Comparative Study of Quality of Life After Surgery in Sigmoid and Rectal Cancers: A Single-Center Prospective Study

Anvar Elyasi[1,2], Mohammad Sadeq Najafi[1,2,3], Seyed Mohsen Ahmadi Tafti[1,2,3], Alireza Kazemeini[1,2], Seyed Mostafa Meshkati Yazd[1,2], Mohadese Dashtkuhi[1,2,3], Behnam Behboudi[1,2], Mohammad Sadegh Fazeli[1,2], Amir Keshvari[1,2], Mohammad Reza Keramati[1,2]

[1] *Division of Colorectal Surgery, Department of Surgery, Imam-Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran*
[2] *Colorectal Research Center, Tehran University of Medical Sciences, Tehran, Iran*
[3] *Research Center for Advanced Technologies in Cardiovascular Medicine, Cardiovascular Diseases Research Institute, Tehran University of Medical Sciences, Tehran, Iran*

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Abstract

Background: Sigmoid and rectal cancers are common malignancies that necessitate surgical resection as the primary treatment modality. However, surgery can significantly impact the quality of life (QoL) of patients, particularly in terms of bowel function, sexual function, and psychological well-being. This study aimed to compare the QoL of patients who underwent surgery for sigmoid and rectal cancers.

Methods: A prospective study was conducted on 90 patients who underwent elective surgery for sigmoid or rectal cancer between January 2019 and December 2021 at the center. The QLQ-C30 and QLQ-CR29 questionnaires were utilized to assess the QoL of patients post-surgery. The QoL scores between the two groups were compared using t-tests and repeated measures ANOVA.

Results: The average age of the patients was years, and 57.8% were females. The sigmoid group comprised 44 patients (48.8%) who underwent sigmoid colectomy, and the rectal group consisted of 46 patients (51.2%) who underwent low anterior resection. There were no significant differences in the baseline characteristics and QLQ-C30 scores between the two groups and also in other categories (sex, age groups, and cancer stages) ($p > 0.05$). However, a significant difference was observed between the QLQ-CR29 scores of the two surgical groups ($p < 0.05$). QLQ-CR29 was not significantly different between sex and age groups and cancer stages ($p > 0.05$).

Conclusions: The study demonstrated that surgery for sigmoid and rectal cancers deteriorated the QoL of patients, irrespective of the type of surgery or the location of the tumor. There was no significant difference in the QoL between the sigmoid and rectal groups measured by QLQ-C30. However, QLQ-CR29 showed significantly better QoL for the rectal group.

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Background

Colorectal cancer is a common malignancy worldwide. The primary treatment option for patients with localized disease is surgical resection. The type of surgery performed, such as sigmoid colectomy or low anterior resection, depends on the location and extent of the tumor. These procedures may have long-term consequences, including bowel dysfunction after surgery, known as low anterior resection syndrome (LARS), sexual function, and psychological well-being. LARS encompasses symptoms such as fecal incontinence, urgency, frequency, loose stools, and incomplete evacuation [1]. It is more prevalent and severe following rectal surgery than after sigmoid surgery, particularly if the tumor is located in the lower rectum or if the patient received neoadjuvant chemoradiation [2]. However, LARS can also occur after sigmoid surgery and can similarly impact the Quality of Life (QoL) as after rectal surgery [3]. The

*** Corresponding author**: Mohammad Reza Keramati
Division of Colorectal Surgery, Department of Surgery, Imam-Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran AND Colorectal Research Center, Tehran University of Medical Sciences, Tehran, Iran
Tel.: +98 912 114 7406 Email: mr-keramati@tums.ac.ir

aim of this study is to compare the QoL of patients who underwent sigmoid colectomy or low anterior resection for sigmoid and rectal cancer.

Methods

Participants

This study included patients who underwent curative resection surgery for sigmoid and rectal cancer (sigmoid colectomy and low anterior resection) between January 2019 and December 2021 at Imam Khomeini Hospital, affiliated with Tehran University of Medical Sciences. The surgeries had been performed at least three months prior in cases without ostomy and six months prior in cases with temporary ostomy. These patients were included in the study by systematic sampling. Exclusions from the study were patients who had passed away for any reason, those who did not wish to participate in this research or could not be reached, patients with dementia or psychiatric disease who were unable to answer the questionnaire correctly, and cases where rectal surgery was Abdominoperineal Resection (APR) or involved a permanent colostomy. Subsequently, the patients were contacted by phone and asked to fill out the validated Persian translation of QoL questionnaires (QLQ-C30, CR29). Completed forms were collected over time and de-identified by assigning codes.

Quality of Life Assessment

The Persian-validated QLQ-C30 and CR29 questionnaires [4] were used to assess the QoL of patients. The EORTC QLQ-C30 is a questionnaire designed to assess the quality of life of cancer patients. It consists of 30 items that cover five functional scales, three symptom scales, a global health status scale, and six single items [5]. The EORTC QLQ-CR29 is a tumor-specific Health-related QoL questionnaire module for colorectal cancer patients, which is designed to complement the EORTC QLQ-C30 questionnaire. It has five functional and 18 symptom scales [6].

Statistical Analysis

The data were entered into the statistical software SPSS version 28. Descriptive statistics were used to summarize the demographic and clinical characteristics of the patients, as well as the QoL scores in each domain. The T-test was used to compare the QoL scores between the groups before and after surgery. The chi-square test was used to compare the categorical variables, such as gender, stage of cancer, and type of surgery. Repeated measures ANOVA was used to compare the QoL scores within each group over time, as well as the interaction effect between time and group. A significance level of 5% was considered.

Results

This study compared ninety patients (57.8% females) with an average age based on Quality of Life (QoL) in either rectal (n=46, 51.2%) or sigmoid (n=44, 48.8%) cancer groups. The demographic characteristics are summarized in **Table 1**. The results indicated significant differences between the QoL scores measured by QLQ CR29 for the two groups ($P<0.05$). Interestingly, the group with rectal cancer had significantly better scores. However, no significant difference was found among other subgroups, i.e., sex, age, and cancer stage (**Table 2**). The study revealed that surgeries for sigmoid and rectal cancers had similar effects on the overall QoL of patients, but different impacts were observed when using the more specific QoL questionnaire (QLQ CR29). It was suggested that the QoL measured by QLQ C-30 was not significantly different between subgroups.

Discussion

The quality of life after colorectal surgery is influenced by various factors, such as the type of procedure, the location of the tumor, the presence

Table 1. Basic characteristics of the patients. Data are represented in number and percentage in parentheses.

Characteristics		Rectal cancer (n=46)	Sigmoid cancer (n=44)	Total (n=90)	P-value
Sex	Male	23 (50.0)	15 (34.1)	38 (42.2)	
	Female	23 (50.0)	29 (65.9)	52 (57.8)	0.12
Age (years)	35-45	3 (6.5)	7 (15.9)	10 (11.1)	
	46-56	14 (30.4)	12 (27.3)	26 (28.9)	
	57-67	17 (37.0)	21 (47.7)	38 (42.2)	
	68-84	12 (26.1)	4 (9.1)	16 (17.8)	0.10
Cancer stage	0	1 (2.2)	4 (9.1)	5 (5.6)	
	1	2 (4.3)	4 (9.1)	6 (6.7)	
	2	25 (54.3)	15 (34.1)	40 (44.4)	
	3	18 (39.1)	21 (47.7)	39 (43.3)	0.16

Table 2. Comparison of QoL scores between subgroups by independent sample t-test and ANOVA. P<0.05 is considered significant.

Characteristics		QLQ CR-29		QLQ C-30	
		Median (IQR)	P-value	Median (IQR)	P-value
Sex	Male	30.0 (5.25)		44.0 (4.00)	
	Female	30.5 (7.75)	0.97	44.0 (6.00)	0.86
Age	35-45	49.9		41.65	
	46-56	48.35		47.04	
	57-67	47.22		45.97	
	68-84	34.03	0.27	44.28	0.94
Cancer stage	0	29.0 (9.00)		48.0 (13.00)	
	1	30.5 (12.25)		43.0 (13.50)	
	2	30.0 (7.50)		44.0 (6.50)	
	3	30.0 (6.00)	0.71	44.0 (4.00)	0.78
		Mean (SD)		Mean (SD)	
Surgery	Rectal	33.52 (6.23)		45.76 (4.98)	
	Sigmoid	30.54 (4.74)	**0.01**	44.86 (6.45)	0.46

of a stoma, and the occurrence of functional bowel complaints. These complaints, collectively known as low anterior resection syndrome (LARS), can affect up to 90% of patients who undergo rectal resection [7]. However, LARS is not exclusive to rectal surgery, as it can also occur after sigmoid resection or even right-sided colectomy. The study focused on the comparison of the quality of life (QoL) of two different surgeries, namely rectal vs sigmoid resection. The result of this study showed that patients who have undergone rectal surgery have a better QoL compared to sigmoid surgery patients. This significant difference was seen only when the QLQ-CR29 was used but not QLQ-C30. The difference in QoL scores between sexes, age groups, and cancer stages was not significantly measured by both questionnaires.

According to a recent review, patients who underwent rectal resection had worse bowel function, sexual function, and psychological well-being than those who underwent sigmoid resection, regardless of the type of anastomosis (connection) or stoma (opening) performed. The authors suggested that these consequences may be due to the loss of rectal reservoir function, damage or removal of pelvic nerves, blood vessels, or organs during surgery, and risk of complications, recurrence, or mortality [8].

Another review with a focus on rectal cancer surgeries showed that abdominoperineal resection (APR) is associated with lower QoL than sphincter-saving surgery (SSS) in terms of body image, stoma-related problems, sexual function, and social functioning. SSS is associated with lower QoL than APR in terms of bowel function, fecal incontinence, urgency, frequency, and gas leakage. Moreover, transanal excision (TAE) is associated with higher QoL than APR or SSS in terms of bowel function, sexual function, and stoma-related problems. However, TAE is not suitable for all patients and may have higher rates of local recurrence and need for salvage surgery than APR or SSS [9].

A study by Yuge [10] compared the QoL after two types of surgeries: low anterior resection (LAR) and high anterior resection (HAR). They found that HAR was generally better than other procedures in terms of the modified Fecal Incontinence Quality of Life (mFIQL) and Role-Physical and Social Functioning subscales of the Short Form-36 Health Survey (SF-36), which supports previous reports [11, 12]. However, Vironen et al. found no significant difference in QOL between LAR and HAR [13].

Therefore, the QoL outcomes of rectal and sigmoid resection surgeries may vary depending on several factors, such as the type of surgery (sphincter-preserving vs. sphincter-sacrificing) [14], the use of neoadjuvant or adjuvant therapy (radiation and/or chemotherapy) [15,16], the presence or absence of a stoma (permanent vs. temporary) [17], the age and gender of the patient, the preoperative QoL and functional status of the patient, and the postoperative complications like LARS [18] and recovery process. In this regard, patients with rectal cancer surgeries usually have worse QoL compared to sigmoid colectomy [19].

Conclusion

Rectal and sigmoid resection surgeries can have varying effects on the quality of life of patients

in terms of bowel function, sexual function, and psychological well-being. The study demonstrated that surgery for sigmoid and rectal cancers deteriorated QoL of patients, regardless of the type of surgery or the location of the tumor. There was no significant difference in the QoL between the sigmoid and rectal groups, as well as in different age groups and cancer stages measured by QLQ-C30. However, QLQ-CR29 showed a significantly better QoL for the rectal group. These outcomes are not static and may improve over time or with appropriate interventions. Therefore, it is crucial to assess and address the quality of life issues of patients after colorectal surgery in a holistic and individualized manner.

Declarations

Ethics approval and consent to participate

Written informed consent was obtained from all patients before the study (ethics code: IR.TUMS.. REC).

Consent for publication

The authors declare that consent for publication has been obtained from all the participants involved in the study. The consent forms are available upon request from the corresponding author.

Availability of data and materials

Datasets are available upon reasonable request from the corresponding author.

Competing interests

None declared.

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The authors' contributions

hypothesized this work.
MSN wrote the main manuscript.
prepared the figures.
cleaned the data and did the statistical analysis.
revised the manuscript.
contributed to data collection and management
supervised the project.
All authors reviewed and approved the manuscript.

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List of abbreviations

EORTC: European Organization for Research and Treatment of Cancer
QoL: Quality of Life
LAR: Low Anterior Resection
LARS: Low Anterior Resection Syndrome
ANOVA: Analysis of Variances
SSS: Sphincter-saving Surgery
TAE: Transanal Excision
HAR: High Anterior Resection
mFIQL: modified Fecal Incontinence Quality of Life
SF-36: Short Form-36 Health Survey

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