Low Anterior Resection Syndrome Score

Development and Validation of a Symptom-Based Scoring System for Bowel Dysfunction After Low Anterior Resection for Rectal Cancer

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Objective: The aim of this study was to develop and validate a scoring system for bowel dysfunction after low anterior resection (LAR) for rectal cancer, on the basis of symptoms and impact on quality of life (QoL).

Background: LAR for rectal cancer often results in severe bowel dysfunction (LAR syndrome [LARS]) with incontinence, urgency, and frequent bowel movements. Several studies have investigated functional outcome, but the terminology is inconsistent hereby complicating comparison of results.

Methods: Questionnaires regarding bowel function was sent to all 1143 LAR patients eligible for inclusion identified in the national Colorectal Cancer Database. Associations between items and QoL were computed by binomial regression analyses. The important items were selected and regression analysis was performed to find the adjusted risk ratios. Individual score values were designated items to form the LARS score, which was divided into "no LARS," "minor LARS," and "major LARS." Validity was tested by receiver operating characteristic (ROC) curve and Spearman's rank correlation and discriminant validity was tested by Student *t* tests.

Results: A total of 961 patients returned completed questionnaires. The 5 most important items were "incontinence for flatus," "incontinence for liquid stools," "frequency," "clustering," and "urgency." The range (0–42) was divided into 0 to 20 (no LARS), 21 to 29 (minor LARS), and 30 to 42 (major LARS). The score showed good correlation and a high sensitivity (72.54%) and specificity (82.52%) for major LARS. Discriminant validity showed significant differences between groups with and without radiotherapy ($P < 0.0001$), tumor height more or less than 5 cm ($P < 0.0001$), and total mesorectal excision/ partial mesorectal excision ($P = 0.0163$).

Conclusions: We have constructed a valid and reliable LARS score correlated to QoL—a simple tool for quick clinical evaluation of the severity of LARS.

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During the past decades, treatment and cure of rectal cancer have improved markedly. These advancements have resulted in more patients receiving sphincter-preserving surgery with a low colorectal or a coloanal anastomosis to avoid permanent colostomy. Unfortunately, many of these patients develop severe bowel dysfunction resulting in incontinence for flatus and/or feces, urgency, and frequent bowel movements. This combination of symptoms after LAR is referred to as *LAR syndrome* (LARS) and can be associated with a negative impact on quality of life (QoL).[1,2]

In a recent Cochrane review on the effect of reconstruction on the functional outcome, the authors intended to do a meta-analysis to combine the data from the trials and report pooled odds ratios and risk differences. Unfortunately, the use of many different scales for reporting the function made a meta-analysis impossible. For instance, fecal incontinence was reported using 7 different scales. Therefore the results were reported in tabular form and discussed qualitatively only.[3]

To be able to assess the functional outcome after surgery and to compare results from different surgical approaches and from different studies, it is important that uniform terminology and scales are used. The Wexner incontinence score, the Rockwood Fecal Incontinence Severity Index, or the St Marks' Fecal Incontinence Grading Score are used in several studies to assess the incontinence in LARS patients.[4–12] Although very useful in assessing simple incontinence, they are much too narrow and specific for assessing the complicated dysfunctions in LARS, which in many cases include fragmentation and urgency.[13] Also these scores do not incorporate the degree of subjective bother or impact on QoL. A scoring system based purely on quantification of symptoms, without considering the degree of subjective bother, could give a wrong impression of the impact on the patient's life. A scoring system used for the assessment of the function should therefore be constructed by taking incidence and subjective bother/impact on QoL for each symptom into consideration. The objective of this study was to develop and validate a scoring system based on the symptoms and impact on QoL to evaluate bowel dysfunction after LAR.

METHODS

The Danish Colorectal Cancer Group has prospectively registered all patients diagnosed with rectal cancer in Denmark since May 2001. The database contains information on patient characteristics, stage of disease, and treatment. Through this database, patients eligible for inclusion were identified. The inclusion criterion was curative LAR for nondisseminated rectal cancer during the period of May 2001 to April 2007. According to national guidelines, LAR includes all patients receiving a total mesorectal excision (TME) or a partial mesorectal excision (PME) for rectal cancer with the creation of an anastomosis. Through cross-checking with the National Patient Registry, patients eligible for this study were identified. The exclusion criteria were the following: disseminated or recurrent disease, younger than 18 years, previous cancer excluding spinocellular and basocellular carcinoma of the skin, mental dementia, and the inability to read and understand the Danish language. Data on the patients' mental states and their language abilities were not available through registries and was therefore obtained by contacting their general practitioners.

Of 2557 patients meeting the inclusion criteria, 1414 patients met the exclusion criteria. The remaining 1143 patients were contacted by mail during the spring of 2009 and asked to participate in the study (Fig. 1). The study was approved by the Regional Committee on Biomedical Research Ethics and supported by the Danish Cancer Foundation.

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