

Quality of life in rectal cancer surgery: What do the patient ask?

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Abstract

Rectal cancer surgery has dramatically changed with

the introduction of the total mesorectal excision (TME), which has demonstrated to significantly reduce the risk of local recurrence. The combination of TME with radiochemotherapy has led to a reduction of local failure to less than 5%. On the other hand, surgery for rectal cancer is also impaired by the potential for a significant loss in quality of life. This is a new challenge surgeons should think about nowadays: If patients live more, they also want to live better. The fight against cancer cannot only be based on survival, recurrence rate and other oncological endpoints. Patients are also asking for a decent quality of life. Rectal cancer is probably a paradigmatic example: Its treatment is often associated with the loss or severe impairment of faecal function, alteration of body anatomy, urogenital problems and, sometimes, intractable pain. The evolution of laparoscopic colorectal surgery in the last decades is an important example, which emphasizes the importance that themes like scar, recovery, pain and quality of life might play for patients. The attention to quality of life from both patients and surgeons led to several surgical innovations in the treatment of rectal cancer: Sphincter saving procedures, reservoir techniques (pouch and coloplasty) to mitigate postoperative faecal disorders, nerve-sparing techniques to reduce the risk for sexual dysfunction. Even more conservative procedures have been proposed alternatively to the abdominal-perineal resection, like the local excisions or transanal endoscopic microsurgery, till the possibility of a wait and see approach in selected cases after radiation therapy.

Key words: Quality of life; Rectal cancer; Laparoscopic surgery; Sphincter preservation; Nerve-sparing

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Core tip: Survival and disease-free survival for patients affected by rectal cancer have overall increased, thanks to the advances in surgery, medical treatments, palliative care and multimodal strategies. This editorial will explore how the growing demand for a better quality

of life has in some way favored the development of new practices and new techniques such as sphincter saving procedures, reservoir techniques, minimally invasive surgery, as long as local treatments or even the possibility of a wait and see approach in highly selected cases.

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INTRODUCTION

Rectal cancer surgery has dramatically changed with the introduction of the total mesorectal excision (TME)^[1-3], which has demonstrated to significantly reduce the risk of local recurrences. Further improvement in local control has been achieved with the implementation of multimodal treatments, specially through the radio-chemotherapy^[4]. Despite a better local control achieved through radiation regimens and proper surgical techniques, the risk for distal failure and systemic disease still represents an issue. Anyway, survival and disease-free survival for patients affected by rectal cancer have overall increased, thanks to the advances in surgery, medical treatments, palliative care and multimodal strategies. This also represents the basis for a new challenge that doctors should face nowadays: If patients live more, they also want to live better. In other words, the fight against cancer cannot be based only on survival, recurrence rate and other oncological endpoints: patients also ask for a decent quality of life. In this regard, rectal cancer is probably a paradigmatic example: We know that its treatment is often associated with the loss or severe impairment of faecal function, alteration of body anatomy, urogenital problems and, sometimes, intractable pain. We also now that post-operative quality of life depends on many factors, some of them related to the disease itself (lower, advanced cancers), some related to the treatments (type of surgery, radiotherapy, stomas, etc.), and all these factors may play a role in reducing the perceived quality of life^[5].

In this effort to improve postoperative short-term outcomes and quality of life-related issues, laparoscopic surgery has rapidly evolved in the last decades, sometimes revolutionizing surgical practice. The role and the dramatic implementation of laparoscopy in the field of colon and rectal surgery also emphasizes how the paradigm of cancer treatment is in some way changing: This story tells us about the role that themes like pain, scars, recovery and quality of life might play for patients.

It has been clearly demonstrated that laparoscopic surgery can offer benefits in terms of cosmesis, shorter recovery, shorter hospital stay, less pain, etc.; on the

other hand, the application of laparoscopic surgery to oncological resections encountered many difficulties at the beginning: Concerns were raised regarding the oncological adequacy of laparoscopic resections and lymph nodes yield, the fear for the pneumoperitoneum and the risk for tumor cells implantation on surgical wounds. Such oncological concerns have now been addressed, after many years of clinical trials (COST^[6], COLOR^[7], CLASSIC^[8], Barcelona^[9]), which have demonstrated the non inferiority of laparoscopic resections in the treatment of colon cancer and, more recently, of rectal cancer^[10]. It has also been clearly demonstrated that laparoscopic colorectal resections produce high quality specimens, similar to those obtained with proper open resections and similar results can be achieved by supervised trainee in learning curve settings^[11,12]. But the question is: Why have so many patients decided to enter in clinical trials, when laparoscopic surgery was not proven to give the same oncological results? The answer is probably that people are actually scared of surgery, and the possibility to get short term advantages, less pain, shorter hospital stay and better cosmesis turned out to be attractive, despite the risk for worse oncological outcomes. Actually, if we specifically look into quality of life parameters, literature shows a modest benefit from laparoscopic surgery in the field of colorectal cancer; there are basically two randomized trials and a meta-analysis of them^[13], which failed to demonstrate a clear advantage in term of quality of life in the laparoscopic arm, 2 mo after surgery. The COST study^[14], on the other hand, showed a slightly better overall quality of life in the laparoscopic group two weeks after surgery, without any additional benefit after two months. Possible explanations for the modest benefits in quality of life scores in lap groups from trials, may lay on the substantial lack of proper tools to measure quality of life in patients with cancer. Compared with patients undergoing surgery for benign diseases, cancer patients might perceive postoperative pain, recovery and cosmesis differently. More, most analysis are performed on an intention-to-treat basis, and converted cases, being included in the laparoscopic arms, might mask the benefits in quality of life achieved in the cases completed laparoscopically.

Quality of life after rectal cancer surgery has always been a challenge for surgeons^[5]; the acquisition of the safety of 2 cm disease-free margin or even less^[15], specially in radiated patients, led to a significant improvement of sphincter saving procedures. The possibility to restore intestinal continuity, thus preserving fecal continence is generally considered a key factor for a better quality of life^[16]. Other than the issue of a definitive stoma, the abdominal perineal resections is also impaired by a significant rate of perineal wound complications. This aspect has also become prominent, since the introduction of the "extralevator abdominal perineal resection", first described by Holm *et al*^[17]; this is based on performing the perineal dissection, the patient being turned in a prone jackknife position,

outside the levator plane, rather than along its inner aspect. This approach has demonstrated to reduce the circumferential resection margin positivity and intraoperative perforation rate^[18]. Nevertheless, despite a clear reduction in quality of life after extended APR has not been demonstrated, a significant risk for perineal wound complications has been demonstrated^[19], up to 46.6% of cases, including wound infections, breakdown and chronic perineal pain; however, a conservative management is usually required to face such situations.

On the other hand, low anterior resections with coloanal anastomosis, while preserving sphincters, led to the so called "anterior resection syndrome", characterized by high stool frequency, incontinence, urgency and soiling^[20-23]. A low anterior resection syndrome score (LARS score) has also been created and has been internationally validated recently^[24]; it is a self-administered questionnaire which has demonstrated to be a reliable tool in clinical practice, also considering the high correlation between the LARS score and quality of life.

In order to reduce the anterior resection syndrome, Lazorthes *et al.*^[25] and Parc *et al.*^[26] described the colonic J-pouch reconstruction; it is based on fashioning a 6-cm side-to-side anastomosis with the terminal distal colon in order to create a new reservoir, that will be then anastomosed to the anus. After its introduction, several studies have demonstrated the overall superiority of the colonic j-pouch in terms of functional results^[27,28], with lower incidence of soiling, urgency and decreased stool-frequency. On the other hand, some studies have also demonstrated that in case of a "straight" coloanal anastomosis, there is a kind of functional adaptation of the pelvic colon and results tend to become similar to the j-pouch 1 year after surgery^[29,30]. More, in case of pre or postoperative radiotherapy, pouch function seems to be significantly impaired, cause of damage to both nerves and sphincters, with high incidence of incontinence and diarrhoea; in these cases benefits from pouches are even less significant^[31,32]. Another kind of colonic reservoir has also been described, in order to face difficult situations like narrow pelvis, fatty mesentery, diverticulitis or inadequate colon length to fashion a j-pouch: The transverse coloplasty pouch, first described by Z'graggen *et al.*^[33] and Fazio *et al.*^[34]. Several studies have demonstrated that coloplasty may be considered a suitable alternative to j-pouch with similar functional results and a fewer rate of incomplete emptying^[35]. A recent meta-analysis also confirmed that j-pouch or transverse coloplasty allow to achieve better functional results compared to conventional straight anastomosis but this is true only for the first year after surgery^[36].

In this effort to preserve sphincter function, "intersphincteric resection" has also been described for very low rectal cancer instead of the abdominal-perineal resection (APR)^[37,38]. This technique is based on the total or partial resection of the internal sphincter, following the intersphincteric space in order to get a good distal

margin and preserve intestinal continuity, usually through a handsewn coloanal anastomosis. Oncological safety of this procedure has been demonstrated, when proper selection criteria are adopted: No external anal sphincter involvement, no levator plane involvement, at least 1 cm distal margin. When proper selection is obtained, oncological outcome do not differ from APR, in terms of local failure and overall survival^[39]. While the rationale to propose a patient an intersphincteric resection is clearly the possibility to offer him a better quality of life preserving faecal function, some concerns persist cause of the possibility to obtain a poor post-operative continence, specially when a significant portion of the sphincter is resected. Unfortunately a poor faecal function with a high risk of incontinence has been described after the intersphincteric resection, even if an improvement of continence scores is generally registered 12 mo after surgery^[40-42]. Some studies have also specifically looked into the quality of life^[43], showing how a clear deterioration in the faecal incontinence quality of life score is obtained in case of significant impairment of continence; being said, it's a grey zone where surgeons should wonder if a stoma might offer an overall better function. From this standpoint, it should also be argued that colo-anal anastomosis and intersphincteric resections also require the fashioning of a temporary loop ileostomy; this is a further "hot topic" in rectal cancer surgery: It has been demonstrated that ileostomies seem to produce a reduction in quality of life before reversions^[44,45], with decreased social and physical function, cause of the alteration of body anatomy, the risk for peristomal dermatitis, overflow diarrhea and subsequent dehydration, other than for the obvious psychological impact. More, data from literature shows that the ileostomy reversal surgery might be impaired by a significant morbidity, ranging from 9.3% to 45.9%^[46-49] (major morbidity being essentially represented by the risk for postoperative small bowel obstruction and anastomotic leaks). One further problem is that around one third of the ileostomies, intended to be temporary, won't actually be never reverted^[50,51]. Nevertheless, from our experience, loop ileostomy reversal surgery is quite a safe operation, with very low morbidity rate; obviously, adequate selection of patients really needing a diversion is the key point to make it worthwhile to perform the procedure.

Nerve injury during pelvic dissection is another hot topic in rectal cancer surgery, as it may lead to a severe impairment of urinary and sexual function postoperatively^[52]. Nerve-sparing technique is still considered a technical challenge among colorectal surgeons, with no clear consensus on which technique is better to adopt to reduce pelvic nerve injuries. A nerve-preserving technique was first describe by Walsh *et al.*^[53] for radical prostatectomy and then applied to rectal surgery. Hypogastric nerves, inferior hypogastric plexus, pelvic sacral nerves and the "nervi erigentes" are the most commonly nerve structures to be damaged during surgery. Risk for nerve injuries should be avoided

through a perfect knowledge of surgical anatomy and relationship between nerves and pelvic organs^[54]; nevertheless, even if a perfect nerve sparing technique is adopted, a complete functional preservation cannot be ensured at the moment^[55]. More, in locally advanced disease, tumor removal is the priority and pelvic nerves need to be sacrificed if necessary. Causes for sexual dysfunctions, in terms of impotency or ability to ejaculate, are sometimes also difficult to determine, as they can also be related to radiotherapy or surgical tractions, even when nerves are recognized and saved. More, erectile dysfunction might also be related to psychological factors and an overall decreased quality of life due to cancer diagnosis. Lindsey *et al.*^[56] suggested the possibility to perform the TME leaving intact the Denonviellier's fascia on the prostate, thus preserving cavernous nerves; this plane is not generally accepted among colorectal surgeons, and we generally believe that it could be considered safe only in case of early tumors not located on the anterior aspect of rectal wall. The magnified view obtained through laparoscopic surgery may play a significant role to help in nerves identification and preservation, but results are not definitive yet^[57,58]. Robotic surgery might combine the benefits from a magnified view and a highly precise dissection, but randomized data are required. The topic of genito-urinary function becomes also more prominent when TME is associated with extended lateral pelvic lymphnode dissection (ELD); this procedure is usually performed in Japan for stage II and III rectal cancer, due to presumed risk of 6.5%-16% to find positive pelvic nodes^[59]. Extended lymphnode dissection is often associated with a tentative pelvic autonomic nerve preservation, nevertheless both the extension of pelvic dissection and the completeness of nerve preservation may vary, depending on tumor stage, location and technical issues. Akasu *et al.*^[60] have demonstrated that while optimal results on sexual and urinary function can be obtain with TME alone, results get significantly worse if pelvic node dissection is added and the degree of dysfunction is directly associated with the extension of the dissection and the degree of preservation of autonomic nerves.

In order to mitigate the sequelae of rectal surgery, transanal local excision and transanal endoscopic microsurgery^[61] have also been described as alternatives in selected cases. It is a local treatment which will allow to take out a small rectal tumor, through a circumferential, full-thickness resection, without the need to enter the abdomen and resect the whole rectum with its lymphatic drainage, thus not fashioning a stoma and avoiding the anterior resection syndrome and a poor quality of life. On the other hand, big concerns still arise regarding the oncological safety of local excision and no clear guidelines currently exist. The most important aspect of the technique is the "full thickness" resection: All the layers adjacent to the lesion need to be excised till the mesorectal fat: Being said, the specimen needs to be a "total biopsy", for further histological assessment.

The major drawback of this technique is the lack of mesorectal lymphnodes clearance; for this reasons a big effort has been made to predict those situations in which the risk to find metastatic mesorectal nodes is high. Several criteria have been described to discriminate "low" and "high risk" rectal tumor. Nascimbeni *et al.*^[62] show a different depth of invasion of the submucosal layer (upper, middle or lower third), correlates with a different risk of finding nodes in the mesorectum (from 3% to 23%); other high risk factors are the grading of the lesion, lymphovascular invasion, the size and a lower location of the tumor. When these high risk factors are identified at the total biopsy, the patient should probably undergo a radical resection within one month from local excision, thus not compromising the prognosis^[63]. Some trials are also investigating the oncological safety of local excision after radiochemotherapy, also in T2 patients^[64]; this latter option, at the moment, should probably be reserved to elderly patients, unfit for surgery or absolutely determined to refuse the risk for a stoma. In this effort to preserve function, quality of life and avoid a mutilating surgery, a "wait and see" approach after preoperative radiotherapy has also been proposed in patients with a complete clinical response; nevertheless, this is still a really debating issue and we should probably look very carefully at this data, at the moment^[65].

Robotic and natural-orifice transluminal surgery are getting more popularity nowadays and probably represent future prospects in rectal cancer surgery. A recent, single institution experience from Park *et al.*^[66], concluded that robotic surgery for rectal cancer failed to offer oncological or clinical benefits over conventional laparoscopy, despite a significant increase in costs. Transanal total mesorectal excision seems to be a promising approach, based on a "bottom-up" dissection to deal with low rectal cancers, specially in narrow pelvis, when traditional laparoscopy may be technically challenging^[67,68]; anyway long-term outcomes, clinical advantages or impact on patients' quality of have not been provided yet.

Randomised, high quality data are still necessary, but new realities are probably not as far, if we consider the development of rectal surgery in the last decades, the new technologies and the importance that patients nowadays give to theme like cosmesis, recovery and quality of life.

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