELAPE 并没有显著降低术中肠穿孔率以及环周切缘阳性率，需要随机对照实验探讨其优越性。且文献报道术后性功能及排尿障碍高达 30% [30]。Holm 所行的 ELAPE 要求经会阴部切除全部肛提肌和后方的骶尾骨，但切除全部肛提肌增加了创伤与盆底修复的难度，增加创伤，延长术后住院时间。How 等[38]研究认为实施 ELAPE 应具有选择性，直肠肿瘤位于直肠两侧、耻骨直肠环处附时，ELAPE 手术优于传统 APR，肿瘤位于直肠前方、前列腺附近时，ELAPE 并没降低阳性切缘率。ELAPE 手术适应症尚需进一步研究。

### 3.3. Ischioanal-APR

低位直肠癌侵犯盆地、直肠癌穿孔形成肛周脓肿、瘻管或肿瘤侵犯肛周皮肤时，肛提肌外腹会阴联合切除并不能达到根治的目的，需要增加会阴区切除范围以获得肿瘤学安全的切除边界，不仅需要肛提肌完整还需切除足够的坐骨直肠窝脂肪组织。有学者提出坐骨肛管间腹会阴联合切除术(Ischioanal-APR)的手术方式[39]，其腹部操作遵循 ELAPE 操作原则和解剖边界；会阴部皮肤和坐骨直肠窝的切除范围依据肿瘤外侵的范围来决定，会阴皮肤的切除范围需要距离肿瘤侵犯边缘或瘻管的距离至少在 2~3 cm。与 ELAPE 不同的是，Ischioanal-APR 会阴部操作时不是沿着肛门外括约肌和肛提肌平面游离，而是沿着闭孔内肌筋膜平面切除了整个坐骨直肠间隙的脂肪组织[24]。这种手术方式与 Miles 提出的腹会阴联合切除术相似。也有学者将肛提肌外腹会阴联合切除和坐骨直肠窝腹会阴联合切除归为一类[40]。

### 3.4. “标准、传统” APR

回顾文献发现，在有关 ELAPE 的研究中常常将其与“标准、传统”APR 相比较，而“标准、传统”APR 又被称为 Miles 所提出的腹会阴联合切除[41]。而 Miles 当时已提出直肠标本应保持柱状，切除坐骨直肠窝脂肪目的是为了淋巴结清扫[42]。但是，近 20 年中，直肠癌手术教学则重点强调全直肠系膜切除和保肛，以致腹会阴联合切除术的腹部操作过多的遵循 TME 原则，分离直肠系膜至盆地，以追求完美的手术标本。而会阴部操作被忽略，仅在靠近括约肌外侧间隙向上分离，并切除部分肛提肌[24]。这种方式又被称为“标准 APR 或传统 APR (conventional APR)” [30] [31]。由于过多的将直肠系膜和肛提肌分离，导致术后标本形成“外科腰”。综上所述，Miles 所提倡的切除方式并不是“标准 APR 或传统 APR”，其切除范围明显超过 ELAPE，与 Ischioanal-APR 的切除范相似。

从 1908 年提出腹会阴联合切除术，到全直肠系膜切除、低位前切除的流行，以及现在 APR 形成各种分类，腹会阴联合切除术各种分类的发展，拓宽了直肠癌治疗方式，根据术前影像提示的肿瘤象限，合理选择切除方式，才能使患者最大获益。

## 4. “微创”手术的应用

微创外科是一种应用于外科的治疗技术，更是一种现代外科的治疗理念。近三十年来，随着高科技医学设备、器械的研发与应用，以腔镜外科技术为代表的微创外科技术获得十足发展。1987 年法国里昂 Mouret 医师施行了首例腹腔镜胆囊切除术，掀起腹腔镜外科手术热潮。Fowler 和 White 于 1991 年将腹腔镜技术首先应用于结肠癌领域[43]。目前，应用于结直肠癌的主要微创技术还包括经肛门内窥镜手术。

### 4.1. 腹腔镜技术

大量的随机试验证明腹腔镜结肠癌根治术与开放手术远期效果相似，且短期获益明显。而目前数据表明腹腔镜直肠癌根治术短期获益，但由于其缺乏长期疗效的对比，因而就治疗中低位直肠癌而言，目前腹腔镜技术未能被 NCCN 纳入常规推荐。狭小的骨盆空间中应用腹腔镜技术仍是挑战性。

欧洲的 COLOR II 实验报道 1103 例直肠癌患者, 其中腹腔镜组 739 例, 开腹组 364 例。两组患者在完整切除率、环周切缘率、并发症发生率方面无统计学差异, 且腹腔镜组患者失血量较少, 住院时间短, 肠功能恢复快[44]。Meta 分析和系统综述显示腹腔镜手术患者伤口感染率、围术期死亡率和住院时间方面优于传统开腹组[44], 而淋巴结获取方面于开腹组无差异[45]。无论是开腹手术还是腹腔镜手术, 直肠癌术后患者膀胱功能和性功能没有明显优劣[46]。

研究传统手术方式与腔镜辅助治疗结直肠癌对比试验(CLASSIC 研究)的其中一子研究中报道开腹组与腹腔镜组直肠癌根治术后患者 5 年生存和无病生存无明显差异(5 年总生存率 53% vs 60%, 5 年无病生存率 52% vs 53%), 且局部复发率、远处转移相似(局部复发率 8.7%vs 10.8%; 远处转移率 20.6%vs 20.9%) [47]。韩国学者近期报道 COREAN 试验的远期结果, 340 位符合要求的患者随机被分为 2 组。其中 170 例患者随机被分为开放手术组, 另外 170 例被纳入腹腔镜手术组。被纳入的 340 例患者都在术前按要求实施了为期 5.5 周的放化疗。腹腔镜组对比开腹组: 3 年无病生存率 79.2% vs 72.5%; 3 年总体生存率 91.7% vs 90.4%; 局部复发率 2.6% vs 4.9%; 二组患者的长期生活质量无显著差异。结果表明对于术前行放化疗的局部进展期、中低位直肠癌患者, 腹腔镜手术能够取得与开腹手术相似的无病生存率[25]。COLOR II、JCOG0404 等其他中心的随机对照实验正在进行中, 期待其远期结果。

腹腔镜直肠癌根治术目前仍限于临床试验, 大型随机对照试验表明腹腔镜手术和开腹手术在完整直肠系膜切除和手术并发症方面相似。深入的研究正在进行中, 而在远期结果公布之前, 腹腔镜直肠癌根治术仍有待观察。

## 4.2. 经肛门局部切除

### 4.2.1. TME

经肛门外窥镜下微创外科手术(Tansanal Endoscopic Microsurgery, TEM)是使用特殊的具有放大功能及立体视角的直肠镜, 在直肠内建立恒定的气压的情况下, 切除直肠内任何部位的肿物, 具有较高的可操作性、可视化、精确性[48]。这种手术技术不受肛门括约肌和狭窄骨盆的限制。1983 年 Buess 首先中报告它的研究及临床使用[44]。

这项技术的发展成熟已经逐渐被大家认可, 尤其在治疗良性直肠肿瘤方面技术已经比较成熟, 亦应用于早期直肠癌, 并取得良好效果。文献报道 T1 直肠癌局部切除后复发率约 0%~11% [45], 局部切除后复发率、生存率与根治性手术相比无统计学差异[49] [50] [51]。Borschitz 等[52]研究 105 例行 TEM 术 T1 直肠癌患者, 根据病理分化程度、脉管浸润等分为两组: 高风险组和低风险组, 发现低风险组复发率为 6%, 高风险组为 39%。随着放化疗的改进, 部分 T2 期可选择性行 TEM, 其文献报道总体复发率为 6%~18% [48]。而当新辅助或辅助放化疗联合 TEM 后, 能显著降低 T2 期局部切除术后复发率。Duek 等研究发现 T2 期患者行 TEM 术后联合放疗后局部复发率为 0%, 而术后拒绝行放疗病人局部复发率高达 50% [53]。Lezoche 等研究新辅助放化疗后 T2 患者随机性 TEM 和腹腔镜切除术, 两组局部复发、无病生存、总生存率无差异[54]。但也有 meta 分析显示, TME 局部复发率较根治性切除手术较高, 但是总生存率及远处转移率相似[55]。

### 4.2.2. TAMIS

20 年来, TEM 进展缓慢, 主要是在于 TEM 系统仪器昂贵、操作装配复杂、学习曲线较长。近年来, 随着单孔腹腔镜技术的发展, 美国学者将 TEM 与单切口腹腔镜手术(single incision laparoscopic surgery, SILS)技术相结合, 提出经肛门微创手术(Transanal Minimally Invasive Surgery, TAMIS)的概念[56]。经肛门微创手术的安全性、有效性已经被国外多项研究证实, 使用于早期直肠癌是安全可行的[57] [58] [59]。系统综述回顾分析显示 TAMIS 手术切除直肠良恶性肿瘤平均大小为 3.1 cm (0.8~4.75 cm); 距肛缘距离为

7.6 cm (3~15 cm), 总体切缘阳性率 4.36%, 标本破碎率为 4.1%, 中位随访 7.1 月复发率为 2.7%, 平均手术时间为 76 分钟(25 分钟~162 分钟), 并发症发生率为 7.2% [59]。有学者将此应用于直肠癌放疗后完全缓解患者, 8 例放疗后进展期结直肠癌患者中 5 例病理证实完全缓解, 2 例接近缓解, 1 例中度缓解 [60]。但是, 盆腔放疗后直肠创面感染率 47.5%, 常常导致严重的直肠疼痛和伤口延迟愈合 [61]。此外, 也有学者将 TAMIS 技术用于吻合口瘘的治疗 [62]、修补直肠尿道瘘 [63]、直肠异物取出 [64]。

智能手术机器人的出现, 促进外科手术的发展。机器人手术与经肛门手术相结合, 产生 robotic-TAMIS, 首先由 Atallah 于 2012 报道 [65], RTS 是一种新颖的方法, 目前仅处于早期阶段目前文献报道较少, 仅限于专业中心、专业技术人员临床试验 [66] [67] [68]。

#### 4.2.3. Transanal-TME

在 TAMIS 技术出现以前, 已经有学者尝试使用 TEM 技术进行经肛门的全系膜切除术, 证明自然腔道内镜外科手术可以使用 TEM 技术 [69]。经肛 TME 是建立在经腹联合经肛手术(Trans-Abdominal Trans-Anal, TATA)的基础之上 [70], 是经自然腔道内镜手术的一种。中国学者张首次报道使用单孔腹腔镜经肛门 TME 治疗直肠癌 [71]。目前, 真正的经肛 TME 很少, 只是联合腹腔镜处理近端结肠及制作造口, 会阴操作使用 TAMIS 或 TEM, 以自下而上的原则, 由肛门向上分离直肠系膜 [72]。全直肠系膜切除和 TAMIS 结合称为 TAMIS-TME [73]。在远段直肠充分游离情况下, TAMIS-TME 可在内部视角进行直肠分离, 提高外科手术可视化程度, 这对肥胖男性和骨盆狭窄患者尤其重要。TAMIS 技术的出现, 使得 transanal TME 快速发展, 多数文献报道使用 TAMIS 技术实施 TME 是安全可行的 [59] [74] [75]。目前有学者报道术中 CT 引导, 采用立体定向技术实施 transanal TME, 可以高 RO 切除率 [27]。

经肛门 TME 是一项新技术, 处于起步阶段, 虽然目前的研究表明其令人鼓舞的结果, 但是我们应慎重, 需要长期的训练和学习。缺乏大样本量研究论证经肛手术的优越性, 其直肠系膜的完整性、环周切缘情况有待深入研究。

## 5. 结语

手术方式演进过程中不变的是肿瘤根治的理念。依据患者肿瘤特征, 个体化选择手术方式, 达到肿瘤 R0 切除的同时最大限度保留器官功能, 是结直肠癌治疗的最终目的。结直肠癌手术治疗的发展, 使患者在获得长期生存的同时也获得更高生活质量的机会。

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