

# Educational and Psychological Support Combined with Minimally Invasive Surgery Reduces Perioperative Depression and Anxiety in Patients with Bladder Cancer Treated with Radical Cystectomy.

Artur Lemiński (✉ [artur.leminski@gmail.com](mailto:artur.leminski@gmail.com))

Pomeranian Medical University <https://orcid.org/0000-0003-1446-2970>

Krystian Kaczmarek

Pomeranian Medical University in Szczecin: Pomorski Uniwersytet Medyczny w Szczecinie

Marcin Słojewski

Pomeranian Medical University: Pomorski Uniwersytet Medyczny w Szczecinie

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## Original Article

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# Abstract

## Purpose

Radical cystectomy (RC) for muscle-invasive bladder cancer (MIBC) is an extensive and morbid operation, often associated with a permanent alteration of body image. Combined with aggressive malignant potential of MIBC and considerable risk of complications, it may pose a serious threat to psychological well-being of patients. Educational deficiencies not infrequently encountered in everyday hospital practice, may lead to confusion and further aggravate procedure-related emotional distress. We conceived a preoperative informational and supportive program named “Cystocare”, with monthly meetings held by a team of urologists, stoma therapist, psychologists and cancer survivors to facilitate patients’ adaptation and coping. We aimed to evaluate whether participation in Cystocare meetings would alleviate emotional distress in patients undergoing RC.

## Methods

We included 95 consecutive patients who agreed to participate and returned Hospital Anxiety and Depression Score (HADS) questionnaires before RC and on discharge. The intervention arm (A) comprised 32 patients who participated in meetings, the remaining 63 constituted controls (B). Patients from arm A were significantly younger than controls (mean age arm A: 64.7 SD 8.25; arm B: 68.8 SD 7.87), there were no further differences between study arms.

## Results

We found no differences between groups in median anxiety and depression scores preoperatively. In postoperative measurement, the intervention arm showed significantly lower median depression score than controls: 3 vs 8 points,  $p=0.015$ , while the anxiety score remained comparable. On multivariate analysis we found lower odds of preoperative anxiety in patients planned for laparoscopic RC  $OR=0.351$  (95%CI: 0.139-0.884),  $p=0.026$ , lower risk of postoperative depression in patients from arm A  $OR=0.253$  (95% CI: 0.087-0.732)  $p=0.011$  and higher risk of postoperative anxiety in patients whose length of stay exceeded 7 days  $OR=9.48$  (95%CI: 1,146-78,428)  $p=0.037$ .

## Conclusions

Preoperative educational and supportive intervention combined with minimally invasive approach to RC seem effective in alleviation of surgery-related anxiety and depression.

## Introduction

Radical cystectomy (RC) with pelvic lymphadenectomy remains the mainstay of surgical treatment for muscle-invasive bladder cancer (MIBC) [1]. It is an extensive surgical procedure, and regardless of the surgical technique used, it is associated with substantial morbidity and high burden of complications [2]. The majority of patients would still receive an incontinent urinary reconstruction which implicates

creation of a unilateral or bilateral urostomy, leading to a permanent depreciation of body image. Radical cystectomy is a life transforming surgery affecting numerous aspects of patients' functioning, which include, but are not limited to self-care and stoma management, everyday coping, sexuality and psychological well-being. All these factors combined with informational and supportive deficiencies not infrequently encountered in everyday practice of urological departments, may contribute to significant psychological distress of patients with MIBC scheduled to undergo RC [3, 4].

We sought to evaluate, whether a preoperative supportive and educational intervention within a support group program named 'Cystocare' would lead to an improvement in patients' mental well-being within a perioperative period.

## Methods

Our study was conducted amongst patients undergoing RC in Department of Urology of the Pomeranian Medical University, Szczecin, Poland. Patients scheduled for surgery were invited to participate in Cystocare meetings together with their families and caregivers. The meetings were held on a monthly basis since April 2017, run by a team of urologists, stoma therapist, clinical psychologist and educators: patients who underwent RC in the past and volunteered to share their experience. Each meeting consisted of two parts. The first educational part included a short lecture on RC, types of urinary reconstruction, necessary preparation for the surgery, and a day-to-day description of a typical hospital stay of a cystectomy patient. Patients were also familiarized with their part of Enhanced Recovery After Surgery (ERAS) protocol procedures, with a strong emphasis placed on diet and a prehabilitation program involving a gradual increase in aerobic physical activity, cessation of smoking and alcohol, along with medical optimization of their comorbidities. The second psychotherapeutic and supportive part of the meeting included individual consultations with clinical psychologist, stoma therapist and discussions with educators on various aspects of everyday life after RC.

From the study population we excluded patients with significant cognitive impairment and patients with previous diagnosis of anxiety or depression and history of psychiatric treatment. Consequently, we prospectively enrolled 95 patients to the study cohort, which was divided into two arms: patients who participated in one or more Cystocare program meetings (arm A) and a standard preparation arm (arm B), which included patients who did not respond to invitation or refused to participate and were prepared for RC in a traditional way. The latter included distribution of information brochure on RC and a preoperative meeting with a surgeon and a stoma therapist. Intensity of psychological distress symptoms was measured using the Hospital Anxiety and Depression Scale (HADS) questionnaire in both study arms. The questionnaire was used twice for each participant: baseline assessment was made on the day before surgery, and a postoperative one on the day of discharge. The HADS questionnaire allowed for separate measurements of anxiety and depression intensity, and these were compared between study arms A and B. We used the recommended cut-off value of 8 points for each of the HADS subdomains to identify patients at risk for anxiety and depression respectively [5]. We also sought to evaluate other factors influencing patients' mental well-being and therefore performed a multivariate analysis of additional

clinical features potentially influencing their emotional comfort. These included: age, sex, surgical access (open vs lap.), length of hospital stay (LOS:  $\leq 7$  vs  $> 7$  days), incidence of severe (grade 3-4) complications and type of urinary diversion. Single variables were compared using an independent t-test for parametric variables and a Mann-Whitney U-test for non-parametric variables. The multivariate analysis was performed with Cox proportional hazard test. We considered  $p$  value  $< 0.05$  statistically significant and all  $p$  values were two-sided. All tests were performed with Statistica software, version 13.5 (StatSoft, Inc., Tulsa, OK).

## Results

Ninety-five consecutive patients who correctly filled and returned HADS questionnaires constituted the study group. In a cut-off level analysis, 43 (45.3%) and 37 (38.9%) patients had preoperative anxiety and depression, respectively. After RC, the anxiety and depression rates have not decreased significantly. Postoperative anxiety was noted in 37 patients (38.9%;  $p = 0.185$ ), whereas 36 patients were at risk of depression (37.9%  $p = 0.444$ ). Thirty-two (33.6%) patients responded to invitation and agreed to participate in the Cystocare meetings. Younger patients were more likely to join the program (mean age arm A: 64.7 SD 8.25; arm B: 68.8 SD 7.87). There were no further differences in demographic and clinical features of patients between both study arms [Table 1].

The median preoperative anxiety and depression scores were comparable in both arms: HADS baseline - Arm A anxiety: 7 points, Arm B anxiety: 8 points,  $p = 0.096$ ; Arm A depression: 5 points, Arm B depression: 6.5 points,  $p = 0.302$ . Furthermore, in multivariable analysis, attending the Cystocare meeting had no influence on preoperative level of anxiety and depression. Nonetheless, we found a lower risk for borderline/abnormal preoperative anxiety in patients planned for laparoscopic RC, compared to those scheduled for an open procedure: OR = 0.351 (95%CI: 0.139–0.884),  $p = 0.026$  [Table 2].

The median postoperative anxiety score was similar in both study arms: Arm A: 6 points, Arm B: 8 points,  $p = 0.127$ . However, there was a significantly lower median postoperative depression score in patients from Arm A: 3 points, compared to patients from Arm B: 8 points,  $p = 0.015$ . Moreover, in a multivariable analysis of postoperative data, we found that there was a lower risk of borderline/abnormal depression score in patients who participated in one or more Cystocare meetings (Arm A) OR = 0.253 (95% CI: 0.087–0.732)  $p = 0.011$  [Table 3].

In additional evaluation of factors associated with prolonged length of hospital stay we found it was strongly associated with abnormal postoperative anxiety score OR = 9.48 (95%CI: 1,146 – 78,428)  $p = 0.037$  and with type of surgical approach (laparoscopic vs open RC), favoring the laparoscopic technique OR = 0.278 (95%CI: 0.095–0.814)  $p = 0.019$  [Table 4].

## Discussion

The psychological distress symptoms, specifically depression and anxiety remain an inherent part of oncological surgery. This is particularly true for RC patients in whom the prevalence of psychological distress is higher than in those affected with other cancers [6]. The emotional response may be a function of different factors such as diagnosis of an aggressive tumor with uncertain long-term prognosis, large extent of the imminent surgical procedure and the need for an alternative urinary diversion, frequently leading to a permanent deterioration of body image. Bearing in mind the complexity of emotional response preoperative support and psychological preparation to RC is likely to play a substantial role, particularly given that patient reported mental health has been independently associated with incidence of high-grade complications after cystectomy [7].

Most studies investigating emotional response to surgery have demonstrated an elevated risk of anxiety and depression before surgery, followed by a significant decrease thereafter. This phenomenon was described amongst patients subjected to emergency and major elective surgeries, including RC [6, 8]. In our study more than one third of patients who were scheduled to RC had anxiety and depression symptoms within the mild to severe range (HADS score  $\geq 8$ ). Interestingly, the overall proportion of patients at risk has not decreased significantly on the day of discharge. This is in line with findings from Benner et al., who observed an increase in depression symptoms during follow-up after RC. In aforementioned study, pre-cystectomy average HADS scores for anxiety and depression were within normal range, whereas at 4 and 6 months after RC increased to borderline abnormal level [9]. It may indicate that in certain groups of patients with MIBC treated with RC distress may continue to accumulate after surgery, a phenomenon possibly related to urinary diversion type and supportive undertakings. Taking above into account, establishing mechanisms to preemptively moderate the emotional response of cystectomy patients seems a very attractive pathway.

There is now general understanding that educational and psychological preparation for surgery is advantageous for most patients, however there is a paucity of outcomes for patients who were scheduled for elective RC [10]. The effects of psychological preparation have mostly been measured after non-urolurgical surgeries [11, 12]. Moreover, the influence of preoperative psychological preparation was usually measured 3 months or later after surgery [12]. These outcomes may in greater extent represent the preparation for the long-term sequelae of the procedure, rather than preparation to handle procedure-related stress itself. Taking this into account, in our study we restricted assessment of anxiety and depression to the immediate perioperative period. Consequently, we chose the Hospital Anxiety and Depression Scale, designed primarily for hospital use and despite its subsequent validation in different clinical settings, we decided to use it only for inpatients [13]. This study design enabled us to investigate direct association between preoperative supportive and psychological intervention and early emotional response to RC.

It remains undetermined which preparation techniques would bring most benefit to population of patients with MIBC undergoing RC. To date, several forms of preoperative supportive and educational interventions have been proposed, and some proven effective in improving physical performance, emotional functioning and self-caring of patients after cystectomy [14, 15]. Our study revealed a

significant reduction in postoperative depression within a subgroup of patients who joined Cystocare meetings and followed the prehabilitation program during preparation for surgery. Effects of psychotherapy on depressive symptoms in cancer patients have been summarized in recent systematic review which demonstrated that cognitive behavioral therapy (CBT) brings the best outcome [16]. However, this review included only incurable cancer patients and the number of those with BC was limited. Effectiveness of CBT after surgery for early-stage cancer patients was reported by Stagl et al. Women with stage 0 to IIIb breast cancer were recruited after surgery and randomized to cognitive-behavioral stress management or control group. Participants assigned to intervention group reported significantly lower depressive symptoms OR 0.63 (95%CI: 0.56–0.70) [12]. The abovementioned findings are obviously difficult to translate into perioperative settings and associated depressive symptoms of a cystectomy patient. We believe our study contributes to the scarce evidence on the effectiveness of preemptive supportive and psychotherapeutic intervention in alleviating perioperative psychological distress symptoms amongst cystectomy patients.

Our study also showed a beneficial influence of minimally invasive surgical technique on preoperative anxiety. Patients due to undergo a laparoscopic RC suffered significantly less anxiety than those planned for an open procedure. Interestingly, conflicting results were presented by recent comparison of laparoscopic and open cholecystectomy. Patients, who underwent laparoscopic cholecystectomy more frequently presented moderate to high level of anxiety preoperatively [17]. These surprising results may suggest difficulties in patients' adaptation to rapid technical developments in surgery. Some patients may find it difficult to believe that surgery can safely be performed through a small incision, a phenomenon which emphasizes the importance of a thorough patient information. Therefore, patients who are operated in a high-volume center with extensive experience in laparoscopic surgery may experience lower anxiety before surgery. It may be one of plausible explanations of our results. Our department is a pioneer and one of the highest volume centers for laparoscopic RC in Poland, and closely follows all developments in this field. Nevertheless, up to our knowledge our study is the first one to demonstrate such benefit of laparoscopic approach to RC.

Our study also revealed the association between abnormal level of postoperative anxiety and hospital stay longer than a week, even in absence of high-grade complications. This finding has some plausible explanations. Patients with an increased anxiety level are more often reluctant to leave the hospital earlier, as they may worry about being challenged with new everyday reality after the surgery at home [18, 19]. At the same time, a prolonged hospital stay may represent a source of anxiety itself, when patients are becoming increasingly concerned about the postoperative course not going exactly according to plan.

We are aware of certain limitations of this study. None of patients from our cohort received an orthotopic bladder substitution. Patients from the intervention arm were also significantly younger than those who received standard preparation, which may represent their more proactive approach to treatment and more positive attitude towards impending surgery, nonetheless patients' age has not been independently associated with any of the HADS domain sub-scores.

## Conclusions

Preoperative educational and supportive intervention within a support group program improves patient's preparation for surgery and adjustment to its sequelae, resulting in decrease of depression intensity on discharge. Minimally invasive surgical technique is associated with a lower intensity of preoperative anxiety, and allowing shorter hospital stay, also contributes to a decrease in proportion of patients experiencing intensified postoperative anxiety.

## Declarations

### Funding:

The study required no external funding.

### Conflicts of interest:

none applicable to the study (see attached forms)

### Ethics approval:

Ethical approval was waived by the local Ethics Committee of Pomeranian Medical University in view of the retrospective nature of the study and all the procedures being performed were part of the routine patient care.

### Consent to participate:

Verbal informed consent was obtained from each participant prior to the questionnaire distribution.

### Consent for publication:

N/A

### Availability of data and material:

All source data regarding the Cystocare program are available from the corresponding author

### Code availability:

N/A

# Authors' contribution:

Artur Lemiński: study design, data collection, manuscript

Krystian Kaczmarek: data integrity and analysis, manuscript revisions

Marcin Słojewski: manuscript revisions and proofing.

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## Tables

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