Quality of Life After Sphincter-Preserving Rectal Cancer Resection

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Abstract

In this study we evaluated quality of life (QoL) of cancer patients after sphincter-preserving anterior resection (AR) compared with right hemicolectomy and lay persons. Long-term follow-up revealed that diarrhea and defecation problems markedly impaired QoL after AR, which was worsened after radiation therapy. Physicians therefore have to focus on minimizing gastrointestinal side effects.

Background: With an increasing number of cancer survivors quality of life (QoL) becomes more and more important in the treatment of rectal cancer (RC). QoL after sphincter-preserving anterior resection (AR), however, was found nonsuperior to abdominoperineal resection. The aim of our study was to evaluate QoL after AR compared with colon cancer patients after right hemicolectomy (CC) and healthy lay persons without history of cancer (HL) in long-term follow-up. **Patients and Methods:** Consecutive alive RC patients (n = 293) who received an AR between 1998 and 2008 were included. CC patients (n = 201) and HL of the same age were used as a surgical and a nonsurgical control group, respectively. QoL was assessed using European Organization of Research and Treatment of Cancer questionnaires QLQ-C 30 and -CR 38. **Results:** Questionnaires from 116 RC patients, 105 CC patients, and 103 HL were evaluable with a median time after surgery of 5 years. The global health status did not differ. Social functioning, future perspectives, and financial difficulties tended to poorer scores in the cancer groups. Physical functioning was better in RC and CC patients compared with HL. Defecation problems and diarrhea were more frequent in RC patients ($P < .05$). An additional open question revealed a median stool frequency of 3, 2, and 1 per day for RC, CC, and HL, respectively. Defecation problems were more frequent in RC patients who received radiation therapy ($P < .05$). **Conclusion:** Diarrhea and defecation problems impaired QoL after AR for RC, which was worsened after radiation therapy. To improve QoL of RC patients in the future, physicians have to focus on minimization of gastrointestinal side effects while optimizing surgical reconstruction.

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Introduction

Colon and rectal cancer (RC) are one of the most common malignancies in Western countries. They rank third in annual incidence and cause of death in the United States.[1] Numbers in Germany are still slightly increasing because of the aging population and nutrition habits with a mean age at diagnosis in the seventh decade.[2] Despite these numbers significant advances have been made including earlier detection and improved treatment, which converts to a decline in mortality in the United States of 3% per year from 2004 to 2010.[1] In 2014 an estimated 14.5 million people with a history of cancer were alive in the United States.[3] Approximately 35% of cancer survivors suffer from chronic gastrointestinal symptoms.[4] With even more cancer survivors to be expected in the future[3] physicians have to include quality of life (QoL) aspects to a greater extent into their treatment recommendations.

For RC the establishment of total mesorectal excision was the outstanding surgical improvement over the past 3 decades, resulting in a dramatic decrease of local recurrence rates and increase in survival rates.[5] The optimization of the resection technique enabled more often deeper anterior resection (AR) and reduced the need for an abdominoperineal resection (APR).[6] Because of the presence of a permanent colostomy one would assume that APR patients have a worse QoL than those who received AR. A Cochrane review did surprisingly not find any difference in terms of QoL.[7] This is probably attributable to the fact that 50% to 90% of AR patients experience

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bowel dysfunction to a variable degree.[8,9] Urgency, incontinence, frequent bowel movement, and clustering might culminate in the low AR syndrome (LARS).[9] Even though symptoms are known to underlie a phase of early adaption, impaired neorectal functioning might be permanent and impair long-term QoL after AR.

Neoadjuvant radiation therapy (RT) alone and in combination with chemotherapy has proven to cut local recurrence rates to half and also enable sphincter preservation in some selected cases.[5,10] Neoadjuvant RT, however, does not improve survival with quality controlled surgery.[11] Yet, it is associated with a doubling of fecal incontinence and increased sexual dysfunction compared with surgery alone, further compromising QoL.[4,12] Assessment of QoL for colon cancer (CC) and RC patients can be done using standardized and validated European Organization of Research and Treatment of Cancer (EORTC) questionnaires.[13,14] Although the EORTC provides reference values[15] a translation of QoL scores into a specific clinical situation with a change of treatment recommendations remains difficult in our opinion.

As mentioned, most studies on QoL conducted in RC addressed AR versus APR with a focus on short-term rather than long-term effects without demonstrating a benefit for AR versus APR in terms of QoL[7-9] or compared with various disease stages in RC with a normative population.[16] No long-term data are available about QoL of RC patients who underwent an AR compared with a population that underwent resection of large bowel cancer without expected defecation problems after surgery. Therefore, we aimed in our study to assess QoL of RC patients after AR with or without RT and to directly compare it with CC patients after right-sided hemicolectomy. In addition, age- and sex-matched healthy volunteers uncompromised by a history of cancer were used as a control group.

Patients and Methods

Study Design

This was a questionnaire-based cross-sectional evaluation of QoL of patients with RC after AR. QoL scores of RC patients were compared with CC patients after right hemicolectomy and with a control group without cancer using the EORTC questionnaires QLQ-C30[13] and EORTC QLQ-CR38.[14] Patients with right-sided CC served as a cancer control group that had also undergone surgery of the large bowel without expectation of postsurgical defecation problems. In addition, as a healthy control group we used healthy lay persons without a history of cancer (HL).

Study Participants

Patients with RC and right-sided CC treated between 1998 and 2008 were identified using our tumor documentation system (Cancer REetrieval and DOcumentation System). This system is used to prospectively document treatment and follow-up of all of our cancer patients and allows us to precisely search the database for specific groups. The terms CC, RC, sphincter-preserving resection, and status alive were used. A minimum time interval of 12 months from surgery to the evaluation was mandatory to eliminate the effect of transitory functional impairment in the phase of early postoperative adaption.

A total of 293 alive patients who received sphincter-preserving AR without permanent stoma for RC and 201 alive patients who received a right hemicolectomy for CC were identified. For each patient, time elapsed after surgery, neoadjuvant/adjuvant radio-/chemotherapy, and tumor stage according to the Union Internationale Contra le Cancer staging manual version 6.0 were recorded from the internal electronic database.

The HL group consisted of volunteers randomly recruited by the authors. It mainly included family members and neighbours of the authors. A total of 103 volunteers of the same age filled out the questionnaires. Informed consent was obtained from each participant.

General Cancer-Related and Colorectal Cancer-Specific QoL Questionnaires

General cancer-related QoL was measured using the EORTC questionnaire QLQ-C30. The EORTC QLQ-C30 features outstanding psychometric performance concerning reliability and validity proven in various international multicenter studies.[13] The questionnaire contains 30 questions that are summarized to determine QoL in 5 functional scales (physical, role, emotional, cognitive, and social functioning), 9 symptom scales (fatigue, nausea and vomiting, pain, dyspnea, insomnia, loss of appetite, constipation, diarrhea, and financial difficulties), and in global health status.

Colorectal cancer-specific QoL was determined using the EORTC QLQ-CR38, which was especially designed to measure QoL in colorectal cancer patients.[14] It contains 38 questions summed into 4 functional scales (body image [BI], future perspective, sexual functioning, and sexual enjoyment), 8 symptom scales (micturition problems, gastrointestinal tract symptoms, chemotherapy side effects, defecation problems, stoma-related problems, weight loss, and male and female sexual problems). According to our study design, fecal diversion was a criterion for exclusion. Patients were therefore requested to answer "no" on stoma-related problems (questions 62-68) because EORTC questionnaires do not allow skipping or deleting of questions.

Regarding functional outcome in terms of defecation problems and diarrhea QLQ-C30 and -CR38 modules are quite short. To meet our concern, an additional open question for the total number of stools per day was added by grant of EORTC ($68 + 1 = 69$ questions). Both questionnaires relate to the patient's status of the previous week. High scores in functional scales and global health status denote a high level of functioning and QoL, whereas high scores in a symptom scale represent a high level of symptomatology or dysfunction. The estimated average of items that contribute to a scale generates a raw score, which is further standardized using linear transformation into a score ranging from 1 to 100 (BI score).[15]

Statistical Analysis

Evaluation of the questionnaires was performed as recommended by the EORTC scoring methodology.[15] Data were evaluated in a descriptive manner. For qualitative variables absolute and relative frequencies, and for quantitative variables mean, SD, median, minimum, and maximum were calculated. QoL scores are presented in figures as mean and SD. QoL scores were further assigned to BI values ≥ 50 and < 50 for each scale and patient group. The frequencies were compared using an explorative χ^2 test.

Results

Evaluable Questionnaires

One hundred sixteen of 293 (39.6%) patients with AR returned evaluable questionnaires. From the 201 CC patients, 105 evaluable