

# Postoperative quality of life in patients with chronic slow-transit constipation according to the PAC-QOL scale

I. M. Leshchyshyn, L. Y. Markulan, O. I. Okhotska, P. L. Byk

Bogomolets National Medical University

✉ Pavlo Byk: [byckpavlo@gmail.com](mailto:byckpavlo@gmail.com)

I. M. Leshchyshyn, <http://orcid.org/0000-0003-1429-2756>

L. Y. Markulan, <http://orcid.org/0000-0003-2879-5012>

O. I. Okhotska, <http://orcid.org/0000-0002-3468-8179>

P. L. Byk, <http://orcid.org/0000-0002-2215-3978>

Chronic constipation is a common heterogeneous condition affecting all population groups, with its prevalence increasing with age. The prevalence of chronic constipation varies from 3% to 27% in the general population. Worldwide, the average prevalence of constipation is 16%, with a prevalence of 33.5% in adults aged 60–110 years. Information about the quality of life in patients with chronic slow transit constipation (CSTC) in Ukraine is very limited.

**OBJECTIVE** — to assess the quality of life in patients with chronic slow transit constipation using the Patient Assessment of Constipation Quality of Life Questionnaire (PAC-QOL) scale after surgical treatment.

**MATERIALS AND METHODS.** 107 patients with CSTC were examined and treated at the surgical department of the Saint Michael Clinical Hospital in the period 2011–2023.

**RESULTS.** Significant improvements in all PAC-QOL scale indicators were observed one year after surgery. The physical component score decreased from  $2.78 \pm 0.52$  to  $1.01 \pm 0.32$ ;  $p < 0.01$ ; the psychological component score decreased from  $1.90 \pm 0.48$  to  $0.83 \pm 0.41$ ;  $p < 0.01$ ; the anxiety component score decreased from  $1.99 \pm 0.31$  to  $0.72 \pm 0.34$ ;  $p < 0.01$ ; and the satisfaction component score decreased from  $2.35 \pm 0.60$  to  $0.84 \pm 0.47$ . The total PAC-QOL score decreased from  $2.14 \pm 0.23$  to  $0.82 \pm 0.35$ ;  $p < 0.01$ . A reduction in the PAC-QOL score was observed one year after surgery, with an average improvement of  $61.5 \pm 14.9\%$  (ranging from 6.2% to 77.2%). The highest percentage of improvement was registered in the «Satisfaction» component, with an increase of  $81.2 \pm 15.0\%$  (ranging from 33.3% to 88.2%), while the lowest improvement was in the psychological component,  $56.7 \pm 16.1\%$  (ranging from 0.0% to 78.6%). For the physical component, the percentage of improvement was  $63.14 \pm 11.23\%$  (ranging from 30.0% to 81.82%), and for the worries component, it was  $64.0 \pm 15.75\%$  (ranging from 0.0% to 77.2%).

**CONCLUSIONS.** According to the PAC-QOL scale, surgical treatment involving colectomy improves quality of life significantly in the long-term postoperative period in patients with CSTC who are resistant to conservative therapy. Overall PAC-QOL scores improved by 61.51%, as did all components: physical (63.14%), psychological (56.73%), anxiety (64.0%), and satisfaction (81.2%).

## KEYWORDS

chronic slow-transit constipation, PAC-QOL score, quality of life.

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Chronic constipation (CC) is a common heterogeneous condition affecting all population groups, with its prevalence increasing with age. The prevalence of chronic constipation varies from 3% to 27% in the general population [11]. Worldwide, the average prevalence of constipation is 16%, with a prevalence of 33.5% in adults aged 60–110 years [2].

Millions of dollars are spent annually on laxatives. The prevalence of constipation among adults in Australia is 24% according to the Rome criteria [16]. In Brazil, prevalence ranges from 14% to 26% according to previous studies [3–11].

Chronic constipation negatively affects various aspects of patients' quality of life and may

be accompanied by psychological disorders [10, 13–15]. The impact of different treatment methods on quality of life in patients with chronic constipation was insufficiently observed in the modern literature, and the effects of surgical treatment remain controversial.

Traditionally, the SF-36 (not disease-specific) scale [14, 15], was used to assess quality of life in patients with chronic slow transit constipation (CSTC). Recently, some studies recommended the disease-specific Patient Assessment of Constipation Quality of Life Questionnaire (PAC-QOL) scale to evaluate quality of life in patients with CSTC [8, 10].

However, there are currently no studies evaluating the impact of surgical treatment on the quality of life (QoL) in patients with CSTC using the PAC-QOL scale.

Table. **Main characteristics of patients**

Index	Value
Men	5 (4.7%)
Women	102 (95.3%)
Age, years	43.1 ± 13.6 (16–78)
Height, cm	166.8 ± 6.1 (150–183)
Weight, kg	63.3 ± 11.9 (40–90)
Body mass index, kg/m <sup>2</sup>	22.9 ± 4.5 (14.8–41.1)
Weight loss	29 (27.1%)
Onset of constipation, years	21.5 ± 16.3 (1–67)
Duration of constipation before surgery, years	20.7 ± 13.2 (5–53)
Interval between bowel movements, days	9.4 ± 5.1 (3–30)
Abdominal bloating and pain	80 (74.8%)
Feeling of incomplete evacuation	101 (94.4%)
Feeling of blockage in the rectum > 1/4 of defecations	97 (90.7%)
Manual assistance during defecation > 1/4 of defecations	60 (56.1%)
Stool consistency according to the Bristol Stool Scale [4]	
Type 1	67 (62.6%)
Type 2	28 (26.2%)
Type 3	8 (7.5%)
Type 4	3 (2.8%)
Type 5	1 (0.9%)

Note. Categorical variables are presented as the number of cases and percentage, while quantitative indicators are presented as M ± SD (Min–Max).

A standardized patient assessment is essential for evaluating and treating chronic constipation.

Information about the quality of life in patients with CSTC in Ukraine is very limited. Appropriate treatment should aim to alleviate individual symptoms and improve the quality of life for such patients.

**OBJECTIVE** – to assess the QoL in patients with chronic slow transit constipation using the PAC-QOL scale after surgical treatment.

## Materials and methods

107 patients with CSTC were examined and treated at the surgical department of the Saint Michael Clinical Hospital in the period 2011–2023.

The main characteristics of the patients are presented in Table.

Rome IV criteria [1] were used to diagnose CSTC.

### Inclusion criteria

- Age over 18 years.
- CSTC that does not respond or poorly responds to modern conservative treatment methods for at least 6 months.
- Low QoL.
- Consent for surgical treatment.
- Consent to complete a QoL questionnaire.

### Exclusion criteria

- Age under 18 years.
- Severe comorbidities.
- Patients with mental disorders.
- Pregnancy.
- Oncological diseases.
- Harmful habits.
- Refusal to complete the QoL questionnaire.
- Proctogenic constipation.
- Irritable bowel syndrome and/or constipation of secondary specific etiology (associated with an underlying condition).
- Drug-induced constipation.

### Quality of life assessment

The quality of life was evaluated using the disease-specific PAC-QOL questionnaire, developed and validated by Marquis et al. [8] in 2005. The questionnaire includes 28 items grouped into 4 subscales:

- Worries and concerns (11 items),
- Physical discomfort (4 items),
- Psychosocial discomfort (8 items), and
- Satisfaction with treatment (5 items).

Each item is assessed using a 5-point Likert scale ranging from 0 (not at all/never) to 4 (very much/all the time) over the previous 2-week period.

A higher score indicates a worse QoL due to constipation.

Total PAC-QOL scores and subscale scores were calculated according to the original PAC-QOL documentation for every patient [7]. QoL was assessed before surgery and one year after the surgery.

Subtotal colectomy was performed in 29 (27.1 %) patients, total colectomy in 57 (53.3 %) patients, and colectomy with low rectal resection in 21 (19.6 %) patients.

Open surgery was performed in 70 (65.4 %) patients, while laparoscopic access was used in 37 (34.6 %) patients [5].

### Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics, version 22. Descriptive statistics were calculated. Mean values were presented as  $M \pm SD$ . Categorical data were expressed as counts (%).

Data normality was assessed using the Shapiro-Wilk test. The Student's t-test was used to compare variables between groups when the data distribution was normal; in other cases, the Wilcoxon test was used.

Comparisons of relative frequencies were performed using Pearson's chi-square test. The null hypothesis of equality of variables was rejected at  $p < 0.05$ .

### Results

Significant improvements in all PAC-QOL scale indicators were observed one year after surgery. The physical component score decreased from  $2.78 \pm 0.52$  to  $1.01 \pm 0.32$ ;  $p < 0.01$ ; the psychological component score decreased from  $1.90 \pm 0.48$  to  $0.83 \pm 0.41$ ;  $p < 0.01$ ; the anxiety component score decreased from  $1.99 \pm 0.31$  to  $0.72 \pm 0.34$ ;  $p < 0.01$ ; and the satisfaction component score decreased from  $2.35 \pm 0.60$  to  $0.84 \pm 0.47$ . The total PAC-QOL score decreased from  $2.14 \pm 0.23$  to  $0.82 \pm 0.35$ ;  $p < 0.01$  (Figure).

Overall, a reduction in the PAC-QOL score was observed one year after surgery, with an average improvement of  $61.5 \pm 14.9\%$  (ranging from 6.2 % to 77.2 %). The highest percentage of improvement was registered in the «Satisfaction» component, with an increase of  $81.2 \pm 15.0\%$  (ranging from 33.3 % to 88.2 %), while the lowest improvement was in the psychological component,  $56.7 \pm 16.1\%$  (ranging from 0.0 % to 78.6 %).

For the physical component, the percentage of improvement was  $63.14 \pm 11.23\%$  (ranging from 30.0 % to 81.82 %), and for the worries component, it was  $64.0 \pm 15.75\%$  (ranging from 0.0 % to 77.2 %).

### Discussion

The primary aims of colectomy in patients with CSTC were to relieve constipation and increase the frequency of bowel movements.

Total colectomy has been proven to be effective for patients with CSTC, with some studies reporting satisfaction rates exceeding 80 % in this group of patients [6, 9, 12].

In this study, we analyzed the QoL in patients with CSTC before and after surgical treatment using the PAC-QOL questionnaire. We found limited information regarding the use of the PAC-QOL questionnaire in patients with CSTC before and after colectomy, as reported by different authors.

Different questionnaires were used to assess the severity of constipation. In a study published in 2015, both PAC-QOL and SF-36 questionnaires were used to analyse patients with chronic functional constipation and irritable bowel syndrome (IBS) with constipation according to the Rome III criteria. The study included PAC-QOL data from 43 patients (14 % with IBS with constipation predominance, 37 % with functional constipation, and 49 % with unclassified constipation) and SF-36 data from 93 patients (23 % with IBS with constipation predominance, 27 % with functional constipation, and 51 % with unclassified constipation).

The SF-36 questionnaire revealed that patients with irritable bowel syndrome (IBS) had a poorer quality of life compared to the functional constipation and unclassified constipation groups. Statistically significant differences were observed between IBS patients and those with functional constipation in the fatigue/energy subscale, favouring the latter, and in the pain subscale between IBS patients with constipation predominance and those with unclassified constipation.

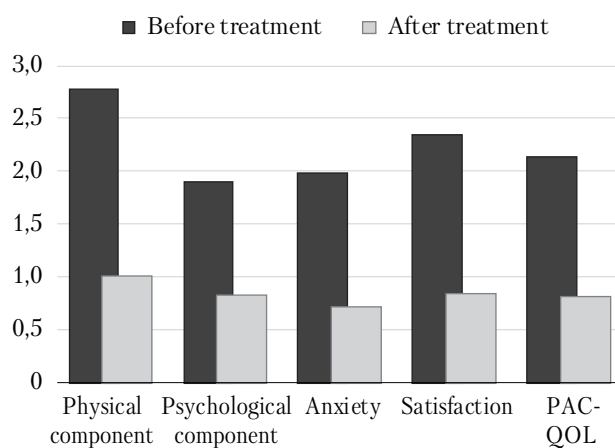


Figure. Average scores for individual PAC-QOL subscales before and after surgical treatment in patients with CSTC

The PAC-QOL questionnaire also revealed that IBS patients performed worse than those with functional constipation in the following components: physical, psychological, worries, satisfaction, and total PAC-QOL score [10].

In our study, significant improvements in QoL for PAC-QOL subscales were observed in patients with CSTC following surgical treatment, demonstrating the effectiveness of using this disease-specific scale. Unlike the data described by M. C. Ruiz-López, other authors evaluated the QoL in 30 patients with CSTC after colectomy using the Gastrointestinal Quality of Life Index (GIQLI) and SF-36 questionnaires.

The GIQLI scores were found to improve significantly ( $p < 0.05$ ) over the entire follow-up period (3 months, 6 months, 1 year, and 2 years) as follows:  $77.8 \pm 17.5$  before surgery,  $109.7 \pm 21.2$  at 3 months,  $115.0 \pm 20.7$  at 6 months,  $121.3 \pm 20.3$  at 1 year, and  $123.6 \pm 17.5$  at 2 years.

The SF-36 results demonstrated significant improvements in six health domains at 3, 6, 12, and 24 months post-colectomy: physical role, emotional role, physical pain, vitality, mental health, and general health status.

Thus, this study demonstrated that total or subtotal colectomy for CSTC is not only an effective method for relieving constipation-associated symptoms but also significantly improves patients' QoL [15].

Some authors also report a decline in QoL according to the SF-36 scale following total colectomy with ileorectal anastomosis in patients with inert colon. The results of total colectomy in 17 women with an inert colon were analysed. The follow-up period was  $58.3 \pm 27.3$  months. SF-36 scores were significantly lower compared to the general population ( $p < 0.005$ ). Despite substantial improvements in constipation symptoms, the quality of life deteriorated significantly.

In univariate regression analysis, postoperative abdominal pain was a predictive factor for lower scores in the general health and vitality domains, while the need for manual assistance was predictive of lower scores in the physical function, social functioning, and emotional role limitation domains. Thus, postoperative pain and functional impairments are predictors of lower QoL scores [14].

## Conclusions

According to the PAC-QOL scale, surgical treatment involving colectomy improves QoL significantly in the long-term postoperative period in patients with CSTC who are resistant to conservative therapy. Overall PAC-QOL scores improved by

61.51 %, as did all components: physical (63.14 %), psychological (56.73 %), anxiety (64.0 %), and satisfaction (81.2 %).

## DECLARATION OF INTERESTS

The authors declare that they have no conflicts of interest.

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The work was performed in accordance with the research plan of the Department of Surgery with the course of Emergency and Vascular Surgery at Bogomolets National Medical University.

## AUTHORS CONTRIBUTIONS

Conception and design, statistical analysis — I. M. Leshchyshyn, L. Y. Markulan; acquisition and interpretation of data — I. M. Leshchyshyn, O. I. Okhotska, P. L. Byk; drafting the article — I. M. Leshchyshyn; critical revision of the article — I. M. Leshchyshyn, P. L. Byk.

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## Якість життя за шкалою PAC-QOL пацієнтів із хронічним повільнотранзитним запором після хірургічного лікування

І. М. Лещишин, Л. Ю. Маркулан, О. І. Охоцька, П. Л. Бик

Національний медичний університет імені О. О. Богомольця, Київ

Хронічний запор є поширеною гетерогенною патологією, що вражає всі групи населення, а його поширеність зростає з віком. У загальній популяції поширеність хронічних запорів становить від 3 до 27 %, у середньому — 16 %, серед осіб віком від 60 років — 33,5 %. Інформація про якість життя хворих на хронічний повільнотранзитний запор (ХПТЗ) в Україні дуже обмежена.

**Мета** — оцінити якість життя хворих на хронічний повільнотранзитний запор за шкалою PAC-QOL (Patient Assessment of Constipation Quality of Life Questionnaire) після хірургічного лікування.

**Матеріали та методи.** У хірургічному відділенні Свято-Михайлівської клінічної лікарні в 2011—2023 рр. обстежено та проліковано 107 хворих на ХПТЗ.

**Результати.** Через рік після операції зафіксували значне поліпшення всіх показників шкали PAC-QOL. Показник фізичного компонента знизився з  $(2,78 \pm 0,52)$  до  $(1,01 \pm 0,32)$  бала ( $p < 0,01$ ), показник психологічного компонента — з  $(1,90 \pm 0,48)$  до  $(0,83 \pm 0,41)$  бала ( $p < 0,01$ ), показник компонента тривожності — з  $(1,99 \pm 0,31)$  до  $(0,72 \pm 0,34)$  бала ( $p < 0,01$ ), показник компонента задоволеності — з  $(2,35 \pm 0,60)$  до  $(0,84 \pm 0,47)$  бала. Загальний бал PAC-QOL зменшився з  $2,14 \pm 0,23$  до  $0,82 \pm 0,35$  ( $p < 0,01$ ). Через рік після операції оцінка за PAC-QOL у середньому поліпшилася на  $(61,5 \pm 14,9)$  % (від 6,2 до 77,2 %). Найбільше поліпшився компонент задоволеності — на  $(81,2 \pm 15,0)$  % (діапазон — 33,3—88,2 %), найменше — психологічний компонент —  $(56,7 \pm 16,1)$  % (діапазон — 0—78,6 %). Для фізичного компонента відсоток поліпшення становив  $63,14 \pm 11,23$  (діапазон — 30,0—81,82 %), для компонента тривожності —  $64,0 \pm 15,75$  (діапазон — 0,0—77,2 %).

**Висновки.** Хірургічне лікування з колектомією у хворих із резистентним до консервативної терапії ХПТЗ забезпечує статистично значуще поліпшення якості життя за шкалою PAC-QOL у віддалений післяопераційний період. Поліпшення зареєстровано як за загальним показником PAC-QOL (61,51 %), так і за всіма компонентами: фізичним (63,14 %), психологічним (56,73 %), тривожності (64,0 %) і задоволеності (81,2 %).

**Ключові слова:** хронічний повільнотранзитний запор, шкала PAC-QOL, якість життя.

### FOR CITATION

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